# European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

## Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the habitat:

## H1140 - Mudflats and sandflats not covered by seawater at low tide

ENGLAND

## IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this habitat, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this habitat is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- 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 only relevant at UK-level (sections 10 Future prospects and 11 Conclusions).
- For technical reasons, the country-level future trends for Range, Area covered by habitat and Structure and functions are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

# Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

## NATIONAL LEVEL

### 1. General information

| | |
|---|---|
| 1.1 Member State | **UK (England information only)** |
| 1.2 Habitat code | **1140 - Mudflats and sandflats not covered by seawater at low tide** |

### 2. Maps

| | |
|---|---|
| 2.1 Year or period | |
| 2.3 Distribution map | Yes |
| 2.3 Distribution map Method used | |
| 2.4 Additional maps | No |

## BIOGEOGRAPHICAL LEVEL

### 3. Biogeographical and marine regions

| | |
|---|---|
| 3.1 Biogeographical or marine region where the habitat occurs | **Marine Atlantic (MATL)** |

3.2 Sources of information


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## 4. Range

| | | |
|---|---|---|
| 4.1 Surface area (in km²) | 1981.52 | |
| 4.2 Short-term trend Period | | |
| 4.3 Short-term trend Direction | | |
| 4.4 Short-term trend Magnitude | a) Minimum | b) Maximum |
| 4.5 Short-term trend Method used | | |
| 4.6 Long-term trend Period | | |
| 4.7 Long-term trend Direction | | |
| 4.8 Long-term trend Magnitude | a) Minimum | b) Maximum |
| 4.9 Long-term trend Method used | | |
| 4.10 Favourable reference range | a) Area (km²)<br>b) Operator | |

| | |
|---|---|
| | c) Unknown No |
| | d) Method |
| 4.11 Change and reason for change in surface area of range | No change<br>The change is mainly due to: |
| 4.12 Additional information | |

## 5. Area covered by habitat

| | | | |
|---|---|---|---|
| 5.1 Year or period | | | |
| 5.2 Surface area (in km²) | a) Minimum 1981.52 | b) Maximum 1981.52 | c) Best single value 1981.52 |
| 5.3 Type of estimate | | | |
| 5.4 Surface area Method used | | | |
| 5.5 Short-term trend Period | | | |
| 5.6 Short-term trend Direction | | | |
| 5.7 Short-term trend Magnitude | a) Minimum | b) Maximum | c) Confidence interval |
| 5.8 Short-term trend Method used | | | |
| 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 |
| 5.12 Long-term trend Method used | | | |
| 5.13 Favourable reference area | a) Area (km²)<br>b) Operator<br>c) Unknown No<br>d) Method | | |
| 5.14 Change and reason for change in surface area of range | No change<br>The change is mainly due to: | | |
| 5.15 Additional information | | | |

## 6. Structure and functions

| | | | |
|---|---|---|---|
| 6.1 Condition of habitat | a) Area in good condition (km²) | Minimum 948.17977 | Maximum 948.17977 |
| | b) Area in not-good condition (km²) | Minimum 543.91442 | Maximum 543.91442 |
| | c) Area where condition is not known (km²) | Minimum 489.42379 | Maximum 489.42379 |
| 6.2 Condition of habitat Method used | Based mainly on extrapolation from a limited amount of data | | |
| 6.3 Short-term trend of habitat area in good condition Period | 2007-2018 | | |
| 6.4 Short-term trend of habitat area in good condition Direction | Decreasing (-) | | |
| 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 | A combination of methods has been used to come up with the area of the feature in \good\ and \not good\ condition. This has been a mixture of data from: 1) full condition assessments from SACs using monitoring data to assess condition against a number of attributes at the sub-feature level, before aggregating this for feature condition. Across the feature different areas may be allocated to different condition categories based on sub-feature condition and the resolution of available data. 2) Proxy condition assessments to assign condition for sites for which there is no full condition assessment. A model was used to calculate the proxy condition of the feature based on the activities that are occurring within a site and the vulnerability of features to activities they are exposed to. This output was evaluated and the percentage of the feature in unfavourable condition was estimated from the model output. 3) Outputs of vulnerability assessments for tranche 2 and 3 marine conservation zone features that are directly or broadly comparable to annex I mudflats and sandflats. These were generated as part of the designation process. Any areas that overlapped with existing SACs were removed. The data from these three sources was then aggregated up to a national level, giving an area value for 'good' and 'not good' condition for each annex 1 feature. Comparison of the results from these three sources suggests that they may differ in their ability to identify 'unfavourability' with full condition assessments being more likely to identify unfavourable condition than other methods. Short term trend of the habitat area in good condition has decreased from 2013-2018. This is on the basis of coastal squeeze, other pressures that the feature is sensitive to which may lead to unfavourable condition have been broadly stable over this period. |

