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

Conservation status assessment for the species:

S1365 - Common seal (*Phoca vitulina*)

UNITED KINGDOM

IMPORTANT NOTE - PLEASE READ

- The information in this document represents the UK Report on the conservation status of this species, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- It is based on supporting information provided by the geographically-relevant Statutory Nature Conservation Bodies, which is documented separately.
- The 2019 Article 17 UK Approach document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Maps showing the distribution and range of the species are included (where available).
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the UK assessments. Further underpinning explanatory notes are available in the related country-level reports.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species).
- The UK-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 11 for Annex II, IV and V species (Annex B)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK**
1.2 Species code	**1365**
1.3 Species scientific name	**Phoca vitulina**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Common seal

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1991-2018
2.3 Distribution map	Yes
2.4 Distribution map Method used	Complete survey or a statistically robust estimate
2.5 Additional maps	No

3. Information related to Annex V Species (Art. 14)

3.1 Is the species taken in the wild/exploited?	Yes	
3.2 Which of the measures in Art. 14 have been taken?	a) regulations regarding access to property	No
	b) temporary or local prohibition of the taking of specimens in the wild and exploitation	No
	c) regulation of the periods and/or methods of taking specimens	Yes
	d) application of hunting and fishing rules which take account of the conservation of such populations	No
	e) establishment of a system of licences for taking specimens or of quotas	Yes
	f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens	Yes
	g) breeding in captivity of animal species as well as artificial propagation of plant species	No
	h) other measures	No

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3.3 Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)

a) Unit number of individuals (i)

b) Statistics/ quantity taken	Provide statistics/quantity per hunting season or per year (where season is not used) over the reporting period					
	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
Min. (raw, ie. not rounded)	36	42	42	22	19	
Max. (raw, ie. not rounded)	36	42	42	22	19	
Unknown	No	No	No	No	No	Yes

3.4. Hunting bag or quantity taken in the wild Method used

Complete survey or a statistically robust estimate

3.5. Additional information

Numbers of takes requested in seal management applications (license request), the actual numbers granted (licence granted), and the total number of harbour seals shot each year for Scotland (2013-2018) are available on the Scottish Government website. Numbers on all accounts have declined over the years. The number of harbour seals shot has declined by 47%, from 36 in 2013 to 19 in 2017. A combination of measures appear to have contributed to the significant reduction in seal shootings at fish farms, including the expansion of properly tensioned nets across the industry, improved attention to the frequency of the removal of dead fish, and the use of seal blinds to help reduce the attraction for seals (Marine Scotland, 2015).

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Marine Atlantic (MATL)

4.2 Sources of information

Arso Civil, M., Smout, S., Onoufriou, J., Thompson, D., Brownlow, A., Davison, N., Duck, C., Morris, C., Cummings, C., Pomeroy, P., McConnell, B. and Hall, A.J. (2016). Harbour Seal Decline - vital rates and drivers. Report to Scottish Government HSD2.
Arso Civil, M., Smout, S.C., Thompson, D., Brownlow, A., Davison, N., Doeschate, M., Duck, C., Morris, C., Cummings, McConnell, B. and Hall, A.J. (2017). Harbour Seal Decline - vital rates and drivers. Report to Scottish Government HSD2.
Band, B., Sparling, C., Thompson, D., Onoufriou, J., San Martin, E. & West, N. (2016). Refining Estimates of Collision Risk for Harbour Seals and Tidal Turbines Scottish Marine and Freshwater Science Volume 7 Number 17 Published by Marine Scotland Science ISSN: 2043-7722 DOI: 10.7489/1786-1
Bishop, A. M., Onoufriou, J., Moss, S., Pomeroy, P. P., & Twiss, S. D. (2016). Cannibalism by a male grey seal (Halichoerus grypus) in the North Sea. Aquatic Mammals, 42(2), 137-143. http://dx.doi.org/ 10.1578/ AM.42.2.2016.137
Brownlow et al., (2009:2016). Scottish Marine Animal Stranding Scheme Annual Report (1st January to 31st December). Available at:

http://www.strandings.org/smass/publications/
Brownlow, A., Onoufriou, J., Bishop, A., Davison, N., & Thompson, D. (2016). Corkscrew seals: Grey seal (Halichoerus grypus) infanticide and cannibalism may indicate the cause of spiral lacerations in seals. PLoS ONE, 11(6):1-14. doi: 10.1371/journal.pone.0156464.
DG Environment. (2017). Reporting under Article 17 of the Habitats Directive: Explanatory notes and guidelines for the period 2013-2018. Brussels. Pp 188 http://cdr.eionet.europa.eu/help/habitats_art17
Duck, C.D. & Morris, C.D. (2016). Surveys of harbour and grey seals on the south-east (border to Aberlady Bay) and south-west (Sound of Jura to Solway Firth) coasts of Scotland, in Shetland, in the Moray Firth and in the Firth of Tay in August 2015. Scottish Natural Heritage Commissioned Report No. 929.
Duck, C.D. & Morris, C.D. (2018). Aerial survey of harbour seals (Phoca vitulina), and grey seal (Halichoerus grypus) summer distribution in Scotland in 2016: Orkney and the North Coast, the Moray Firth, and part of East Scotland. Scottish Natural Heritage Commissioned Report No. 1005 (in prep.)
Evans. D and Marvela, A. (2013). Assessment and reporting under Article 17 of the Habitats Directive: Explanatory notes and Guidelines. 123pp. https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp
Hammond, P. S. and Wilson, L. J. (2016). Grey Seal Diet Composition and Prey Consumption. Scottish Marine and Freshwater Science, 7(20):1-28. doi: 10.7489/1799-1.
Hastie, G. D., Russell, D., McConnell, B., Moss, S., Thompson, D., & Janik, V. (2015). Sound exposure in harbour seals during the installation of an offshore wind farm: Predictions of auditory damage. Journal of Applied Ecology, 52(3):631-640. doi: 10.1111/1365-2664.12403.
Hastie, G. D., Russell, D., Lepper,P., Elliot, J., Wilson, B., Benjamins, S & Thompson, D. (2018). Harbour seals avoid tidal turbine noise: Implications for collision risk. Journal of Applied Ecology, 55(2):684-693. doi: 10.1111/1365-2664.12981.
Jansen, J. K., Brady, G. M., Hoef, J. M. V., & Boveng, P. L. (2015). Spatially estimating disturbance of harbor seals (Phoca vitulina). PLoS ONE, 10(7):1-13. https://doi.org/10.1371/journal.pone.0129798
Jones, E. L., Hastie, G., Smout, S., Onoufriou, J., Merchant, N.D., Brookes, K., & Thompson, D. (2017). Seals and shipping: quantifying population risk and individual exposure to vessel noise. Journal of Applied Ecology, 54(6): 1930-1940. doi: 10.1111/1365-2664.12911.
Jones, E. L., McConnell, B. J, Duck, C. D., Morris, C. D., Hammond, P. S., Russell, D. J. F. & Matthiopoulos, J. (2012). Marine distribution of grey and harbour seals around the UK. SCOS Briefing paper 12/06
Lonergan, M., Duck, C., Moss, S., Morris, C., & Thompson, D. (2013). Rescaling of aerial survey data with information from small numbers of telemetry tags to estimate the size of a declining harbour seal population. Aquatic Conservation-Marine and Freshwater Ecosystems, 23 (1):135-144.https://doi.org/10.1002/aqc.2277
Onoufriou, J. & Thompson, D. (2014). Testing the hypothetical link between shipping and unexplained seal deaths: Final report. Marine Mammal Scientific Support Research Programme Report to Scottish Government (October), pp. 1-33.
Russell, D. J. F., Hastie, G.D., Thompson, D., Janik, V.M., Hammond, P.S., Scott-Harward, L.A.S., Matthiopoulos, J., Jones, E., & McConnell, B. (2016). Avoidance of wind farms by harbour seals is limited to pile driving activities. Journal of Applied Ecology, 53(6):1642-1652. doi: 10.1111/1365-2664.12678.

