



# **Condition Assessments for Otter Lutra** *lutra* in Welsh Marine Special Areas of Conservation

NRW Evidence Report No: 899

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European Otter Lutra lutra © Natural England/Allan Drewitt CC BY-NC-ND 2.0

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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 dyfrgi *Lutra lutra* o fewn ardaloedd cadwraeth arbennig dynodedig (ACA) ledled Cymru. Mae Adran 1 yn rhoi trosolwg o'r broses asesu ac mae Adran 2 yn darparu disgrifiad a lleoliad y nodwedd(ion).

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 yr IMCA.

| Lleoliad y nodwedd ACA      | Asesiad cyflwr | Hyder yn yr<br>asesiad |  |
|-----------------------------|----------------|------------------------|--|
| Pen Llŷn a'r Sarnau         | Anffafriol     | Canolig                |  |
| Bae Caerfyrddin ac Aberoedd | Anffafriol     | Canolig                |  |
| Sir Benfro Forol            | Anffafriol     | 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 for otter *Lutra lutra* within designated special areas of conservation (SACs) across Wales. Section 1 gives an overview of the assessment process and Section 2 provides a description and location of the feature.

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 A report on the assessment process used can be found in the <u>IMCA final report</u>.

| Summary of | condition | assessments | TOR | otter | in i | marine | SACS | across | wales. |
|------------|-----------|-------------|-----|-------|------|--------|------|--------|--------|
|            |           |             |     |       |      |        |      |        |        |

| SAC feature occurs in          | Condition assessment | Confidence in assessment |  |
|--------------------------------|----------------------|--------------------------|--|
| Lleyn Peninsula and the Sarnau | Unfavourable         | Medium                   |  |
| Carmarthen Bay and Estuaries   | Unfavourable         | Medium                   |  |
| Pembrokeshire Marine           | Unfavourable         | 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 <u>2018 indicative assessments</u> 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 A report on the assessment process used can be found in the <u>IMCA final report</u>.

 Table 1. 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<br>assess the performance indicators and targets using a pass,<br>fail or unknown. Record findings in the condition assessment<br>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<br>shallow inlets and bays) consider the results of any nested<br>feature assessments within the overall complex feature<br>assessment.   |
| Step 4: Condition pressures and threats.    | Use the evidence gathered and information on management<br>and activities to determine threats and pressures on feature<br>condition.   |
| Step 5: Finalise the assessments.           | Ensure all required fields in the assessment have been<br>completed and all assessed targets have an associated<br>confidence. Circulate the reports to the relevant NRW<br>specialists for review and comment. After issues have been<br>resolved, the assessments will be signed off by the project<br>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. Feature description

The Eurasian otter *Lutra lutra* is the only species of otter found in the UK. It is a semiaquatic mammal that occurs in a wide range of ecological conditions, including inland, freshwater and coastal areas.

Populations in coastal areas of Wales utilise shallow, inshore marine habitats for feeding but also require fresh water for bathing and terrestrial areas for resting and breeding. They are known to make regular use of the coast where there is good access to the sea, sufficient tree and scrub cover, near streams where salt water can be washed off, and good feeding locations such as rock pools. Otters have a varied diet including fish, crayfish, eels, amphibians and young birds. The extent to which otters use the open coast is less well understood when compared to freshwater or terrestrial environments (Liles, 2003; Strachan et al., 2005).

Further information on otter can be found on the JNCC website.

# 3. Otter Lutra lutra condition assessments

This section contains condition assessments for the three marine ardal cadwraeth arbennig / special areas of conservation (SACs) where otter is a designated feature (Figure 1).

- Pen Llŷn a'r Sarnau / Lleyn Peninsula and the Sarnau
- Sir Benfro Forol / Pembrokeshire Marine
- Caerfyrddin ac Aberoedd / Carmarthen Bay and Estuaries

The indicators were assessed using a combination of information from NRW monitoring, commissioned evidence reports, Water Framework Directive (WFD) Regulations 2017 (WFD Regulations) monitoring, scientific literature, plan and project assessments, site knowledge and expert judgement. The outcome and any reasons for failure for each SAC are discussed in more detail in the sections below.

In these condition assessments, the WFD 2024 cycle 3 interim classification was the default information used for water quality, however other earlier cycles were referenced, as follows:

- 2009 cycle 1 classification
- 2015 cycle 2 classification
- 2018 cycle 2 interim classification
- 2021 cycle 3 classification

In the WFD classification, results are rolled forward from previous assessments where there are no new monitoring data to provide a new classification. It is used to gap fill and provide a more complete classification. A decision was made to limit roll forward to six years which has been applied to the 2024 cycle 3 interim classification.

Additional information on water quality can be found in the IMCA final report.

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Figure 1. Location of SACs assessed for the otter feature.

Otters are a mobile species travelling between resting, foraging and breeding sites over large home ranges. Male otters have larger home ranges than females. In Wales otters have been monitored through the Otter Survey of Wales since the 1970s. The first report was published in 1978 and repeated every 7 years since. The latest report was published in 2021 with the surveys taking place over 2015-2018. Each survey consists of sites across all river catchments (hydrometric areas) in Wales. This equates to 1108 sites over 15 hydrometric areas (see Figure 2). The same sites are revisited during each survey creating a data set currently spanning 40-years of otter occurrence in Wales. Professional surveyors or trained volunteers look for positive signs of otter (e.g. spraints or footprints) at each site. If they are found the site is recorded as positive; if they are not the site is recorded as negative. Comparisons across surveys can then be made to see if there has been a change in the number of positive sites in a hydrometric area. Surveying in this way is considered a good proxy for assessing population size.

In the fifth Otter Surveys of Wales and England (Strachan, 2015 and Crawford, 2010 respectively) the baseline target for favourable condition was set at 80% positive sites for two consecutive surveys. This was assumed to be the maximum population size any given habitat could support (carrying capacity). Although there is lack of evidence for this figure, this target was chosen as the performance indicator on population health in the relevant hydrometric areas for this condition assessment of the otter SAC marine sites.

A genetic study found that otters in Wales are comprised of three genetically distinct subregions; southwest Wales, northwest Wales and mid-east Wales (Hobbs et al., 2011). The Hobbs study recommended each subpopulation be treated as a management unit. The basis for this is that management of the otter population needs to consider gene flow between subregions by understanding what barriers (landscape or anthropogenic features) are creating the population structure within each of the regions. Ideally, gene flow should be re-established between the regions. Therefore, the second target, 'otter population health' performance indicator has been set to look at the wider population relevant to the SAC. Any declines in the wider population are likely to impact the number of otters using the SAC.

Local Environmental Records Centres (LERCs) hold records of otter signs (sightings, spraints, footprints, roadkill) and these records include those made as part of the Otter Survey of Wales as well as those submitted by members of the public. These records allow an insight into otter usage of the SACs. LERC records held on file by NRW were filtered to the ten years before and including the assessment year (2013-2023). From those, records that were located within the SAC boundary or within 1km were selected and mapped. The 1km buffer was chosen as it is assumed otters this close to the coast will be likely to use it in some way, be it travelling via the coast, feeding or resting.



**Figure 2.** Hydrometric areas of Wales. Map taken from the 6<sup>th</sup> Otter Survey of Wales (Kean and Chadwick, 2021).