## 7. Main pressures and threats

### 7.1 Characterisation of pressures/threats

| Pressure | Ranking |
|---|---|
| Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08) | H |
| Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01) | H |
| Other invasive alien species (other then species of Union concern) (I02) | H |
| Sea-level and wave exposure changes due to climate change (N04) | H |
| Mixed source marine water pollution (marine and coastal) (J02) | H |
| Introduction and spread of species (including GMOs) in marine aquaculture (G17) | M |
| Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03) | M |
| Sports, tourism and leisure activities (F07) | M |

| | |
|---|---|
| Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03) | M |
| Agricultural activities generating marine pollution (A28) | M |

| Threat | Ranking |
|---|---|
| Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures) (F08) | H |
| Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01) | H |
| Other invasive alien species (other then species of Union concern) (I02) | H |
| Sea-level and wave exposure changes due to climate change (N04) | H |
| Mixed source marine water pollution (marine and coastal) (J02) | M |
| Introduction and spread of species (including GMOs) in marine aquaculture (G17) | H |
| Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03) | M |
| Sports, tourism and leisure activities (F07) | M |
| Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03) | M |
| Wind, wave and tidal power, including infrastructure (D01) | M |

| | |
|---|---|
| 7.2 Sources of information | |
| 7.3 Additional information | F08: Mudflats and sandflat habitat is being lost due to the pressures exerted by coastal squeeze. When combined with expected sea level rise and wave exposure changes from climate change (summarised in Robins et al., 2016), the pressure from coastal squeeze is likely to increase in the future and it remains a high future threat.<br>G01: Mudflats and sandflats are sensitive to pressures from shellfish harvesting which is widespread across these habitats, and has an impact by both removing and species and on the habitat. In addition, bait digging additionally removes and disturbs species within the habitat. Conservation measures have been brought in to reduce these pressures within marine protected areas, but not outside of them, and inshore fishing pressures are unlikely to decrease in the future.<br>I02: Annex I mudflats and sandflats are sensitive to pressures from non-native species, such as Crassostrea gigas and Crepidula fornicata which are prevalent across mudflats and sandflats in certain locations, and are becoming more widespread (GB NNSS, 2018). Currently there is little management in place to address the further spread of these species in the future.<br>N04: Sea levels have risen 1-3mm over the last century (Robins et al., 2016). This pressure combined with the pressure of coastal squeeze from hard sea defences is already acting on mudflats and sandflats and sea level rise is |

predicted to increase with climate change. There is also the likely effect of increased wave damage from storms causing biological communities to be removed or disturbed.
J02: This is a broad pressure that covers mixed pollution pressures in the marine environment: agriculture, waste water, transport, as well as unknown sources. Mudflats and sandflats are sensitive to pressures from marine pollution. This can cause shifts in community composition and potentially the loss or decline of important native keystone species. There are various management measures in place that regulate pollutants but it unlikely they can be fully eliminated.
G17: Crassostrea gigas and Ruditapes philippinarum have both spread from marine aquaculture in southern England where they have been settling on intertidal mudflats and sandflats and are competing with other species. Where Crassostrea gigas exist in deep layers they can alter the natural state of the ecosystem (GB NNSS, 2018).
E03: Mudflats and sandflats are sensitive to pressures derived from maintaining navigational channels. In the UK 20 million tonnes of sediment is dredged a year, largely subtidally, but it can affect the sediment regimes of the system. Near to disposal sites, smothering of the communities within the mudflats and sandflats may occur although the effects will generally be short lived. Anchoring and moorings are increasing in number on mudflats and sandflats and they are sensitive to the pressures from these activities. Shipping activity is increasing, and while more targeted management may be brought in in the future to manage effects, this is likely to largely be within marine protected areas.
F07: Intertidal mudflats and sandflats are subject to large amounts of recreation. They include intertidal seagrass beds which are sensitive to pressures derived from recreational activities such as trampling and anchoring from recreational boating. Mudflats and sandflats are also sensitive to pressures from infrastructure from recreational activities, such as moorings, pontoons and slipways. These pressures are likely to increase in the future.
G03: Mudflats and sandflats are sensitive to pressures from shellfish harvesting which is widespread across these habitats, and has an impact on both the species and the habitat. Conservation measures have been brought in to reduce these pressures within marine protected areas, but not outside of them, and inshore fishing pressures are unlikely to decrease in the future.
A28: Agricultural run-off, including eutrophic river water, encourages the growth of algal mats that adversely affects invertebrate communities within the mudflats and sandflats. This is a widespread issue in England, but management measures are being introduced to reduce agricultural run-off in problem areas, which reduces the future threat of this pressure.
D01: Mudflats and sandflats are sensitive to pressures from wind, wave and tidal power activities, and may be damaged by the installation of infrastructure, although recovery is often fast. However the infrastructure installations are likely to increase over the next 12 years, with more renewable installations being planned (Crown Estate, 2017) as well as the possible installation of tidal lagoons across the country which would impound areas of mudflats and sandflats. Whilst the installation of this infrastructure would be a one off impact, the area and volume can be large and recovery could take some time.

