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:

H1160 - Large shallow inlets and bays

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	**1160 - Large shallow inlets and bays**

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)	1722.54		
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)		
	b) Operator		
	c) Unknown	No	
	d) Method		
4.11 Change and reason for change in surface area of range	No change 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 1722.54	b) Maximum 1722.54	c) Best single value 1722.54
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)		
	b) Operator		
	c) Unknown No		

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	d) Method
5.14 Change and reason for change in surface area of range	No change 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	513.52398	Maximum	513.52398
	b) Area in not-good condition (km²)	Minimum	623.95748	Maximum	623.95748
	c) Area where condition is not known (km²)	Minimum	585.05694	Maximum	585.05694

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. For sandbanks, reef and mudflats and sandflats, a model was used to calculate the proxy condition of each 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. To calculate the proxy condition of the large shallow inlets and bays feature, we have used: a) The proportion of favourable and unfavourable area from the proxy assessments of sandbanks, mudflats and sandflats and reefs where they are sub-features of the large shallow inlets and bays feature, b) The proportion of favourable and unfavourable area of Saltmarsh within the large shallow inlet and bay from SSSI saltmarsh assessments. c) The WFD classification generated for each SAC for the condition assessment process. The data from these 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 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.

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

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
Sea-level and wave exposure changes due to climate change (N04)	H
Agricultural activities generating marine pollution (A28)	H
Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03)	H
Mixed source marine water pollution (marine and coastal) (J02)	H
Other invasive alien species (other then species of Union concern) (I02)	M
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03)	M
Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F22)	M
Deposition and treatment of waste/garbage from commercial and industrial facilities (F10)	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
Sea-level and wave exposure changes due to climate change (N04)	H
Agricultural activities generating marine pollution (A28)	H
Mixed source marine water pollution (marine and coastal) (J02)	M
Other invasive alien species (other then species of Union concern) (I02)	H
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	H
Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03)	M

Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F22)	M
Wind, wave and tidal power, including infrastructure (D01)	M
Change of species distribution (natural newcomers) due to climate change (N08)	M

7.2 Sources of information	Robins et al., (2016) Robins et al., (2016)
7.3 Additional information	F08: 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 within large shallow inlets and bays 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. 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 within large shallow inlets and bays 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. A28: Agricultural run-off, including eutrophic river water, encourages the growth of algal mats which adversely affect invertebrate communities on the mudflats and sandflats within large shallow inlets and bays. High nutrient levels within the water column encourage algal growth and can lead to hypoxia. High nutrient loading of the water column is a widespread issue in England, and while management measures are being introduced to reduce agricultural run-off in problem areas, as eutrophic river inputs from large catchment areas are often concentrated in Estuaries and Large shallow inlets and bays, the magnitude of the sources that need to be addressed means this remains a high future threat. G03: Whilst management measures have been brought in to prevent damage to subtidal large shallow inlet and bay features within some marine protected areas, many areas are still recovering from the pressures exerted by demersal fishing which caused historical damage. Intertidal features within large shallow inlets and bays are sensitive to pressures from shellfish harvesting which has an impact by both removing and species and on the habitat. In addition, bait collection 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. J02: This is a broad pressure that covers mixed pollution pressures in the marine environment: agriculture, waste water, transport, as well as unknown sources. Large shallow inlets and bays 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. I02: Large shallow inlets and bays are sensitive to pressures from non-native species, such as Crassostrea gigas and Crepidula fornicata which are prevalent across intertidal areas 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.