## 3.1. Pen Llŷn a'r Sarnau SAC

A summary of the condition assessment for otter *Lutra lutra* in Pen Llŷn a'r Sarnau SAC can be seen in Table 2. The overall feature condition, a detailed summary of the assessment and threats to condition can be found in the detailed assessment information

**Table 2.** Condition assessment of otter in Pen Llŷn a'r Sarnau SAC. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting (see Section 1.1).

| Indicator   | Target  | Assessment rationale   | Target<br>assessment | Target<br>confidence |
|---|---|--|----------------------|----------------------|
| Otter<br>population<br>health<br>(hydrometric<br>areas) | Relevant<br>hydrometric areas<br>used for the Otter<br>Survey of Wales<br>have 80% positive<br>sites. (P) | <ul> <li>The Glaslyn and Dyfi hydrometric areas are relevant for this SAC.</li> <li>The Glaslyn had 62% positive sites, a statistically significant 33% decrease since the last survey.</li> <li>The Dyfi had 71% positive sites.</li> <li>Both areas did not meet the required 80% positive sites, so the target failed.</li> <li>Confidence in the overall fail is medium given the age of the</li> </ul>                | Fail                 | Medium               |
|   |   | survey data.   |                      |                      |
| Otter<br>population<br>health (wider<br>population)     | The wider otter<br>population relevant<br>to the SAC is stable<br>or increasing. (P)                      | <ul> <li>The relevant wider population is the northwest subpopulation which includes the hydrometric areas of Anglesey, Conwy and Clwyd, the Dee, the Dyfi, the Glaslyn and the Ystwyth.</li> <li>All have seen a statistically significant decline in positive otter sites since the last survey.</li> <li>The wider population was assessed as not being stable or increasing so the target failed to be met.</li> </ul> | Fail                 | Medium               |
|   |   | Confidence in the overall fail is medium given the age of the survey data.   |                      |                      |

| Indicator                     | Target  | Assessment rationale   | Target<br>assessment | Target confidence |
|-------------------------------|---|--|----------------------|-------------------|
| Presence<br>within the<br>SAC | Positive signs otters<br>using sites within<br>the SAC (P)                                  | • Local Records Centre (LERC) data shows otter signs have been observed in the SAC boundary and within 1km of the boundary over 500 times in the 10-year period 2023-2013. | Pass                 | Medium            |
|                               |   | • The last available record at the time of assessment in the LERC is from 2021.  |                      |                   |
|                               |   | • No inference can be made on the number of otter as multiple record signs may have been left by the same otter.   |                      |                   |
|                               |   | • There is strong evidence to suggest that otters were using the SAC up until 2021.  |                      |                   |
|                               |   | <ul> <li>Confidence is medium as there have been no targeted<br/>surveys of use of the SAC and the last sign was record in<br/>2021.</li> </ul>                            |                      |                   |
| Habitat<br>connectivity       | No evidence of<br>barriers that impact  | <ul> <li>No major barriers have been identified from development<br/>related plans or projects.</li> </ul>   | Pass                 | Low               |
|                               | the safe passage<br>and movement of<br>otters into, within<br>and away from the<br>SAC. (P) | No major road schemes planned or under construction.   |                      |                   |
|                               |   | <ul> <li>Confidence is low as there have been no surveys to map barriers.</li> </ul>   |                      |                   |

| Indicator                      | Target   | Assessment rationale  | Target<br>assessment | Target confidence |
|--------------------------------|--|---|----------------------|-------------------|
| Water quality:<br>contaminants | Contaminants within<br>the water column do<br>not exceed the<br>Environmental  | • Six of the nine WFD waterbodies in the SAC were not classified as the chemicals have not been assessed within the last six years (Caernarfon Bay South, Tremadog Bay, Artro, Dwyfor, Dysynni and Glaslyn).                                    | Fail                 | Low               |
| Quality Standard<br>(EQS). (S) | • One WFD waterbody has a pass for chemicals in the 2024 cycle 3 interim classification (Dyfi / Leri). However, the chemical classifications were rolled forward from the 2021 cycle 3 classification. |   |                      |                   |
|                                |  | • Two waterbodies have a fail for chemicals (Cardigan Bay<br>North and Mawddach). Both fail for polybrominated diphenyl<br>ethers (PBDE), which is classed as persistent organic<br>pollutant (POP). Cardigan Bay North also fails for mercury. |                      |                   |
|                                |  | <ul> <li>Confidence was reduced to low as the human health<br/>standard has been used for PBDE, and due to the<br/>unclassified waterbodies.</li> </ul>   |                      |                   |

## **Assessment conclusions**

The otter feature in Pen Llŷn a'r Sarnau SAC has been assessed as being in **unfavourable** condition (medium confidence). There were two failing indicators (Table 3). Further investigation is needed to better understand all of the failures to be able to identify management options that can bring the feature back into favourable condition.

A summary of the assessment can be seen in Table 3 with more detail on each performance indicator, and any reasons for failure, provided in the sections below.

| Table 3. Summar | ry of the condition | assessment for otter in | Pen Llŷn a'r Sarnau SAC. |
|-----------------|---------------------|-------------------------|--------------------------|
|-----------------|---------------------|-------------------------|--------------------------|

| SAC                    | Overall<br>Condition<br>Assessment     | Indicator failures   | Reason for indicator failure   | Threats to condition   |
|------------------------|--|--|--|--|
| Pen Llŷn a'r<br>Sarnau | Unfavourable<br>(medium<br>confidence) | Otter population health<br>(P)<br>Water quality:<br>contaminants (S) | <ul> <li>Declining population adjacent to the SAC.<br/>Declining wider population.</li> <li>Levels of PBDE and / or mercury in the<br/>Cardigan Bay North and Mawddach<br/>waterbodies are failing to meet<br/>environmental quality standards (EQS).</li> </ul> | <ul> <li>Road traffic collisions</li> <li>Water quality: contaminants</li> </ul> |

## **Detailed assessment information**

Otters in Pen Llŷn a'r Sarnau SAC have been assessed against the chosen performance indicators using the Otter Survey of Wales, Local Records Centre (LERC) data, WFD data, licensed activities assessments and expert knowledge.

#### Otter population health

The latest Otter Survey of Wales was published in 2021 with the surveys taking place over 2015-2018. The same sites are revisited every seven years, allowing comparisons between surveys to determine if there has been a change in the number of sites with positive signs of otter in a hydrometric area (river catchment).

The relevant hydrometric areas for a SAC are those whose boundaries border the SAC boundary. For the Pen Llŷn a'r Sarnau SAC the relevant hydrometric areas are the Glaslyn and Dyfi (See Figure 2).

Both the Glaslyn and the Dyfi hydrometric areas have seen a decline in positive sites in the 6<sup>th</sup> Otter Survey of Wales compared to the 5<sup>th</sup> Otter Survey of Wales (Kean and Chadwick, 2021). Of the 99 sites in the Glaslyn area surveyed between 2017-2018, 61 sites showed positive for signs of otter (62%). This was a statistically significant 33% decrease since the last survey. Of the 93 sites surveyed in the Dyfi between 2017-2018, 66 sites showed positive for signs of otter (71%). This was a slight (non-significant) decrease of 9% since the last survey, but there were four fewer sites surveyed. As the Glaslyn and Dyfi hydrometric areas failed to meet the 80% positive site target, the target failed. The age of the data reduces the confidence in this fail to medium, as recovery in declining sites may have occurred.

The second indicator for the population heath indicator is around the wider otter population. A genetic study found that otters in Wales are comprised of three genetically distinct sub-groups; southwest Wales, northwest Wales and mid-east Wales (Hobbs et al., 2011). Therefore, the performance indicator target has been set to look at the wider population relevant to the SAC for the assessment, as any declines in the wider population are likely to impact the number of otters using the SAC. The relevant subpopulation is the northwest.