## 8. Conservation measures

# Report on the main results of the surveillance under Article 17 for Annex I habitat types (Annex D)

| | | |
|---|---|---|
| 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, population and/or habitat for the species | |
| 8.3 Location of the measures taken | Both inside and outside Natura 2000 | |
| 8.4 Response to the measures | Medium-term results (within the next two reporting periods, 2019-2030) | |
| 8.5 List of main conservation measures | | |

Reduce/eliminate marine pollution from agricultural activities (CA13)

Reduce/eliminate marine pollution from industrial, commercial, residential and recreational areas and activities (CF07)

Manage changes in hydrological and coastal systems and regimes for construction and development (CF10)

Management of professional/commercial fishing (including shellfish and seaweed harvesting) (CG01)

Management of hunting, recreational fishing and recreational or commercial harvesting or collection of plants (CG02)

Adapt/manage renewable energy installation, facilities and operation (CC03)

Reduce impact of transport operation and infrastructure (CE01)

Reduce impact of outdoor sports, leisure and recreational activities (CF03)

Reduce/eliminate marine contamination with litter (CF08)

Early detection and rapid eradication of invasive alien species of Union concern (CI01)

| | |
|---|---|
| 8.6 Additional information | Medium term results as some of the measures (for example managed realignment to re-create habitat lost to coastal squeeze, or as compensation for development; best fit for this would be measure code CF10) will take several years to become functional habitat, and some are still in the planning phase. |

## 9. Future prospects

| | |
|---|---|
| 9.1 Future prospects of parameters | a) Range<br>b) Area<br>c) Structure and functions |
| 9.2 Additional information | An increase in pressures to which this feature is sensitive means that there is likely to be a decrease of more than 1% per year in the structure and function and area of this habitat as a result of climate change, harvesting activities and coastal / industrial development leading to coastal squeeze. The range is likely to remain stable. However, coastal squeeze and sea level rise could have an increased effect on this attribute in the long term. There are a number of uncertainties affecting this judgement of future prospects; these include the application and interpretation of EU Caselaw to small scale developments within European Sites. |

## 10. Conclusions

| | |
|---|---|
| 10.1. Range | |
| 10.2. Area | |
| 10.3. Specific structure and functions (incl. typical species) | |
| 10.4. Future prospects | |

| | |
|---|---|
| 10.5 Overall assessment of Conservation Status | |
| 10.6 Overall trend in Conservation Status | |
| 10.7 Change and reasons for change in conservation status and conservation status trend | a) Overall assessment of conservation status<br>No change<br>The change is mainly due to:<br>b) Overall trend in conservation status<br>No change<br>The change is mainly due to: |
| 10.8 Additional information | |

## 11. Natura 2000 (pSCIs, SCIs, SACs) coverage for Annex I habitat types

| | |
|---|---|
| 11.1 Surface area of the habitat type inside the pSCIs, SCIs and SACs network (in km² in biogeographical/ marine region) | a) Minimum 1352.29<br>b) Maximum 1352.29<br>c) Best single value 1352.29 |
| 11.2 Type of estimate | |
| 11.3 Surface area of the habitat type inside the network Method used | |
| 11.4 Short-term trend of habitat area in good condition within the network Direction | Decreasing (-) |
| 11.5 Short-term trend of habitat area in good condition within network Method used | Based mainly on expert opinion with very limited data |
| 11.6 Additional information | Whilst management measures have been put in place to protect damage of the feature where nessesary within Natura 2000 sites, the impact of coastal squeeze means that the habitat area in good condition is decreasing both inside and outside the network |

