Report under The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended), Regulation 6A

2019-2024

Conservation status assessment for the habitat:

H1180 - Submarine structures made by leaking gases

United Kingdom Offshore

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This report was produced by JNCC.

This document should be cited as:

JNCC. (2026). Conservation status assessment for the habitat: H1180 Submarine structures made by leaking gases.

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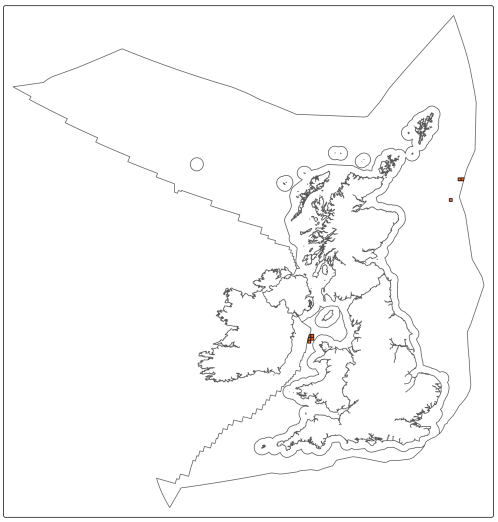
Important note - Please read

- The information in this document represents United Kingdom Offshore Report under The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended), Regulation 6A, for the period 2019-2024.
- It is based on supporting information provided by JNCC.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Maps showing the distribution and range of the habitat are included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country reports.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was not relevant to this habitat (section 11 National Site Network coverage for Annex I habitats).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the JNCC website.

Assessment Summary: Submarine structures made by leaking gases

Distribution Map



Range Map

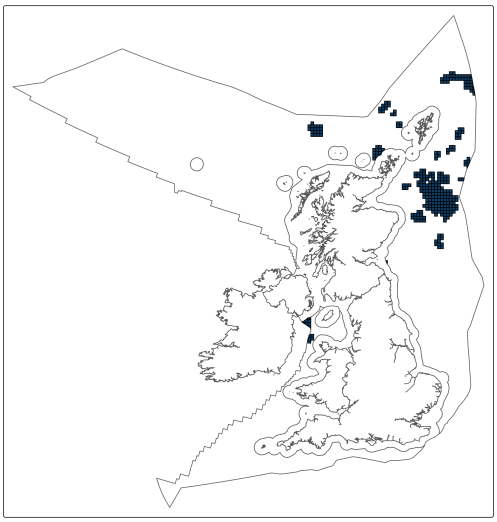


Figure 1: United Kingdom Offshore distribution and range map for H1180 - Submarine structures made by leaking gases. Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available habitat records which are considered to be representative of the distribution within the current reporting period.

The range map was developed from the distribution map, but additionally included areas that had the potential for the habitat to occur based on an understanding of seabed geology.

Table 1: Table summarising the conservation status for H1180 - Submarine structures made by leaking gases. Overall conservation status for habitat is based on assessments of range, area covered by habitat, structure and functions, and future prospects.

Overall Conservation Status (see section 10)

Unknown (XX)

Breakdown of Overall Conservation Status

Range (see section 4)	**Unknown (XX)**
Area covered by habitat (see section 5)	**Unknown (XX)**
Structure and functions (see section 6)	**Favourable (FV)**
Future prospects (see section 9)	**Unknown (XX)**

List of Sections

National Level

1. General information

1.1 Country	United Kingdom Offshore
1.2 Habitat code	H1180 - Submarine structures made by leaking gases

2. Maps

2.1 Year or period	1985-2015
2.2 Distribution map	Yes
2.3 Distribution map; Method used	Based mainly on extrapolation from a limited amount of data

2.4 Additional information

No additional information

Biogeographical Level

3. Biogeographical and marine regions

3.1 Biogeographical or marine region where the habitat occurs MATL

3.2 Sources of information

See section 13 References

4. Range

4.1 Surface area (km²)	14,021
4.2 Short-term trend; Period	2013-2024
4.3 Short-term trend; Direction	Uncertain
4.4 Short-term trend; Magnitude	

a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
4.5 Short-term trend; Method used	Insufficient or no data available
4.6 Long-term trend; Period	
4.7 Long-term trend; Direction	
4.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	
4.9 Long-term trend; Method used	