N01: Sea surface temperature rose 0.7 degree C from 1971-2010 (Robins et al., 2016), and this is predicted to increase in the future. The impacts from temperature rises are already causing notable shifts in species distribution and alter community composition: the ranges of many southern (lusitanean) species are known to have expanded their range north, and some northern species are known to retract further north. Further increases in temperatures will likely have further effects on marine invertebrate biodiversity as species distributions change. Also, increase in the abundances and ranges of INNS such as Crassostrea gigas are likely.
E03: Large shallow inlets and bays are sensitive to pressures derived from maintaining navigational channels. In the UK 20 million tonnes of sediment is dredged a year, which can affect the sediment regimes of the system although this is regulated. Near to disposal sites, smothering of the communities may occur although the effects will generally be short lived. Anchoring and moorings are increasing in number and features within large shallow inlets and bays 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.
F22: Features within large shallow inlets and bays are sensitive to the pressures exerted from marine plastics in the water column, which derive from a variety of sources, not just residential and recreational. The impact of these plastics within the water column and habitats on the species that inhabit large shallow inlets and bays is still being investigated, but the majority of evidence shows impacts at the individual level, with less understanding of the impact on a population of a habitat (GESAMP, 2016). More measures are required to reduce the pressures deriving from marine plastics within the marine environment.
F10: Features within large shallow inlets and bays are sensitive to pressures from marine pollution which may enter the system from waste water and potentially cause eutrophication. High nutrient levels within the water column encourage algal growth and can lead to hypoxia. High nutrient loading of the water column is a widespread issue in England, and while management measures are being introduced to reduce pollution from waste water, inputs from large urban centres areas will be more concentrated in shallow coastal waters and the magnitude of the sources that need to be addressed means this remains a future threat, although it did not make the top 10 list of threats for this habitat.
D01: Large shallow inlets and bays are sensitive to pressures from wind, wave and tidal power activities. The possible installation of tidal lagoons around the country could impound areas of large shallow inlets and bays, and are likely to have an impact on their habitats and physical processes.
N08: The impacts from climate change are already causing notable shifts in species distribution and alter community composition: the ranges of many southern (lusitanean) species are known to have expanded their range north, and some northern species are known to retract further north. Further climatic changes are likely to have further effects on marine invertebrate biodiversity as species distributions change.

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	Restore the habitat of the species (related to '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 impact of transport operation and infrastructure (CE01)
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)
Adapt/manage renewable energy installation, facilities and operation (CC03)
Reduce impact of outdoor sports, leisure and recreational activities (CF03)
Reduce/eliminate marine contamination with litter (CF08)
Management of hunting, recreational fishing and recreational or commercial harvesting or collection of plants (CG02)
Early detection and rapid eradication of invasive alien species of Union concern (CI01)

8.6 Additional information	Conservation measures such as fisheries byelaws are already having an effect within marine protected areas (MPAs), with some recovery of communities. Other management measures within MPAs, such as the marine licensing and EIA process are also enabling the protection of large shallow inlets and bays. Some other measures, such as addressing the sources of marine pollution will have longer term results.

9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area 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 of this habitat as a result of climate change, fisheries, recreational activities and coastal / industrial development leading to coastal squeeze. The area of the feature is likely to change by less than 1% per year and the range will remain stable as the sensitivity of the feature to these pressures will affect the structure and function more than the area, and the range should remain stable over the next two reporting cycles. However, coastal squeeze and sea level rise will have an increased effect on these attributes 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 No change The change is mainly due to: b) Overall trend in conservation status No change 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	1234.86
	b) Maximum	1234.86
	c) Best single value	1234.86
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

