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Condition assessment for the designated feature of Ardal Gwarchodaeth Arbennig Glannau Aberdaron and Ynys Enlli / Aberdaron Coast and Bardsey Island Special Protection Area

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Manx Shearwater *Puffinus puffinus* © Martin Reith. This file is licenced CC BY-SA 3.0

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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) Glannau Aberdaron and Ynys Enlli. 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 Glannau Aberdaron and Ynys Enlli.

Nodweddion Dynodedig	Asesiad cyflwr	Hyder yn yr asesiad
Aderyn drycin Manaw *Puffinus puffinus*	Ffafriol	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 of Manx shearwater *Puffinus puffinus* within Aberdaron Coast and Bardsey Island special protection area (SPA). Section 1 gives an overview of the assessment process and Section 2 provides a description of the feature.

The assessments are based on the best evidence available at the time of assessment (late 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 IMCA final report.

Summary of condition assessments for the designated features of Aberdaron Coast and Bardsey Island SPA.

Designated Features	Condition assessment	Confidence in assessment
Manx shearwater *Puffinus puffinus*	Favourable	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 indicative condition assessments 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 IMCA final report.

Table 1: Details the main steps of the marine feature condition assessment process.

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 site lies at the very southwestern tip of the Llŷn Peninsula, almost surrounded by the Irish Sea and exposed to the prevailing winds and weather systems. Its habitats are influenced by its location, geology and the climate, and the coastal area supports some of the best remaining examples of coastal and maritime heaths and grasslands on the Llŷn, while areas further inland support more agriculturally improved areas. The site includes the end of the Llŷn peninsula as well as three islands, Ynys Enlli/Bardsey and two small islands known as Ynysoedd y Gwylanod. The site is designated as an SPA for its Manx shearwater breeding populations which are situated on Bardsey Island. The site also has an SPA feature of chough *Pyrrhocorax pyrrhocorax* who use parts of the coast as well as the islands. As chough is not considered a seabird this species is not an MPA feature and is therefore not considered in this condition assessment.

The Manx Shearwater is a pelagic seabird, only returning to land to breed on a small number of select offshore North Atlantic islands. Bardsey is the fifth largest Manx Shearwater colony in the world and is the third largest of the three major colonies in Wales, following Skomer and Skokholm (Bolton and Thompson, 2023).

The site was classified in 1992 and then extended in 2017 to include an extension up to 9km out to sea for preening, bathing, displaying and rafting. The seaward extension was based on fieldwork undertaken on Bardsey Island to ascertain the rafting area utilised by Manx shearwaters. The methodology involved tagging individual breeding birds which were then tracked using radiotelemetry, to determine the location of rafting birds and to assess how regularly rafts were used (McSorley et al., 2003).

