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:

H1150 - Coastal lagoons

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	**1150 - Coastal lagoons**

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	**Atlantic (ATL)**
3.2 Sources of information	Angus, S. 2017. Scottish saline lagoons: Impacts and challenges of climate change. Estuarine, Coastal and Shelf Science,198,626-635.. http://dx.doi.org/10.1016/j.ecss.2016.07.014 Loch nam Madadh SAC management plan - http://www.cne-siar.gov.uk/consultations/documents/LM EMS Oct 2007.pdf The Vadills and Sullom Voe SAC management covered under Shetland Marine Spatial Plan - http://www.nafc.uhi.ac.uk/departments/marine-science-and-technology/strategy/copy_of_SIMSP_2015.pdf Simpson, J.H. & Hunter, J.R. 1974. Fronts in the Irish Sea. Nature,250,404-6. 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

4. Range

4.1 Surface area (in km²)	35.37	
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 d) Method	No
4.11 Change and reason for change in surface area of range	No change The change is mainly due to:	
4.12 Additional information		

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5. Area covered by habitat

5.1 Year or period			
5.2 Surface area (in km²)	a) Minimum 35.37	b) Maximum 35.37	c) Best single value 35.37
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 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 35.36976	Maximum 35.36976
	b) Area in not-good condition (km²)	Minimum 0	Maximum 0
	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 extrapolation from a limited amount of 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

Agricultural activities generating marine pollution (A28)	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
Modification of flooding regimes, flood protection for residential or recreational development (F28)	M

Threat	Ranking
Modification of hydrological flow (K04)	M
Agricultural activities generating marine pollution (A28)	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
Modification of flooding regimes, flood protection for residential or recreational development (F28)	M
Temperature changes (e.g. rise of temperature & extremes) due to climate change (N01)	M
Increases or changes in precipitation due to climate change (N03)	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		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)
Manage changes in hydrological and coastal systems and regimes for construction and development (CF10)
Reduce impact of multi-purpose hydrological changes (CJ02)

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. For SACs, licensable activities (e.g. aquaculture, renewable developments, coastal developments) 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. For SSSIs, It is an offence for anyone to intentionally or recklessly damage the protected natural features of an SSSI. Those wishing to carry out certain activities within an SSSI must apply to SNH for consent. They are also considered for developments within the Environmental Impact Assessment process. There are management plans in place for Loch nam Madadh SAC (http://www.cne-siar.gov.uk/consultations/documents/LM EMS Oct 2007.pdf), and The Vadills and Sullom Voe SAC via the Marine Spatial Plan for Shetland (http://www.nafc.uhi.ac.uk/departments/marine-science-and-technology/strategy/copy_of_SIMSP_2015.pdf). In addition for Sullom Voe (which is linked with Yell Sound Coast SAC) it is covered by the Shetland regulating Order, Sullom Voe Harbour Order, ZCC policy , Soteag, SVT management plan, Sullom Voe Oil spill contingency plan. Outside of protected areas, impacts are considered on Priority Marine Features (PMFs) (https://www.snh.scot/professional-advice/safeguarding-protected-areas-and-species/priority-marine-features-scotlands-seas). Low or variable salinity habitats are a PMF and are found within saline lagoons. These would therefore be considered under Scotland's National Marine Plan GEN Policy 9 (Marine Scotland 2015), which requires that development and use of the marine environment must not result in a significant impact on the national status of PMFs. Regional Marine Management Plans for some regions (Shetland) have been developed which seek to identify the location of sensitive PMFs including some associated with lagoons 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

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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 b) Maximum c) Best single value 14.18968
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	Stable (0)
11.5 Short-term trend of habitat area in good condition within network Method used	Based mainly on extrapolation from a limited amount of data
11.6 Additional information	

