Reporting under the Habitat Regulations (as amended)[1]

2019-2024

Conservation status assessment for the species:

S1365 - Common seal

(*Phoca vitulina*)

United Kingdom

[1] **Habitat Regulations (as amended):**

- The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A
- The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended), Regulation 6A
- Report under The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), regulation 3ZA
- The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended), regulation 3ZA

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Important note - Please read

- The information in this document represents the United Kingdom Reporting under the Habitat Regulations (as amended)[1], for the period 2019-2024.
- It is based on supporting information provided by Joint Nature Conservation Committee and UK Country Nature Consevation Bodies (CNCBs), which is documented separately.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Map showing the distribution and range of the species is included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country 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 National Site Network coverage for Annex II species).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the JNCC website.

Assessment Summary: Common seal

Distribution and Range Map

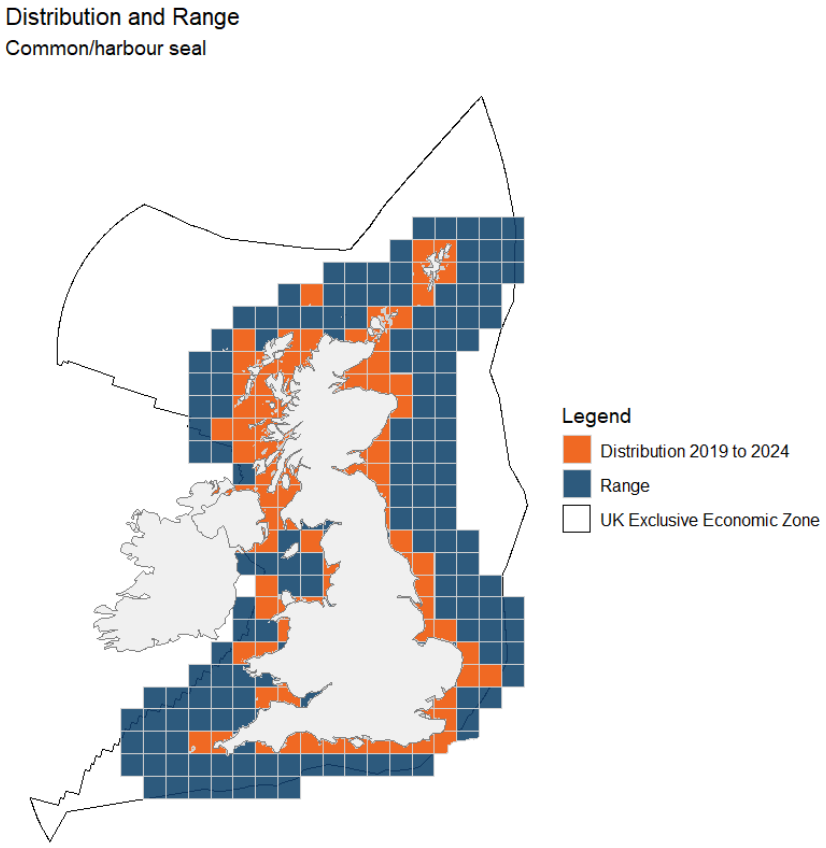

Figure 1: United Kingdom distribution and range map for S1365 - Common seal (*Phoca vitulina*). The 50km grid square distribution map is based on available species records within the current reporting period.

Table 1: Table summarising the conservation status for S1365 - Common seal (*Phoca vitulina*). Overall conservation status for species is based on assessments of range, population, habitat for the species, and future prospects.

Overall Conservation Status (see section 11)

Unfavourable-inadequate (U1)

Breakdown of Overall Conservation Status

Range (see section 5)	**Favourable (FV)**
Population (see section 6)	**Unfavourable-inadequate (U1)**
Habitat for the species (see section 7)	**Unknown (XX)**
Future prospects (see section 10)	**Unfavourable-inadequate (U1)**

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National Level

1. General information

1.1 Country	United Kingdom
1.2 Species code	S1365
1.3 Species scientific name	*Phoca vitulina*
1.4 Alternative species scientific name	
1.5 Common name	Common seal
Annex(es)	II, V

2. Maps

2.1 Sensitive species	No
2.2 Year or period	2019-2022
2.3 Distribution map	Yes
2.4 Distribution map; Method used	Complete survey or a statistically robust estimate

