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# Condition assessments for the designated features of Ardal Gwarchodaeth Arbennig Bae Caerfyrddin/ Carmarthen Bay Special Protection Area

Report No: 912

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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) Bae Caerfyrddin. 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 Bae Caerfyrddin.**

| Nodweddion Dynodedig | Asesiad cyflwr | Hyder yn yr asesiad |
|---|---|---|
| Môr-hwyaden ddu *Melanitta nigra* | Ffafriol | Canolig |

# 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 shearwaters *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 the condition assessment for the designated features of Carmarthen Bay SPA.**

| Designated Features | Condition assessment | Confidence in assessment |
|---|---|---|
| Common scoter *Melanitta nigra* | Favourable | Medium |

# 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 and feature description

The ardal gwarchodaeth arbennig Bae Caerfyrddin/ Carmarthen Bay special protection area (SPA) covers the majority of Carmarthen Bay in south Wales. The site was designated solely for the common scoter and was the first fully marine SPA in Wales. Carmarthen Bay is an extensive shallow bay with a wide variety of seabed types and is one of the most important individual wintering sites in Britain and Ireland for this species.

The SPA was designated in 2003 under Article 4.2 of the Convention on Wild Birds Directive (79/409/EEC) for regularly supporting at least 1.1% of the biogeographic population of non-breeding common scoter.

The common scoter is a large sea duck, 43–54 cm (17–21 in) in length, which breeds in the far north of Europe. The common scoter is characterised by its bulky shape and large bill. The male is all black with a bulbous bill which shows some yellow coloration around the nostrils. The female is brown with pale cheeks.

Common scoters are most often observed in inshore waters of less than 20 m in depth due to the energetic costs of diving to the seabed to forage for benthic prey (Kaiser et al., 2006). Water depth is therefore a critical parameter for common scoters and their distribution may shift according to tidal state and prey availability.