The hydrometric areas that cover the northwest population are, Anglesey, Conwy and Clwyd, the Dee, the Dyfi, the Glaslyn and the Ystwyth. All areas have seen declines in the number of positive sites. The largest decline was seen in the Glaslyn (33%) followed by Anglesey (22%), and Conwy and Clwyd (18%). These declines were all statistically significant. The declines in the Dyfi (9%) and the Dee (9%) were not significant but still relatively large. A resurvey of the Dyfi and Conwy hydrometric areas in 2021 showed no further decline (Kean, 2021), but was only a subset of sites in two hydrometric areas. Due to the large declines in the northwest subpopulation hydrometric areas the wider population was not deemed to be stable, and the target failed. The fact the main survey data ranges from 8-10 years old at publication reduces the confidence in the failure to medium. The population may have recovered in the last 10 years or may have declined further. The next Otter Survey of Wales is due to take place in 2024-2025.

## Otter presence in the SAC

Otter presence in the SAC has not been directly surveyed, although some sites in the Otter Survey of Wales are close to the coast (within 500 m). LERCs hold records of otter signs (sightings, spraints, footprints, roadkill) and these records include those made as part of the Otter Survey of Wales as well as those submitted by members of the public.

For the Pen Llŷn a'r Sarnau SAC, signs of otter were recorded over 500 times inside the SAC boundary or within 1km of it between 2013-2023 (Figure 3). At the time of the assessment the last recorded sign in the database was in 2021 (database accessed in November 2023). No comment can be made on the numbers of otter, as multiple recorded signs may have been left by the same otter. However, it is clear otters use and benefit from this SAC. The target for this indicator is met but confidence in the target pass is reduced to medium as the last record in the LERC at the time of assessment is from 2021 and the LERC records are a proxy. More targeted surveys of otter use of coastal areas are needed.



Figure 3. Otter signs in the Pen Llŷn a'r Sarnau SAC between 2013-2022.

#### Habitat quality and connectivity

It is known that coastal sites are important to otter in terms of travelling between sites, foraging for food and resting. Therefore, it is important that the habitat quality and functionality is maintained within the SAC. In Pen Llŷn a'r Sarnau SAC there is a lack information on available otter habitat and its quality along the coast, so it was not possible

to assess the habitat quality and function indicator. This will be noted as an evidence gap to try and fill before the next assessment.

As otters are a highly mobile species that have large home ranges, unimpeded movement across their range is vital. Looking at developments in the area, assessors found no evidence of obvious barriers to otter movement within the SAC or the wider area, therefore the habitat connectivity indicator met its target. However, as there has been no specific surveys of more localised barriers to movement the confidence in the pass is low.

#### Water quality

Many contaminants are known to persist and bioaccumulate in top predators through the food chain. As well as this past declines in otter populations have been linked to persistent organic pollutants (POPs). For this reason water quality: contaminants was chosen as a performance indicator for otter.

The water quality target failed to be met for polybrominated diphenyl ethers (PBDE) (a group of POPs) in two waterbodies that otters are likely to use, Cardigan Bay North and the Mawddach in the 2024 cycle 3 interim classification. The Cardigan Bay North waterbody also failed for mercury. The human health protection goal that is used for PBDE may be considered as over precautionary as the effect of contaminants on otters are not fully understood. The EQS for mercury is based on the secondary poisoning protection goal (for wildlife), which be more relevant to otters and is sampled from biota they may eat. The Dyfi / Leri waterbody passes for chemicals in the 2024 cycle 3 interim classification, however the chemical classifications were rolled forward from the 2021 cycle 3 classification. In addition, there have been failures for PBDE in this waterbody in previous cycles, but it has not been assessed in the cycle 3 classifications. All of the other waterbodies within the SAC were not classified as the chemicals have not been assessed within the last six years.

Confidence in the failure is low as the impact of these chemicals on the otter population is not clear, and because the human health standard has been used for PBDE. Further to this, even though historic declines in otter populations have been linked to POPs, otters in Wales reached 90% sites occupied in the 2009-2010 national survey when POPs levels were high. Since the POPs use has been banned under the Stockholm Convention (2001), this makes it is unlikely that POPs are responsible for the declines recorded in the 2015-2018 survey (Kean and Chadwick, 2021), lowering confidence in the fail.

Otters are exposed to a variety of pollutants, not only those monitored as part of WFD, but there is a lack of information on otter health implications to priority substance exposure. As otter numbers were at record highs when PBDE and mercury levels were also high, the available evidence suggests these specific chemicals are not restricting populations (Kean and Chadwick, 2021). It is not known if other contaminants not currently monitored are having an impact on otter populations either directly or through their prey. Contaminants in general should not be ruled out as a cause of the declines seen in otters across Wales.

## **Reasons for target failure**

The assessment of the Pen Llŷn a'r Sarnau SAC otter feature failed two primary targets, and one secondary target. As a result the feature was assessed as being in **unfavourable** condition. The failing indicators and reasons for failure, if known, are summarised below.

#### Otter population health

Two primary targets failed to be met. The two hydrometric areas that border the SAC have both seen declines in the most recent survey. The wider otter population relevant to the SAC (the Northwest subpopulation) had also seen declines in all relevant hydrometric areas.

It is not yet clear what has caused the declines seen in the otter population. In the previous Otter Survey of Wales (2009-2010) the population was at record high levels (an average of 90% of sites had positive signs across Wales). It may be that the population had reached carrying capacity and the declines seen in the most recent survey are the population naturally settling out. However, some of the steep declines seen are cause for concern. Further investigation is needed, and a full resurvey of Wales's otter population is a priority and should provide more clarity.

#### Water quality: contaminants

This secondary target failed due to PBDE and mercury exceeding their EQS in two waterbodies that otters are likely to use frequently (Cardigan Bay North and the Mawddach). Historically, the main source of PBDE is as flame retardants in a variety of materials (Viñas et al., 2022). Mercury has been used in many industries, but today the primary sources are burning of coal and artisan mining for mercury (Larsen and Hjermann, 2022).

The PBDE in the Mawddach waterbody may be derived from diffuse sources from contaminated waterbody sediments from industry, and point sources from continuous sewage discharge from the water industry. The exact sources of mercury and PBDE into the Cardigan Bay North waterbody are unknown. WFD investigations of the failures in both waterbodies are yet to be undertaken. The impact of these chemicals on otter are not understood and further investigation as to the impact of these at a population level is needed. Although this indicator fails, mercury and PBDE are being managed in the UK and it is hoped levels will reduce over time.

## Threats to condition

Part of the condition assessment is to identify threats to the condition of the otter 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. The threats to the otter feature condition in the Pen Llŷn a'r Sarnau SAC are stated below.

#### **Road traffic collisions**

Otters can travel several miles in a night, and often cross roads where rivers are culverted or bridged. Road traffic accidents cause a large number of casualties.

The Cardiff Otter Project typically receives around 200 otters per year, of which 80-90% have been killed as a result of road traffic accidents. The death of otters on roads can have a serious impact on populations, particularly where population densities are low or where danger-spots impact on breeding females (<u>Cardiff Otter Project</u>).

#### Water quality: contaminants

There is the potential for unregulated contaminants (such as Per- and polyfluoroalkyl substances (PFAS)) to increase. This could affect the otter feature as PFAS has been shown to bioaccumulate in marine species, increasing up the trophic levels (Khan et al., 2023). However, the biological impact of PFAS on marine species is not well understood.

Some persistent chemicals are not measured in every WFD waterbody, and some of the relevant waterbodies have not been classified for any chemicals. It is possible that WFD contaminants that are not monitored, or emergent contaminants, are present and impacting the otter population.