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Russell, D. J. F., Jones, E. L. and Morris, C. D. (2017). Updated Seal Usage Maps: Estimated at-sea Distribution of Grey and Harbour Seals. Scottish Marine and Freshwater Science Vol 8 No 25. pp. 25. DOI: 10.7489/2029-1. Accessed June 2018 from; https://data.marine.gov.scot/dataset/estimated-sea-distribution-grey-and-harbour-seals-updated-maps-2017
Savidge, G., Ainsworth, D., Bearhop, S., Christen, N., Elsaesser, N., Fortune, F., et al. (2014). Strangford Lough and the SeaGen Tidal Turbine. 153-172. doi: 10.1007/978-94-017-8002-5.
SCOS, 2017. Scientific Advice on Matters Related to the Management of Seal Populations: 2017. http://www.smru.st-andrews.ac.uk/files/2018/01/SCOS-2017.pdf
Simmonds, M. P. & Brown, V. C. (2010). Is there a conflict between cetacean conservation and marine renewable-energy developments? Wildlife Research, 37(8): 688-694. doi: 10.1071/WR10020.
Skeate, E. R., Perrow, M. R. & Gilroy, J. J. (2012). Likely effects of construction of Scroby Sands offshore wind farm on a mixed population of harbour Phoca vitulina and grey Halichoerus grypus seals. Marine Pollution Bulletin,64(4):872-881. doi: 10.1016/j.marpolbul.2012.01.029.
Sparling, C., Lonergan, M. & McConnell, B. (2017). Harbour seals (Phoca vitulina) around an operational tidal turbine in Strangford Narrows: No barrier effect but small changes in transit behaviour. Aquatic Conservation: Marine and Freshwater Ecosystems, 28(1):94-204. doi: 10.1002/aqc.2790.
Thompson, D., Onoufrio, J., & Patterson, W. (2016). Report on the distribution and abundance of harbour seals (Phoca vitulina) during the 2015 and 2016 breeding seasons in The Wash. Report number: SMRUC-DOW-2016,016 (Unpublished).
Tollit, D. J. & Thompson, P. M. (1996). Seasonal and between-year variations in the diet of harbour seals in the Moray Firth, Scotland. Canadian Journal of Zoology, 74(6):1110-1121. doi: 10.1139/z96-123.
Wilson, L. J. & Hammond, P. S. (2016). Harbour seal diet composition and diversity. Scottish Marine and Freshwater Science, 7(21). 86pp. doi: 10.7489/1801-1.

5. Range

5.1 Surface area (km²)	512984	
5.2 Short-term trend Period	1988-2018	
5.3 Short-term trend Direction	Stable (0)	
5.4 Short-term trend Magnitude	a) Minimum	b) Maximum
5.5 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data	
5.6 Long-term trend Period		
5.7 Long-term trend Direction		
5.8 Long-term trend Magnitude	a) Minimum	b) Maximum
5.9 Long-term trend Method used		
5.10 Favourable reference range	a) Area (km²)	512984
	b) Operator	
	c) Unknown	
	d) Method	Range estimated for the current period matches the range given in the 2013 reporting round (excluding analytic differences).

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5.11 Change and reason for change in surface area of range	Use of different method	
	The change is mainly due to:	Use of different method
5.12 Additional information	Range estimated for the current period matches the range given in the 2013 reporting round (excluding analytical differences). This range is considered sufficient and includes all significant ecological variations to ensure survival of the species. Areas within the range are utilised to a lesser or greater extent.	

6. Population

6.1 Year or period	2011-2017	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	37000
	c) Maximum	60400
	d) Best single value	45100
6.3 Type of estimate	95% confidence interval	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit	
	b) Minimum	
	c) Maximum	
	d) Best single value	
6.5 Type of estimate		
6.6 Population size Method used	Complete survey or a statistically robust estimate	
6.7 Short-term trend Period	2007-2017	
6.8 Short-term trend Direction	Unknown (x)	
6.9 Short-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.10 Short-term trend Method used	Insufficient or no data available	
6.11 Long-term trend Period	1996-2017	
6.12 Long-term trend Direction	Increasing (+)	
6.13 Long-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.14 Long-term trend Method used	Based mainly on extrapolation from a limited amount of data	
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size	46520 with unit number of individuals (i)
	b) Operator	
	c) Unknown	
	d) Method	The favourable reference population value (FRV) was set as 46,300 in the UKÔÇÖs 3rd reporting round (2013) to equal the scaled abundance estimate from the 2000-2005 surveys as given in SCOS (2012). This

	survey estimate was chosen as it represented the first estimate with full coverage of the major haul-outs around the UK, and was the highest abundance estimate for harbour seals since the adoption of the Habitats Directive. (See species audit text for further detail)
6.16 Change and reason for change in population size	Genuine change
	The change is mainly due to: Genuine change
6.17 Additional information	

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (for long-term survival)?	Unknown
	b) Is there a sufficiently large area of unoccupied habitat of suitable quality (for long-term survival)?	
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on extrapolation from a limited amount of data	
7.3 Short-term trend Period	2007-2018	
7.4 Short-term trend Direction	Unknown (x)	
7.5 Short-term trend Method used	Based mainly on expert opinion with very limited data	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information		

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Industrial or commercial activities and structures generating noise, light, heat or other forms of pollution (F25)	M
Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01)	M
Management of fishing stocks and game (G08)	M
Interspecific relations (competition, predation, parasitism, pathogens) (L06)	M

Threat	Ranking
Wind, wave and tidal power, including infrastructure (D01)	M
Industrial or commercial activities and structures generating noise, light, heat or other forms of pollution (F25)	M

Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species (G01)	M
Management of fishing stocks and game (G08)	M
Interspecific relations (competition, predation, parasitism, pathogens) (L06)	M
Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change (N07)	M

8.2 Sources of information

8.3 Additional information

9. Conservation measures

9.1 Status of measures

a) Are measures needed? Yes

b) Indicate the status of measures Measures identified and taken

9.2 Main purpose of the measures taken: Maintain the current range, population and/or habitat for the species

9.3 Location of the measures taken: Both inside and outside Natura 2000

9.4 Response to the measures: Medium-term results (within the next two reporting periods, 2019-2030)

9.5 List of main conservation measures

Reducing the impact of (re-) stocking for fishing and hunting, of artificial feeding and predator control (CG03)

