



Condition assessments for the designated features of Ardal Gwarchodaeth Arbennig Gogledd Bae Ceredigion/ Northern Cardigan Bay Special Protection Area.

Report No: 915

Author Name: M. Hatton-Ellis, M. Murphy, S. Cuthbertson, M. Jackson-Bué and E. Wynter

Author Affiliation: Natural Resources Wales



Red-throated Diver (Gavia stellata) by Gregory "Slobirdr" Smith. This file is licensed CC BY-SA 2.0

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Report series:	NRW Evidence Report
Report number:	915
Publication date:	June 2025
Title:	Condition assessments for the designated features of Gogledd Bae Ceredigion/ Northern Cardigan Bay Special Protection Area.
Author(s):	Hatton-Ellis, M., Murphy, M Cuthbertson, S., Jackson-Bué, M. and Wynter, E.
Technical Editor:	Hatton-Ellis, M.
Quality assurance:	Tier Three
Peer Reviewer(s):	Alvarez, M., Butterill, G., Camplin, M., Davis, S., Ellis, T., Gjerlov, C., Haines, L., Moon, J., Pauls., L., Ramsey, K., Sharp, J. and Winterton, A.
Approved By:	Winterton, A.
Restrictions:	None

Distribution List (core)

NRW Library	2
National Library of Wales	1
British Library	1
Welsh Government Library	1
Scottish Natural Heritage Library	1
Natural England Library (Electronic Only)	1

Recommended citation for this volume:

Hatton-Ellis, M., Murphy, M., Cuthbertson, S., Jackson-Bué, M. and Wynter, E. 2025. Condition assessments for the designated features of Ardal Gwarchodaeth Arbennig Gogledd Bae Ceredigion/ Northern Cardigan Bay Special Protection Area. NRW Evidence Report No: 915, 22pp, Natural Resources Wales, Cardiff.

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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 Grbennig (ACA) Gogledd Bae Ceredigion. 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 Gogledd Bae Ceredigion.

Nodweddion Dynodedig	Asesiad cyflwr	Hyder yn yr asesiad	
Trochydd gyddfgoch Gavia stellata	Anhysbys	Ddim yn Gymwys	

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 assessment of red-throated diver *Gavia stellata* within Northern Cardigan Bay 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 <u>IMCA final report</u>.

Summary of condition assessments for the designated features of Northern Cardigan Bay SPA.

Designated Features	Condition assessment	Confidence in assessment	
Red-throated diver Gavia stellata	Unknown	N/A	

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 Gogledd Bae Ceredigion/ Northern Cardigan Bay special protection area (SPA), occupies the northern half of Cardigan Bay on the west coast of Wales. Several rivers flow into the northern part of Cardigan Bay. For the majority of the SPA the seabed is relatively shallow (less than 20 m) sediment habitats, with the notable exception of three shallow rocky reefs, known as the Sarnau.

Cardigan Bay began to emerge as an important site for red-throated diver in the late 1970s. The largest concentrations can often be found associated with the shallow waters over Sarn Cynfelin, Sarn y Bwch and Sarn Badrig producing large counts from the coast off Borth, Wallog and Aberdysynni (Pritchard et al., 2021). This association can be seen from the mean estimated densities shown in Figure 1.

The SPA was designated in 2017 for regularly supporting more than 1% of the nonbreeding population of the Annex I species, red-throated diver *Gavia stellata*, allowing the site to qualify under Article 4.1 of the Birds Directive (2009/147/EC). Aerial survey data assessed the red-throated diver population to be 1,186 birds (peak mean population estimate 2001/04) (O'Brien et al., 2015), approximately 7% of the UK's wintering population. The densities of wintering red-throated divers in the SPA range between 0.01 birds/km² at the edges of the site, and up to 2.75 birds/km² in the core areas (O'Brien et al., 2015).