4.10 Favourable Reference Range (FRR)

a) Area (km²)	
b) Pre-defined increment	
c) Unknown	Yes
d) Method used	
e) Quality of information	

4.11 Change and reason for change in surface area of range

a) Change	Yes
b) Genuine change	No
c) Improved knowledge or more accurate data	Yes

d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Improved knowledge/more accurate data

4.12 Additional information

Range was previously reported for the whole of the UK, however due to the practical difficulties in detecting Methane-Derived Authigenic Carbonate remotely, the total range in offshore UK waters remains unknown.

5. Area covered by habitat

5.1 Year or period	2011-2015
5.2 Surface area (km²)	
a) Minimum	
b) Maximum	
c) Best single value	58.06
5.3 Type of estimate	Minimum
5.4 Surface area; Method used	Based mainly on extrapolation from a limited amount of data
5.5 Short-term trend; Period	2013-2024
5.6 Short-term trend; Direction	Stable
5.7 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
5.8 Short-term trend; Method used	Based mainly on expert opinion with very limited data

5.9 Long-term trend; Period	
5.10 Long-term trend; Direction	
5.11 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Confidence interval	
d) Rate of decrease	
5.12 Long-term trend; Method used	
5.13 Favourable Reference Area (FRA)	
a) Area (km²)	
b) Pre-defined increment	
c) Unknown	Yes
d) Method used	
e) Quality of information	

5.14 Change and reason for change in surface area of range

a) Change	Yes
b) Genuine change	No
c) Improved knowledge or more accurate data	Yes
d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Improved knowledge/more accurate data

5.15 Additional information

Area was previously reported for the whole of the UK, however due to the practical difficulties in detecting Methane-Derived Authigenic Carbonate remotely, total extent was unknown. Most of the known extent feature occurs in offshore waters and new areas of MDAC have not been detected since the previous reporting round, however there may still be areas undiscovered. Therefore the Area reported is the minimum present offshore in the UK.

Area has been assessed as Stable as there is thought to be only a limited amount of mobile fishing pressure on Submarine Structures, particularly around the largest area of this feature in Wales (Croker Carbonate Slabs) where it is thought that there will not have been a significant change since the previous assessment (JNCC, 2025). However, there is not a good understanding of the impacts of repeated exposure from static gears, the level of static fishing pressure on this Annex I habitat is unknown (JNCC 2025). This pressure may potentially impact and cause deterioration to the reef, impacting the extent of this feature.

6. Structure and functions

6.1 Condition of habitat (km²)	
Area in good condition	
ai) Minimum	56.7
aii) Maximum	56.7
Area not in good condition	
bi) Minimum	0.06
bii) Maximum	0.06
Area where condition is unknown	
ci) Minimum	1.3
cii) Maximum	1.3
6.2 Condition of habitat; Method used	Based mainly on expert opinion with very limited data
6.3 Short-term trend of habitat area in good condition; Period	2013-2024
6.4 Short-term trend of habitat area in good condition; Direction	Stable

6.5 Short-term trend of habitat area in good condition; Method used	Based mainly on expert opinion with very limited data

6.6 Typical species

Has the list of typical species changed in comparison to the previous reporting period?	No

6.7 Typical species; Method used

6.8 Additional information

The Annex I Submarine Structures Made by Leaking Gases features within the Braemar Pockmarks SAC and Scanner Pockmark SAC are in unfavourable condition (i.e. not good) due to removal or abrasion of characteristic biological communities in the sites by demersal trawling (JNCC, 2020a, JNCC 2020b). The feature within Croker carbonate slabs SAC, which make up the largest area of the feature, are considered to be in favourable condition (i.e. good) based on latest SAC assessments. Condition of habitat is, therefore, based on the known extent of this habitat. 97% of the known extent is in 'good' condition, while 0.1% is in 'not good' condition and 2.2% is unknown. This assessment is based on the known areas of this habitat. No assessment were made in 2019 due to the unknown Area. However, given that the largest extent of this feature is within Croker Carbonate Slabs, which were considered Favourable, the trend has been assessed as stable. Low fishing pressure from mobile gears act at this site, however, there is uncertainty around static fishing gear and poor understanding of their impact on MDAC reef, so potential for damage cannot be assessed. There is no evidence to show a change in condition of the feature and expert opinion suggests there is unlikely to have been a change since the last survey and previous reporting round.