9.6 Additional information

Twelve Special Areas of Conservation (SAC) have been designated with harbour seals as a qualifying feature (grade A-C), which are listed on the JNCC website: (UK0030230) Ascrib, Isay and Dunvegan (Scotland inshore); (UK0019806) Dornoch Firth and Morrich More (Scotland inshore); (UK0030182) Eileanan agus Sgeiran Lios mor (Scotland inshore); (UK0030311) Firth of Tay and Eden Estuary (Scotland inshore); (UK0012711) Mousa (Scotland inshore); (UK0016612) Murlough (Northern Ireland inshore); (UK0030069) Sanday (Scotland inshore); (UK0012705) Sound of Barra (Scotland inshore); (UK0030067) South-East Islay Skerries (Scotland inshore); (UK0016618) Strangford Lough (Northern Ireland inshore); (UK0017075) The Wash and North Norfolk Coast (England inshore); (UK0012687) Yell Sound Coast (Scotland inshore). Other sites (MPAs) designated under domestic legislation in the UK (e.g. Marine Conservation Zones (MCZ); Site of Special Scientific Interest (SSSI) Area of Special Scientific Interest (ASSI)) have harbour seals as 'features' and contribute to the conservation and management of the species. Furthermore, under Section 117 of the Marine (Scotland) Act 2010, Scottish Ministers, consulting with the Natural Environment Research Council (NERC), are permitted to designate specific seal haul-out sites to provide additional protection for seals from intentional or reckless harassment. 194 seal haul-out sites, including key breeding sites along with a number of additional specific sites proposed by respondents, were designated through The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014 with the addition of the River Ythan in 2017. https://www.gov.scot/Topics/marine/marine-environment/species/19887/20814/haulouts. The UK has been committed to

supporting several international agreements and conventions on the conservation of marine mammals and the marine environment in general. For example: The Convention on Migratory Species (CMS); the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR). The UK Government funds a national strandings scheme, ongoing since 1990, with a Scottish arm which monitors causes of death in seals.

10. Future prospects

10.1 Future prospects of parameters	a) Range	Good
	b) Population	Poor
	c) Habitat of the species	Unknown
10.2 Additional information	These results are based on the current conservation status for each parameter combined with the future trend for each parameter. The future trend is an estimate of how the parameter is likely to progress into the future, using the current trend as a baseline and considering the balance between threats and measures to assess how these are likely to affect that trend over the next two reporting cycles (12 years). For common seal, the future trend of Range is assessed as Overall Stable. As the current conservation status for Range is Favourable for this species, the future prospects are considered Good. The future trend for the Population parameter is assessed as Positive - increasing 22641% (one percent or less) per year on average largely due to the current trajectory of the population and no indication of any increase in threats. However, the current conservation status of this parameter is Unfavourable-inadequate, and the future prospects are therefore assessed as Poor for this species. The future trend and consequently the future prospects for the Habitat parameter is assessed as Unknown; this is due to there being insufficient data to establish current trends for these parameters.	

11. Conclusions

11.1. Range	Favourable (FV)
11.2. Population	Unfavourable - Inadequate (U1)
11.3. Habitat for the species	Unknown (XX)
11.4. Future prospects	Unfavourable - Inadequate (U1)
11.5 Overall assessment of Conservation Status	Unfavourable - Inadequate (U1)
11.6 Overall trend in Conservation Status	Unknown (x)
11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status Genuine change The change is mainly due to: Genuine change b) Overall trend in conservation status Genuine change The change is mainly due to: Genuine change
11.8 Additional information	There has been a genuine increase in harbour seal abundance in the UK since the

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3rd reporting round (2013). Although serious declines are still observed in some areas, other areas have remained stable or have shown substantial increase in numbers resulting in an overall increase in abundance of harbour seal at the UK scale. As a result, the current abundance estimate is close to the Favourable Reference Population value resulting in a genuine change in the overall assessment of conservation status from 'Unfavourable-Bad' to 'Unfavourable-Inadequate' and the trend has changed from declining to improving. Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is stable and (ii) the current Range surface area is approximately equal to the Favourable Reference Range.
Conclusion on Population reached because: (i) the short-term trend direction in Population size is unknown; and (ii) the current Population size is less than the Favourable Reference Population.
Conclusion on Habitat for the species reached because: (i) the sufficiency of the area of habitat is unknown and (ii) the habitat quality is unknown for the long-term survival of the species.
Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Population are poor; and (iii) the Future prospects for Habitat for the species are unknown.
Overall assessment of Conservation Status is Unfavourable-inadequate because one or more of the conclusions are Unfavourable-inadequate and there are no Unfavourable-bad.
Overall trend in Conservation Status is based on the combination of the short-term trends for Range - stable, Population - unknown, and Habitat for the species - unknown.

12. Natura 2000 (pSCIs, SCIs and SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network (on the biogeographical/marine level including all sites where the species is present)	a) Unit	number of individuals (i)
	b) Minimum	
	c) Maximum	
	d) Best single value	4400
12.2 Type of estimate		Best estimate
12.3 Population size inside the network Method used		Complete survey or a statistically robust estimate
12.4 Short-term trend of population size within the network Direction		Uncertain (u)
12.5 Short-term trend of population size within the network Method used		Complete survey or a statistically robust estimate
12.6 Additional information		

13. Complementary information

13.1 Justification of % thresholds for trends	
13.2 Trans-boundary assessment	

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13.3 Other relevant Information