## **3.2. Pembrokeshire Marine SAC**

A summary of the condition assessment for otter *Lutra lutra* in Pembrokeshire Marine SAC can be seen in Table 4. The overall feature condition, a detailed summary of the assessment and threats to condition can be found in the detailed assessment information.

**Table 4.** Condition assessment of otter in Pembrokeshire Marine SAC. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting (see Section 1.1).

| Indicator   | Target  | Assessment rationale   | Target<br>assessment | Target<br>confidence |
|---|---|--|----------------------|----------------------|
| Otter<br>population<br>health<br>(hydrometric<br>areas) | Relevant<br>hydrometric areas<br>used for the Otter<br>Survey of Wales<br>have 80% positive<br>sites. (P) | <ul> <li>The relevant hydrometric area for this SAC is the Cleddau.</li> <li>The Cleddau hydrometric area saw a statistically significant 14% decrease since the last survey. However, 83% of sites were positive so the target passes.</li> <li>Confidence in the pass is medium due to the age of the survey data.</li> </ul>  | Pass                 | Medium               |
| Otter<br>population<br>health (wider<br>population)     | The wider otter<br>population relevant<br>to the SAC is stable<br>or increasing. (P)                      | <ul> <li>The relevant wider population is the southwest sub-population which includes the hydrometric areas the Cleddau, Loughour, Tywi and Teifi.</li> <li>All have seen a statistically significant decline in positive otter sites since the last survey.</li> <li>The population is not stable or increasing, so the target fails, failing the indicator everall.</li> </ul> | Fail                 | Medium               |
|   |   | <ul> <li>Confidence in the fail is medium due to the age of the survey data.</li> </ul>  |                      |                      |

| Indicator              | Target  | Assessment rationale   | Target<br>assessment | Target confidence |
|------------------------|---|--|----------------------|-------------------|
| Presence<br>within the | Positive signs otters<br>using sites within                                     | There has been periodic surveying of otters in the SAC between 2002-2017.  | Pass                 | Medium            |
| SAC                    | the SAC. (P)  | • Sites positive for otter signs increased from 13 to 19 between 2002 and 2012 in the SAC but decreased slightly to 17 in 2017. Overall otter presence was recorded in 26 sites over the 2002- 2017 survey period. |                      |                   |
|                        |   | • LERC document 17 records of otter within the SAC boundary or 1 km inland over the last 5 years 2018-2022 and 32 records in the previous 5 years 2017-2013. A total of 49 records in 10 years.                    |                      |                   |
|                        | • The last available record at the time of assessment in the LERC is from 2022. |  |                      |                   |
|                        |   | • No comment can be made on numbers of otter as multiple record signs may have been left by the same otter.  |                      |                   |
|                        |   | However, there is strong evidence to suggest that otter are using the SAC up until 2022.   |                      |                   |
|                        |   | • Confidence is medium as there have been no targeted surveys of use of the SAC and the last sign was record in 2022.  |                      |                   |

| Indicator                      | Target  | Assessment rationale   | Target<br>assessment | Target<br>confidence |
|--------------------------------|---|--|----------------------|----------------------|
| Habitat quality and function   | Maintain quality and functionality of                             | There has been periodic surveying of otters in the SAC between 2002-2017.  | Pass                 | Medium               |
|                                | habitat to protect<br>potential foraging,<br>resting and breeding | <ul> <li>In 2012 most resting and breeding site habitats identified<br/>during the 2002 survey remained intact.</li> </ul>                     |                      |                      |
| sites relevant to the SAC. (P) |   | <ul> <li>In 2017 resting and breeding site habitats remained intact<br/>with no evidence of human disturbance or damage.</li> </ul>            |                      |                      |
|                                |   | • A survey in the Cleddau catchment in 2022 found 8 of 10 potential breeding sites were still viable. This was a subset of all breeding sites. |                      |                      |
|                                |   | Confidence is medium due to the scale and date of the last survey.   |                      |                      |
| Habitat<br>connectivity        | No evidence of<br>barriers that impact                            | <ul> <li>No evidence of barriers to movement have been noted in<br/>Pembrokeshire otter monitoring reports.</li> </ul>                         | Pass                 | Low                  |
|                                | the safe passage and movement of                                  | <ul> <li>No major impacts on otter movement have been identified<br/>from development related plans or projects.</li> </ul>                    |                      |                      |
|                                | otters into, within   | No major road schemes planned or under construction.   |                      |                      |
|                                | SAC. (P)  | Confidence is low as there have been no specific surveys to map barriers.  |                      |                      |

| Indicator                      | Target   | Assessment rationale  | Target<br>assessment | Target<br>confidence |
|--------------------------------|--|---|----------------------|----------------------|
| Water quality:<br>contaminants | Contaminants within<br>the water column do<br>not exceed the<br>EQS. (S) | • Four of the six WFD waterbodies in the SAC were not classified as the chemicals have not been assessed within the last six years (Pembrokeshire South, Cardigan Bay South, Grassholm Island and the Smalls, and Solfach Estuary).                                       | Fail                 | Low                  |
|                                |  | • One WFD waterbody has a pass for chemicals in the 2024 cycle 3 interim classification (Milford Haven Outer). However, some of the chemical classifications were rolled forward from the 2021 cycle 3 classification. This waterbody has improved since previous cycles. |                      |                      |
|                                |  | <ul> <li>One WFD waterbody has a fail for chemicals (Milford Haven<br/>Inner), due to PBDE and polycyclic aromatic hydrocarbons<br/>(PAH). This caused the indicator to fail.</li> </ul>  |                      |                      |
|                                |  | <ul> <li>Confidence was reduced to low as the human health<br/>standard has been used for PBDE, and due to the<br/>unclassified waterbodies.</li> </ul>   |                      |                      |

## **Assessment conclusions**

The otter feature in Pembrokeshire Marine SAC has been assessed as being in **unfavourable** condition (medium confidence). There were two failing indicators (Table 5). Further investigation is needed to better understand all of the failures to be able to identify management options that can bring the feature back into favourable condition.

A summary of the assessment can be seen in Table 5 with more detail on each performance indicator, and any reasons for failure, provided in the sections below.

**Table 5.** Summary of the condition assessment for otter in Pembrokeshire Marine SAC.

| SAC                     | Overall<br>Condition<br>Assessment     | Indicator failures   | Reason for indicator failure  | Threats to condition   |
|-------------------------|--|--|---|--|
| Pembrokeshire<br>Marine | Unfavourable<br>(medium<br>confidence) | Otter population health<br>(S)<br>Water quality:<br>contaminants (S) | <ul> <li>Declining wider otter population.</li> <li>Levels of PBDE and PAH in the Milford<br/>Haven Inner waterbody are failing to meet<br/>EQS.</li> </ul> | <ul> <li>Road traffic collisions</li> <li>Water quality: contaminants</li> </ul> |

## **Detailed assessment information**

Otter in Pembrokeshire Marine SAC have been assessed against the chosen performance indicators using the Otter Survey of Wales, commissioned SAC surveys, LERC data, WFD data, licenced activities assessments and expert knowledge.

#### Otter population health

The latest Otter Survey of Wales was published in 2021, with the surveys taking place over 2015-2018. The same sites are revisited every seven years allowing comparisons between surveys to see if there has been a change in the number of sites with positive signs of otter in a hydrometric area (river catchment).

The relevant hydrometric areas for a SAC are those whose boundaries border the SAC boundary. For the Pembrokeshire Marine SAC, the relevant hydrometric area is the Cleddau (see Figure 2).