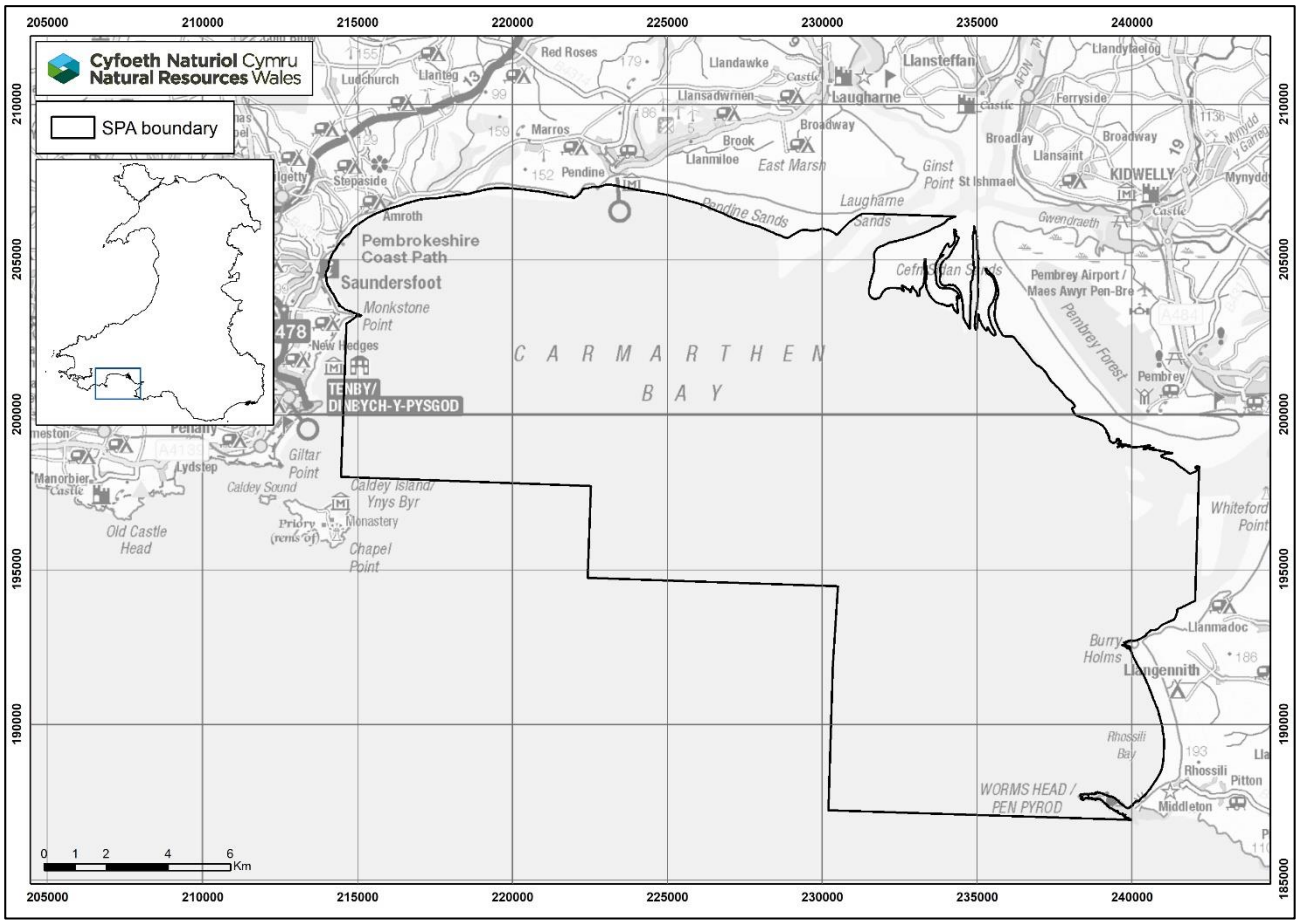
# 3. Feature condition assessment

The condition assessment for common scoter was based on monitoring commissioned by NRW and on the expert knowledge and judgement of NRW staff.

Figure 1 is a map of the location of Carmarthen Bay SPA.

More information on the SPA can be found in NRW's conservation advice on our website.

**Figure 1.** Map of the Carmarthen Bay SPA.



## 3.1 Condition assessment for common scoter *Melanitta nigra*

Common scoter in Carmarthen Bay SPA has been assessed in Table 2. The table has a summary of the assessment outcome against each performance indicator. This outcome and any reasons for failure are discussed in more detail in the sections below.

**Table 2.** Condition assessment of common scoter in Carmarthen Bay 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 |
|---|---|---|---|---|
| Wintering population | Maintain the wintering population of common scoter at or above 16,946 individuals. (P) | • Population size was estimated in February 2021 as 18,128 individuals (APEM, 2021). This exceeds the target set for this SPA.<br>• Peak counts between 1998/99 and 2020/21 (not all years available) suggest the abundance of common scoter in the bay is highly variable (Banks et al., 2004; WWT, 2012; APEM, 2017; APEM, 2021).<br>• Confidence is medium as the data are now three years old. | **Pass** | Medium |
| Wintering population distribution | The distribution of the common scoter population should not be significantly impacted by anthropogenic activity. (P) | • Common scoters are generally found throughout a 5 km wide band running from the northwest of the bay off Amroth and Saundersfoot to the east off Pembrey Sands, where the seabed is at 10 m depth or less (Banks et al., 2004; WWT, 2012; APEM, 2017; APEM, 2021).<br>• The latest survey in 2021 found birds distributed across the expected range in the SPA (APEM, 2021).<br>• There are currently no anthropogenic activity known to significantly impact their distribution in this SPA.<br>• Confidence is medium as the data are now three years old. | **Pass** | Medium |