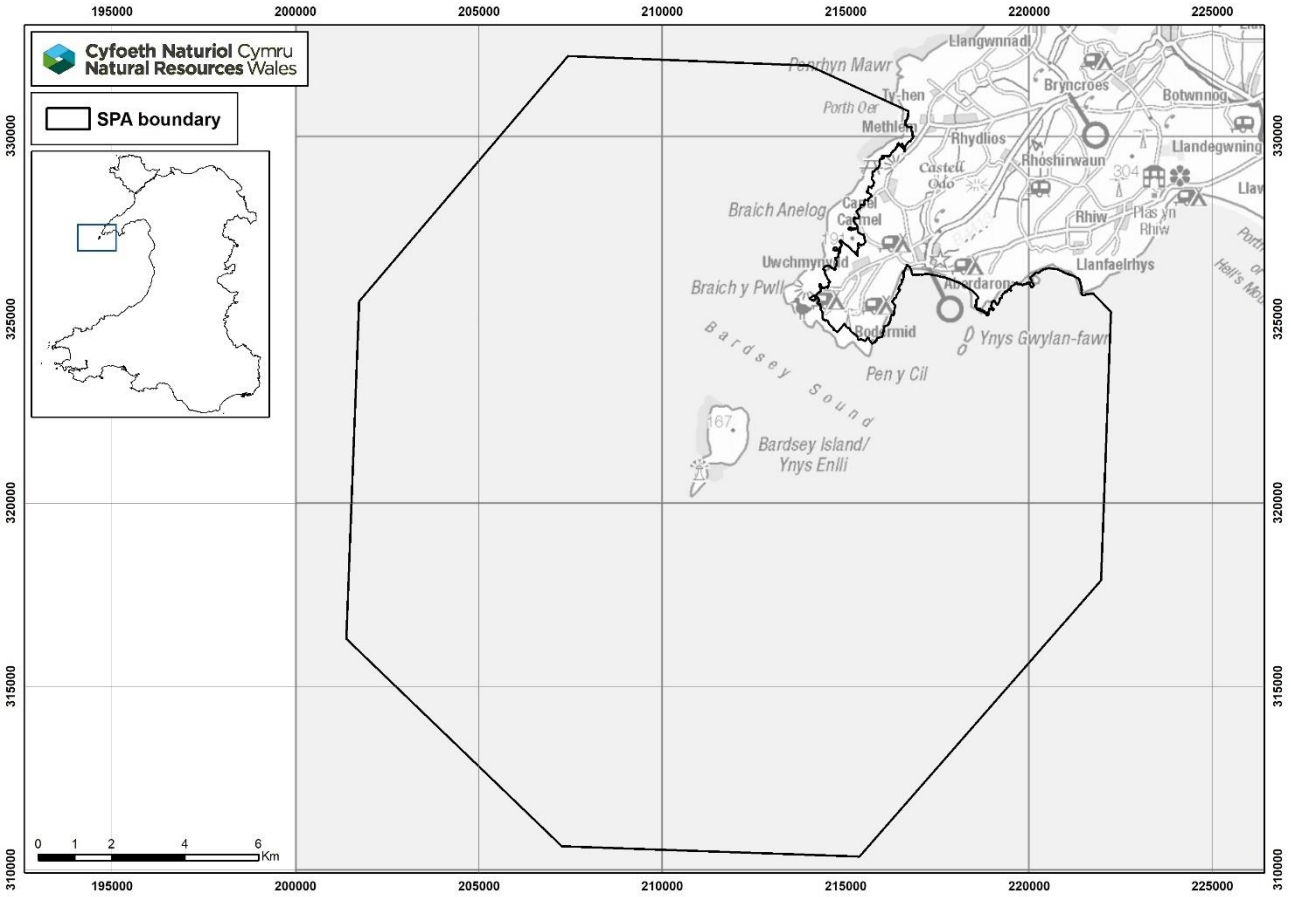
3. Feature condition assessments

The condition assessment for Manx shearwater was based on a report from 2022 by staff at the Bardsey Bird and Field Observatory who carried out fieldwork for a number of projects with financial aid from Natural Resources Wales and on the expert knowledge and judgement of NRW staff.

Figure 1 is a map of the location of Aberdaron Coast and Bardsey Island SPA.

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

Figure 1. Map of the Aberdaron Coast and Bardsey Island SPA.



3.1 Condition assessment for Manx shearwater *Puffinus puffinus*

Manx shearwater in Aberdaron Coast and Bardsey Island 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 Manx shearwater in Aberdaron Coast and Bardsey Island 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	The population size of breeding Manx shearwater should be stable or increasing with no less than 10,000 breeding pairs. (P)	• The latest population estimate for Bardsey Island is 26,423 breeding pairs based on figures from 2019-2022 • The overall number of burrows counted (2019-2022) was 28,884, 55.80% above the total for the same areas in the previous census in (2014/2015). • The results of the 2019 to 2022 surveys suggest that Bardsey's Manx Shearwater population is still rapidly expanding. • Results are well above the target and are based on whole island counts so this indicator passes with high confidence.	**Pass**	High
Breeding population distribution	The distribution of the breeding Manx shearwater population should not be significantly impacted by anthropogenic activity. (P)	• There is currently no evidence of anthropogenic activities affecting the distribution of breeding Manx shearwater on this site. • Confidence is high as the site has wardens all year-round.	**Pass**	High