## 12. Complementary information

| | |
|---|---|
| 12.1 Justification of % thresholds for trends | |
| 12.2 Other relevant information | |

# Distribution Map

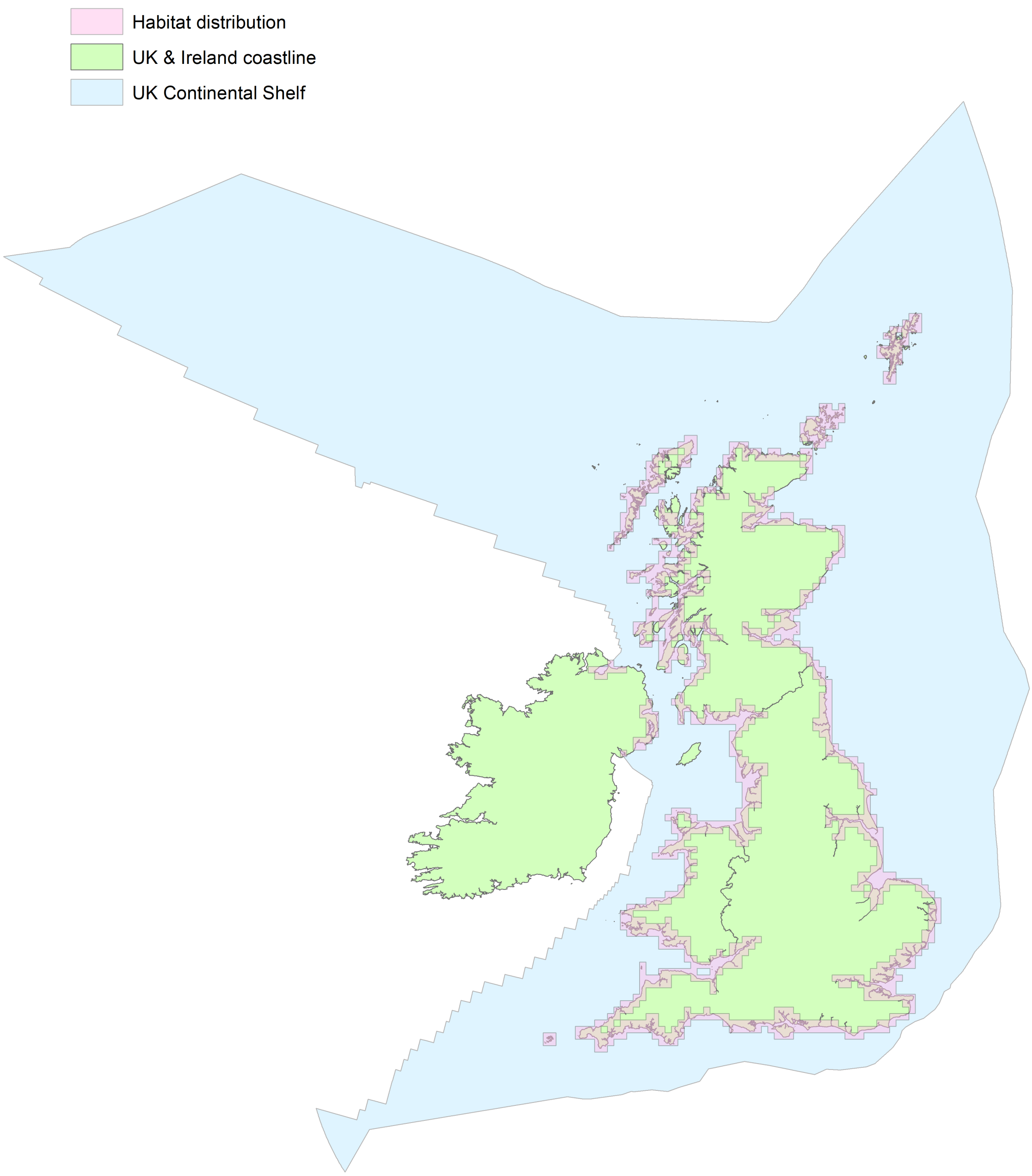


Figure 1: UK distribution map for H1140 - Mudflats and sandflats not covered by seawater at low tide.

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. For further details see the 2019 Article17 UK Approach document.