2.5 Additional information

The distribution map is based on verified sightings data of harbour/common seal between 2019 and 2024, and a modelled at-sea distribution based on terrestrial count data and telemetry data collected between 1991 - 2016. The sightings were collated from SCANS IV, Pelagis French surveys, NBN Atlas, European Seabirds at Sea, the Joint Cetacean Data Programme, POSEIDON project, University of Aberdeen, The Crown Estate Marine Data Exchange, Whale and Dolphin Conservation, Hebridean Whale and Dolphin Trust, ORCA, Sea Watch Foundation, Marine Discovery Penzance, Sussex Dolphin Project, Cornwall Seal Group Research Trust, Cardigan Bay Marine Wildlife Centre, Natural England, Sea Trust and The Royal Society for the Protection of Birds (RSPB). The modelled distribution was produced for the ‘Updated Seal Usage Maps: Estimated at-sea Distribution of Grey and Harbour Seals” project conducted by the Sea Mammal Research Unit (SMRU) in St. Andrews, Scotland (Russell et al., 2017).

3. Information related to Annex V Species

3.1 Is the species taken in the wild / exploited?	Yes
3.2 What measures have been taken?	
a) Regulations regarding access to property	No
b) Temporary or local prohibition on 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
Other measures	No
Other measures description	

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

a) Unit	number of individuals

Table 2: Quantity taken from the wild during the reporting period (see 3.3a for units). For species with defined hunting seasons, Season 1 refers to 2018/2019 (autumn 2018 to spring 2019), and Season 6 to 2023/2024. For species without hunting seasons, data are reported by calendar year: Year 1 is 2019, and Year 6 is 2024.

	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
b) Minimum	16	42	0	0	0	0

c) Maximum	16	42	0	0	0	0
d) Unknown	No	No	No	No	No	No

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 and in 2021 changes to the Marine (Scotland) Act 2010 removed two grounds for which licences could be granted to take or kill seals; preventing serious damage to fisheries and fish farms and to protect the health and welfare of farmed fish. This change to the legislation significantly decreased the number of licences granted with only one licence being issued since 2021. No seals have been shot under that licence.

Biogeographical Level

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs	MATL

4.2 Sources of information

See section 14 References

5. Range

5.1 Surface area (km²)	512,972
5.2 Short-term trend; Period	2013-2024
5.3 Short-term trend; Direction	Stable

5.4 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
5.5 Short-term trend; Method used	Complete survey or a statistically robust estimate
5.6 Long-term trend; Period	1988-2024
5.7 Long-term trend; Direction	Stable
5.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	
5.9 Long-term trend; Method used	Complete survey or a statistically robust estimate

5.10 Favourable Reference Range (FRR)

a) Area (km²)	512,972
b) Pre-defined increment	
c) Unknown	No
d) Method used	Model-based approach
e) Quality of information	high

5.11 Change and reason for change in surface area of range

a) Change	No
b) Genuine change	

c) Improved knowledge or more accurate data	
d) Different method	
e) No information	
f) Other reason	
g) Main reason	

5.12 Additional information

The distribution is based on verified sightings of harbour/common seal between 2019 and 2024; and a modelled at-sea distribution based on terrestrial count and telemetry data collected between 1991 - 2016. The sightings were collated from SCANS IV, Pelagis French surveys, NBN Atlas, European Seabirds at Sea, the Joint Cetacean Data Programme, POSEIDON project, University of Aberdeen, The Crown Estate Marine Data Exchange, Whale and Dolphin Conservation, Hebridean Whale and Dolphin Trust, ORCA, Sea Watch Foundation, Marine Discovery Penzance, Sussex Dolphin Project, Cornwall Seal Group Research Trust, Cardigan Bay Marine Wildlife Centre, Natural England, Sea Trust and The Royal Society for the Protection of Birds (RSPB). The modelled distribution was produced for the ‘Updated Seal Usage Maps: Estimated at-sea Distribution of Grey and Harbour Seals” project conducted by the Sea Mammal Research Unit (SMRU) in St. Andrews, Scotland (Russell et al., 2017).

The FRV for range was based on interpolation of distribution data and 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.

6. Population

6.1 Year or period	2021

6.2 Population size (in reporting unit)

a) Unit	number of individuals
b) Minimum	35,100
c) Maximum	57,100

d) Best single value	42,900
6.3 Type of estimate	95% confidence interval
6.4 Quality of extrapolation to reporting unit	high

6.5 Additional population size (using population unit other than reporting unit)

a) Unit	
b) Minimum	
c) Maximum	
d) Best single value	
e) Type of estimate	
6.6 Population size; Method used	Complete survey or a statistically robust estimate
6.7 Short-term trend; Period	2016-2021
6.8 Short-term trend; Direction	Decreasing
6.9 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	Decreasing 0 - 12%
d) Unknown	No
e) Type of estimate	95% confidence interval
f) Rate of decrease	Decreasing <=1% (one percent or less) per year on average
6.10 Short-term trend; Method used	Complete survey or a statistically robust estimate
6.11 Long-term trend; Period	2007-2021
6.12 Long-term trend; Direction	Increasing