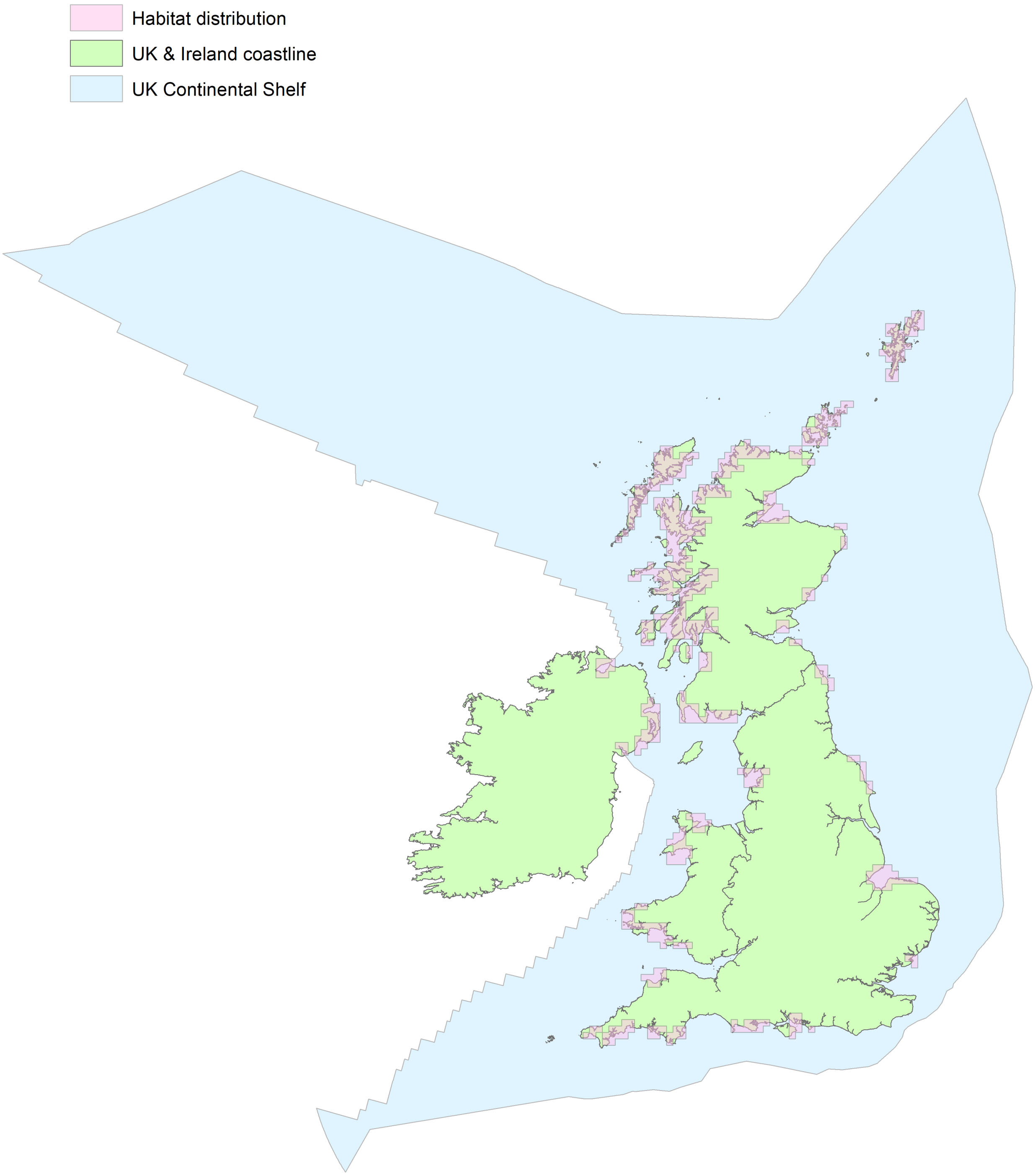

Figure 1: UK distribution map for H1160 - Large shallow inlets and bays.