Distribution Map

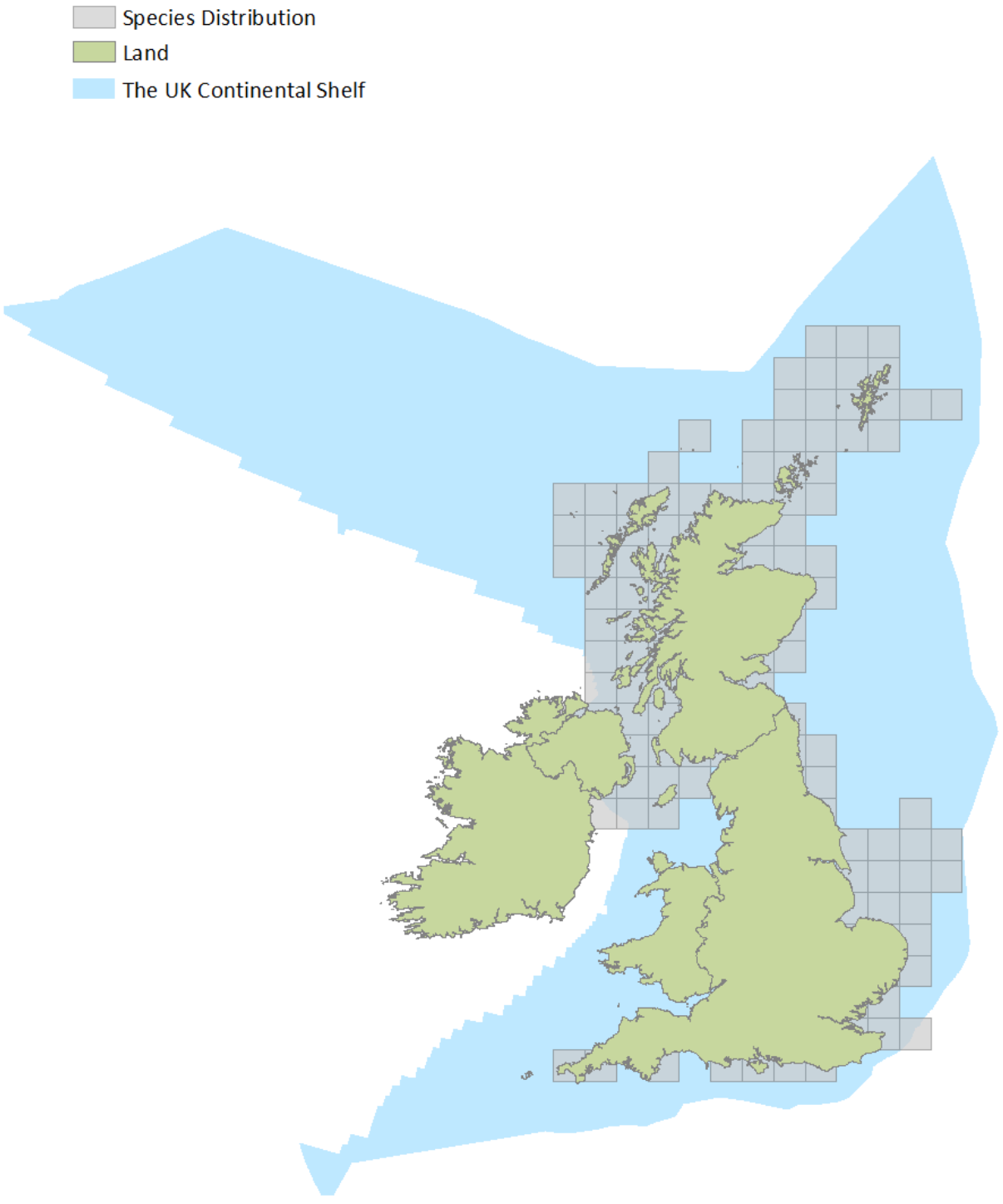

Figure 1: UK distribution map for S1365 - Common seal (*Phoca vitulina*).

The 50km grid square distribution map is based on available species records within the current reporting period. For further details see the 2019 Article 17 UK Approach document.

Range Map

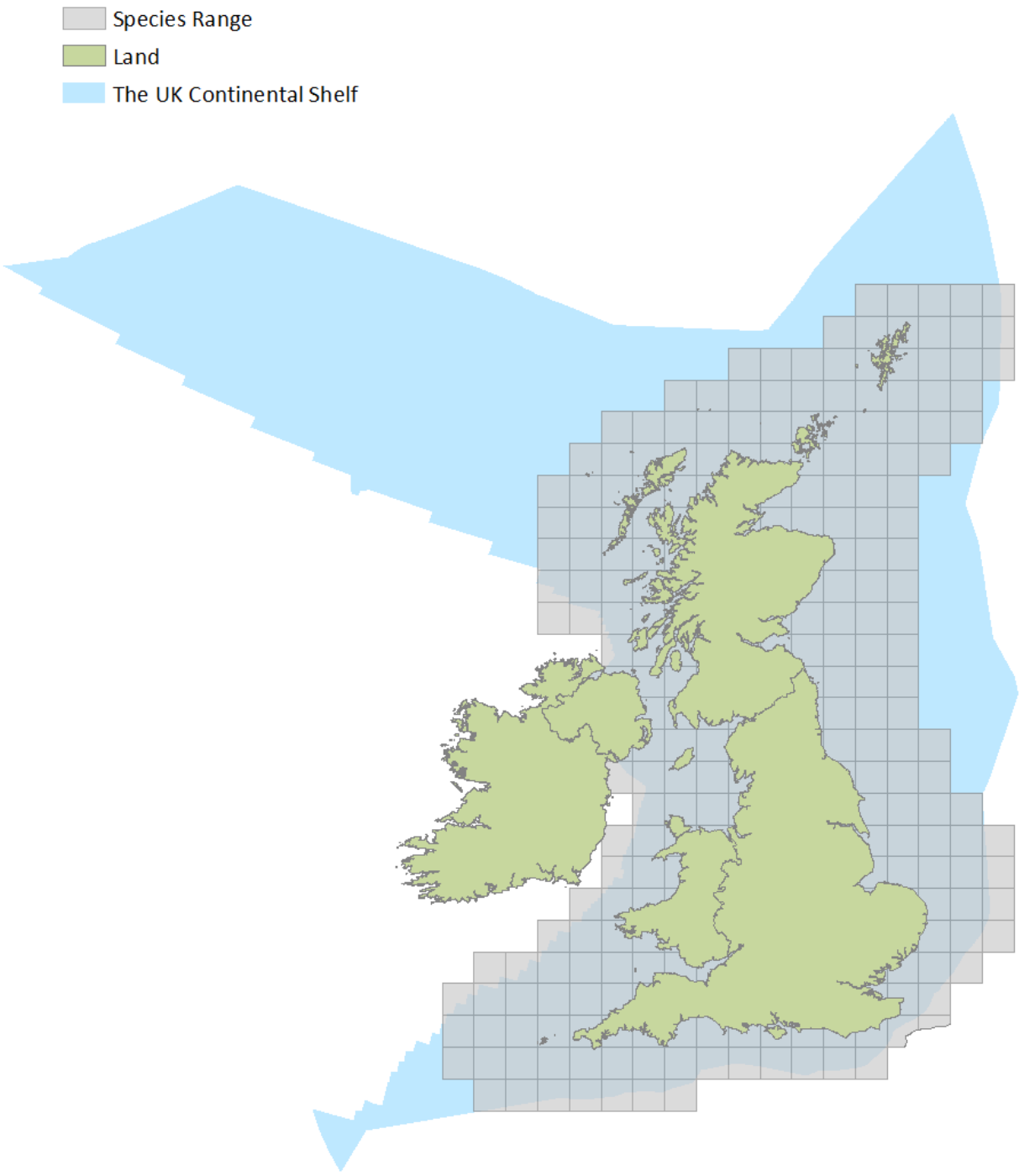

Figure 2: UK range map for S1365 - Common seal (*Phoca vitulina*).

The assessment of range in the current report uses the same range as the previous report (2007-2012) as the distribution of Common seal (*Phoca vitulina*) is not thought to have changed since the previous reporting round. The 2007-2012 range was based on interpolation of distribution data collated for the

2007-2012 report, predicted Common seal (*Phoca vitulina*) distribution obtained through modelling of at-sea (telemetry) and haul-out data collected from 1988 to 2012 (Jones et al., 2012) and expert judgement was used to predict where the likely boundaries of the species range occur. The range was developed to represent the greatest likely extent of the species considering year-round distribution of haul-out and at-sea data. A 50x50km grid was used and the projection is ETRS LAEA 5210.