6.13 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Confidence interval	
d) Rate of decrease	
6.14 Long-term trend; Method used	Complete survey or a statistically robust estimate

6.15 Favourable Reference Population (FRP)

ai) Population size	46,520
aii) Unit	number of individuals
b) Pre-defined increment	
c) Unknown	No
d) Method used	Model-based approach
e) Quality of information	high

6.16 Change and reason for change in population size

a) Change	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	No
d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Genuine change

6.17 Additional information

The harbour seal population remains 10% lower than the late 1990s before the 2002 phocine distemper virus (PDV) epizootic outbreak which has a mortality rate of 58% of the population (Harding, et al., 2002). However, trends in harbour seal numbers vary

significantly between regions; numbers are increasing slightly in west of Scotland, stable at depleted levels in the Moray Firth and Shetland, depleted and declining on the North Coast and Orkney and in East Scotland, and declining after periods of increase in Southeast England (SCOS, 2023). Their status across the Celtic Seas remains uncertain due to data gaps.

6.18 Age structure, mortality and reproduction deviation	No deviation from normal

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat (for long-term survival)

a) Is area of occupied habitat sufficient?	Unknown
b) Is quality of occupied habitat sufficient?	Unknown
c) If No or Unknown, is there a sufficiently large area of unoccupied habitat of suitable quality?	Unknown

7.2 Sufficiency of area and quality of occupied habitat; Method used

a) Sufficiency of area of occupied habitat; Method used	Based mainly on expert opinion with very limited data
b) Sufficiency of quality of occupied habitat; Method used	Based mainly on expert opinion with very limited data

7.3 Short-term trend; Period

7.4 Short-term trend; Direction	Unknown
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	Unknown

7.8 Long-term trend; Method used	Based mainly on expert opinion with very limited data

7.9 Additional information

Direct evidence of pinniped habitat quality is limited as presently, a comprehensive understanding of the key elements important to the species is undetermined. In some cases, conclusions for species range and population could be indicative of habitat quality by proxy, however confidence in assessment outputs would be low.

Though the range has remained stable, abundance of common seals across UK coasts has largely increased since the 1990s across English and western Scottish coastlines, punctuated by outbreaks of Phocine Distemper Virus(PDV) in the early to mid 2000s. In some regions of the UK (eastern Scotland), common seal abundance has continued to decline for more than a decade, and more recently, populations in east England have declined. It is presently unclear what role habitat, and potential habitat change is having on the observed trends in population, however studies are underway.

8. Main pressures

8.1 Characterisation of pressures

Table 3: Pressures affecting the species, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Pressure	Timing	Ranking
Wind, wave and tidal power (including infrastructure)	Ongoing and likely to be in the future	Medium (M)
Residential, commercial and industrial activities and structures generating noise, light, heat or other forms of pollution	Ongoing and likely to be in the future	Medium (M)
Marine fish and shellfish harvesting causing reduction of species/prey populations and disturbance of species (professional)	Ongoing and likely to be in the future	Medium (M)
Management of fishing stocks and game	Ongoing and likely to be in the future	High (H)
Problematic native species	Ongoing and likely to be in the future	Medium (M)

Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiote, etc.) due to climate change	Ongoing and likely to be in the future	Medium (M)
Sea-level rise due to climate change	Ongoing and likely to be in the future	Medium (M)
Cyclones, storms, or tornados due to climate change	Ongoing and likely to be in the future	Medium (M)
Plant and animal diseases, pathogens and pests	Only in future	High (H)

8.2 Sources of information

See section 14 References

8.3 Additional information

PI03: Relating to reported grey seal attacks on common seal.

PJ04: Harbour seals may be able to adapt to these changes in isolation but in combination with coastal developments (i.e., flood defenses), potential impacts to breeding/haul out sites arise.

PJ07: Harbour seals may be able to adapt to these changes in isolation but in combination with coastal developments (i.e., flood defenses), potential impacts to breeding/haul out sites arise.