| Indicator | Target | Assessment rationale | Target assessment | Target confidence |
|---|---|---|---|---|
| Wintering population disturbance (by human activity) | Aggregations of roosting or feeding common scoter are not subject to significant anthropogenic disturbance. (P) | • Common scoter is a very shy species and sensitive to disturbance from human activity. Common scoter had the highest vulnerability score in relation to disturbance by offshore wind farm, ship and helicopter traffic when compared to 25 other sea bird species (Garthe and Huppop, 2004).<br>• Throughout winter, common scoter numbers within Carmarthen Bay build up, with the largest peak usually occurring in January or February (Banks et al., 2004; McCormack et al., 2012).<br>• While Carmarthen Bay is popular for recreation boat use in spring / summer, the activity levels when the birds are present in winter are not currently impacting the species, as numbers of birds present is high and distribution across the SPA remains consistent.<br>• Confidence is medium due to a lack of direct activity monitoring. | **Pass** | Medium |
| Supporting habitat | Maintain sufficient extent, distribution, function and quality of habitat to support a common scoter population of 16,946 individuals. (S) | • Carmarthen Bay contains suitable habitat for common scoter which is evidenced by the large aggregation of common scoters in the winters of 2016/17 and 2020/21 utilising similar habitats across the SPA.<br>• Common scoters outside the breeding period, predominantly use marine environments, resting and feeding in aggregations in shallow, inshore waters, generally 500 m to c. 2 km from land, where depth is not more than 10–20 m and food is abundantly accessible.<br>• The link between common scoter distribution and depth is directly connected with the energetic cost of diving when feeding (Kaiser et al., 2006).<br>• Lack of direct monitoring has reduced the confidence. | **Pass** | Medium |

| Indicator | Target | Assessment rationale | Target assessment | Target confidence |
|---|---|---|---|---|
| Food availability | Maintain abundance and distribution of food supply at levels sufficient to support a population of 16,946 common scoters. (S) | • Common scoters are diving ducks that feed on benthic prey species.<br>• They feed predominantly on small bivalves such as cockles and clams, but will also eat a variety of other molluscs, crustaceans, and worms.<br>• As benthic feeders, the quality of common scoters diet is closely linked with the availability and condition of their shallow seabed habitat.<br>• The number of common scoter present in Carmarthen Bay is high and distribution across the SPA remains consistent so food availability is thought to be sufficient to maintain the population.<br>• The confidence is high as bivalves are monitored in this area. | **Pass** | High |

## Assessment conclusions

The common scoter feature in Carmarthen Bay SPA has been assessed as being in favourable condition (medium confidence) as all primary indicators passed (Table 3). The main threats to common scoter come from 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:** Summary of the condition assessment for common scoter in Carmarthen Bay SPA.

| SPA Feature | Overall Condition Assessment | Indicator failures | Reason for indicator failure | Threats to condition |
|---|---|---|---|---|
| Common scoter *Melanitta nigra* | **Favourable (medium confidence)** | None | None | • Disturbance<br>• Climate change |

# Detailed assessment information

## Wintering population & distribution

The population size of common scoter using Carmarthen Bay in February 2021 was estimated at 18,128 individuals. This is the peak count of common scoter in the bay during the 2020/21 winter season. As this exceeds 16,946 individuals the target has passed. A previous count in the winter of 2016/17 produced a winter peak of 34,244. However, peak counts between 1998-1999 and 2020/21 (not all years available) suggest the abundance of common scoter in the bay is highly variable (Banks et al., 2004; WWT, 2012; APEM, 2017; APEM, 2021). Confidence in the pass has been reduced to medium, as the supporting data are now three years old.

The distribution of common scoter within Carmarthen Bay varies spatially and temporally, between winters but also within the wintering period. Figure 2 to Figure **5** show the density surface models for the two winter periods 2016/17 and 2021. The variation between the two years is most likely due to local food availability, depth of water, weather and disturbance. However, birds are generally found throughout a 5 km wide band running from the northwest of the bay off Amroth and Saundersfoot to the east off Pembrey Sands, where the seabed is at 10 m depth or less (Banks et al., 2004; WWT, 2012; APEM, 2017; APEM, 2021). This species is most observed in water less than 20 m deep due to the energetic cost of diving to the seabed to forage benthic prey (Kaiser et al., 2006).