7. Main pressures

7.1 Characterisation of pressures

Table 2: Pressures affecting the habitat, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Pressure	Timing	Ranking
PJ01: Temperature changes and extremes due to climate change	Ongoing and likely to be in the future	Medium (M)

PJ10: Change of habitat location, size, and / or quality due to climate change	Only in future	Medium (M)
PJ11: Desynchronisation of biological / ecological processes due to climate change	Only in future	Medium (M)
PJ12: Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change	Only in future	Medium (M)
PJ13: Change of species distribution (natural newcomers) due to climate change	Ongoing and likely to be in the future	Medium (M)
PG03: Marine fish and shellfish harvesting activities causing physical loss and disturbance of seafloor habitats	Ongoing and likely to be in the future	High (H)

7.2 Sources of information

See section 13 References

7.3 Additional information

No additional information

8. Conservation measures

8.1: Status of measures

a) Are measures needed?	Yes
b) Indicate the status of measures	Measures identified and taken
8.2 Main purpose of the measures taken	Maintain the current range, surface area or structure and functions of the habitat type
8.3 Location of the measures taken	Both inside and outside National Site Network
8.4 Response to measures	Long-term results (after 2036)

8.5 List of main conservation measures

Table 3: Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Conservation measure	Ranking
MG01: Management of professional/commercial fishing, shellfish and seaweed harvesting (incl. restoration of habitats)	Medium (M)
MC03: Adapt/manage renewable energy installation, facilities and operation (excl. hydropower and abstraction activities)	Medium (M)
MC02: Adapt/manage exploitation of energy resources	Medium (M)

8.6 Additional information

There is overlap between ‘Submarine structures made by leaking gases’ features and pressures known to impact the feature. The feature is in ‘unfavourable’ condition in two of the three offshore MPAs where it is protected, with objectives to ‘restore’ or ‘maintain’ the feature to ‘favourable’ condition

Licensable activities, such as renewable energy developments, oil and gas, CCUS and aggregate extraction: The assessment and management of impacts on SACs from plans and projects in UK waters is carried out through the implementation of the Conservation of Offshore Habitats and Species Regulations 2017 requirements throughout the consenting process. The Conservation of Offshore Marine Habitats and Species Regulations are, amongst other things, mechanisms used to implement conservation measures for offshore European sites.

Fisheries: Proposals for management were previously developed under the EU Joint Recommendation process for Croker Carbonate Slabs SAC. These measures aimed to exclude demersal trawls, dredges and seine nets to protect Annex I ‘Submarine structures made by leaking gases’ feature within the sites management boundaries. These measures had not been agreed at the time of the UK’s exit from the EU, and management of this site now falls under the remit of Welsh Ministers and the Secretary of State. Measures for this site have not progresses since the 2019 reporting round.

9. Future prospects

9.1a Future trends of parameters

ai) Range	Unknown
bi) Area	Unknown
ci) Structure and functions	Unknown

9.1b Future prospects of parameters

aii) Range	Unknown
bii) Area	Unknown
cii) Structure and functions	Unknown

9.2 Additional information

Due to insufficient information on the true range, area and structure and functions parameters it is not possible to assess the future prospects for submarine structures made by leaking gases.