# Range Map

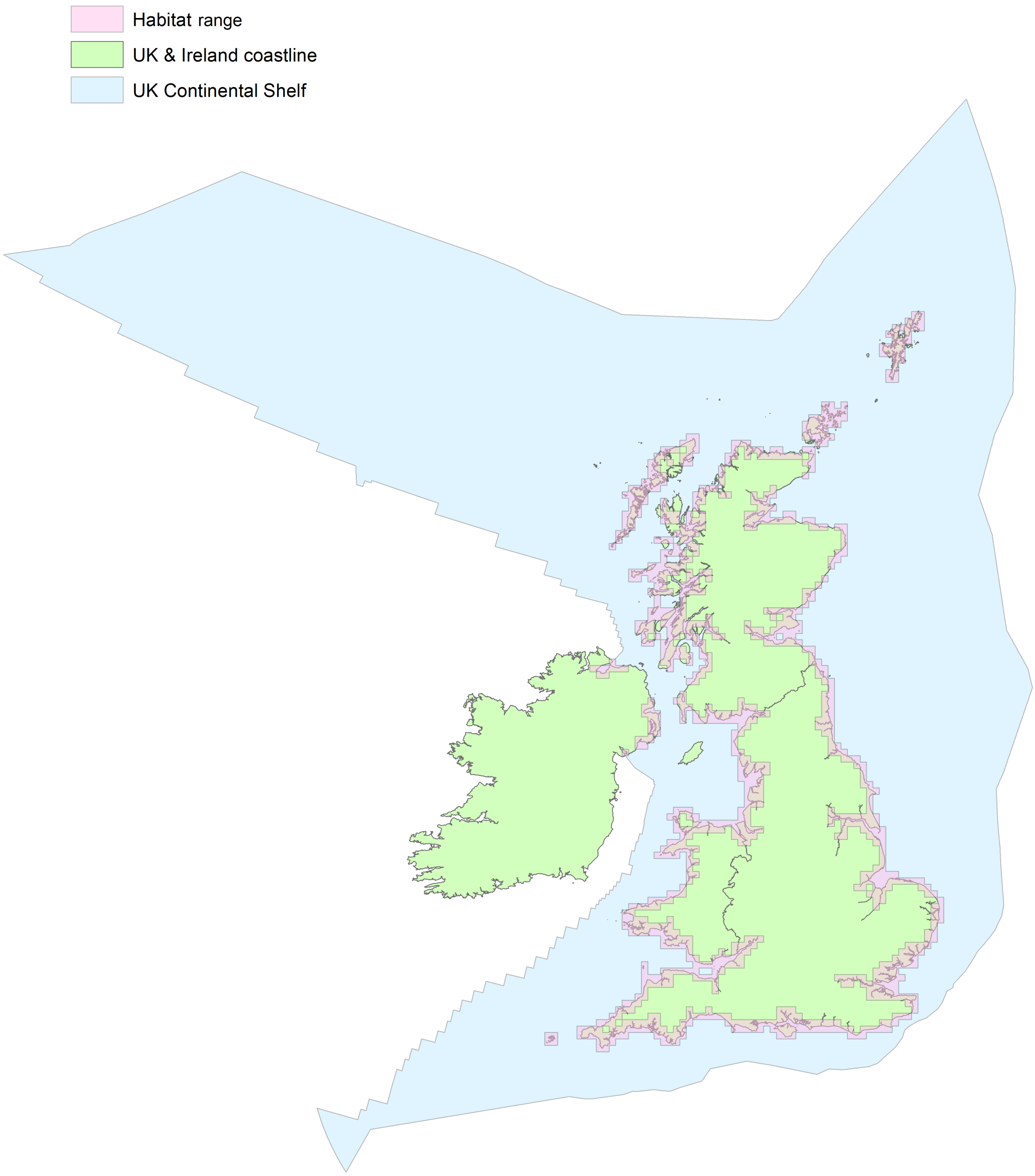


Figure 2: UK range map for H1140 - Mudflats and sandflats not covered by seawater at low tide.

The range of mudflats and sandflats is determined by physical and geological processes and was not related to the biological communities or processes supported by them. Therefore, the range was considered equivalent to the surface area of the habitat.