The Cleddau hydrometric area has seen a statistically significant decline of 14% in positive sites in the 6<sup>th</sup> Otter Survey of Wales compared to the 5<sup>th</sup> Otter Survey of Wales (Kean and Chadwick, 2021). However, 84% of sites (56 out of 67) were still positive. The sites were surveyed between 2015-2016 with one site surveyed in 2017. As the relevant hydrometric area met the required 80% positive sites, this target passed. However, as the data are now 8-10 years old at the time of publication, the confidence in this pass is reduced to medium, as recovery in declining sites may have occurred.

The second indicator for the population heath indicator is around the wider otter population. A genetic study found that otters in Wales are comprised of three genetically distinct sub-groups; southwest Wales, northwest Wales and mid-east Wales (Hobbs et al., 2011). This means that otters within each sub-population are genetically similar, demonstrating a high level of interbreeding within each subregion. This highlights how widely otters move and interact with each other. The Hobbs study recommended each subpopulation be treated as a management unit. Therefore, the performance indicator target has been set to look at the wider population relevant to the SAC for the assessment, as any declines in the wider population are likely to impact the number of otters using the SAC. The relevant subpopulation is the southwest.

The hydrometric areas that cover the southwest population are the Cleddau, Loughor, Tywi and Teifi. All areas have seen declines in the number of positive sites. The largest decline was seen in the at Teifi 48%, followed by the Loughor 37.21%, Tywi 22.32%, and the Cleddau 14%. All were statistically significant declines. The decline on the Teifi was of particular concern as it was nearly a 50% reduction.

Due to the steep declines, the Teifi was resurveyed in 2019-2020 to assess whether volunteer skill in the 6<sup>th</sup> Otter Survey of Wales contributed to the decline. This resurvey found 74% were positive for otter signs. As this was close to the 6<sup>th</sup> Otter Survey of Wales results it was deemed volunteer surveying skill were not behind the decline (Kean and Chadwick, 2021). However, it is still important to note the resurvey still showed a significant decline since the 5<sup>th</sup> Otter Survey of Wales where 95% of sites were positive.

Due to the large declines in these hydrometric areas the wider population was not deemed to be stable, and the target was failed. The fact the survey data ranges from six to ten years old reduces the confidence in the fail to medium. The population may have

recovered or may have declined further. The next Otter Survey of Wales is due to take place in 2024-2025.

#### Otter presence in the SAC

Otter presence in the Pembrokeshire Marine SAC has been periodically surveyed. Sites positive for otter signs increased from 13 to 19 between 2002 and 2012 in the SAC but decreased slightly to 17 in 2017. Otter signs were present in 26 sites over the 2002-2017 survey period (Liles, 2017).

LERCs hold records of otter signs (sightings, spraints, footprints, roadkill) and these records include those made as part of the Otter Survey of Wales as well as those submitted directly to the LERC. These records allow an insight into otter usage of the SAC. The LERC data documents 17 records of otter within the SAC boundary or 1 km in land over the last 5 years 2018-2022 and 32 records in the previous 5 years 2017-2013. A total of 49 records in 10 years (Figure 4).

The last recorded sign on the LERC when the database was accessed on 22/11/2023 was in 2022. The target for this indicator is met but confidence is reduced to medium as the LERC records are a proxy. An updated survey of otter use of coast in the SAC is needed.

Cyfoeth Naturiol Cymru Natural Resources Wales Otter records post 2013 SAC boundary SAC 1km buffer MBROKESHIRE COAS ..... NAL P 01.53 Kilometers 

Figure 4. Otter signs in the Pembrokeshire Marine SAC between 2013-2023.

## Habitat quality and connectivity

It is known that coastal sites are important to otter in terms of travelling between sites, foraging for food and resting. Therefore, it is important that the habitat quality and functionality is maintained within and around the SAC.

There has been periodic surveying of otters in the SAC between 2002-2017. In 2012 most resting and breeding site habitats related to the SAC (extensive fen, bracken, gorse, bramble scrub, woodland, reed beds and boulder piles) identified during the 2002 survey remained intact with no evidence of disturbance or damage. In the 2017 survey resting and breeding site habitats again remained intact with no evidence of human disturbance or damage (Liles, 2017).

In 2022 a subset of known potential breeding sites in the Cleddau catchment were surveyed. Of the 10 sites investigated, eight were still viable as breeding sites (Liles 2023). These surveys suggest that otter habitat quality is good within the SAC and surrounding catchment, so the habitat quality and function indicator passed. Due to the age of the data the confidence in the pass was reduced to medium.

As otters are a highly mobile species that have large home ranges, unimpeded movement across their range is vital. None of the otter surveys between 2002-2017 noted any barriers to otter movements within the SAC. Assessors also looked at developments in the area and found no evidence of obvious barriers to otter movement within the SAC or the wider area. Based on this the habitat connectivity indicator passed. However, as there has been no specific surveys of more localised barriers to movement the confidence in the pass is low.

#### Water quality

Many contaminants are known to persist and bioaccumulate in top predators through the food chain. As well as this, past declines in otter populations have been linked to persistent organic pollutants (POPs). For this reason water quality was chosen as a performance indicator for otter.

The water quality target failed to be met for PBDE and polycyclic aromatic hydrocarbons (PAHs) (two groups of POPs) in one WFD waterbody that otters are known to use, the Milford Haven Inner, in the 2024 cycle 3 interim classification. PBDE has failed in this waterbody in all previous cycles. The human health protection goal that is used for PBDE may be considered as over precautionary as the effect of contaminants on otters are not fully understood. PAH failed due to the maximum allowable concentration (a short term breech) which is based on the most sensitive taxa, which may also be over precautionary for otters. The Milford Haven Outer waterbody previously failed for mercury and TBT in previous cycles. This waterbody now passes for chemicals in the 2024 cycle 3 interim classification, however TBT, which was previously a failing chemical, is no longer assessed. In addition, mercury was not classified in the 2024 cycle 3 interim classification. The other four waterbodies in the SAC were not classified as the chemicals have not been assessed within the last six years.

Confidence in the failure is low as the impact of these chemicals on the otter population is not clear, and because of the potentially over precautionary standards used for PBDE and PAH. Further to this, even though historic declines in otter populations have been linked to

POPs, otters in Wales reached 90% sites occupied in the 2009-2010 national survey when POPs levels were high. Since the POPs use has been banned under the Stockholm Convention (2001), this makes it is unlikely that POPs are responsible for the declines recorded in the 2015-2018 survey (Kean and Chadwick, 2021), lowering confidence in the fail.

Otters are exposed to a variety of pollutants, not only those monitored as part of WFD, but there is a lack of information on otter health implications to priority substance exposure. As otter numbers were at record highs when PBDE levels were also high, the available evidence suggests these specific chemicals are not restricting populations (Kean and Chadwick, 2021). It is not known if other contaminants not currently monitored are having an impact on otter populations either directly or through their prey. Contaminants in general should not be ruled out as a caused of the declines seen in otters across Wales.

## **Reasons for target failure**

The assessment of the Pembrokeshire Marine SAC otter feature failed one primary target, and one secondary target. This resulted in feature to be assessed as being in **unfavourable** condition. The failing indicators and reasons for failure, if known, are summarised below.

#### **Population health**

While the Cleddau hydrometric area adjacent to the SAC boundary met the primary target of 80% of survey sites having positive signs for otter, the primary target of the wider population to be stable or increasing failed to be met. The wider otter population relevant to the SAC has seen some large declines in all relevant hydrometric areas. All four hydrometric areas saw statistically significant declines over 10%. The Teifi had between a 22-48% decline since the previous survey.