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

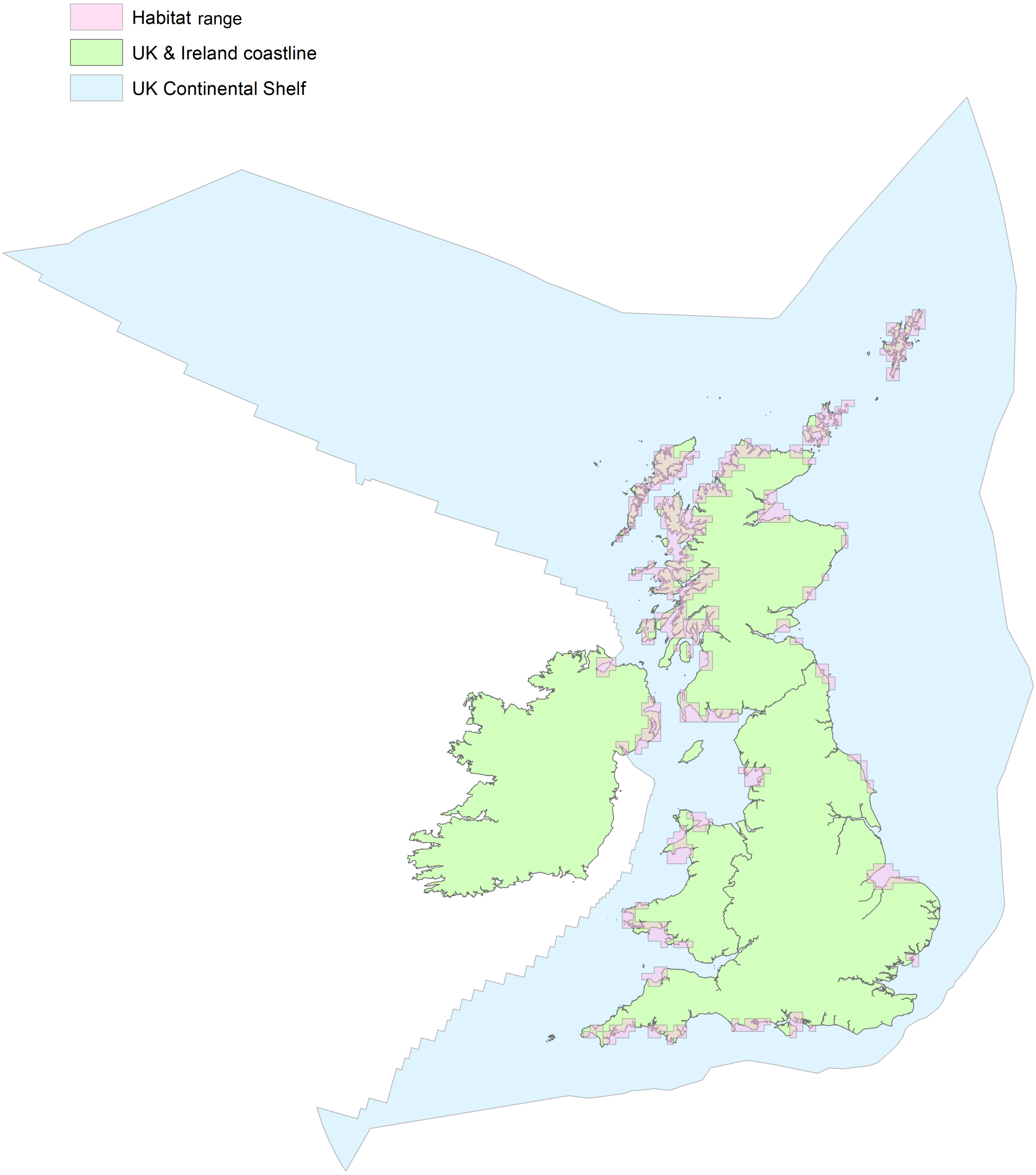

Figure 2: UK range map for H1160 - Large shallow inlets and bays.

Large shallow inlets and bays are physiographic features and so their range is determined primarily by geomorphological and hydrographic processes occurring over long time-scales and is not related to biological communities or processes supported by communities. Therefore, the range was considered equivalent to the surface area of the habitat.