All NRW maps in this document are copyrighted as follows: © Hawlfraint y Goron a hawliau cronfa ddata 2025 Arolwg Ordnans AC0000849444 © Crown copyright and database rights 2025 Ordnance Survey AC0000849444 **Figure 1.** Mean estimated red-throated diver density surface for Bae Ceredigion/Cardigan Bay from aerial surveys (O'Brien et al., 2015). Lighter coloured areas show higher densities.



3. Feature condition assessment

The condition assessment for red-throated diver was based on a survey of the site carried out between 2001 and 2004 and on the expert knowledge and judgement of NRW staff.

Figure 2 is a map of the location of Northern Cardigan Bay SPA.

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



Figure 2. Map of the Northern Cardigan Bay SPA.

3.1. Condition assessment for red-throated diver Gavia stellata

Red-throated diver in the Northern Cardigan 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 red-throated diver in the Northern Cardigan 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 red- throated diver at or above 1,186 individuals (mean peak population 2001- 2004). (P)	 A survey of the wintering population of red-throated diver on this SPA was last carried out between 2001 and 2004. The peak mean of the red-throated diver population of Northern Cardigan Bay SPA was estimated as 1,186 birds. The only data available for this population are that used for its classification from counts made in 2001 to 2004 and therefore a condition assessment cannot be made due to the lack of any new data on the wintering population. 	Unknown	N/A
		• For this reason, this indicator was assessed as unknown.		
Wintering population distribution	The distribution of the wintering red-throated diver population should not be significantly impacted by anthropogenic activity. (P)	 This indicator seeks to ensure that red-throated diver can continue to use and access all areas within the SPA needed for feeding, moulting, roosting, loafing, shelter and any other activities necessary to support their survival. There are currently no known anthropogenic activities that would impact the distribution of the feature on the SPA. Confidence is medium as the anthropogenic activities information is based on expert knowledge. 	Pass	Medium

Indicator	Target	Assessment rationale	Target assessment	Target confidence
Wintering population disturbance (by human activity)	Aggregations of resting or feeding red- throated diver should not be subject to significant disturbance. (P)	 Changes in the distribution of red-throated diver may be brought on by disturbance. Disturbance occurs when an activity is sufficient to disrupt normal behaviours. Red-throated divers are highly sensitive to vessel movements and windfarms and have been shown to have a strong stress response to disturbance. There is currently no significant anthropogenic disturbance known to occur on this SPA during the winter period. Confidence is medium as the anthropogenic activities information is based on expert knowledge. 	Pass	Medium
Supporting habitat	Maintain sufficient extent, distribution, function and quality of habitat to support a red-throated diver population of 1,186 individuals. (S)	 The extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding) should be at a level to support 1,186 individuals. Northern Cardigan Bay has shallow areas of sub-tidal cobble and boulder reefs, known as Sarnau. These shallow reefs are important ecological habitats for the red-throated diver in this SPA and the habitat has been shown to support sufficient numbers of birds in the past. There are no known issues with the red-throated diver habitat, but the confidence is low as there is no direct evidence. 	Pass	Low

Indicator	Target	Assessment rationale	Target assessment	Target confidence
Prey availability	Maintain the distribution and abundance of red- throated diver food supply at levels sufficient to support a population of 1,186 red-throated divers. (S)	 Red-throated divers are opportunistic feeders, diving below the surface to catch small fish at shallow depths and forage on the seabed in some environments. Evidence also suggests that red-throated divers prey on several different fish species including members of the gadoid family, various flatfish, herring, gobies, sand eels and sprat. Prey availability has previously been sufficient to support the required number of birds, based on previous bird numbers. 	Unknown	N/A
		• However, there is a lack of evidence on the diet of red- throated diver in Cardigan Bay and the bird numbers are too old to use as a proxy.		
		• There has been no targeted surveys on red-throated diver prey and its availability and no recent information on feature numbers. Therefore, this indicator was assessed as unknown.		

Assessment conclusions

Red-throated diver in the Northern Cardigan Bay SPA has been assessed as unknown. The lack of recent bird surveys on the SPA has meant that a full condition assessment could not be carried out.