Explanatory Notes

Species name: Phoca vitulina (1365)

Field label	Note
2.1 Sensitive species	This refers to sensitivities around publishing distribution data.
2.3 Distribution map	Harbour seals are widespread along the west coast of Scotland and around the Hebrides and the Northern Isles. Approximately 80% of the UK population resides around the Scottish coast. On the east coast, their distribution is more localised with concentrations in the major estuaries of the Thames, The Wash, and the Moray Firth. Low numbers are also encountered along the south and west coast of England and along the coasts of Wales. Around 5% of the UK population occur in colonies in Northern Ireland (SCOS, 2017). The distribution map (Annex A) is based on a combination of confirmed sightings data from 2013-2018 (including confirmed at-sea sightings and terrestrial count data from ORCA and the National Biodiversity Network (NBN)) and predicted harbour seal distribution obtained through modelling terrestrial count data and telemetry data collected from 1991 to 2016 (Russell et al., 2017). The distribution is based on the best available data for this species and is considered statistically robust. It should be noted that seals can be difficult to spot at sea, and information relating to their at-sea distribution is heavily reliant on telemetry data, which has a number of associated caveats. Although the derived distribution map is considered statistically robust and is a good representation of harbour seal distribution in UK waters, it is likely that the species can be observed anywhere within their range (see Annex B).
2.5 Additional maps	The predicted range for harbour seal in UK waters is in Annex B. No evidence of change since the 2013 reporting round. The 2013 range was based on interpolation of distribution data collated for the 2013 report, predicted harbour seal distribution obtained through modelling of at-sea (telemetry) and haul-out data collected from 1988 to 2012 (Jones et al., 2012) and expert judgement was used to predict where the likely boundaries of the species range occur. The range was developed to represent the greatest likely extent of the species considering year-round distribution of haul-out and at-sea data.
3.1 Is the species take in the wild/ exploited	Harbour seal is an Annex V species and can be shot legally in UK waters to prevent damages to fisheries or fish-farms, and to protect the welfare of farmed fish. In Scotland, under the Marine (Scotland) Act 2010, the shooting of seals is only legal under specific license, and licence holders are required to report takes including nil returns. The same applies in Northern Ireland under the Wildlife (Northern Ireland) Order 1985 (as amended). In England and Wales, the Conservation of Seals Act 1970 prohibits the shooting of seals during the closed season (1st June to 31st August for harbour seal). The Conservation of Seals (England) Order 1999 protects grey and harbour seals on the east coast of England, from the Border at Berwick to Newhaven Pier. However, Section 9 of the Conservation of Seals Act 1970 details general exceptions whereby a seal can be shot legally during the closed season or in an area where the killing or taking of seals is prohibited as described in an order. Under 9.(1)(c) fisherman are permitted to kill a seal in order to prevent it causing damage to their fishing tackle, net, or fish in their net, provided the seal is in the vicinity of said equipment at the time of shooting. Shootings in England Wales are not required to be reported. Although the overall conservation status of harbour seal for the UK is improving (from Unfavourable-Bad in the 3rd reporting round (2013) to Unfavourable-Inadequate in the current reporting round; see Section 11.6), regional population declines have been observed in this species.

3.3 Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)	Number of takes are only reported and recorded in Scotland under the Marine (Scotland) Act 2010 and in Northern Ireland under the Wildlife (Northern Ireland) Order 1985 (as amended). Takes are not required to be reported in England and Wales under the Conservation of Seals Act 1970. The quantities taken reported here are the total number of harbour seals shot in Scotland each year, where season/year 1 is the take for 2013, through to season/year 6 in 2018. No data are currently available for 2018. No harbour seals were shot under licence in Northern Ireland 2013-2018.
3.4 Hunting bag or quantity take in the wild; Method used	The quantity taken is based on licence returns in Scotland. Under the seal licencing system of the Marine (Scotland) Act 2010, each licensee is required to submit a quarterly return, including nil takes. This includes the date and location of shooting, the species of seal, and, where possible, information on the recovery of the carcass. There is currently no evidence to suggest licence returns do not reflect actual practice, and therefore the number reported here reflects actual number of seals taken under licence per year in Scotland.
3.5 Additional information	Given the dramatic decline in harbour seal populations on the east coast of Scotland, no licenses have been issued to shoot harbour seals in the Orkney and North Coast Management Region since 2014, and within the East Scotland Management Region since 2010 (SCOS, 2017).

Species name: Phoca vitulina (1365) Region code: MATL

Field label	Note
5.3 Short term trend; Direction	Range for the current report (512,984 km2) is equal to the range presented in the 3rd reporting round (510,413 km2).
5.5 Short term trend; Method used	The 2013 range was based on interpolation of distribution data collated for the 2013 report, predicted harbour seal distribution obtained through modelling of at-sea (telemetry) and terrestrial count data collected from 1988 to 2012 (Jones et al., 2012) and expert judgement was used to predict where the likely boundaries of the species range occur. The range was developed to represent the greatest likely extent of the species considering year-round distribution of haul-out and at-sea data. The distribution data collated for the current report was compared with the predicted range from the 2013 report. As there was no discernible difference between the reporting rounds, the range is considered stable.
5.10 Favourable reference range	The favourable reference range is approximately equal to the surface area given in Section 5.1.
5.11 Change and reason for change in surface area of range	Range is considered stable but there is a minor difference in the range value between this report and the UK's 3rd reporting round (2013). The difference is due to the use of a slightly different grid template and does not represent an actual difference in the species range between reporting rounds.
6.1 Year or Period	The current abundance estimate is derived by combining the most recent counts (2011-2016) to give a minimum estimate of abundance for harbour seals in the UK over the 2011-2016 period.
6.2 Population size	The 2011-2017 estimate is calculated from the combined survey counts for 2011-2017, giving a minimum estimate of 32,600 counted in the UK. Scaling this by the estimated proportion hauled out gives an estimated total population estimate of harbour seal abundance in UK waters for this period of 45,100 (approximate 95% CI: 37,000-60,400). The most accurate estimate of the species abundance in UK waters is likely to lie within the confidence intervals.

