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:

H1130 - Estuaries

SCOTLAND

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 (Scotland information only)**
1.2 Habitat code	**1130 - Estuaries**

2. Maps

2.1 Year or period	1988-2006
2.3 Distribution map	Yes
2.3 Distribution map Method used	Complete survey or a statistically robust estimate
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	Axelsson, M., Dewey, S., Tourell, A. and Karpouzli, E. (2006). Site condition monitoring - the sublittoral sandbanks of the Solway Firth. Scottish Natural Heritage Commissioned Report No. 155 (ROAME No. F02AA409) http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=657. Bates, C. R., Moore, C. G., Malthus, T., Mair, J. M. and Karpouzli, E. (2004). Broad scale mapping of habitats in the Firth of Tay and Eden Estuary, Scotland. Scottish Natural Heritage, Commissioned Report No. 007 (ROAME No. F01AA401D) http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=423. Central Environmental Surveys (2003). Habitat survey Inner Tay Estuary 2002. Scottish Natural Heritage Commissioned Report No. 003 (ROAME No. F01LH04B) http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=503. Cutts, N. and Hemingway, K. (1996). The Solway Firth: broad scale habitat mapping. Scottish Natural Heritage Research, Survey and Monitoring Report. No. 46 http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=1356 Dargie, T. (2015) Morrich More coastal change analysis 1987 to 2015. Scottish Natural Heritage Commissioned Report No. 927. http://www.snh.org.uk/pdfs/publications/commissioned_reports/927.pdf ERT (Scotland) Ltd. (2011) Broadscale mapping of marine features within the Luce Bay and Sands Special Area of Conservation. Scottish Natural Heritage Commissioned Report No. 471 http://www.snh.org.uk/pdfs/publications/commissioned_reports/471.pdf Smith, R.F., Sotheran, I. and Foster, D. (2009)Sublittoral biotope mapping of the Moray Firth SAC. Scottish Natural Heritage Commissioned Report No. 338 http://www.snh.org.uk/pdfs/publications/commissioned_reports/338.pdf Baxter, J.M., Boyd, I.L., Cox, M., Donald, A.E., Malcolm, S.J., Miles, H., Miller, B., Moffat, C.F., Editors. (2011).Scotland's Marine Atlas: information for the national marine plan. Marine Scotland, Edinburgh. Available from: http://www.gov.scot/Topics/marine/science/atlas Scotland's Dynamic Coast - National Coastal Change Assessment. http://www.dynamiccoast.com/

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Scottish Climate Change Adaptation Programme.
http://www.gov.scot/Resource/0045/00451392.pdf

4. Range

4.1 Surface area (in km²)	816.28		
4.2 Short-term trend Period			
4.3 Short-term trend Direction	Stable (0)		
4.4 Short-term trend Magnitude	a) Minimum	b) Maximum	
4.5 Short-term trend Method used	Complete survey or a statistically robust estimate		
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	1988-2006		
5.2 Surface area (in km²)	a) Minimum 816.28	b) Maximum 816.28	c) Best single value 816.28
5.3 Type of estimate	Best estimate		
5.4 Surface area Method used	Complete survey or a statistically robust estimate		
5.5 Short-term trend Period	2007-2018		
5.6 Short-term trend Direction	Stable (0)		
5.7 Short-term trend Magnitude	a) Minimum	b) Maximum	c) Confidence interval
5.8 Short-term trend Method used	Based mainly on extrapolation from a limited amount of 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
5.12 Long-term trend Method used			
5.13 Favourable reference area	a) Area (km²) b) Operator c) Unknown No 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

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6.1 Condition of habitat	a) Area in good condition (km²)	Minimum	777.97665	Maximum	777.97665
	b) Area in not-good condition (km²)	Minimum	38.3005	Maximum	38.3005
	c) Area where condition is not known (km²)	Minimum	0	Maximum	0
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	Stable (0)				
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					

7. Main pressures and threats

7.1 Characterisation of pressures/threats

Pressure	Ranking
Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03)	M
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)	M
Industrial or commercial activities and structures generating marine pollution (excluding marine macro- and micro-particular pollution) (F21)	M
Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F22)	M
Industrial or commercial activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F23)	M
Modification of flooding regimes, flood protection for residential or recreational development (F28)	M
Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01)	M
Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03)	M
Other invasive alien species (other then species of Union concern) (I02)	M