10. Conclusions

10.1 Range	Unknown (XX)
10.2 Area	Unknown (XX)
10.3 Specific structure and functions (incl. typical species)	Favourable (FV)
10.4 Future prospects	Unknown (XX)
10.5 Overall assessment of Conservation Status	Unknown (XX)
10.6 Overall trend in Conservation Status	Unknown

10.7 Change and reason for change in conservation status

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

10.7 Change and reason for change in conservation status trend

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

10.8 Additional information

Since 2019 no further records of this feature have been identified, and given the approach for submarine structures is to largely protect all instances of occurrence, this assessment is based on best available evidence of the extent of this feature. This meant that an assessment for Structure and Function could be completed as this feature is classed as Favourable within Croker Carbonate Slabs SAC which contains the largest proportion of this feature within the UK (>95% total area). Sites in Scotland are classed as Unfavourable but make up a small proportion of this features known area within the UK. Conclusions for Range and Area are unknown due to Unknown Favourable Reference Values.

11. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex I habitat types

11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (km^2)

a) Minimum	
b) Maximum	
c) Best single value	56.76
11.2 Type of estimate	Best estimate
11.3 Habitat area inside the network; Method used	Based mainly on extrapolation from a limited amount of data
11.4 Short-term trend of habitat area within the network; Direction	Stable
11.5 Short-term trend of habitat area within the network; Method used	Based mainly on expert opinion with very limited data
11.6 Short-term trend of habitat area in good condition within the network; Direction	Stable
11.7 Short-term trend of habitat area in good condition within the network; Method used	Based mainly on expert opinion with very limited data

11.8 Additional information

The known area of this feature was intersected with SACs that contain qualifying marine habitats (designated grades A-C).

Known occurrences are located in three sites in offshore UK waters. Croker Carbonate Slabs cSAC/SCI (the largest occurrence), Braemar Pockmarks SAC and Scanner Pockmark SAC. Croker Carbonate Slabs was assessed as being in favourable condition and with a stable short-term trend of habitat area in good condition. Monitoring is in the initial stages and time-series data are not yet available, however expert judgement suggests there is unlikely to have been a change since the last survey and previous reporting round.

12. Complementary information

12.1 Justification of percentage thresholds for trends

No justification information

12.2 Other relevant information

No other relevant information

13. References

Biogeographical and marine regions

3.2 Sources of information

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Main pressures

7.2 Sources of information

No sources of information

14. Explanatory Notes

Field label	Note
2.3: Distribution map; Method used	The distribution map represents areas of known occurrence of the habitat in 10km grid squares up to 2024. These are protected sites in UK offshore waters that contain the habitat - Braemar Pockmarks SAC, Scanner Pockmark SAC, Croker Carbonate Slabs cSAC/SCI. Consequently, the map constitutes a poor representation of the actual distribution of Submarine Structures Made By Leaking Gases in UK waters.
4.1: Surface area	The UK range map was developed from the UK distribution map, but additionally included areas that had the potential for the habitat to occur based on an understanding of seabed geology. Submarine structures made by leaking gases are created through a process of precipitation (attributed to the oxidation of methane) whereby the carbonate cements the normal seabed sediment, forming rock-like concretions of 'Methane-Derived Authigenic Carbonate (MDAC) (Judd, 2001). Therefore, a fundamental requirement for the formation of these structures is the presence of methane (Judd, 2005). There is insufficient data on the habitat to determine its true range, due to the practical difficulties in detecting MDAC remotely. Nevertheless, it is possible to identify sites at which MDAC is likely to occur by identifying 'shallow gas' (gas in the sediments close to the seabed), gas seeps, and seabed features associated with gas seepage (pockmarks, mud volcanoes etc.) (Judd, 2005; Judd et al., 2007). Therefore, a range map has been produced showing these areas within which the Annex I habitat may occur. The value given is the estimated potential range over which MDAC could occur
4.10: Favourable Reference Range (FRR)	MDAC will only form where there is leakage of methane. Where the sediment is not suitable, there may be no morphological feature as evidence of fluid escape (Judd, 2001). Therefore H1180 will only be found where both