# Explanatory Notes

**Habitat code: 1140 Region code: MATL**

| Field label | Note |
|---|---|
| 6.1 Condition of habitat | A combination of methods has been used to come up with the area of the feature in \good\ and \not good\ condition. This has been a mixture of data from: 1) full condition assessments from SACs using monitoring data to assess condition against a number of attributes at the sub-feature level, before aggregating this for feature condition. Across the feature different areas may be allocated to different condition categories based on sub-feature condition and the resolution of available data. 2) Proxy condition assessments to assign condition for sites for which there is no full condition assessment. A model was used to calculate the proxy condition of the feature based on the activities that are occurring within a site and the vulnerability of features to activities they are exposed to. This output was evaluated and the percentage of the feature in unfavourable condition was estimated from the model output. 3) Outputs of vulnerability assessments for tranche 2 and 3 marine conservation zone features that are directly or broadly comparable to annex I mudflats and sandflats. These were generated as part of the designation process. Any areas that overlapped with existing SACs were removed. The data from these three sources was then aggregated up to a national level, giving an area value for 'good' and 'not good' condition for each annex 1 feature. Comparison of the results from these three sources suggests that they may differ in their ability to identify 'unfavourability' with full condition assessments being more likely to identify unfavourable condition than other methods. Short term trend of the habitat area in good condition has decreased from 2013-2018. This is on the basis of coastal squeeze, other pressures that the feature is sensitive to which may lead to unfavourable condition have been broadly stable over this period. |
| 6.2 Condition of habitat; Method used | A combination of methods has been used to come up with the area of the feature in \good\ and \not good\ condition. This has been a mixture of data from: 1) full condition assessments from SACs using monitoring data to assess condition against a number of attributes at the sub-feature level, before aggregating this for feature condition. Across the feature different areas may be allocated to different condition categories based on sub-feature condition and the resolution of available data. 2) Proxy condition assessments to assign condition for sites for which there is no full condition assessment. A model was used to calculate the proxy condition of the feature based on the activities that are occurring within a site and the vulnerability of features to activities they are exposed to. This output was evaluated and the percentage of the feature in unfavourable condition was estimated from the model output. 3) Outputs of vulnerability assessments for tranche 2 and 3 marine conservation zone features that are directly or broadly comparable to annex I mudflats and sandflats. These were generated as part of the designation process. Any areas that overlapped with existing SACs were removed. The data from these three sources was then aggregated up to a national level, giving an area value for 'good' and 'not good' condition for each annex 1 feature. Comparison of the results from these three sources suggests that they may differ in their ability to identify 'unfavourability' with full condition assessments being more likely to identify unfavourable condition than other methods. Short term trend of the habitat area in good condition has decreased from 2013-2018. This is on the basis of coastal squeeze, other pressures that the feature is sensitive to which may lead to unfavourable condition have been broadly stable over this period. |

| | |
|---|---|
| 6.3 Short term trend of habitat area in good condition; Period | A combination of methods has been used to come up with the area of the feature in \good\ and \not good\ condition. This has been a mixture of data from: 1) full condition assessments from SACs using monitoring data to assess condition against a number of attributes at the sub-feature level, before aggregating this for feature condition. Across the feature different areas may be allocated to different condition categories based on sub-feature condition and the resolution of available data. 2) Proxy condition assessments to assign condition for sites for which there is no full condition assessment. A model was used to calculate the proxy condition of the feature based on the activities that are occurring within a site and the vulnerability of features to activities they are exposed to. This output was evaluated and the percentage of the feature in unfavourable condition was estimated from the model output. 3) Outputs of vulnerability assessments for tranche 2 and 3 marine conservation zone features that are directly or broadly comparable to annex I mudflats and sandflats. These were generated as part of the designation process. Any areas that overlapped with existing SACs were removed. The data from these three sources was then aggregated up to a national level, giving an area value for 'good' and 'not good' condition for each annex 1 feature. Comparison of the results from these three sources suggests that they may differ in their ability to identify 'unfavourability' with full condition assessments being more likely to identify unfavourable condition than other methods. Short term trend of the habitat area in good condition has decreased from 2013-2018. This is on the basis of coastal squeeze, other pressures that the feature is sensitive to which may lead to unfavourable condition have been broadly stable over this period. |
| 6.4 Short term trend of habitat area in good condition; Direction | A combination of methods has been used to come up with the area of the feature in \good\ and \not good\ condition. This has been a mixture of data from: 1) full condition assessments from SACs using monitoring data to assess condition against a number of attributes at the sub-feature level, before aggregating this for feature condition. Across the feature different areas may be allocated to different condition categories based on sub-feature condition and the resolution of available data. 2) Proxy condition assessments to assign condition for sites for which there is no full condition assessment. A model was used to calculate the proxy condition of the feature based on the activities that are occurring within a site and the vulnerability of features to activities they are exposed to. This output was evaluated and the percentage of the feature in unfavourable condition was estimated from the model output. 3) Outputs of vulnerability assessments for tranche 2 and 3 marine conservation zone features that are directly or broadly comparable to annex I mudflats and sandflats. These were generated as part of the designation process. Any areas that overlapped with existing SACs were removed. The data from these three sources was then aggregated up to a national level, giving an area value for 'good' and 'not good' condition for each annex 1 feature. Comparison of the results from these three sources suggests that they may differ in their ability to identify 'unfavourability' with full condition assessments being more likely to identify unfavourable condition than other methods. Short term trend of the habitat area in good condition has decreased from 2013-2018. This is on the basis of coastal squeeze, other pressures that the feature is sensitive to which may lead to unfavourable condition have been broadly stable over this period. |