Explanatory Notes

Habitat code: 1160 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. For sandbanks, reef and mudflats and sandflats, a model was used to calculate the proxy condition of each 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. To calculate the proxy condition of the large shallow inlets and bays feature, we have used: a) The proportion of favourable and unfavourable area from the proxy assessments of sandbanks, mudflats and sandflats and reefs where they are sub-features of the large shallow inlets and bays feature, b) The proportion of favourable and unfavourable area of Saltmarsh within the large shallow inlet and bay from SSSI saltmarsh assessments. c) The WFD classification generated for each SAC for the condition assessment process. The data from these 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 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. For sandbanks, reef and mudflats and sandflats, a model was used to calculate the proxy condition of each 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. To calculate the proxy condition of the large shallow inlets and bays feature, we have used: a) The proportion of favourable and unfavourable area from the proxy assessments of sandbanks, mudflats and sandflats and reefs where they are sub-features of the large shallow inlets and bays feature, b) The proportion of favourable and unfavourable area of Saltmarsh within the large shallow inlet and bay from SSSI saltmarsh assessments. c) The WFD classification generated for each SAC for the condition assessment process. The data from these 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 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. For sandbanks, reef and mudflats and sandflats, a model was used to calculate the proxy condition of each 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. To calculate the proxy condition of the large shallow inlets and bays feature, we have used: a) The proportion of favourable and unfavourable area from the proxy assessments of sandbanks, mudflats and sandflats and reefs where they are sub-features of the large shallow inlets and bays feature, b) The proportion of favourable and unfavourable area of Saltmarsh within the large shallow inlet and bay from SSSI saltmarsh assessments. c) The WFD classification generated for each SAC for the condition assessment process. The data from these 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 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. For sandbanks, reef and mudflats and sandflats, a model was used to calculate the proxy condition of each 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. To calculate the proxy condition of the large shallow inlets and bays feature, we have used: a) The proportion of favourable and unfavourable area from the proxy assessments of sandbanks, mudflats and sandflats and reefs where they are sub-features of the large shallow inlets and bays feature, b) The proportion of favourable and unfavourable area of Saltmarsh within the large shallow inlet and bay from SSSI saltmarsh assessments. c) The WFD classification generated for each SAC for the condition assessment process. The data from these 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 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. For sandbanks, reef and mudflats and sandflats, a model was used to calculate the proxy condition of each 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. To calculate the proxy condition of the large shallow inlets and bays feature, we have used: a) The proportion of favourable and unfavourable area from the proxy assessments of sandbanks, mudflats and sandflats and reefs where they are sub-features of the large shallow inlets and bays feature, b) The proportion of favourable and unfavourable area of Saltmarsh within the large shallow inlet and bay from SSSI saltmarsh assessments. c) The WFD classification generated for each SAC for the condition assessment process. The data from these 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 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	A28: Agricultural run-off, including eutrophic river water, encourages the growth of algal mats which adversely affect invertebrate communities on the mudflats and sandflats within large shallow inlets and bays. High nutrient levels within the water column encourage algal growth and can lead to hypoxia. High nutrient loading of the water column is a widespread issue in England, and while management measures are being introduced to reduce agricultural run-off in problem areas, as eutrophic river inputs from large catchment areas are often concentrated in Estuaries and Large shallow inlets and bays, the magnitude of the sources that need to be addressed means this remains a high future threat.
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 within large shallow inlets and bays 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	G03: Whilst management measures have been brought in to prevent damage to subtidal large shallow inlet and bay features within some marine protected areas, many areas are still recovering from the pressures exerted by demersal fishing which caused historical damage. Intertidal features within large shallow inlets and bays are sensitive to pressures from shellfish harvesting which has an impact by both removing and species and on the habitat. In addition, bait collection 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	J02: This is a broad pressure that covers mixed pollution pressures in the marine environment: agriculture, waste water, transport, as well as unknown sources. Large shallow inlets and bays 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	N01: Sea surface temperature rose 0.7 degree C from 1971-2010 (Robins et al., 2016), and this is predicted to increase in the future. The impacts from temperature rises are already causing notable shifts in species distribution and alter community composition: the ranges of many southern (lusitanean) species are known to have expanded their range north, and some northern species are known to retract further north. Further increases in temperatures will likely have further effects on marine invertebrate biodiversity as species distributions change. Also, increase in the abundances and ranges of INNS such as Crassostrea gigas are likely.