**Figure 2.** Density surface model of common scoter distribution in Carmarthen Bay SPA in December 2016 (APEM, 2017).

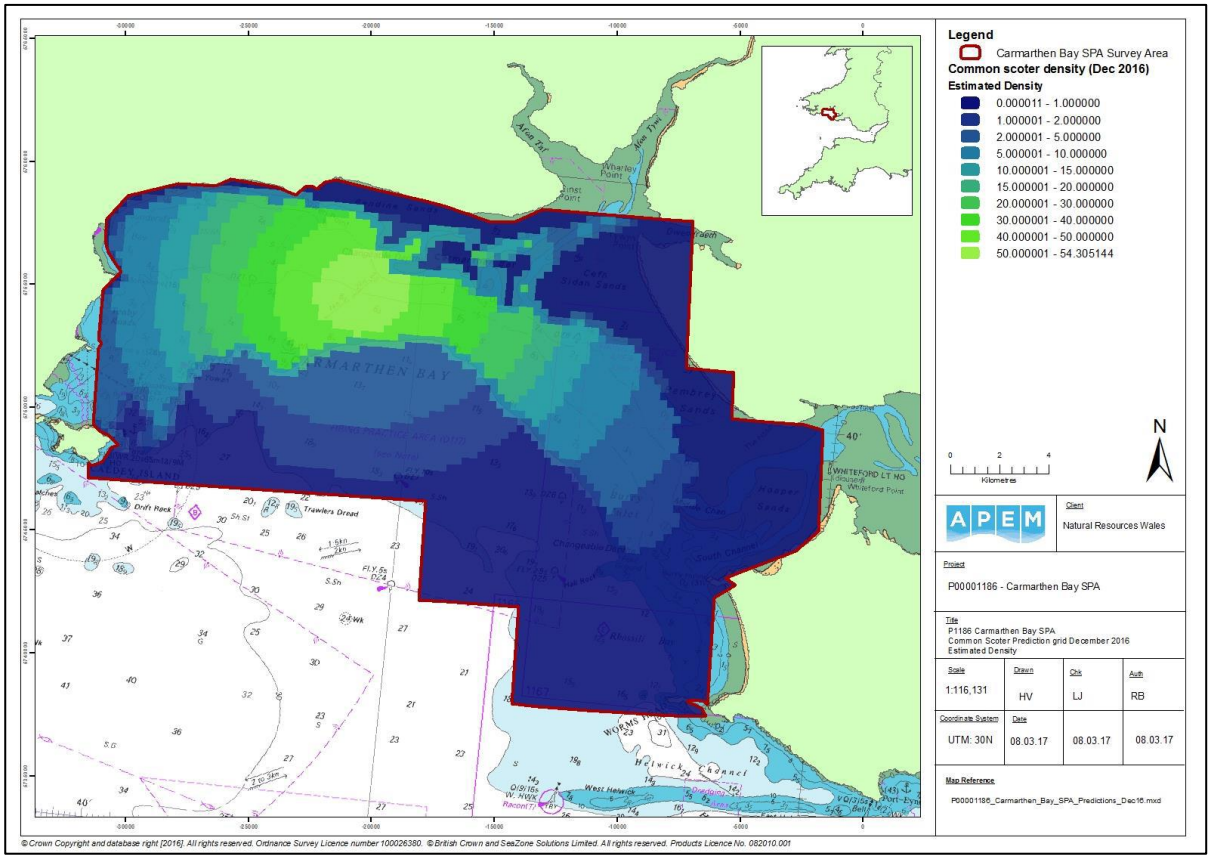


**Figure 3.** Density surface model of common scoter distribution in Carmarthen Bay SPA in February 2017 (APEM, 2017).