12. Complementary information

12.1 Justification of % thresholds for trends	
12.2 Other relevant information	

Distribution Map

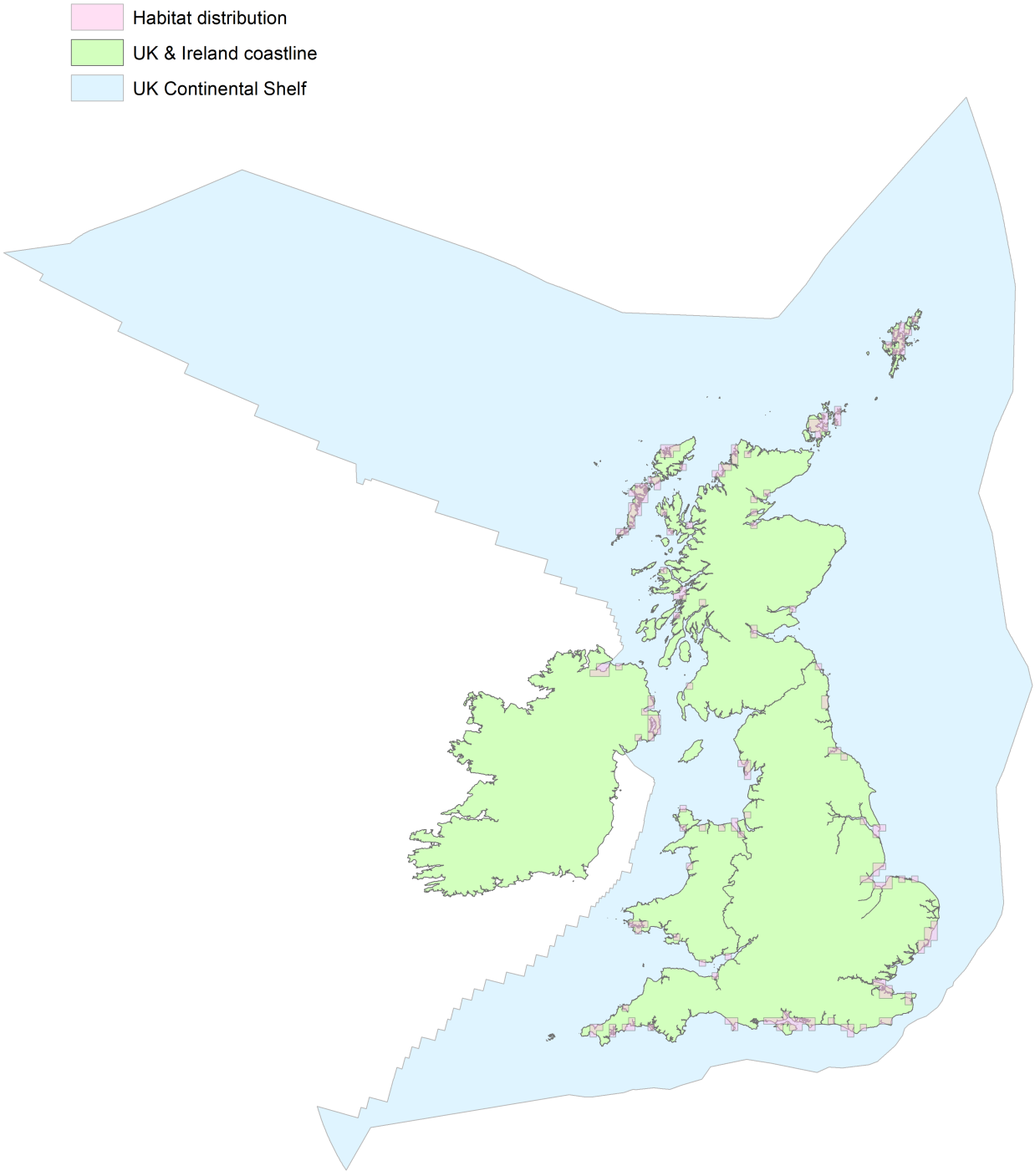

Figure 1: UK distribution map for H1150 - Coastal lagoons.