	conditions are met and then only at some of those sites. Within UK waters, this habitat is mainly associated with large pockmarks formed through the expulsion of shallow gas. Pockmarks are widespread in the North Sea, but there is little evidence of MDAC. Since the range of the feature is dependent on geological processes rather than ecological processes, and these are unlikely to be affected by anthropogenic activities, the actual range is likely to be equivalent to the favourable reference range. However, in the absence of both a true range estimate and trend data, it is not appropriate to report a favourable reference range estimate at this time.
4.11: Change and reason for change in surface area of range	The most recent update drew on existing survey data and expert opinion to inform the potential range of this feature. Current range is estimated to cover 14021km2; improved mapping has resulted in a smaller surface range figure since 2019 where the range was 14074km2
4.12: Additional information	The UK range map was developed from the UK distribution map, but additionally included areas that had the potential for the habitat to occur based on an understanding of seabed geology. Submarine structures made by leaking gases are created through a process of precipitation (attributed to the oxidation of methane) whereby the carbonate cements the normal seabed sediment, forming rock-like concretions of 'Methane-Derived Authigenic Carbonate (MDAC) (Judd, 2001). Therefore, a fundamental requirement for the formation of these structures is the presence of methane (Judd, 2005). Estimated range in 2019 was 14074 km² in 2019. As a result of improved mapping of the habitat, estimated reef range is 14021 km². There is insufficient data on the habitat to determine its true range, due to the practical difficulties in detecting MDAC remotely. Nevertheless, it is possible to identify sites at which MDAC is likely to occur by identifying 'shallow gas' (gas in the sediments close to the seabed), gas seeps, and seabed features associated with gas seepage (pockmarks, mud volcanoes etc.) (Judd, 2005;

	Judd et al., 2007; Judd et al., 2019). Therefore, a range map has been produced showing these areas within which the Annex I habitat may occur. The value given is the estimated potential range over which MDAC could occur. The short-term range trend for the feature is Uncertain due to insufficient data on the habitat to determine its true range. It is not possible to determine the long-term range trend due to a lack of data over time. Since the range of the feature is primarily dependent on geological processes the actual range is likely to be equivalent to the favourable reference range. However, in the absence of both a true range estimate and trend data, it is not appropriate to report a favourable reference range estimate for this reporting period.
4.3: Short-term trend; Direction	As described in Section 4.1, it is not possible to determine the true range of this habitat. Detection difficulties mean that the area of the feature is not believed to have been fully mapped. Range has, therefore, been determined from current known occurrences of the habitat and from areas of shallow gas where the habitat could potentially occur. It is extremely difficult to predict in which specific areas of the shallow gas, this habitat would occur, therefore a model of area and range is not available. Consequently, figures represent potential habitat range and there are no real trend data from which to determine any change in the range of this habitat.
5.13: Favourable Reference Area (FRA)	While a minimum estimate is available, in the absence of a current best estimate or maximum estimate for total area and a lack of long-term trend data, it is not possible to determine the favourable reference area at this time.
5.15: Additional information	The total area of the habitat in offshore UK waters is unknown due to the practical difficulties detecting Methane-Derived Authigenic Carbonate (MDAC) remotely. To date, known occurrences of the habitat in UK waters cover a minimum of 58.06km². Croker Carbonate Slabs SAC covering 58km² and the Scanner and Braemar Pockmark

	SACs are thought to cover 0.06km². Area was not reported in 2019, however best available evidence suggests the best estimate may be a minimum value for offshore waters. A multibeam survey in 2015 (Noble James et al., 2017) showed evidence that the seep in Croker Carbonate Slabs SAC is still active and that MDAC is still likely to be forming, and a review of evidence has improved knowledge of Croker (Judd et al., 2019), however there have not been any follow up monitoring surveys since. The total area in Scotland remains unknown due to the practical difficulties detecting MDAC. The short-term area trend is Stable based on extrapolations from a limited amount of data and expert opinion. Croker Carbonate Slabs SAC forms the largest known example of the feature in offshore UK waters and is assessed as being in favourable condition. There is insufficient data over time to assess the long-term area trend
5.2: Surface area	The total area of the habitat in UK waters is unknown due to the practical difficulties in detecting Methane-Derived Authigenic Carbonate remotely, however the estimated minimum based on known occurrences of the habitat in offshore UK waters cover an area of 58.06 km2
5.6: Short-term trend; Direction	The short-term trend of area is thought to be stable. There have not been any further surveys since the last reporting round, however expert judgement suggests the area is unlikely to have changed for this feature since the last reporting round (see 6.1).
6.1: Condition of habitat	Condition is derived from condition assessments which class Croker Carbonate Slabs in Favourable condition (JNCC, 2020c, 2025). A survey in 2015 (Noble James et al., 2017) showed evidence that the seep is still active and that Methane-Derived Authigenic Carbonate (MDAC) is still likely to be forming. However, the monitoring programme is in the initial stages and time-series data are not yet available. Croker faces low fishing pressure and is targeted by static bottom-contacting gear (Wood et al, 2016) but