It is not yet clear what has caused the declines seen in the otter population. In the previous Otter Survey of Wales (2009-2010) the population was at record high levels (average of 90% of sites had positive signs across Wales). It may be that the population had reached carrying capacity and the declines seen in the most recent survey are the population naturally settling out. However, some of the steep declines seen are cause for concern. Further investigation is needed, and a full resurvey of Wales's otter population is a priority and should provide more clarity.

#### Water quality: contaminants

This secondary target failed due to PBDE and PAH exceeding their EQS in a WFD waterbody otter are likely to use frequently (Milford Haven Inner). Historically, the main source of PBDE is as flame retardants in a variety of materials (Viñas et al., 2022). PAHs can be produced through natural processes, but also arise from anthropogenic sources, for example during combustion of fossil fuels and organic material (Webster and Fryer, 2022).

The contaminants in the water column may be derived from diffuse sources from contaminated waterbody bed sediments, or point sources from continuous sewage discharge from waste water treatment. However, a WFD investigation into the failure in the Milford Haven Inner waterbody is yet to be undertaken. The impact of these chemicals on otter are not understood and further investigation as to the impact of these at a population level is needed. Mercury and PBDE are being managed at the UK and it is hoped levels

will reduce over time. There is currently no specific management in place for PAH in Wales. The PAH EQS is based on the most sensitive taxa and may not be applicable to a top predator like otter. The impact of PAH on the otter feature is not fully understood.

## Threats to condition

Part of the condition assessment is to identify threats to the condition of the otter 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. The threats to the otter feature condition in the Pembrokeshire Marine SAC are stated below.

#### **Road traffic collisions**

Otters can travel several miles in a night, and often cross roads where rivers are culverted or bridged. Road traffic accidents cause a large number of casualties.

The Cardiff Otter Project typically receives around 200 otters per year, of which 80-90% have been killed as a result of road traffic accidents. The death of otters on roads can have a serious impact on populations, particularly where population densities are low or where danger-spots impact on breeding females (<u>Cardiff Otter Project</u>).

#### Water quality: contaminants

There is the potential for unregulated contaminants (such as PFAS) to increase. This could affect the otter feature as PFAS has been shown to bioaccumulate in marine species, increasing up the trophic levels (Khan et al., 2023). However, the biological impact of PFAS on marine species is not well understood.

Some persistent chemicals are not measured in every WFD waterbody, and some of the relevant waterbodies have not been classified for any chemicals. It is possible that WFD contaminants that are not monitored, or emergent contaminants, are present and impacting the otter population.

## **3.3. Carmarthen Bay and Estuaries SAC**

A summary of the condition assessment for otter *Lutra lutra* in Carmarthen Bay and Estuaries SAC can be seen in Table 6. The overall feature condition, a detailed summary of the assessment and threats to condition can be found in the detailed assessment information.

**Table 6.** Condition assessment of otter in Carmarthen Bay and Estuaries Carmarthen Bay and Estuaries SAC. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting (see Section 1.1).

| Indicator   | Target  | Assessment rationale  | Target<br>assessment | Target<br>confidence |
|---|---|---|----------------------|----------------------|
| Otter<br>population<br>health<br>(hydrometric<br>areas) | Relevant<br>hydrometric areas<br>used for the Otter<br>Survey of Wales<br>have 80% positive<br>sites. (P) | <ul> <li>The Tywi and the Loughor are the relevant hydrometric areas.</li> <li>The Tywi had 73% positive sites, a statistically significant 22.32% decrease since the last survey.</li> <li>The Loughor had 63% positive sites, a statistically significant 37.21% decrease since the last survey.</li> </ul> | Fail                 | Medium               |
|   |   | • Both relevant areas failed to meet the target. Confidence is medium due to the age of the data.   |                      |                      |
| Otter<br>population<br>health (wider<br>population)     | The wider otter<br>population relevant<br>to the SAC is stable<br>or increasing. (P)                      | • The relevant wider population is the southwest and mid-<br>eastern sub-populations which includes the hydrometric<br>areas the Cleddau, Teifi, Tywi, Loughor, Taf, Usk, and Mid<br>Glamorgan.   | Fail                 | Medium               |
|   |   | • All have seen more than a 10% decline in positive otter sites. The biggest was the at Teifi 47.9%.  |                      |                      |
|   |   | These declines failed the wider population target.  |                      |                      |
|   |   | Confidence in the fail is medium due to the age of the survey data.   |                      |                      |

| Indicator                     | Target  | Assessment rationale   | Target<br>assessment | Target confidence |
|-------------------------------|---|--|----------------------|-------------------|
| Presence<br>within the<br>SAC | Positive signs otters<br>using sites within<br>the SAC. (P)             | <ul> <li>LERC recorded 48 observations of otter presence (live<br/>sightings, roadkill, spraint, tracks, etc.) within the SAC<br/>boundary or up to 1km inland between 2013-2023.</li> </ul> | Pass                 | Medium            |
|                               |   | • The last record in the LERC at the time of the assessment was from 2022.   |                      |                   |
|                               |   | • Of these 48 records less than half (17) were recorded in the last five years (2018-2022).  |                      |                   |
|                               |   | <ul> <li>No comment can be made on numbers of otter as multiple<br/>record signs may have been left by the same otter.</li> </ul>  |                      |                   |
|                               |   | • However, there is strong evidence to suggest that otter were using this SAC up until at least 2022.  |                      |                   |
|                               |   | <ul> <li>Confidence is medium as there have been no targeted<br/>surveys of use of the SAC and the last sign was record in<br/>2022.</li> </ul>  |                      |                   |
| Habitat<br>connectivity       | No evidence of<br>barriers that impact                                  | <ul> <li>No major barriers identified have been from development<br/>related plans or projects.</li> </ul>   | Pass                 | Low               |
| -                             | the safe passage  | No major road schemes planned or under construction.   |                      |                   |
|                               | and movement of<br>otters into, within<br>and away from the<br>SAC. (P) | <ul> <li>Confidence is low as there have been no surveys to map<br/>barriers.</li> </ul>   |                      |                   |

| Indicator                      | Target  | Assessment rationale  | Target<br>assessment | Target confidence |
|--------------------------------|---|---|----------------------|-------------------|
| Water quality:<br>contaminants | Contaminants within<br>the water column do<br>not exceed the<br>Environmental<br>Quality Standard<br>(EQS). (S) | <ul> <li>Three of the four WFD waterbodies in the SAC have a pass for chemicals in the 2024 cycle 3 interim classification (Burry Inlet Outer, Burry Inlet Inner and Three Rivers Estuary). In all waterbodies, some or all of the chemical classifications were rolled forward from previous cycles as they were not classified in the 2024 cycle 3 interim classification.</li> <li>The other WFD waterbody has a fail for chemicals (Carmarthen Bay). It failed for mercury, PBDE and cypermethrin. Otters within the SAC use this waterbody.</li> <li>Confidence is low as the human health standard has been used for PBDE, due to the roll forward of some chemical classifications.</li> </ul> | Fail                 | Low               |

## **Assessment conclusions**

The otter feature in Carmarthen Bay and Estuaries has been assessed as being in **unfavourable** condition (medium confidence). There were two failing indicators (Table 7). Further investigation is needed to better understand all of the failures to be able to identify management options that can bring the feature back into favourable condition.