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

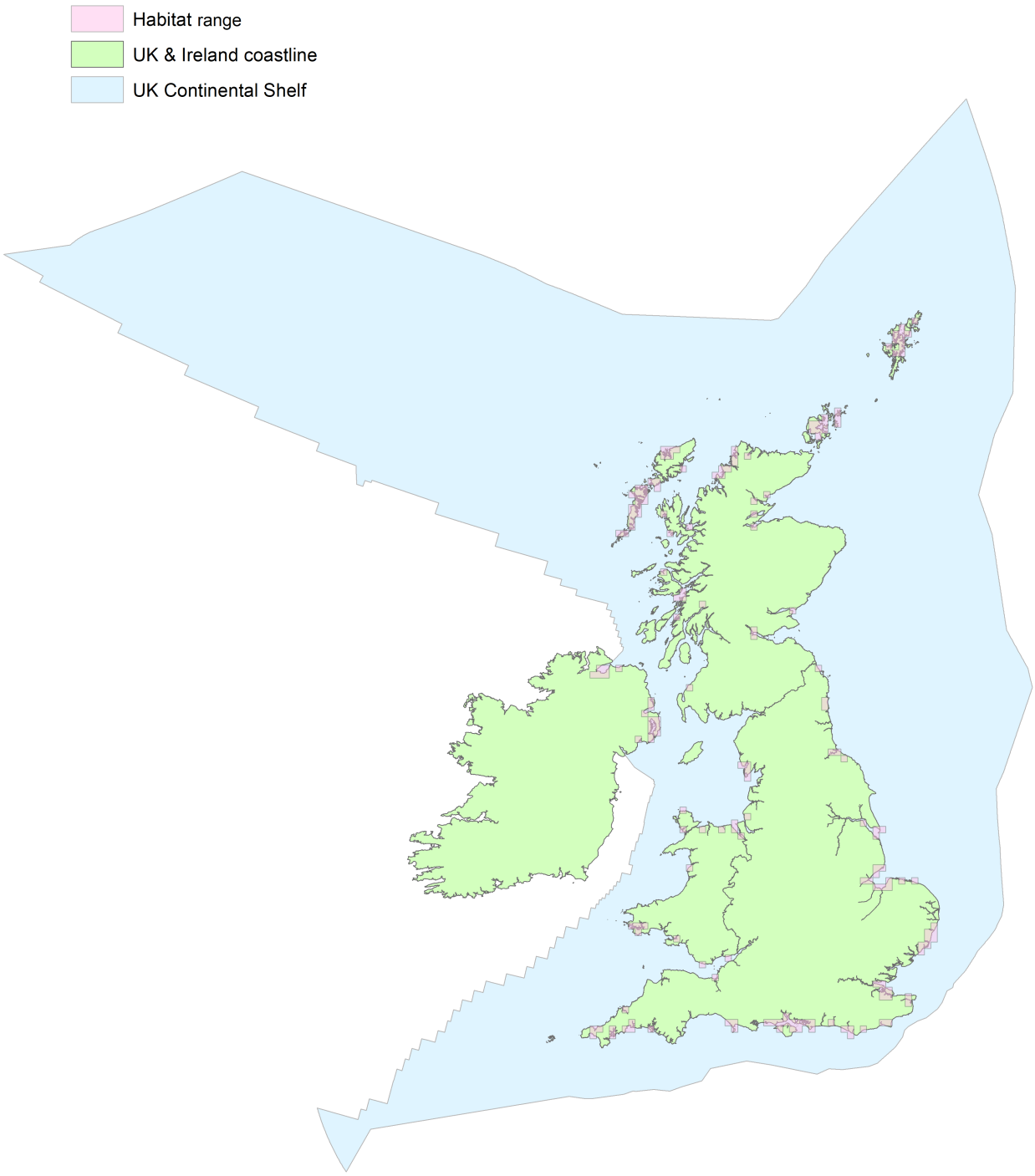

Figure 2: UK range map for H1150 - Coastal lagoons.

The range was considered equivalent to the surface area. Coastal lagoons 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.