| | |
|---|---|
| 6.5 Short term trend of habitat area in good condition; Method used | A combination of methods has been used to come up with the area of the feature in \good\ and \not good\ condition. This has been a mixture of data from: 1) full condition assessments from SACs using monitoring data to assess condition against a number of attributes at the sub-feature level, before aggregating this for feature condition. Across the feature different areas may be allocated to different condition categories based on sub-feature condition and the resolution of available data. 2) Proxy condition assessments to assign condition for sites for which there is no full condition assessment. A model was used to calculate the proxy condition of the feature based on the activities that are occurring within a site and the vulnerability of features to activities they are exposed to. This output was evaluated and the percentage of the feature in unfavourable condition was estimated from the model output. 3) Outputs of vulnerability assessments for tranche 2 and 3 marine conservation zone features that are directly or broadly comparable to annex I mudflats and sandflats. These were generated as part of the designation process. Any areas that overlapped with existing SACs were removed. The data from these three sources was then aggregated up to a national level, giving an area value for 'good' and 'not good' condition for each annex 1 feature. Comparison of the results from these three sources suggests that they may differ in their ability to identify 'unfavourability' with full condition assessments being more likely to identify unfavourable condition than other methods. Short term trend of the habitat area in good condition has decreased from 2013-2018. This is on the basis of coastal squeeze, other pressures that the feature is sensitive to which may lead to unfavourable condition have been broadly stable over this period. |
| 7.1 Characterisation of pressures/ threats | I02: Annex I mudflats and sandflats are sensitive to pressures from non-native species, such as Crassostrea gigas and Crepidula fornicata which are prevalent across mudflats and sandflats in certain locations, and are becoming more widespread (GB NNSS, 2018). Currently there is little management in place to address the further spread of these species in the future. |
| 7.1 Characterisation of pressures/ threats | G01: Mudflats and sandflats are sensitive to pressures from shellfish harvesting which is widespread across these habitats, and has an impact by both removing and species and on the habitat. In addition, bait digging additionally removes and disturbs species within the habitat. Conservation measures have been brought in to reduce these pressures within marine protected areas, but not outside of them, and inshore fishing pressures are unlikely to decrease in the future. |
| 7.1 Characterisation of pressures/ threats | N04: Sea levels have risen 1-3mm over the last century (Robins et al., 2016). This pressure combined with the pressure of coastal squeeze from hard sea defences is already acting on mudflats and sandflats and sea level rise is predicted to increase with climate change. There is also the likely effect of increased wave damage from storms causing biological communities to be removed or disturbed. |
| 7.1 Characterisation of pressures/ threats | J02: This is a broad pressure that covers mixed pollution pressures in the marine environment: agriculture, waste water, transport, as well as unknown sources. Mudflats and sandflats are sensitive to pressures from marine pollution. This can cause shifts in community composition and potentially the loss or decline of important native keystone species. There are various management measures in place that regulate pollutants but it unlikely they can be fully eliminated. |
| 7.1 Characterisation of pressures/ threats | G17: Crassostrea gigas and Ruditapes philippinarum have both spread from marine aquaculture in southern England where they have been settling on intertidal mudflats and sandflats and are competing with other species. Where Crassostrea gigas exist in deep layers they can alter the natural state of the ecosystem (GB NNSS, 2018). |