6.6 Population size; Method used	Harbour seals are surveyed during their annual moult in August, when they spend a high proportion of time on land. Most regions are surveyed using thermographic aerial imagery to identify seals along the coastline. However, conventional photography is used to survey populations in the estuaries of the English and Scottish east coasts. Due to the length of coastline, particularly along the north and west coast of Scotland where harbour seals are common and widely distributed, it is impractical to survey the entire coastline each year and survey is spread across consecutive years with the aim of achieving full coverage over 5 years. The estimate of the total population size is derived from the seal counts estimated from these surveys (the raw abundance estimate) and scaled to account for the proportion of individuals which haul-out at any given time (0.72 (95% CI: 0.54-0.88). This correction factor was derived from haul-out patterns of harbour seals fitted with flipper mounted ARGOS tags (n=22) in Scotland (see Lonergan et al., 2013 for detail).
6.8 Short term trend; Direction	Short-term trend is reported as Unknown as some data are available, but they are not enough to accurately determine trend direction. Harbour seal numbers (scaled) have increased by approximately 27.5% between the 2007-2009 (35,504) and 2011-2017 (45,100) survey periods. While there have been significant declines in several areas around Scotland during this time period, particularly around Orkney, the east coast and Shetland (although recent evidence suggest Shetland may be recovering), these declines are not universal. The west coast of Scotland and western Isles have had considerable increases since the late 2000's. Overall, the Scottish population has increased by approximately 25% since the 2007-2009 survey. This level of increase has also been observed in England and Wales (SCOS 2017).
6.10 Short term trend; Method used	As only two estimates have been made over the last 12 years, a robust assessment of trend over the short-term was not possible for this species. A minimum of three population estimates are required before trends can be explored.
6.12 Long term trend; Direction	Harbour seal numbers have increased since the early 2000s and are close to the abundance estimated in the late 1990s (SCOS, 2017)
6.14 Long term trend; Method used	Trend was assessed over the long-term by comparing the total estimated abundance of harbour seal hauled out along the UK from the most recent survey (2011-2016) and the previous surveys (2007-2009, 2000-2006 and 1996-1997). The count value for the 1996-1997 is likely to be an under-estimate as not all areas in Northern Ireland were surveyed and those areas that were covered were ground counted or surveyed by boat rather than by aerial survey. However, the Northern Irish harbour seals account for less than 5% of the UK population and the underestimate is thought to be minor. The 1996-1997 does represent a minimum estimate for harbour seal for that time.

6.15 Favourable reference population	The favourable reference population value (FRV) was set as 46,300 in the UK's 3rd reporting round (2013) to equal the scaled abundance estimate from the 2000-2005 surveys as given in SCOS (2012). This survey estimate was chosen as it represented the first estimate with full coverage of the major haul-outs around the UK, and was the highest abundance estimate for harbour seals since the adoption of the Habitats Directive. There were two survey estimates before this estimate which used comparable survey techniques to the methods used currently; 1988-1995 and 1996-1997 (see SCOS 1997 and SCOS 2012). However, these values were not used to set the FRV. The 1988-1995 estimate was not used because 1) the surveys did not cover haul-out sites in Northern Ireland, and 2) the estimate (raw count = 29,182; total population estimate for Great Britain (0.72 correction factor applied) = ~40,500) was not thought to represent a 'favourable' condition as this period included counts made during and immediately after an outbreak of Phocine distemper virus (PDV). The 1996-1997 estimate was not used because 1) the surveys did not cover haul-out sites in Northern Ireland, and 2) the estimate (raw count = 32.794; total population estimate for Great Britain (0.72 correction factor applied) = ~45,600) was roughly equivalent to the 2000-2005 estimate and this was thought to be the better estimate as it had full coverage of the major UK sites including Northern Ireland. However, the way these surveys have been combined has changed over the years, and from 2014 onwards, the abundance estimate for the 2000-2005 period has changed. The estimate is now based on surveys from 2000-2006, giving a new estimate of abundance for that period (raw count = 27,648; total population estimate for the UK (0.72 correction factor applied) = ~ 38,400). As a result, the 2000-2006 estimate is no longer comparable with the 1996-1997 estimate, being substantially lower. Although the 1996-1997 figure does not include counts for Northern Ireland, it still represents the largest estimate for harbour seals at a UK scale and is therefore thought to be the best representation of a 'favourable' state. To reconcile these changes, the FRV in the current report is being reset to the 1996-1997 estimate. Incomplete count data from Northern Ireland collected during this period, but not included in the SCOS derived estimate has also been included to account for some of the Northern Ireland's animals. The estimate of Northern Ireland animals is based on ground counts and boat surveys covering this period and does not cover all the areas included in contemporary UK surveys which cover the coastline using aerial platforms. Although the estimate is likely to be an under-estimate of the Northern Ireland animals, it is the best data available and provides a good minimum estimate for this period. The new FRV is therefore based on the raw 1996-1997 count for Great Britain (32,794) combined with the Northern Ireland estimate for the same period (701) to give a raw estimate for the UK of 33,495. Scaling this to account for animals not hauled-out gives a total UK abundance estimate of 46,520.
6.16 Change and reason for change in population size	There has been a ~27% increase in abundance since the UK's 3rd reporting round (2013) and this is due to a genuine change in abundance in UK waters. Declines are still observed at several colonies around Scotland, including Orkney, the east coast and Shetland, but these declines are not universal, with many other colonies exhibiting stable or increasing trends in abundance. Although regionally there is still concern that populations may not be doing well, when considering the UK population, harbour seal abundance is increasing and is close to the abundances estimated in the late 1990s when the population was considered favourable.

7.1 Sufficiency of area and quality of occupied habitat	Although data from aerial surveys and telemetry studies show no evidence that foraging, moulting or breeding sites have been lost (SCOS, 2017) indicating that the area of available habitat has been maintained, there have been severe declines at certain sites since the early 2000s. Although the habitat is still available, it is difficult to rule out a reduction in habitat quality as a cause for the diminishing numbers associated with these sites. In the absence of definitive evidence relating to habitat quality, the population and range parameter assessments are used as a proxy of habitat quality. In the case of harbour seal, range has been assessed as favourable, and abundance is increasing but the current abundance estimate is below the FRV and the overall population parameter is assessed as Unfavourable-Inadequate as a result. Given the evidence that habitat availability is being maintained, and abundance is on the increase, habitat does not appear to be limiting population growth, but could be a factor influencing local declines, thus it cannot be stated with certainty that the quality of habitat is sufficient throughout the UK range for this species. Sufficiency of area and quality of habitat is therefore assessed as Unknown.
7.2 Sufficiency of area and quality of occupied habitat; Method used	There are data available on habitat usage for harbour seals, but data relating to habitat quality is limited. Assessments of population and range have therefore been used as a proxy for assessing habitat quality in addition to the available evidence on usage.
7.4 Short term trend; Direction	Habitat was previously assessed as sufficient for harbour seals, but uncertainty around regional declines and a current abundance estimate which is below the FRV have led to an unknown conclusion for this parameter in the current report. As a result, the short-term trend for habitat cannot be assessed and is considered Unknown.
7.5 Short term trend; Method used	There is limited evidence to assess whether habitat quality and availability has changed over the short-term. The assessment of trend is based largely on expert opinion, using trends in range and population as a proxy for habitat condition.
8.1 Characterisation of pressures/ threats	G08 Management of fishing stocks and game: Application of pressure: Used to identify risk from predator control when associated with aquaculture. Under the Marine (Scotland) Act 2010, harbour seals can be shot legally, under specific license, at fish farms and salmon netting stations to prevent damage to and loss of stock. License holders a required to record and report all seals shot. Between 2011 - 2016, 309 harbour seals were reported as shot around Scottish fisheries, with numbers ranging from 93 in 2011 to 22 in 2016 (Scottish Government website, http://www.gov.scot/Topics/marine/Licensing/SealLicensing). The potential biological removal (PBR) is calculated annually by SMRU using the latest seal counts (Scottish Government website, http://www.gov.scot/Topics/marine/Licensing/SealLicensing). In 2016 the PBR was calculated at 805 individuals, thus the 22 individuals removed (2.7% of the PBR), which were all shot around the West of Scotland where populations are not in decline, would be unlikely to impact local population numbers. In England and Wales, the shooting of harbour seals is permitted under the Conservation of Seals Act 1970, even without licence, to prevent a seal causing damage to fishing net, fishing tackle, or fish held in the net, so long as the seal is in the vicinity of the net at time of shooting. However, there is no requirement to report seals taken in England and Wales, therefore the extent of this pressure in unknown in these regions. 10 harbour seals (8%) necropsied by SMASS between 2011-2016 died due to gunshot wounds, making gunshot the highest anthropogenic cause of death observed in stranded harbour seals. The pressure is expected to continue into the longer term. However, both the number of licenses granted and number of seals shot annually has been declining since 2011, suggesting the future threat is unlikely to worsen for harbour seals.