Explanatory Notes

Habitat code: 1150 Region code: ATL

Field label	Note
6.2 Condition of habitat; Method used	All SACs and SSSIs where coastal/saline lagoons are protected as a feature have been assessed as being in favourable condition in site condition monitoring (see SNH doc A2664086) and have been classed as being in good condition. Area in SACs (all in good condition) = 14.18968km2, area in SSSIs (in good condition) = 15.722466km2, total in good condition = 29.912146km2). Remaining area = 35.369763-29.912146 = 5.457617km2 outside of protected sites. SNH document A2668892 summarises the sites included and their SCM assessments. In areas where the feature is protected in overlapping SACs and SSSIs, the area in the SAC was used. Outside of these protected sites (area of 5.457617m2) is present in the Hebrides and West Shetland regions of Scotland's Marine Atlas (Baxter et al., 2011). Shallow and shelf sediments and subtidal rock which are both present within lagoons, have been assessed by Baxter et al. (2011) in both regions. Shallow and shelf sediments have been assessed as 'many concerns no trend information' in West Shetland and 'some concerns/no trend information' in the Hebrides. Subtidal rock has been asssessed as 'few or no concerns/stable' in West Shetland and the Hebrides. However, these are broad assessments and because of the restricted nature of lagoons and the environment, they are not as representative of lagoon habitats as some of the other Annex I features e.g. reefs, subtidal sandbanks. Additonally activites such as fishing, aquaculture, coastal developments which can result in issues/concerns tend not to occur in lagoons. Also a monitoring survey of the Uists (see 6.2) has indicated that the status of the lagoons there is favourable. Therefore this remaining area has been assigned to 'good' condition. Therefore total figure of good condition = 35.369763. SNH document A2631873 outlines the method used in more detail.
6.3 Short term trend of habitat area in good condition; Period	All SACs and SSSIs where coastal/saline lagoons are protected as a feature have been assessed as being in favourable condition in site condition monitoring (see SNH doc A2664086). There have been limited repeat surveys and lagoons are very variable making it difficult to make assessments, which ideally would require multiple visits. However, the Uist lagoons were monitored in a report by APEM for SNH which is yet to be published which concluded designated sites were Favourable. One small non-SSSI/SAC lagoon seems to have been lost to coastal protection. Therefore overall we have concluded that the short term trend is stable.

7.1 Characterisation of pressures/ threats	N01 included because despite Cerastoderma glaucum (a typical species of Scottish lagoons) occurring in N Africa, UK animals appear to be adapted to lower temperatures. On 21.7.14 several moribund cockles were found at Danna where water temperature was 25 degree C. Therefore characteristic species of lagoons could be sceptible to temperate increases (Stewart Angus, pers.comm, 2018). N03 included because storms could bring marine breakdown of shingle barriers while the increased precipitation in winter could lead to breaches in the barrier from the landward side due to excess volume of water. This could also happen in some rock basin lagoons where a causeway has been built across the sea exchange, e.g. Loch Bee (S. Angus, pers.comm, 2018) N04 included because Angus (2016) reports that saline lagoons are particularly vulnerable to Relative Sea Level Rise (RSLR) as a result of climate change. N05 included because many lagoons have acidic fresh water inflow, whereas some western lagoons such as west Loch Bee and Loch Roag (South Uist) will be alkaline due to shell sand in substrate. Climate change pressures could therefore affect the qualities of these lagoons (S. Angus, pers.comm, 2018). N09 not included because S. Angus discussed the oceanic (or at least coastal) currents with A. Dale citing Simpson and Hunter (1974) who, by using a simple energy argument, predicted that fronts should lie along a critical contour of the parameter h/u3, where h = depth and u = amplitude of tidal streams. Andy's view was that despite h (depth) increasing with relative sea level rise SLR there should be negligible impact on positions of fronts (and also on amphidromic points). However, water density is important which varies with salinity.
9.1 Future prospects of parameters	We believe that the future prospects with regard to range will be stable as we do not foresee this changing within the next 12 years. However there could be changes in area and structure/function due to climate change (see Angus, 2017) and therefore these have been set as unknown as what the final results will be aren't clear. For example typical species of Scottish lagoons e.g. Cerastoderma glaucum (appear to be sceptible to temperate increases (S. Angus, pers.comm, 2018). Increasing storms could bring marine breakdown of shingle barriers while the increased precipitation in winter could lead to breaches in the barrier from the landward side due to excess volume of water. This could also happen in some rock basin lagoons where a causeway has been built across the sea exchange, e.g. Loch Bee (S. Angus, pers.comm, 2018). Saline lagoons are particularly vulnerable to Relative Sea Level Rise (RSLR) as a result of climate change. Also their nature may change (pH) due to alterations in freshwater inflow.
11.4 Short term trend of habitat area in good condition within the network; Direction	See 6.3