	there is uncertainty around static fishing gear and poor understanding of their impact on MDAC reef, so potential for damage cannot be assessed. There is no evidence to show a change in condition of the feature and expert opinion suggests there is unlikely to have been a change since the last survey and previous reporting round. Typical species were not used directly in the assessment of conservation status for habitat structure and function as a comprehensive list is not available (see field 6.7).
7.1: Characterisation of pressures	For offshore submarine structures made by leaking gases, the pressures and threats have remained the same since 2019, however fishing pressure has increased and two climate change threats are now considered ongoing pressures. The OSPAR thematic assessment of benthic habitats (OSPAR, 2023a) highlights that benthic habitats are impacted by activities operating and/or interacting with the biotic and abiotic components of the seafloor. Key pressures include shipping, fish and shellfish harvesting, extraction of minerals, tourism and leisure, renewable energy, submarine cables, oil and gas, agriculture, aquaculture and climate change causing physical disturbance, physical loss, and alterations to biological communities. Offshore submarine structures are likely to be exposed to marine pollution from oil and gas operations and spillages and release from shipping, however the impact of these has been ranked as low. Key pressures for Submarine Structures made by leaking gases include: Medium and High ranked pressures include: PG03: Fishing activity has increased in the Celtic Seas and Greater North Sea. This pressure is ranked high due to the sensitivity of this habitat to the effects of demersal trawling and fishing causing physical disturbance and physical loss, and the spatial overlap of >25% identified from human activity layers. The trend until 2030 is uncertain (OSPAR, 2023b). Fishing pressures resulting in the removal of target and

non-target species refer to any damage, loss or removal of species defined as a designated feature, or species integral to the integrity of a designated feature (for example key structural or influential species). As details of key structural and influential species for offshore submarine structures are yet to be fully defined, they are assessed more completely within the surface and subsurface abrasion pressures meaning PG01 is covered by this pressure/threat code.

Pockmarks may be affected by trawling or bottom gear depending on their size and depth. It is possible that shallow pockmarks could be disturbed by bottom gear and species removed from the pockmark or its slopes. However, removal of emergent infauna (e.g. sea pens or sea anemones) from the slopes of pockmarks or removal of a proportion of the macro-infauna as by-catch may not adversely affect the character of the pockmark community as the microbial and meiofaunal communities will probably remain from the previous submarine structures report.

PJ10, PJ11, PJ12: Climate change and ocean acidification cause direct and indirect pressures which can significantly alter the environmental conditions (e.g. decreases in pH, increases in sea surface temperature) necessary for benthic ecosystem processes and functions (OSPAR, 2023a). Calcifying organisms are thought to be vulnerable to ocean acidification under climate change, with some models predicting up to 13% of cold water coral reefs being in low-aragonite areas (Hoppit & Schmidt 2022, Moore & Smale 2020). Climatic models predict there will be changes to area of suitable habitat in the future depending on the climatic scenario (Moore & Smale, 2020). Other studies suggest ecosystem-level responses could remain stable over long periods of time, depending on the species involved (Moore & Smale, 2020). While confidence in evidence has increased from low to medium, there are still knowledge gaps meaning we are unable to fully assess the scale of benthic species and community responses in