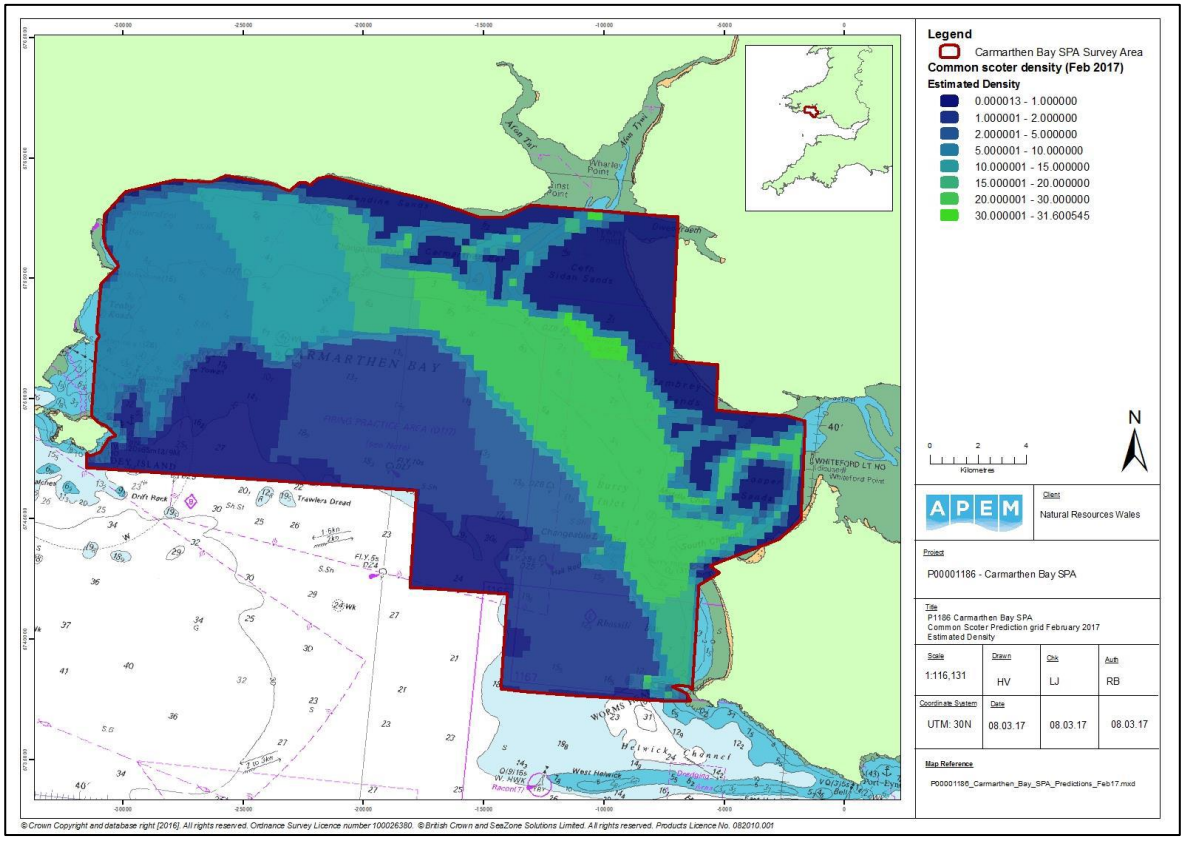



**Figure 4.** Density surface model of common scoter distribution in Carmarthen Bay SPA in January 2021 (APEM, 2021).

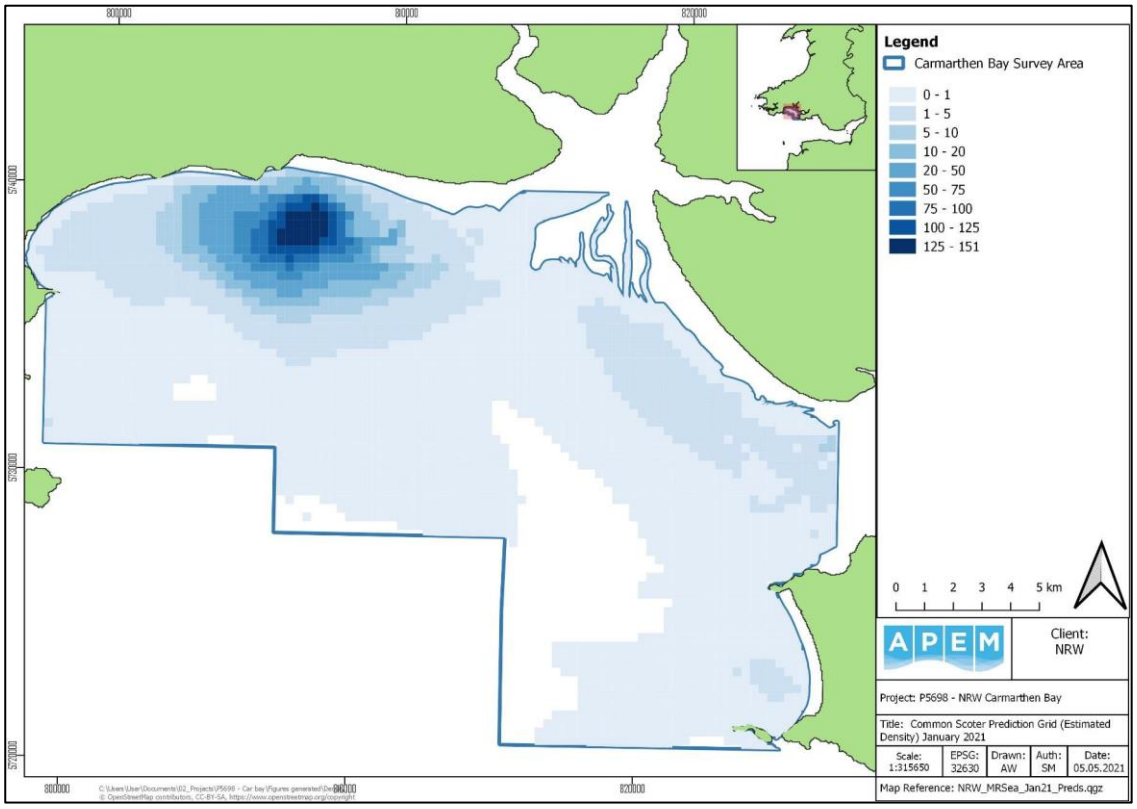
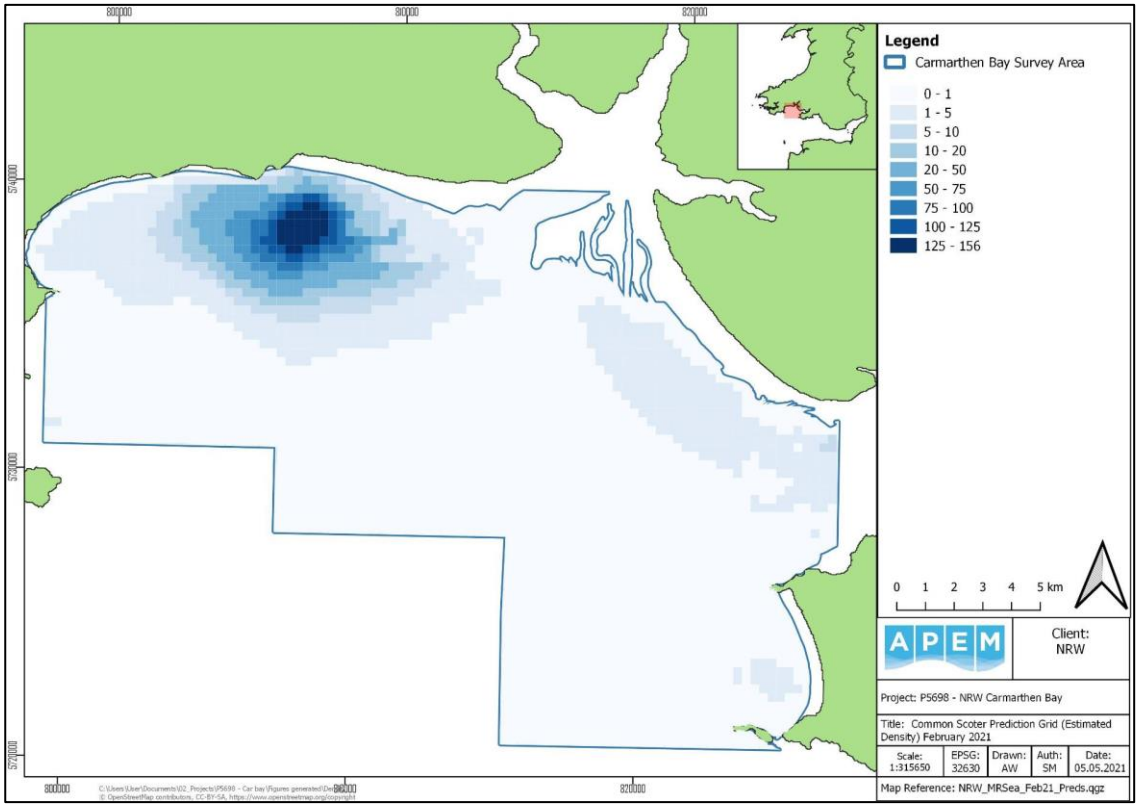


**Figure 5.** Density surface model of common scoter distribution in Carmarthen Bay SPA in February 2021 (APEM, 2021).




Common scoters can also be seen in lower numbers in Carmarthen Bay in the passage period of late July to early September, where the birds stop over and may also moult.