The main threats to the red-throated diver in Northern Cardigan Bay SPA are disturbance and climate change. Further information on the assessment outcome and threats to condition can be seen in the detailed assessment information below.

For features where an unknown result is recorded a simple assessment was undertaken to see what level of risk the feature might currently be experiencing to cause it to be in unfavourable condition. This assessment for red-throated diver looked at:

- How the feature is doing nationally or at other similar sites.
- What pressures are present on the SPA or adjacent to the SPA.

Red-throated divers are on the UK green list and of least concern at a European level. There are no indications at the UK level that the species is in decline. Some counts are done in North Cardigan Bay for red-throated diver from the shore during wetland bird survey (WeBS) counts, indicating that the birds are still present. However, although these counts have huge underestimates compared to the aerial survey the numbers have declined over the 2000's, so it seems likely that there may be fewer red-throated divers in North Cardigan Bay. This cannot be confirmed without aerial surveys. Comparing this SPA to other red-throated diver wintering sites it can be seen the population of Liverpool Bay has increased from 992 individuals from 2001/02 to 2006/07 to 1800 individuals from the winters between 2015 and 2020 even with loss of habitat due to offshore windfarms within the site. A similar increase has been seen in Outer Thames SPA, with population estimates increasing from 6,446 individuals from 1989-2006 to 21,997 individuals in 2017/18 (Irwin et al., 2019). These increases in surveyed population levels are partly attributed to new survey techniques (the use of cameras during aerial surveys, rather than surveyors) being more accurate, but that survey change alone probably doesn't account for the large increases in the populations seen at these sites.

There are no known pressures recorded on the SPA that are likely to be affecting the redthroated diver's ability to use the SPA during the winter. This feature also passed the disturbance and distribution targets as there are currently no significant disturbing anthropogenic activities occurring on the SPA so there are no known reasons for the numbers to have declined significantly.

NRW feel that although this feature is recorded as unknown it is at low risk of being in unfavourable condition. As this is based mainly on expert judgement this assessment of risk is given a medium confidence level.

Table 3. Summary of the condition assessment for	ed-throated diver in the Northern Cardigan Bay SPA.
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SPA Feature	Overall Condition Assessment	Overall Assessment of risk of unfavourable	Confidence in assessment of risk	Indicator failures	Reason for indicator failure	Threats to condition
Red-throated diver <i>Gavia</i> stellata	Unknown	Low	Medium	None	N/A	DisturbanceClimate change

Detailed assessment information

Over-wintering population

The red-throated diver has a restricted breeding distribution within Britain and Ireland, favouring small lochs and lakes close to the sea in the north of Ireland and north and west of Scotland, there are no breeding locations in Wales.

The small UK breeding population is joined by a much larger number of birds from Scandinavia and potentially Iceland during the winter months, when individuals can be found around our entire coastline. The red-throated diver is a well-studied, long-lived species; data from bird ringing reveal that individuals regularly reach 25 years of age.

Based on aerial survey data between 2001-2004 the peak mean of the of red-throated diver population of Northern Cardigan Bay SPA was estimated as 1,186 birds (O'Brien et al., 2015). Seven aerial surveys were carried out over four winters.

This figure includes survey counts labelled as "unidentified divers". This was due to no other diver species being regularly recorded in the area. A similar assumption was made in relation to Liverpool Bay (Webb et al., 2006) and the Outer Thames estuary (Webb et al., 2009). In both sites many diver observations were not identified to a particular species. However, records of diver species in those areas other than red-throated diver are very rare.

As the only data available for this population were that used for its classification from counts from 2001 to 2004 a condition assessment could not be made due to the lack of any new data on the wintering population. The over-wintering population has therefore been assessed as unknown.

Wintering population distribution

It is important that red-throated diver can continue to use and access all areas within the SPA needed for feeding, moulting, loafing, shelter and any other activities necessary to support their survival.