	relation to climate change for broadscale habitats (Moore & Smale, 2020). PJ01, PJ13: The timing of these pressures are now considered ongoing now and in the future due to evidence to suggest temperature changes and extremes and changes in species distributions due to climate change is already occurring. Confidence in available evidence has increased from low to medium (Moore & Smale, 2020). Benthic habitats are predicted to face increased temperatures and frequency of heatwaves under climatic projections in the future. Offshore circalittoral rocks are thought to face a strong effect of increased temperatures in the future (OSPAR, 2023a). Benthic invertebrates and macroalgal species distributions and range shifts of local species, with some increase in warm-water affinity species especially in the South-West.
7.3: Additional information	The following steps were taken to identify ongoing pressures of the highest importance in the offshore: - The human activities and associated pressures to which the habitat's communities were highly and moderately sensitive were identified (JNCC, 2022. Tillin et al 2010). - These human activities/pressures were matched to the Habitats Regulations pressures list using the JNCC Pressures-Activities Database (JNCC, 2022). - Spatial overlap between the habitat and human activities was identified using the UK offshore benthic monitoring options risk assessment results (JNCC,2017). This overlap was sense checked against the most recent habitat extent and human activities layers. - Pressures were marked as high importance (H) when a high or moderate sensitivity was identified AND there was an overlap of >25% with the habitat

- Pressures were marked as medium importance (M) when a high or moderate sensitivity was identified AND there was a 10-25% overlap with the habitat

- Expert judgement used the best available information to determine if future impacts identified in the previous reporting cycle had transitioned into ongoing impacts or past impacts in the current reporting cycle. No pressures were determined to be acting in the past only.

The following steps were taken to identify future pressures of the highest importance:

- Expert judgement used the best available information and trends identified in the Quality Status Report (2023) to predict the main human activities (pressures) that are thought to have a future impact on the feature within the next two reporting cycles. Habitat sensitivity and spatial overlap were considered as they were for ongoing pressures with predicted future overlap considered where available.

Caveats-Human activities data - The monitoring options UK benthic habitats risk assessment and was completed in 2016 and so uses habitat and human activity data updated in that year (JNCC, 2017) - Surface and subsurface abrasion is depicted using 0.5 degree x 0.5 degree c-square grid, which is at a larger scale than habitat or human activity data and overlaps with the c-square grid could be over-estimated.

Caveats - Habitat sensitivity - Caveats associated with the MARESA sensitivity information can be found in the Tyler-Walters, (2018) report.

Caveats - Habitat map - The pressures section only considers the activities that occur over the known mapped area of the feature, as the full extent of the feature is uncertain.

	Caveats – Future - The evidence used in relation to climate change has medium confidence (Moore & Smale, 2020).
8.1: Status of measures	There is overlap between 'Submarine structures made by leaking gases' features and pressures known to impact the feature. The feature is in 'unfavourable' condition in two of the three offshore MPAs where it is protected, with objectives to 'restore' or 'maintain' the feature to 'favourable' condition, for all attributes. Licensable activities, such as renewable energy developments, oil and gas, CCUS and aggregate extraction: The assessment and management of impacts from plans and projects in UK waters is carried out through the implementation of the Conservation of Offshore Habitats and Species Regulations 2017 requirements throughout the consenting process. The Conservation of Offshore Marine Habitats and Species Regulations 2017 are, amongst other things, mechanisms used to implement conservation measures for offshore European sites. Fisheries measures are proposed for two of the offshore MPAs that are designated for this feature (Braemer Pockmarks SAC and Scanner Pockmarks SAC). These measures are currently going through a consultation period. The proposals aim at excluding both mobile and static gear to protect Annex I 'Submarine structures made by leaking gases' feature within the sites management boundaries. Examples of some measures currently in place: - Regulation (EU) 2016/2336 establishes specific conditions for fishing for deep-sea stocks in the north-east Atlantic banning bottom trawling in waters deeper than 800 m, where some areas have been identified as being suitable for MDAC to occur. This feature is assessed as 'favourable' within the Croker Carbonate Slabs SAC in offshore Welsh waters. At the time of assessment (2020 and 2025), there was negligible overlap between the feature and pressures known to impact the this site. However, this does not