Threat	Ranking
Shipping lanes, ferry lanes and anchorage infrastructure (e.g. canalisation, dredging) (E03)	M
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)	M
Shipping lanes and ferry lanes transport operations (E02)	M
Industrial or commercial activities and structures generating marine pollution (excluding marine macro- and micro-particular pollution) (F21)	M
Residential or recreational activities and structures generating marine macro- and micro- particulate pollution (e.g. plastic bags, Styrofoam) (F22)	M
Modification of flooding regimes, flood protection for residential or recreational development (F28)	M
Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01)	M
Marine fish and shellfish harvesting (professional, recreational) activities causing physical loss and disturbance of seafloor habitats (G03)	M
Marine plant harvesting (G04)	M
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
Sea-level and wave exposure changes due to climate change (N04)	M
Change of habitat location, size, and / or quality due to climate change (N05)	M
Change of species distribution (natural newcomers) due to climate change (N08)	M

7.2 Sources of information

7.3 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, 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	Short-term results (within the current reporting period, 2013-2018)	
8.5 List of main conservation measures		

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Manage conversion of land for construction and development of infrastructure (CF01)
Manage changes in hydrological and coastal systems and regimes for construction and development (CF10)
Reduce/eliminate marine pollution from industrial, commercial, residential and recreational areas and activities (CF07)
Reduce/eliminate marine contamination with litter (CF08)
Management of professional/commercial fishing (including shellfish and seaweed harvesting) (CG01)
Reduce impact of transport operation and infrastructure (CE01)
Implement climate change adaptation measures (CN02)
Management, control or eradication of other invasive alien species (CI03)

8.6 Additional information	For SACs, conservation objectives, information on pressures and threats, and details of the habitats and species are contained within the Regulation 33 packages. Licensable activities proposed within SACs e.g. aquaculture, renewable developments, oil and gas exploration and development, coastal developments, activities associated with shipping/vessels e.g. dredging, anchorage, moorings military activities are subject to Habitiats Regulations Appraisal in Scotland which considers whether a particular plan or project (activities) will cause a likely significant effect on the habitat and result in an adverse effect on site integrity. If the tests of the HRA are not met then the development normally will not be allowed to continue unless suitable mitigation can be undertaken. Outside of SACs, Regional Marine Management Plans will continue to be developed - these will seek to identify the location of sensitive PMFs including some associated with estuaries, and propose regional marine management policies to limit impacts of activities on these features and site development in more appropriate places.

9. Future prospects

9.1 Future prospects of parameters	a) Range b) Area c) Structure and functions
9.2 Additional information	

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

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	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	417.96757
	b) Maximum	417.96757
	c) Best single value	417.96757
11.2 Type of estimate	Best estimate	
11.3 Surface area of the habitat type inside the network Method used	Based mainly on extrapolation from a limited amount of data	
11.4 Short-term trend of habitat area in good condition within the network Direction	Stable (0)	
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		