| | |
|---|---|
| 7.1 Characterisation of pressures/ threats | E03: Mudflats and sandflats are sensitive to pressures derived from maintaining navigational channels. In the UK 20 million tonnes of sediment is dredged a year, largely subtidally, but it can affect the sediment regimes of the system. Near to disposal sites, smothering of the communities within the mudflats and sandflats may occur although the effects will generally be short lived. Anchoring and moorings are increasing in number on mudflats and sandflats and they are sensitive to the pressures from these activities. Shipping activity is increasing, and while more targeted management may be brought in in the future to manage effects, this is likely to largely be within marine protected areas. |
| 7.1 Characterisation of pressures/ threats | F07: Intertidal mudflats and sandflats are subject to large amounts of recreation. They include intertidal seagrass beds which are sensitive to pressures derived from recreational activities such as trampling and anchoring from recreational boating. Mudflats and sandflats are also sensitive to pressures from infrastructure from recreational activities, such as moorings, pontoons and slipways. These pressures are likely to increase in the future. |
| 7.1 Characterisation of pressures/ threats | G03: Mudflats and sandflats are sensitive to pressures from shellfish harvesting which is widespread across these habitats, and has an impact on both the species and the habitat. Conservation measures have been brought in to reduce these pressures within marine protected areas, but not outside of them, and inshore fishing pressures are unlikely to decrease in the future. |
| 7.1 Characterisation of pressures/ threats | A28: Agricultural run-off, including eutrophic river water, encourages the growth of algal mats that adversely affects invertebrate communities within the mudflats and sandflats. This is a widespread issue in England, but management measures are being introduced to reduce agricultural run-off in problem areas, which reduces the future threat of this pressure. |
| 7.1 Characterisation of pressures/ threats | D01: Mudflats and sandflats are sensitive to pressures from wind, wave and tidal power activities, and may be damaged by the installation of infrastructure, although recovery is often fast. However the infrastructure installations are likely to increase over the next 12 years, with more renewable installations being planned (Crown Estate, 2017) as well as the possible installation of tidal lagoons across the country which would impound areas of mudflats and sandflats. Whilst the installation of this infrastructure would be a one off impact, the area and volume can be large and recovery could take some time. |
| 7.1 Characterisation of pressures/ threats | F08: Mudflats and sandflat habitat is being lost due to the pressures exerted by coastal squeeze. When combined with expected sea level rise and wave exposure changes from climate change (summarised in Robins et al., 2016), the pressure from coastal squeeze is likely to increase in the future and it remains a high future threat. |
| 8.1 Status of measures | Medium term results as some of the measures (for example managed realignment to re-create habitat lost to coastal squeeze, or as compensation for development; best fit for this would be measure code CF10) will take several years to become functional habitat, and some are still in the planning phase. |
| 8.2 Main purpose of the measures taken | Medium term results as some of the measures (for example managed realignment to re-create habitat lost to coastal squeeze, or as compensation for development; best fit for this would be measure code CF10) will take several years to become functional habitat, and some are still in the planning phase. |
| 8.3 Location of the measures taken | Medium term results as some of the measures (for example managed realignment to re-create habitat lost to coastal squeeze, or as compensation for development; best fit for this would be measure code CF10) will take several years to become functional habitat, and some are still in the planning phase. |
| 8.4 Response to the measures | Medium term results as some of the measures (for example managed realignment to re-create habitat lost to coastal squeeze, or as compensation for development; best fit for this would be measure code CF10) will take several years to become functional habitat, and some are still in the planning phase. |

| | |
|---|---|
| 9.1 Future prospects of parameters | An increase in pressures to which this feature is sensitive means that there is likely to be a decrease of more than 1% per year in the structure and function and area of this habitat as a result of climate change, harvesting activities and coastal / industrial development leading to coastal squeeze. The range is likely to remain stable. However, coastal squeeze and sea level rise could have an increased effect on this attribute in the long term. There are a number of uncertainties affecting this judgement of future prospects; these include the application and interpretation of EU Caselaw to small scale developments within European Sites. |
| 11.4 Short term trend of habitat area in good condition within the network; Direction | Whilst management measures have been put in place to protect damage of the feature where nessesary within Natura 2000 sites, the impact of coastal squeeze means that the habitat area in good condition is decreasing both inside and outside the network |
| 11.5 Short term trend of habitat area in good condition within the network; Method used | Whilst management measures have been put in place to protect damage of the feature where nessesary within Natura 2000 sites, the impact of coastal squeeze means that the habitat area in good condition is decreasing both inside and outside the network |