Indicator	Target	Assessment rationale	Target assessment	Target confidence
Population disturbance (by human activity)	Aggregations of breeding, roosting or feeding Manx shearwater are not subject to significant anthropogenic disturbance. (P)	• There are currently no recorded incidences on the island of disturbance to the Manx shearwater. • Wardens are present throughout the breeding season to control visitor disturbance.	**Pass**	High
Supporting habitat	Maintain sufficient extent, distribution, function and quality of habitat to support a Manx shearwater population of 10,000 breeding pairs. (S)	• Although supporting habitat is not directly monitored the high numbers of Manx shearwater within the SPA indicate that the supporting habitat is sufficient to support many more birds than the minimum required, so this indicator passes. • As this is not directly monitored and based on expert judgement the confidence in the assessment of this indicator is medium.	**Pass**	Medium
Prey availability	Maintain the distribution and abundance of Manx shearwater food supply at levels sufficient to support a population of 10,000 breeding pairs of Manx shearwaters. (S)	• As with supporting habitat this indicator is not directly monitored. • The large increase in Manx shearwaters (61% from 2001 to 2022), means that the food availability is sufficient to support a large number of birds well above the target of 10,000 pairs (BBFO, 2022). • As this is not directly monitored and based on expert judgement the confidence in the assessment of this indicator is medium.	**Pass**	Medium
Invasive species	No invasive species not native to the islands of the SPA should be present. (S)	• There are no known invasive species present on the island and biosecurity measures are in place to prevent harmful mammals reaching this island, allowing the indicator to pass with high confidence.	**Pass**	High

Assessment conclusions

Manx shearwater in Aberdaron Coast and Bardsey Island SPA have been assessed as favourable (high confidence) as all indicators passed (Table 3). The main threats to the Manx shearwater in Aberdaron Coast and Bardsey Island SPA come from invasive mammals, disturbance and climate change. Further information on the assessment outcome and threats to condition can be seen in the detailed assessment information below.

Table 3. Overall condition assessment for Manx shearwater in Aberdaron Coast and Bardsey Island SPA.

SPA Feature	Overall Condition Assessment	Indicator failures	Reason for failure	Threats to condition
Manx shearwater *Puffinus puffinus*	**Favourable (high confidence)**	None	None	• Invasive mammals • Disturbance • Climate change

Detailed assessment information

Breeding population

Manx shearwaters spend most of the year at sea returning to land only to breed. They nest in burrows and under boulders, only coming ashore under the hours of darkness in order to evade predators such as great skuas and great black-backed gulls. Most of the estimated world population of c. 744,697– 1,222,457 pairs of Manx shearwaters breed in Britain and Ireland (Bolton and Thompson, 2023).

The Manx Shearwater is the most northerly Atlantic breeding shearwater species, and the UK holds over 96% of the world's population (Bolton and Thompson, 2023). Bardsey is the fifth largest Manx Shearwater colony in the world and the third largest colony in Wales, with Skomer and Skokholm holding larger populations (Bolton and Thompson, 2023; Perrins et al., 2012).

Owing to the island's significance for Manx shearwaters, it is important that the colony is monitored on a regular basis. It is currently the only one of the four major global colonies to have a complete population census undertaken that involves a count of every burrow, rather than obtaining an estimate extrapolated from sample plots. This census has been carried out every six years since 1996 (BBFO, 2022).

Previously, the island has been divided into three sections and surveyed over a three-year period. However, due to the population increase over recent decades, the island has now been split into four areas and will be surveyed over a four-year period (2019-2022) (BBFO, 2022).

The results of the 2019 to 2022 surveys suggest that Bardsey's Manx Shearwater population is still rapidly expanding and that the island's carrying capacity for nesting Manx Shearwaters has not yet been reached. Combining the 2019-2021 census results, the overall number of burrows counted is 28,884, 62% greater than the census in 2001.

The island's population is now estimated at 26,423 pairs (BBFO, 2022) which is well above the 10,000 pairs target for this site. This allowed the population indicator to pass with high confidence.

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 or 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.