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

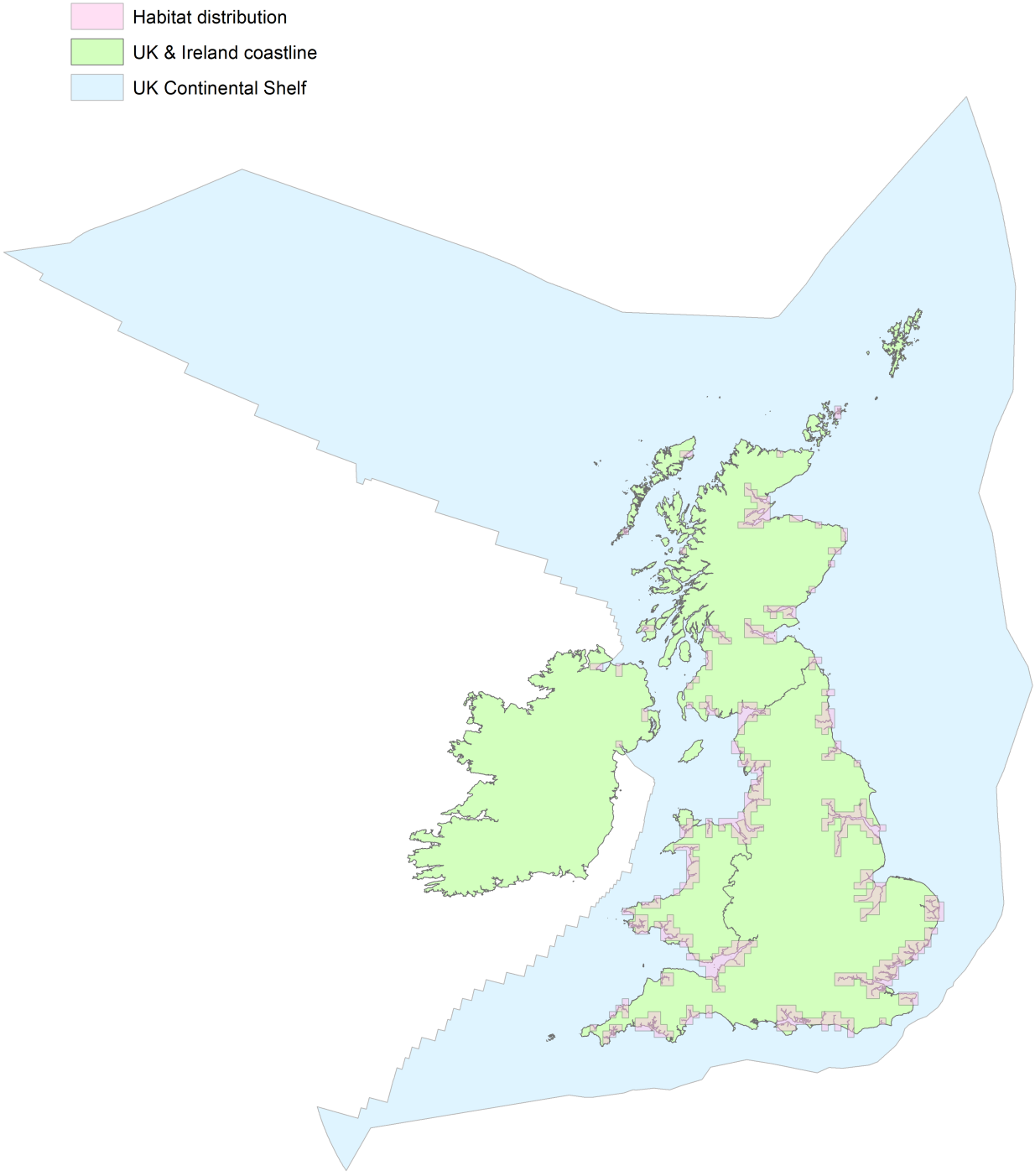

Figure 1: UK distribution map for H1130 - Estuaries.