The wintering population of common scoter starts to arrive in October and will build up to a peak in midwinter, usually occurring in January or February (Banks et al., 2004; McCormack et al., 2012). Numbers then fall as common scoters start their spring migration to breeding grounds. Spatial distribution of birds throughout Carmarthen Bay also changes through the year. The timing of arrival and departure, as well as the timing of the peak abundance, varies from year to year.

There are currently no anthropogenic activity known to significantly impact the distribution of common scoter in this SPA. The wintering distribution indicator, therefore, met its target with medium confidence as the data are now three years old.

## Wintering population disturbance (by human activity)

Changes in the distribution of common scoter are most likely to be brought about through disturbance. Common scoter is a very shy species and sensitive to disturbance from human activity. Common scoter had the highest vulnerability score in relation to disturbance by offshore wind farm, ship and helicopter traffic when compared to 25 other sea bird species (Garthe and Huppop, 2004).

Large flocks of the birds have been observed putting to flight 2 km from a 35 m vessel, though smaller flocks were less sensitive and put to flight at 1 km (Kaiser et al., 2006). Modelling of common scoter distribution in Liverpool Bay SPA showed the greater the ship size the larger the estimated impact on bird numbers in the vicinity (Burt et al., 2022).

Common scoters may be equally sensitive to other sources of non-physical disturbance, especially those creating noise and/or movement. Disturbance can cause birds to reduce or cease feeding in an area or to fly away from an area, i.e. be displaced, even when these areas hold a high prey biomass (Kaiser et al., 2006).

While Carmarthen Bay is popular for recreation boat traffic during spring and summer months, the activity levels during the winter period when the birds are present are not currently impacting the species, as number of birds present is high and distribution across the SPA remains consistent. Therefore, this indicator met its target, but confidence in the result was reduced to medium because of the lack of direct activity monitoring.