7.1 Characterisation of pressures/ threats	N08: The impacts from climate change are already causing notable shifts in species distribution and alter community composition: the ranges of many southern (lusitanean) species are known to have expanded their range north, and some northern species are known to retract further north. Further climatic changes are likely to have further effects on marine invertebrate biodiversity as species distributions change.
7.1 Characterisation of pressures/ threats	E03: Large shallow inlets and bays are sensitive to pressures derived from maintaining navigational channels. In the UK 20 million tonnes of sediment is dredged a year, which can affect the sediment regimes of the system although this is regulated. Near to disposal sites, smothering of the communities may occur although the effects will generally be short lived. Anchoring and moorings are increasing in number and features within large shallow inlets and bays 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	F22: Features within large shallow inlets and bays are sensitive to the pressures exerted from marine plastics in the water column, which derive from a variety of sources, not just residential and recreational. The impact of these plastics within the water column and habitats on the species that inhabit large shallow inlets and bays is still being investigated, but the majority of evidence shows impacts at the individual level, with less understanding of the impact on a population of a habitat (GESAMP, 2016). More measures are required to reduce the pressures deriving from marine plastics within the marine environment.
7.1 Characterisation of pressures/ threats	D01: Large shallow inlets and bays are sensitive to pressures from wind, wave and tidal power activities. The possible installation of tidal lagoons around the country could impound areas of large shallow inlets and bays, and are likely to have an impact on their habitats and physical processes.
7.1 Characterisation of pressures/ threats	F10: Features within large shallow inlets and bays are sensitive to pressures from marine pollution which may enter the system from waste water and potentially cause eutrophication. High nutrient levels within the water column encourage algal growth and can lead to hypoxia. High nutrient loading of the water column is a widespread issue in England, and while management measures are being introduced to reduce pollution from waste water, inputs from large urban centres areas will be more concentrated in shallow coastal waters and the magnitude of the sources that need to be addressed means this remains a future threat, although it did not make the top 10 list of threats for this habitat.
7.1 Characterisation of pressures/ threats	I02: Large shallow inlets and bays are sensitive to pressures from non-native species, such as Crassostrea gigas and Crepidula fornicata which are prevalent across intertidal areas 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	F08: 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 within large shallow inlets and bays 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.
8.1 Status of measures	Conservation measures such as fisheries byelaws are already having an effect within marine protected areas (MPAs), with some recovery of communities. Other management measures within MPAs, such as the marine licensing and EIA process are also enabling the protection of large shallow inlets and bays. Some other measures, such as addressing the sources of marine pollution will have longer term results.
8.2 Main purpose of the measures taken	Conservation measures such as fisheries byelaws are already having an effect within marine protected areas (MPAs), with some recovery of communities. Other management measures within MPAs, such as the marine licensing and EIA process are also enabling the protection of large shallow inlets and bays. Some other measures, such as addressing the sources of marine pollution will have longer term results.
8.3 Location of the measures taken	Conservation measures such as fisheries byelaws are already having an effect within marine protected areas (MPAs), with some recovery of communities. Other management measures within MPAs, such as the marine licensing and EIA process are also enabling the protection of large shallow inlets and bays. Some other measures, such as addressing the sources of marine pollution will have longer term results.
8.4 Response to the measures	Conservation measures such as fisheries byelaws are already having an effect within marine protected areas (MPAs), with some recovery of communities. Other management measures within MPAs, such as the marine licensing and EIA process are also enabling the protection of large shallow inlets and bays. Some other measures, such as addressing the sources of marine pollution will have longer term results.

8.5 List of main conservation measures	Conservation measures such as fisheries byelaws are already having an effect within marine protected areas (MPAs), with some recovery of communities. Other management measures within MPAs, such as the marine licensing and EIA process are also enabling the protection of large shallow inlets and bays. Some other measures, such as addressing the sources of marine pollution will have longer term results.
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 of this habitat as a result of climate change, fisheries, recreational activities and coastal / industrial development leading to coastal squeeze. The area of the feature is likely to change by less than 1% per year and the range will remain stable as the sensitivity of the feature to these pressures will affect the structure and function more than the area, and the range should remain stable over the next two reporting cycles. However, coastal squeeze and sea level rise will have an increased effect on these attributes 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