The key information for this indicator is whether there are any anthropogenic activities occurring in the SPA that could significantly affect the red-throated diver's distribution. There are currently no known anthropogenic activities that would impact the distribution of the feature on the SPA, therefore the wintering population distribution indicator met its target Confidence is medium as the anthropogenic activities information is based on expert knowledge.

Disturbance

Disturbance occurs when an activity is sufficient to disrupt normal behaviours such as feeding or rafting. Disturbance associated with human activity may take a variety of forms including light, sound, vibration, vessel traffic, presence of people and structures.

Disturbance can lead to increased energy expenditure due to time spent moving to avoid stressors or lead to desertion of supporting habitats. If the activity occurs at a level that substantially impacts behaviour for long enough it can lead to changes in distribution through displacement as the habitat available becomes reduced. This could consequently affect the long-term viability of the population.

Red-throated divers are highly sensitive to vessel movements and windfarms, and have been shown to have a strong stress response to disturbance (Dierschke et al., 2017). This can be an issue when windfarms are being constructed and serviced. In a review of the sensitivity of 26 species of "seabird" to the development of offshore windfarms, Garthe and Huppop (2004) found that red-throated divers had the second highest species sensitivity index score.

There are currently no known anthropogenic activities that are significantly disturbing redthroated diver at this SPA, therefore the disturbance indicator met its target. Confidence in the pass was reduced to medium as only expert judgment was used to assess the target.

Supporting habitat

The extent, distribution and availability of suitable habitat which supports the feature for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding) should be available for red-throated divers.

Northern Cardigan Bay has shallow areas of sub-tidal cobble and boulder reefs, known as Sarnau. These shallow reefs are important ecological habitats for the red-throated diver in this SPA.

There are currently no known issues with the red-throated diver habitat, the condition assessment for reef in the underpinning SAC is not showing any issues in this area. It is also known that this SPA was able to support sufficient numbers in the past. This indicator, therefore met its target. However, count data are too old to use as a proxy so the confidence in the target assessment is low.

Prey availability

Red-throated divers are opportunistic feeders, diving below the surface to catch small fish at shallow depths (McGovern et al., 2016; Guse et al., 2009) and forage on the seabed in some environments (Duckworth et al., 2021). Evidence also suggests that red-throated divers prey on several different fish species including members of the gadoid family, various flatfish, herring, gobies, sand eels and sprat (Guse et al., 2009).

There is currently a lack of evidence on the diet of red-throated diver in Cardigan Bay and so this indicator has been recorded as unknown. There has been no targeted surveys on red-throated diver prey and its availability but it is known that prey availability was sufficient to support the target numbers of birds in the past.

Reasons for target failure

Not applicable since the red-throated diver in Northern Cardigan Bay SPA has been assessed as unknown.

Threats to condition

Part of the condition assessment is to identify threats to the condition of the red-throated diver in Northern Cardigan Bay 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 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 the Northern Cardigan Bay SPA red-throated divers are stated below.

Disturbance

Although current boat traffic levels or other activities are not thought to be affecting condition, red-throated diver is very sensitive to disturbance pressure and any new developments or increases in boat traffic need to be carefully assessed for red-throated diver.

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 surface temperature.
- Increased storminess
- Changes to prey availability and abundance.

4. Evidence gaps

There are gaps in the current evidence that NRW feel are needed to be filled to fully understand the condition of this feature.

Listed below are current indicators that were either assessed as unknown or with a low confidence. This was due to either limited data availability, outdated data, or a lack of information. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting (see Section 1.1).

- Wintering population (P). The major evidence gap and the one that stopped a full assessment being carried out was the lack of monitoring of the feature on the SPA. Aerial surveys of the SPA are needed at least every six years in order for a condition assessment to be carried out.
- **Supporting habitat (S)**. There is no direct evidence on the quality of the supporting habitat in the SAC.
- **Prey availability (S).** There is a lack of information and no targeted surveys on redthroated diver prey and its availability.

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