There is currently no evidence that the Manx shearwaters on Bardsey Island are experiencing a significant level of disturbance. There are full time wardens on the island

who control tourist disturbance and arrange controlled walks to see the Manx shearwaters. There is also a visitor centre and signs warning of the presence of nesting seabirds. Due to the management of disturbance the indicator passed 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, and feeding) is important to the condition of the Manx shearwaters using the SPA.

Manx shearwaters breed on Bardsey Island, but they also engage in a behaviour termed "rafting". This is where birds sit, often in large groups, on the water near to their island breeding colonies before and after visiting their chicks. Rafts move closer to the island during the night and further away in the morning which produces a "halo" effect - where no birds are found close to the island during daylight. These day-night cycles of rafting distributions have been studied for Manx shearwaters around Skomer Island and might provide a way of waiting for dusk that reduces predation risk (Richards et al., 2019).

The large numbers of Manx shearwater using the site allows us to conclude that the supporting habitat they are using while at the site is suitable to support the population. As there has been no direct monitoring of supporting habitat and expert judgement was used to the confidence in the pass is medium.

Prey availability

During the breeding-season birds regularly commute between their colonies and offshore feeding grounds that can be up to 1,500 km away (Wischnewski, et al., 2019). A Manx shearwater that nested on Bardsey Island in Wales in 2008 was more than 50 years old and estimated to have flown about 5 million miles in its lifetime (Wildlife trust website).

The Manx shearwater are thought to feed on small fish (herrings, sprats, and sand eels), crustaceans and cephalopods. The bird catches food off the surface or by pursuit diving, and forages alone or in small flocks. The diving behaviour of Manx shearwaters in Wales showed that all individuals routinely dived deeper than traditionally assumed, to a mean maximum depth of 31 m and occasionally down to nearly 55 m (Shoji, et al., 2016).

The large increase of Manx shearwater using the site allows us to conclude that the prey availability is sufficient to support the population. Confidence in the pass was medium as expert judgement has been used.

Invasive mammals

Manx shearwaters breed exclusively on islands, and it is important that they are free of mammals that predate eggs, chicks and adults. Manx shearwaters were believed to have been exterminated from their original colony on the Calf of Man in the Irish Sea by the introduction of rats from a shipwreck in the late 18th Century. More recently rats and cats were responsible for the eradication of Manx shearwaters from Canna in the Inner Hebrides. Those few colonies that occur on islands with rats are generally small and

limited in distribution. The exception is on the Isle of Rum (Lochaber), where the second largest single colony in the world coexists with rats, though there is evidence that deleterious impacts are occurring. Coexistence has been allowed by shearwaters nesting on the slopes of the island's mountains at altitudes of more than 450 m – higher than rats normally occur, though milder winters in recent years may be increasing the habitable range of rats into the shearwaters' range (JNCC website).

Bardsey is currently free of invasive mammals, and it was one of the islands that was covered in the biosecurity for LIFE project which aimed to plan and implement biosecurity measures to safeguard seabird islands against the threat of invasive non-native mammalian predators arriving and becoming established. Confidence in the pass was high due to the levels of management at the colony.

Reasons for target failure

Max shearwater in Aberdaron Coast and Bardsey Island SPA has been assessed as being in favourable condition as none of the performance targets failed.

Threats to condition

Part of the condition assessment is to identify threats to the condition of the Manx shearwater. 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 pre-emptive management in place to prevent further declines in condition. The threats to the Aberdaron coast and Bardsey island SPA for Manx Shearwater are stated below.

Invasive mammals

Any introduction of egg eating mammals (particularly rats) could have a devastating impact on the colony at Bardsey Island.

Disturbance

Although current disturbance levels are not affecting condition it is important that disturbance continues to be controlled, especially as the high levels of tourism locally would be a risk if not managed.

Climate change

It is not yet clear what pressures we will see from climate change at the site level or how different pressures will counter act each other, although it has been noted that extreme temperatures in summer on Skomer has led to the desertion of burrows. Other threats from climate change that could impact the species may include:

- Increasing sea surface temperature leading to changes to prey availability and abundance.
- Increase in weather extremes affecting ability to feed.

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.

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