8.1 Characterisation of pressures/ threats	D01 Wind, wave and tidal power, including infrastructure: Application of pressure: Used where there is evidence that this pressure alone, has a pressure or threat rating of Medium or above. There is currently limited operational activity outside of windfarms resulting in limited evidence of current impact. However, studies show potential collision risk for renewables such as tidal turbines (Band et al., 2016; Hastie et al., 2018). There is also a risk of exclusion/displacement of animals from suitable habitats due to physical or perceived barriers, to physical injury due to direct contact with moving elements of devices. Harbour seals show local scale displacement in response to both tidal turbine noise (Hastie et al., 2018) and operational turbines (Savidge et al., 2014; Sparling et al., 2017), however, the avoidance behaviour is only fine scale with no overall barrier effect observed. Pile driving has the potential to cause auditory damage in pinnipeds (Hastie et all, 2015), and pilling activity during the construction of offshore windfarms has been associated with a significant reduction in harbour seal haul-out counts at a nearby colony (Skeate et al., 2012), and a temporary displacement of animals from the construction area (Russell et al., 2016). However, the construction phase is where the risk lies and once in place, windfarms potentially offer increased foraging due to artificial reefs and limited fishing (Russell et al., 2016). Threat: Given the increasing demand for renewable energy, the rapid increase in experimentation and installation of renewable energy devices, this pressure is likely to increase in the future. Although research typically suggests only fine-scale, short term displacement of animals in response to energy sites, there is evidence to suggest construction activities can lead to a longer-term exclusion effect of animals from important haul-out and breeding sites (Skeate et al., 2012). Risk of collision in other developing marine renewable industries such as tidal turbines, however, would cause a direct impact on the species resulting in a Medium grading.
8.1 Characterisation of pressures/ threats	G01 Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species: Application of pressure: Used to identify risk from prey depletion and disturbance due to fishing activity. A reduction in prey quality and/or availability has been proposed as a potential driver for the declining harbour seal population on the East coast of Scotland (Arso Civil et al., 2017). Long-term fish survey data will be used to assess changes in prey abundance (Arso Civil et al., 2016), and whilst there is evidence to show that declines in harbour seal abundance in the northern regions of Scotland may be linked to a decline in the abundance of sandeels (an important component of harbour seal diet), further investigation is required before conclusions can be drawn (Wilson and Hammond, 2016). Six harbour seals necropsied by SMASS between 2009-2016 (SMASS annual reports, http://www.strandings.org/smass/publications) died of starvation (5% of all animals examined) however, there is no evidence to confirm the cause of this.

8.1 Characterisation of pressures/ threats	L06 Interspecific relations (competition, predation, parasitism, pathogens): Application of pressure: Used to identify risk from intraspecific relations as well as interspecific. Interspecific competition with grey seals can negatively impact harbour seals either through direct predation or competition for prey resources (Arso Civil et al.,2017). Following observations of an adult male grey seal predating seal pups and producing the spiral 'corkscrew' lacerations found on seal carcasses around the UK, these injuries are now attributed to grey seal predation and not contact with rotating boat propeller blades as previously thought (Bishop et al., 2016; Brownlow et al., 2016; Onoufriou and Thompson, 2014). Predation, often presenting as 'corkscrew' lesions is the leading cause of death in stranded seals examined at post-mortem by SMASS between 2009-2016, with 27 (21%) of the 118 harbour seals examined confirmed a cause of death of predation, and a further 23 animals (18%) suspected to have died due to the same injury. Corkscrew injures are therefore the most significant cause of death identified through strandings in harbour seals, although no causal link has been established with the corkscrew events and declining harbour seal populations although it may be regionally significant(Brownlow et al., 2016). Research into the diet of grey and harbour seals (funded by Scottish Government with additional support from Natural England) carried out in 2011 and 2012 (Hammond and Wilson, 2016; Wilson and Hammond, 2016) indicated that harbour seals and grey seals feed on similar prey, in the same regions and at the same time of year. However, the fish size class preferred varied between species, therefore, quantification of whether this overlap is evidence for competition requires further investigation (SCOS, 2017). Pressure is expected to continue in the longer term. Whilst the number of corkscrew seals examined by SMASS has increased over the years, this is likely to be a reflection of increased reporting effort following identification of the cause of the lesions as well as SMASS training courses, and not a reflection of increased mortality in the species (SMASS annual report, 2016). Further investigation into competition with grey seals is required.
8.1 Characterisation of pressures/ threats	N07 Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiot, etc.) due to climate change: Application of pressure: Used to identify risk from climate change. There is no current evidence for the effects of climate change on harbour seal. The effects of climate change is likely to be mediated through variation in prey resource initially. Harbour seals have a varied diet and take a wide variety of prey including sandeels, gadoids, herring and sprat, flatfish, octopus and squid. Diet varies seasonally and from region to region (Tollit and Thompson, 1996; Wilson and Hammond, 2016), therefore the species may adapt to changes in prey distribution as a result of climate change, reducing the overall impact.
8.1 Characterisation of pressures/ threats	General information for harbour seal: Pressure ranking of harbour seal is mainly based on expert opinion. Investigation of seal mortality is conducted by the Scottish Marine Animal Strandings Scheme (SMASS, www.strandings.org). Between 2009 - 2016, 379 harbour seals were reported as stranded around the coast of Scotland, of which 118 were necropsied or analysed through images. The leading cause of death in necropsied harbour seals was from grey seal predation including 'corkscrew' injuries (confirmed 21%, possible 18%), followed by parasitic pneumonia (16%), and gunshot wounds (8%) (SMASS annual reports (Brownlow 2009:2016) http://www.strandings.org/smass/publications/). Seals are currently recorded and analysed specifically in Scotland predominantly due to issuing of licences for management of the animals concerning aquaculture.