	preclude the need for additional management to safeguard the feature from any change in activity occurring in this site.
8.2: Main purpose of the measures taken	Conservation measures can help SACs to achieve their conservation objectives. The feature is in 'unfavourable' condition in two of the three offshore MPAs where it is protected, with objectives to 'restore' or 'maintain' the feature to 'favourable' condition, for all attributes. The purpose of identified conservation measures will be to help 'restore' or 'maintain' the sites to 'favourable' condition. The pressure causing physical loss and disturbance of seafloor habitats and reduction of species/prey populations and disturbance of species deriving from fisheries can be limited through the implementation of fisheries management areas where restrictions on gear apply.
8.3: Location of the measures taken	The Conservation of Offshore Marine Habitats and Species Regulations 2017 are, amongst other things, mechanisms used to implement conservation measures for offshore European sites. If Annex I features are identified during surveys outside of European sites, they may be given consideration in terms of the mitigation hierarchy.
8.4: Response to the measures	MarESA (Marine Evidence based Sensitivity Assessment) indicates that the habitat is sensitive to the pressures caused by renewables energy projects and fishing including 'physical change to another seabed type', as well as surface and subsurface abrasion ('abrasion/disturbance of the surface of the substratum or seabed' and 'penetration or disturbance of the substratum subsurface'). The assessment suggests that the habitat has high sensitivity and very low resilience to the pressure 'physical change to another seabed type', this predicts negligible or prolonged recovery; at least 25 years to recover structure and function (Tyler-Walters, 2025a; Tyler-Walters, 2025b). Therefore, the response to measures, once implemented, is predicted to be long-term. The habitat has medium sensitivity to surface and subsurface abrasion, which suggests full recovery

	within 2 to 10 years (Tyler-Walters, 2025a; Tyler-Walters, 2025b).
8.5: List of main conservation measures	MG01:Ranked as medium. Two activities (PG03 and PG01) were ranked high in terms of both pressures and threats for Annex I 'Submarine structures made by leaking gases'. Fisheries management measures are proposed in two offshore MPAs that are designated for this feature. These measures can remove or reduce significantly the pressure deriving from this type of activity. The measures have the potential to take place over the next two reporting cycles, however, will only act over part of the feature's potential range. While the feature Annex I 'Submarine structures made by leaking gases' is currently assessed as maintain in the Croker Carbonate Slabs SAC , measures were previously considered to safeguard this feature under the Joint Recommendation process prior to EU exit and may be considered in future by the Welsh Ministers and Secretary of State. MC02: Adapt/manage exploitation of energy resources and MC03: Adapt/manage renewable energy installation, facilities and operation (excl. hydropower and abstraction activities) have been included as medium conservation measures due to their importance in protecting habitats. Industry is required to report these activities and limit impact. While pressures associated with these activities are ranked as low based on the methodology used to assess pressures, measures are in place and required to protect habitats. Conservation measures linked to the high and medium pressures/threats (Section 7) but ranked as low: MJ01: Implement climate change mitigation measures: The Climate Change Act 2008 is the basis for the UK's approach to tackling and responding to climate change. The measure is ranked as low as it is unknown how this will impact marine habitats in the next two reporting periods.

9.1:Future trends and prospects of parameters	Due to insufficient information on the range, area and structure and functions parameters it is not possible to assess the future prospects for submarine structures made by leaking gases. It is known that static gears act on these sites which can cause deterioration of habitat, impacting both extent and condition, however the impacts from these pressures and the future prospects are uncertain.
10.1: Range	Conclusion on range reached because the short-term trend, FRV and future prospects are Unknown
10.2: Area	Conclusion on area reached because while the short term trend is stable, FRV and future prospects of area are Unknown
10.3: Specific structure and functions	Conclusion on structure and function reached because at least 95% of the known feature is in 'good' condition and less than 5% of the known feature is in 'poor' condition
10.4: Future prospects	Conclusion on future prospects reached because the future prospects for range, area and structure and function are Unknown
10.5: Overall assessment of Conservation Status	Overall assessment of conservation status is Unknown because two or more of the conclusions are unknown