A summary of the assessment can be seen in Table 7 with more detail on each performance indicator, and any reasons for failure, provided in the sections below.

| Table 7. Summary | y of the condition assessr | ment for otter in Carmarth | en Bay and Estuaries SAC. |
|------------------|----------------------------|----------------------------|---------------------------|
|------------------|----------------------------|----------------------------|---------------------------|

| SAC                                | Overall<br>Condition<br>Assessment     | Indicator failures   | Reason for indicator failure   | Threats to condition   |
|------------------------------------|--|--|--|--|
| Carmarthen<br>Bay and<br>Estuaries | Unfavourable<br>(medium<br>confidence) | Otter population health<br>(P)<br>Water quality:<br>contaminants (S) | <ul> <li>Declining population adjacent to the SAC.<br/>Declining wider otter population.</li> <li>Levels of PBDE, mercury and<br/>cypermethrin in the Carmarthen Bay<br/>waterbody are failing to meet EQS.</li> </ul> | <ul> <li>Road traffic collisions</li> <li>Water quality: contaminants</li> </ul> |

## **Detailed assessment information**

Otter in Carmarthen Bay and Estuaries SAC have been assessed against the chosen performance indicators using the Otter Survey of Wales, LERC data, WFD data, licenced activities assessments and expert knowledge.

#### Otter population health

The latest Otter Survey of Wales was published in 2021 with the surveys taking place over 2015-2018. The same sites are revisited every seven years allowing comparisons between surveys to see if there has been a change in the number of sites with positive signs of otter in a hydrometric area (river catchment).

The relevant hydrometric areas for a SAC are those whose boundaries border the SAC boundary. For the Carmarthen Bay and Estuaries SAC the relevant hydrometric areas are the Tywi and the Loughor (See Figure 2).

Both the Tywi and the Loughor hydrometric areas have seen a decline in positive sites in the 6<sup>th</sup> Otter Survey of Wales compared to the 5<sup>th</sup> Otter Survey of Wales (Kean and Chadwick, 2021). The 90 sites in the Tywi area were surveyed between 2015-2017, where 73% of sites (66) showed positive signs of otter. This was a statistically significant decrease of 22% since the last survey. Of the 43 sites surveyed in the Loughor between 2017-2018, 63% (27) sites were positive. This was a significant decrease of 37% since the last survey where 100% of sites were positive and is a real cause for concern. It should be noted that there were six fewer sites surveyed in the 6<sup>th</sup> Otter Survey of Wales due to difficult conditions.

Due to these steep declines the Loughor was resurveyed in 2019-2020 to assess whether volunteer skill in the 6<sup>th</sup> Otter Survey of Wales was a cause of the decline. This survey assessed 49 sites (one less than 5<sup>th</sup> Otter Survey of Wales) and found 57% (28 sites) were positive for otter signs. As this was close to the 6<sup>th</sup> Otter Survey of Wales results it was deemed volunteer surveying skill were not behind the decline (Kean and Chadwick, 2021).

As neither relevant hydrometric area met the 80% positive site target by quite some way, the indicator target failed. However, as the survey is 8 years old at the time of publication the confidence, the confidence in this failure is reduced to medium, as recovery in declining sites may have occurred.

The second indicator for the population heath indicator is around the wider otter population. A genetic study found that otters in Wales are comprised of three genetically distinct sub-groups; southwest Wales, northwest Wales and mid-east Wales (Hobbs et al., 2011). Therefore, the performance indicator target has been set to look at the wider population relevant to the SAC for the assessment, as any declines in the wider population are likely to impact the number of otters using the SAC.

Due to its position in central south Wales, Carmarthen Bay could be frequented by otters that fall into the mid-eastern genetic population as well as the southwest. The hydrometric sites relevant to Carmarthen Bay are the Cleddau, Teifi, Tywi, Loughor, Taf, Usk, and Mid Glamorgan. All areas have seen declines in the number of positive sites. The largest decline was seen in the Teifi at 48%, followed by the Loughor 37%, Mid Glamorgan 28%,

the Usk 26%, the Tywi 22%, the Taf 15%, and the Cleddau 14%. All except the Taf were statistically significant.

The decline on the Teifi was of particular concern as it was nearly a 50% reduction. The area was resurveyed in 2019-2020 where the surveyor found 74% of sites were positive. This suggested some recovery but was still lower than expected. It should be noted that in many cases during the resurvey it was necessary to survey considerable distances to find signs and those that were found were old spraint. It was concluded that the results did not indicate a population at or near carrying capacity (Kean and Chadwick, 2021). The resurvey still showed a significant decline since the 5<sup>th</sup> Otter Survey of Wales when 95% of sites in the Teifi were positive.

Due to the large declines in these hydrometric areas the wider population was not deemed to be stable or increasing, so the target failed. The fact the survey data ranges from 8-10 years old reduces the confidence in the failure to medium. The population may have recovered or may have declined further. The next Otter Survey of Wales is due to take place in 2024-2025.

#### Otter presence in the SAC

Otter presence in the SAC has not been directly surveyed. Some sites in the Otter Survey of Wales are close to the coast (within 500 m). LERCs hold records of otter signs (sightings, spraints, footprints, roadkill) and these records include those made as part of the Otter Survey of Wales as well as those submitted directly to the LERC.



Figure 5. Otter signs in the Carmarthen Bay and Estuaries SAC between 2013-2023.

For Carmarthen Bay and Estuaries SAC signs of otter were recorded with 48 observations of otter presence (live sightings, roadkill, spraint, tracks, etc.) over the last 10 years within the SAC and 1 km inland (Figure 5). Some of these were likely taken as part of the 6<sup>th</sup> Otter Survey of Wales. No comparisons can be made on numbers as a single otter may have left multiple signs. However, all sightings can be considered as positive signs that otter are using the SAC. At the time of the assessment the last recorded sign in the database (a live sighting) was in 2022 (database accessed in November 2023). The target for this indicator is met but confidence in the target pass is reduced to medium as the LERC records are a proxy. More targeted surveys of otter use of coast are needed.

#### Habitat quality and connectivity

It is known that coastal sites are important to otter in terms of travelling between sites, foraging for food and resting. Therefore, it is important that the habitat quality and functionality is maintained within and around the SAC. In the Tywi hydrometric area a survey of 10 previously identified potential breeding sites found only 5 were still viable (Parry and Liles, 2023). This indicated a concerning reduction in the habitat quality and function in a relevant hydrometric area to the SAC. There is a lack of information on habitat quality and function along the coast in the SAC itself and the survey in the Tywi was just a subset of the breeding sites and only indicative. Therefore, there is not enough information to assess the habitat quality and function indicator. This has been noted as an evidence gap to try and fill before the next assessment.

As otters are a highly mobile species that have large home ranges, unimpeded movement across their range is vital. Looking at developments in the area, assessors found no evidence of obvious barriers to otter movement within the SAC or the wider area, therefore the habitat connectivity indicator met its target. However, as there has been no specific surveys of more localised barriers to movement the confidence in the pass is low.

#### Water quality

Many contaminants are known to persist and bioaccumulate in top predators through the food chain. As well as this past declines in otter populations have been linked to persistent organic pollutants (POPs). For this reason water quality was chosen as a performance indicator for otter.

The water quality target failed to be met for PBDE, mercury and cypermethrin in one WFD waterbody, Carmarthen Bay, in the 2024 cycle 3 interim classification. The EQS for cypermethrin is very low, and in the previous lab methodology it was not possible to detect concentrations below the EQS. There has been a waterbody status change between the 2021 cycle 3 classification and 2024 cycle 3 interim classification due to this reason. Cypermethrin is a synthetic pyrethroid insecticide and is highly toxic to some aquatic species (EA, 2019), but now has a restricted use in Wales. Mercury has failed in the waterbody since the 2015 cycle 2 classification. The EQS for mercury is based on the secondary poisoning protection goal (for wildlife). The PBDE failure was based on the value of the human health protection goal as it is the most stringent. This protection goal may be over precautionary as the effect of contaminants on otters are not fully understood. The Carmarthen Bay waterbody overlaps with a large area in the SAC, therefore the chemical failure there has resulted in the failure for the contaminants indicator. The other three waterbodies have a pass for chemicals in the 2024 cycle 3 interim classification. However, in all three waterbodies, some or all of the chemical classifications were rolled

forward from previous cycles as they were not assessed in the 2024 cycle 3 interim classification.