## Supporting habitat

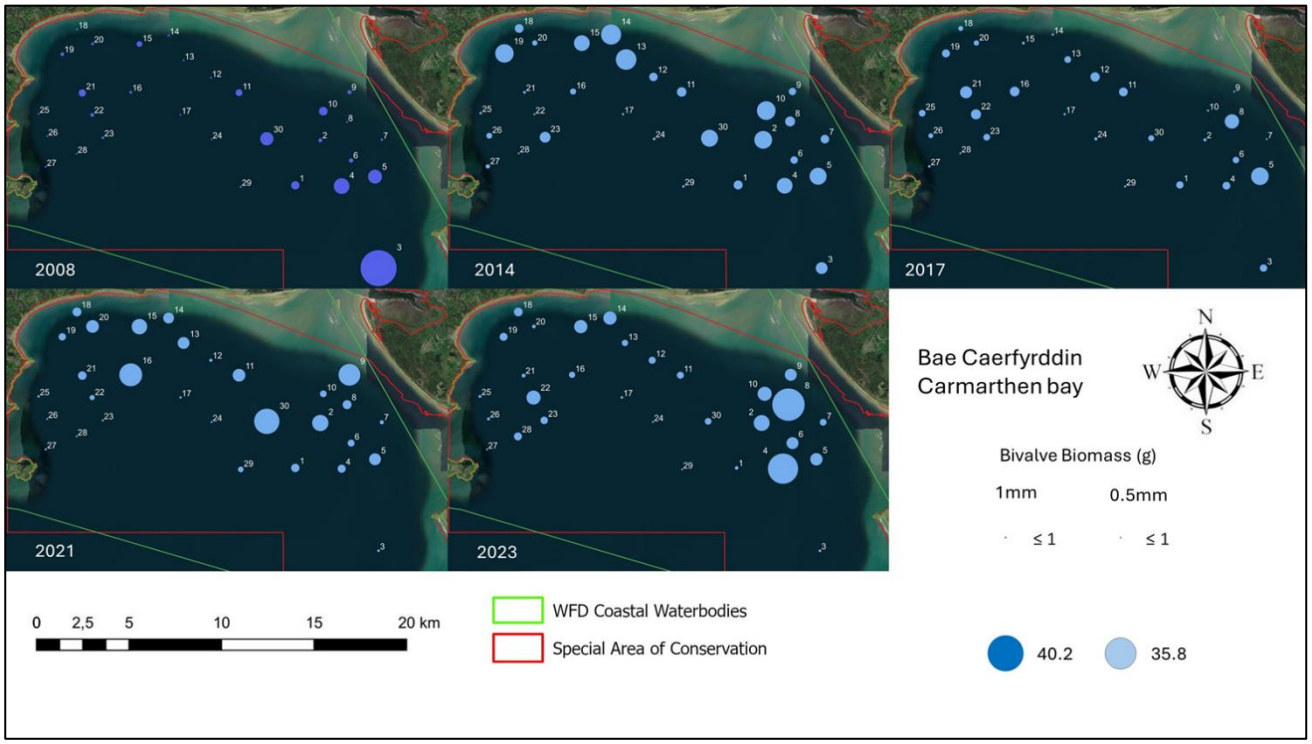
Common scoters outside the breeding period, predominantly use marine environments, resting and feeding in flocks in shallow, inshore waters, generally 500 m to c. 2 km from land, where depth is not more than 10–20 m and food is abundantly accessible (BWPI, 2004). The propensity of common scoter for shallow areas of fine sand in Carmarthen Bay is linked with the ecology of the benthic communities on which they feed. The link between common scoter distribution and depth is directly connected with the energetic cost of diving when feeding (Kaiser et al., 2006). Although supporting habitat is not directly monitored, the habitats in the overlapping Carmarthen Bay and Estuaries SAC are monitored. The habitat of most relevance is subtidal sandbanks which were assessed in 2025 as being in favourable condition (Jackson-Bué et al., 2025). Therefore, this indicator met its target, but confidence in the result was reduced to medium because of the lack of direct activity monitoring.

## Food availability

Common scoters are diving ducks that feed on benthic prey species. They feed predominantly on small bivalves such as cockles and clams, but will also eat a variety of other molluscs, crustaceans, and worms. As benthic feeders, the quality of common scoter's diet is closely linked with the availability and condition of their shallow seabed habitat.

Common scoter prey resources in Carmarthen Bay consist of two communities. A shallow water community off Pembrey Sands and around the mouth of the Loughor estuary is characterised by high bivalve biomass (*Chamelea striatula*, *Donax vittatus*, *Abra Alba*, *Fabulian fabula* and *Thracia* sp. (NRW, 2024)). Secondly, areas below 5 meters in depth in the west of the bay contain the *Tellina* community and more equal proportions of epifauna and bivalve biomass (Woolmer et al., 2003). Common scoters are opportunistic in their diet and will often exploit whatever mollusc happens to be the most locally abundant, if it is a suitable prey resource. Figure 6 shows maps of bivalves recorded at different monitoring stations across the bay. In these maps the bivalve community off Pembrey Sands, as well as the one in the west of the bay can be seen. They also show the variation in numbers from year to year. Overall, the number of common scoter present in Carmarthen Bay is high and distribution across the SPA remains consistent so food availability is thought to be sufficient to maintain the population. The food availability indicator, therefore, met its target with high confidence as bivalves are monitored in the bay.

**Figure 6.** Total biomass of bivalve molluscs recorded at each station in broadscale survey for each year. 2008 from 1mm+ data all other years from 0.5mm+, (Marshall et al., in draft).




# Reasons for target failure

Common scoter in Carmarthen Bay 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 common scoter feature. 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 declines in condition.

Activities that go through licencing and permission process whereby the impact of the activity on the feature would be assessed have not been included. The threats to common scoter in Carmarthen Bay SPA are stated below.

**Disturbance**

Although current boat traffic levels are not affecting condition, common scoter is very sensitive to disturbance pressure and any new developments or increases in boat traffic need to be carefully assessed for common scoter.

**Climate change**

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

- Increasing sea 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.

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