8.1 Characterisation of pressures/ threats	F25 Industrial or commercial activities and structures generating noise, light, head, or other forms of pollution: Application of pressure: Used to identify risk of the cumulative effects of noise on pinnipeds. Phocid seals rely on sounds for communication, predator-prey detection, and potentially navigation. The cumulative effect of anthropogenic noise has the potential to lead to a range of chronic effects, including avoidance of important habitats (for breeding or foraging), auditory masking and communication disruptions, and auditory damage (Simmonds and Brown, 2010). Shipping traffic is known to disrupt seals from haul out sites (Jansen et al., 2015), and a strong co-occurrence was observed between seals and commercial shipping routes around the UK coast (Jones et al., 2017). The cumulative impact of these and other sources of noise pollution may be significant when combined.
9.5 List of main conservation measures	CG03 Reducing the impact of (re-) stocking for fishing and hunting, of artificial feeding and predator control: In England and Wales the Conservation of Seals Act 1970 prohibits the shooting of seals during a close season (1st September to 31st December for grey seals, and 1st June to 31st August for harbour seals) except under license issued by either the Secretary of State or by the devolved powers. The Act also allows the Secretary of State and devolved powers to prohibit by way of an order the killing, injury, or taking of either or both seal species in any area specific in the order. The Conservation of Seals (England) Order 1999 protects grey and harbour seals on the east coast of England, from the Border at Berwick to Newhaven Pier. Under section 9.1(c) of the Conservation of Seals Act 1970, fishermen are permitted to kill any seal during close season, or in an area where the killing or taking of seals is prohibited, to prevent the seal from causing damage to fishing tackle, fishing net, or to fish in the net, provided the seal in the vicinity of said equipment at the time. The Scottish government repealed the Conservation of Seals Act 1970 and replaced it with the Marine (Scotland) Act 2010. Under this new Act, the shooting of all seals in Scotland must be licensed and all seals shot reported. Application are granted for both 'the prevention of damage to fisheries and fish farms' and for 'protecting the health and welfare of farmed fish'. In Northern Ireland, grey and harbour seals are protected under The Wildlife (Northern Ireland) Order 1985 (Schedule 5, 6, and 7) as amended.
10.1 Future prospects of parameters	10.1a Range: The overall assessment of this parameter is favourable and there is no evidence that risk is increasing in the next 12 years (two reporting rounds). 10.1b Population: The conclusion for population is poor because the overall assessment of this parameter is unfavourable-inadequate. Although there is no evidence in Section 8 Pressures and Threats that risk is increasing in the next 12 years (two reporting rounds), there is no evidence to suggest that they are decreasing or that management/mitigation is increasing. There is a balance between threats and measures, indicating that the future trend for population is stable. Thus, the population is expected to be maintained at Unfavourable-Inadequate and the future prospect of this parameter is assessed as poor. 10.1c Habitat of the species: The conclusion for habitat is unknown due to there being insufficient reliable information to assess the status of this parameter. Although the pressures impacting this parameter are not thought to be increasing, and there are no threats identified which are likely to impact in the next 12 years, the uncertainty surrounding the current status of this parameter make it impractical to predict future prospects. The future prospects of this parameter are therefore assessed as Unknown.
11.1 Range	There is no evidence to suggest range has changed since the last reporting round (2013) and therefore the range assessment remains Favourable.

11.2 Population	The current UK harbour seal population estimate is below the UK FRV for this species resulting in an Unfavourable-Inadequate assessment. Although the UK population has increased since the early 2000s with a ~27% increase in abundance since the UK's 3rd reporting round (2013), the long-term trend indicates that the UK population is still slightly below population highs documented in the late 1990s (SCOS, 2017) and serious declines are still apparent at many sites around the north and east of Scotland. The population parameter for harbour seals was assessed as Unfavourable-Bad in the 3rd reporting round (2013) so the current assessment is an improvement. The current abundance estimate is just 3% less than the FRV. Although the declines highlight potential regional issues influencing harbour seal numbers, the UK population as a whole has improved since the UK's 3rd reporting round.
11.3 Habitat for the species	In the absence of sufficient data relating to habitat quality, the assessment of habitat for harbour seals is informed by information on habitat usage and by the range and population assessments. However, these sources are inconsistent. Range is considered favourable, abundance is on the increase and evidence of habitat usage suggests there has been no deterioration in habitat availability, but the population parameter is considered Unfavourable-Inadequate and there have been continued regional declines; it is not possible to assess habitat sufficiency with any confidence. Thus, there is insufficient evidence to conclusively assess this parameter and it is considered Unknown.
11.4 Future prospects	Population is assessed to have poor future prospects as the current population assessment is Unfavourable-Inadequate and there is not predicted to be any increase in management which would outweigh threats to the species. As a result of this poor rating, the overall assessment of future prospects is Unfavourable-Inadequate.
11.5 Overall assessment of Conservation Status	Two parameters are assessed as Unfavourable-Inadequate; therefore, the overall assessment of conservation status is Unfavourable-Inadequate.
11.6 Overall trend in Conservation Status	The overall assessment has changed since the last 3rd reporting round (2013), from Unfavourable-Bad to Unfavourable-Inadequate.
11.7 Change and reasons for change in conservation status and conservation status trend	There has been a genuine increase in harbour seal abundance in the UK since the UK's 3rd reporting round (2013). Although serious declines are still observed in some areas, other areas have remained stable or have shown substantial increase in numbers resulting in an overall increase in abundance of harbour seal at the UK scale. As a result, the current abundance estimate is close to the favourable reference population value resulting in a genuine change in the overall assessment of conservation status from Unfavourable-Bad to Unfavourable-Inadequate and the trend has changed from declining to improving.
12.2 Type of estimate	Population estimates for harbour seal SACs were obtained using established survey methods employed by the Sea Mammal Research Unit (SMRU) (Duck & Morris, 2016; Thompson et al., 2016). For Scottish sites, routine aerial surveys using a thermal imaging camera were conducted along segments of the Scottish coast during the harbour seal annual moult in August. For the Wash and North Norfolk SAC, fixed wing aerial surveys were conducted during both the moult and the breeding season (June/July), providing a robust estimate of pup production (Thompson et al., 2016). The most recent population estimate for each SAC was combined to give a total estimate for the Natura SAC network for harbour seal. The number reported is therefore considered to be a best estimate.

12.4 Short term trend of the population size within the network; Direction	Counts available for the short-term trend period (2007-2016) indicate a decline in most Scottish harbour seal SACs. The three SACs in West Scotland show the least dramatic variation in counts. At the Ascrib, Islay and Dunvegan SAC and at the Lismore SAC, gradual declines interspersed with occasional increases have been observed. However, in the South-East Islay SAC, counts have increased dramatically. The remaining six SACs in the Western Isles, Shetland, Orkney and the North Coast, the Moray Firth, and in East Scotland all show consistent declines, with the most severe on Sanday (Orkney), the Firth of Tay & Eden Estuary, and on Mousa (Shetland). The overall short-term trend of population size within the network is therefore considered Uncertain.