Overall, a low confidence was assigned to the failure of the contaminants indicator because the human health standard has been used for PBDE, and due to the roll forward in some chemical classifications. Further to this, even though historic declines in otter populations have been linked to POPs, otters in Wales reached 90% sites occupied in the 2009-2010 national survey when POPs levels were high. Since the POPs use has been banned under the Stockholm Convention (2001), this makes it is unlikely that POPs are responsible for the declines recorded in the 2015-2018 survey (Kean and Chadwick, 2021), lowering confidence in the fail.

Otters are exposed to a variety of pollutants, not only those monitored as part of WFD, but there is a lack of information on otter health implications to priority substance exposure. As otter numbers were at record highs when PBDE and mercury levels were also high the available evidence suggests these specific chemicals are not restricting populations (Kean and Chadwick, 2021). It is not known if other contaminants not currently monitored are having an impact on otter populations either directly or through their prey. Contaminants in general should not be ruled out as a caused of the declines seen in otters across Wales.

## **Reasons for target failure**

The assessment of the Carmarthen Bay and Estuaries SAC otter feature failed two primary targets, and one secondary target. This resulted in feature to be assessed as being in **unfavourable** condition. The failing indicators and reasons for failure, if known, are summarised below.

#### Otter population health

The primary targets of 80% positive sites in relevant hydrometric areas and the wider population is stable or increasing failed to be met. The two hydrometric areas that border the SAC had both seen declines in the most recent survey. The Loughor saw the largest decline in positive sites at 37% followed by the Tywi at 22%.

The wider otter population relevant to the SAC had also seen declines in all relevant hydrometric areas. All seven of which saw declines over 10% of which six were statistically significant. The Teifi had an almost 50% decline since the previous survey.

It is not yet clear what has caused the declines seen in the otter population. In the previous Otter Survey of Wales (2009-2010) the population was at record high levels (average of 90% of sites had positive signs across Wales). It may be that the population had reached carrying capacity and the declines seen in the most recent survey are the population naturally settling out. However, some of the steep declines seen are cause for concern. Further investigation is needed, and a full resurvey of Wales's otter population is a priority and should provide more clarity.

#### Water quality: contaminants

This secondary target failed due to PBDE, mercury and cypermethrin exceeding their EQS in one WFD waterbody that otters are likely to use frequently (Carmarthen Bay). Historically, the main source of PBDE is as flame retardants in a variety of materials (Viñas et al., 2022). Mercury has been used in many industries, but today the primary sources are

burning of coal and artisan mining for mercury (Larsen and Hjermann, 2022). Cypermethrin is an insecticide used for plant protection in crops, in forestry, gardens, homes and businesses. It is also used in veterinary medicine to control pests in livestock and pets (EA, 2019). The application of cypermethrin has been restricted for some uses (sheep dipping and in forestry against the pine weevil).

Some of the contaminants in the water column may be derived from diffuse sources from atmospheric deposition and contaminated waterbody bed sediments, or point sources from continuous sewage discharge from wastewater treatment. However, a WFD investigation of the failure in the Carmarthen Bay waterbody is yet to be undertaken. The impact of these chemicals on otter are not understood and further investigation as to the impact of these at a population level is needed. Mercury and PBDE are being managed in the UK and it is hoped that these levels will reduce in time.

## Threats to condition

Part of the condition assessment is to identify threats to the condition of the otter 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. The threats to the otter feature condition in the Carmarthen Bay and Estuaries SAC are stated below.

#### **Road traffic collisions**

Otters can travel several miles in a night, and often cross roads where rivers are culverted or bridged. Road traffic accidents cause a large number of casualties.

The Cardiff Otter Project typically receives around 200 otters per year, of which 80-90% have been killed as a result of road traffic accidents. The death of otters on roads can have a serious impact on populations, particularly where population densities are low or where danger-spots impact on breeding females (<u>Cardiff Otter Project</u>).

#### Water quality: contaminants

There is the potential for unregulated contaminants (such as PFAS) to increase. This could affect the otter feature as PFAS has been shown to bioaccumulate in marine species, increasing up the trophic levels (Khan et al., 2023). However, the biological impact of PFAS on marine species is not well understood.

Some persistent chemicals are not measured in every WFD waterbody, and some of the relevant waterbodies have not been classified for any chemicals. It is possible that WFD contaminants that are not monitored, or emergent contaminants, are present and impacting the otter population.

# 3.4. Evidence gaps for otter in Welsh marine SACs

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

Listed below are current indicators that were either assessed as unknown, not assessed, or assessed with a lower confidence. This was due to either limited data availability, outdated data, or a lack of information. Some indicators are not currently monitored but should be ideally considered in future condition assessments. Not all evidence gaps apply to every SAC, see Table 8 for details.

**Table 8.** Evidence gaps for otter in Welsh marine SACs. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting (see Section 1.1).

| Indicator                              | Assessed<br>status               | Comments   |
|--|----------------------------------|--|
| Presence in<br>SAC (P)                 | Medium<br>confidence             | <ul> <li>There has been no targeted survey of otter use<br/>in the Pen Llŷn a'r Sarnau or Carmarthen Bay<br/>and Estuaries SACs.</li> </ul>  |
|  |                                  | <ul> <li>Sites in the Otter Survey of Wales have not<br/>been selected based on their proximity to the<br/>coast and other records rely on public sightings.</li> </ul>  |
|  |                                  | <ul> <li>Work has been done to survey otter SAC use in<br/>Pembrokeshire Marine SAC. The assessment<br/>of Pen Llŷn a'r Sarnau and Carmarthen Bay<br/>and Estuaries SACs would benefit from similar<br/>work.</li> </ul>       |
| Habitat quality<br>and function<br>(P) | Not assessed<br>(Pen Llŷn a'r    | <ul> <li>No surveys of the habitat quality for otter have<br/>been done in the Pen Llŷn a'r Sarnau or<br/>Carmarthen Bay and Estuaries SACs.</li> </ul>  |
|  | Carmarthen Bay<br>and Estuaries) | <ul> <li>Work has been done to survey otter habitat in<br/>Pembrokeshire Marine SAC and future<br/>assessments of Pen Llŷn a'r Sarnau or<br/>Carmarthen Bay and Estuaries SACs would<br/>benefit from similar work.</li> </ul> |
| Water quality: contaminants            | Low confidence                   | <ul> <li>Impacts of contaminants at a population level<br/>are not understood</li> </ul>   |
| (S)                                    |                                  | <ul> <li>it is not clear if other chemicals not currently<br/>monitored are present and having an impact.<br/>More research is needed.</li> </ul>  |

| Indicator                | Assessed<br>status | Comments  |
|--------------------------|--------------------|---|
| Prey<br>availability (S) | Not assessed       | <ul> <li>There is a lack of understanding on the diet of<br/>otters foraging in coastal SACs.</li> </ul>  |
|                          |                    | <ul> <li>This make it difficult to assess if food sources<br/>are sufficient to sustain the population. Further<br/>research is needed for all SACs.</li> </ul> |

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