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

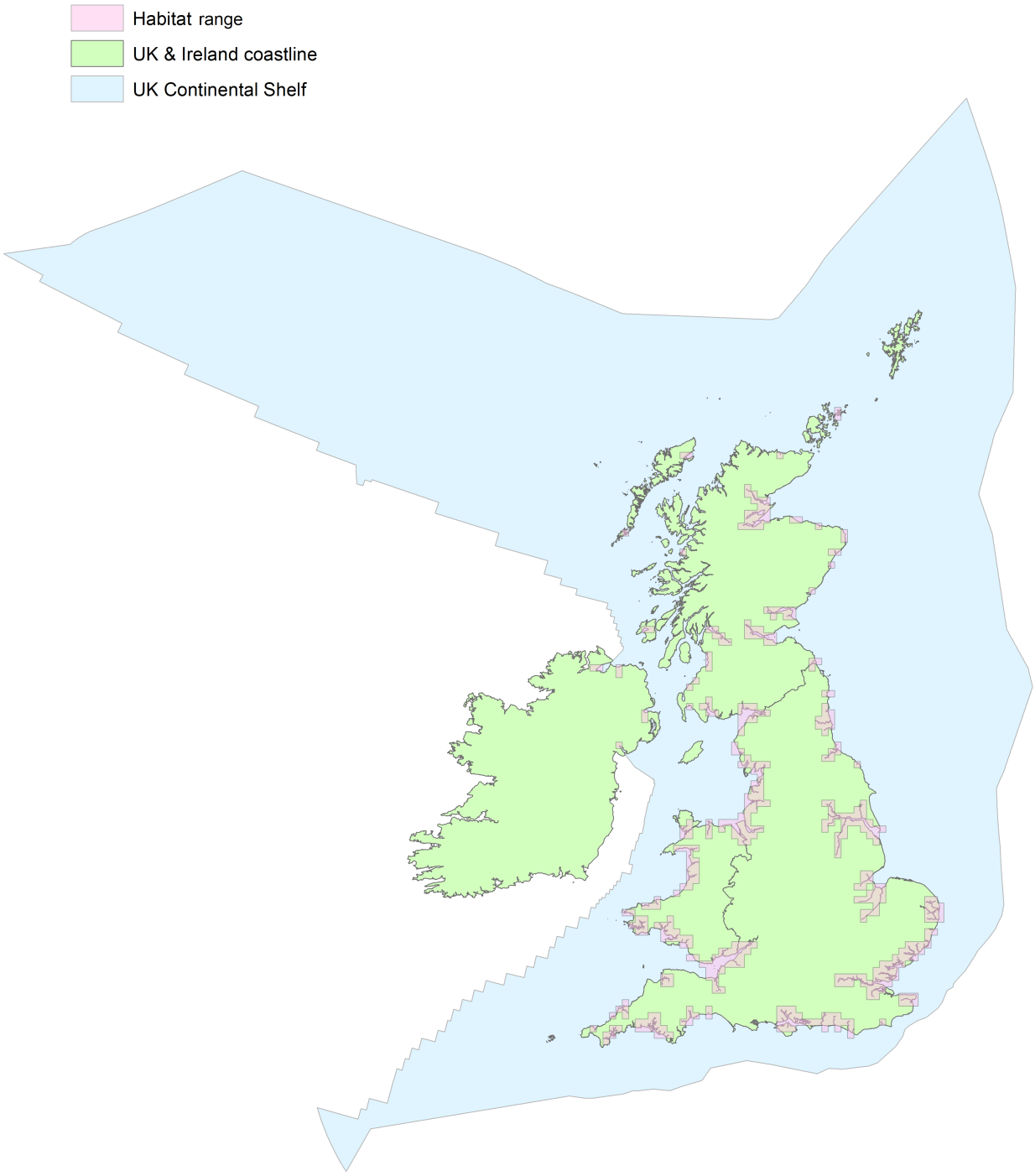

Figure 2: UK range map for H1130 - Estuaries.

Estuaries are physiographic features and so their range is determined primarily by geomorphological and hydrographic processes occurring over geological time-scales and is not related to biological communities or processes supported by communities. Therefore, the range was considered equivalent to the surface area (distribution) of the habitat.

Explanatory Notes

Habitat code: 1130 Region code: MATL

Field label	Note
6.2 Condition of habitat; Method used	The SACs which have been used to assess the habitat area in good condition (based on favourable SCM) are Firth of Tay and Eden Estuary SAC, Dornoch Firth and Morrich More SAC and Solway Firth SAC (although the latter hasn't been assessed because two of the three component marine habitats have not been assessed via SCM - see SNH internal document A2669640).There is no indication that the habitat condition between 2007-2018 has been anything apart from favourable and stable. For the rest of the habtiat area within Scotland most of this is classed as being in good condition based on the habitat assessments in Baxter et al. (2011) for all regions apart from the Clyde (estuary area 38.300501km2) where it is classed as being not-good due to most of the habitats being considered having a 'deteriorating' trend assessment with 'some concerns'. Therefore the total area of good = 816.277155 - area of not good (38.300501km20 = 777.9766654km2).
6.5 Short term trend of habitat area in good condition; Method used	Stable has been noted as the short term trend. The areas of habitat in good condition were taken from SACs. There is no indication that there has been any notable deterioration in these SACs over the period 2007-2018 but there have been no repeat surveys in these sites so therefore this is based mainly on expert opinion with very limited data.
9.1 Future prospects of parameters	We believe that the range of this habitat should remain stable in the future over the next 12 year period because this is a physiographic feature that is unlikely to change in range within Scottish waters as we can not forsee circumstances where we would lose this habitat from the northern or southern extremes in Scotland that would alter it's range. We suggest that the area of estuaries over the next 12 years is unknown. This is because there is uncertainlty about the dynamism of the coast and how this may change over the next 12 years. The area of intertidal sediments, which are a dominant component of estuaries within Scotland, have changed and will continue to will change over time. Under climate change pressures (outlined in summary in the Scottish Climate Change Adaptation Programme) it is unclear whether increases or decreases in area will occur and what the overall affect on the estuaries feature in Scotland will be (see Scotland's Dynamic Coast - National Coastal Change Assessment). We propose that there is the potential for a positive trend in structure and functions albeit slight/moderate based on the management measures now in place and that are proposed again both inside and outside protected areas. However, it should be recognised that there are uncertainties in the positive assessment because the new management measures are being targeted on the basis of the existing evidence-base only and it is unclear whether there may be future iterations needed similar to the current PMF review process. It is also clear from recent work (e.g. in Loch Carron on flameshell beds) that human activities will continue to modify examples of our most sensitive PMFs in areas where no survey records currently exist. Therefore there maybe sensitive components of this habitat that we are currently unaware of that are being impacted by human activities. Additionally there are factors such as coastal dynamism outlined above with regard to area that may affect structure and integrity too. However, as we are now taking positive steps in relation to the most sensitive components and the key pressures / threats, this has been recognised in the future prospect trends of structure and function.
11.5 Short term trend of habitat area in good condition within the network; Method used	There is no indication that there has been any notable deterioration in the SACs protecting this habitat over the period 2007-2018 but there has been limited repeat surveys in these sites so therefore this is based mainly on expert opinion with very limited data.