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 National Site Network
9.4 Response to measures	Medium-term results (within the next two reporting periods, 2025–2036)

9.5 List of main conservation measures

Table 4: Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Conservation measure	Ranking
Reducing the impact of (re-) stocking for fishing and hunting, of artificial feeding and predator control	High (H)
Adapt/manage renewable energy installation, facilities and operation (excl. hydropower and abstraction activities)	High (H)
Adapt/manage exploitation of energy resources	High (H)

9.6 Additional information

Twelve Special Areas of Conservation (SAC) have been designated with harbour seals as a qualifying feature (grade A-C): (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. As a European Protected Species, protection is also provided throughout UK waters and it is an offence to kill, injure or disturb. The UK remains committed to the conservation of marine mammals in UK waters and the implementation of measures to mitigate the impact of pressures and

conservation measures have been undertaken in the UK and adjacent waters as part of the requirements of the Habitats Regulations. Such measures include monitoring bycatch, monitoring strandings data to monitor current and identify emerging pressures, application of appropriate management measures, and noise monitoring and mitigation with regards to offshore industry. This is reflected in the list of conservation measures under field 9.5. The UK also supports a range of 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 Scottish Government funds a national strandings scheme (Scottish Marine Animal Strandings Scheme) which includes seals. The Cetacean Strandings Investigation Programme (CSIP), which is funded by Defra and covers England and Wales has included seals in their programme of work since 2021. Coordinated, national monitoring of seals carried out by the Sea Mammal Research Unit have improved understanding of the size, distribution and status of UK seal populations.

10. Future prospects

10.1a Future trends of parameters

ai) Range	Overall stable
bi) Population	Negative - decreasing <=1% (one percent or less) per year on average
ci) Habitat for the species	Unknown

10.1b Future prospects of parameters

aii) Range	Good
bii) Population	Poor
cii) Habitat for the species	Unknown

10.2 Additional information

No additional information

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	Stable

11.7 Change and reason for change in conservation status

a) Change	No
b) Genuine change	
c) Improved knowledge or more accurate data	
d) Different method	
e) No information	
f) Other reason	
g) Main reason	

11.7 Change and reason for change in conservation status trend

a) Change	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	No
d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Genuine change

11.8 Additional information

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 equivalent to the Favourable Reference Range.

Conclusion on Population reached because: (i) the short-term trend direction in Population size is decreasing; but (ii) the best estimate for population size is greater than the Favourable Reference Population and (iii) the age structure, mortality and reproduction is not deviating from normal.

Conclusion on Habitat for the species reached because: (i) it is unknown whether the area of habitat is sufficiently large; (ii) it is unknown if habitat quality is sufficient for the long-term survival of the species; and (iii) the short-term trend in area and quality of habitat is unknown.

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 conclusions are Unfavourable-inadequate but no conclusions are Unfavourable - bad.

Overall trend in Conservation Status is based on the combination of the short-term trends for Range - stable, Population - decreasing, and Habitat for the species - unknown.

12. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network

a) Unit	number of individuals
b) Minimum	
c) Maximum	
d) Best single value	6,386
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	Decreasing
12.5 Short-term trend of population size within the network; Method used	Complete survey or a statistically robust estimate
12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction	Unknown
12.7 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Method used	Insufficient or no data available

12.8 Additional information

The total SAC population estimate for harbour seals is a collation of the latest August counts from routine monitoring of SACs provided by SMRU, which was then converted into a population estimate using a scaling factor. It should be noted that the underlying data behind this estimate differs from previous reporting, and therefore is not comparbale to the estimate in the last Article 17 report. To identify the trend, an estimate for the 2013-2018 reporting period was back calculated and compared to the best estimate for 2023. Short-term trend for this reporting is defined as between 2018-2023, so as to capture significant changes in the SACs population between 2018 and 2019.

13. Complementary information

13.1 Justification of percentage thresholds for trends

No justification information

13.2 Trans-boundary assessment

No trans-boundary assessment information

13.2 Other relevant information

No other relevant information

14. References

Biogeographical and marine regions

4.2 Sources of information

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Main pressures

8.2 Sources of information

No sources of information

15. Explanatory Notes

Field label	Note
8.1: Characterisation of pressures	PJ12 Decline or extinction of related species (e.g. food source / prey, predator / parasite, symbiot, etc.) due to 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. Analysis of changing fish distributions (19 species across 73 commercial stocks) demonstrated that many species have undergone a shift in distribution over the last three decades and two thirds of species (including key harbour seal prey species) underwent a northward shift in distribution which was not mirrored in seal populations (Baudron et al., 2020). The authors of the study highlight a correlation between a relative increase in seal numbers in southern parts of harbour seals range compared to the central and northern part over a similar time period (Baudron et al., 2020). Five harbour seals necropsied by SMASS between 2019 and 2022 (Davison et al., 2020; Davison & ten Doeschate, 2022; Scottish Marine Animal Stranding Scheme, 2022; 2023) died of starvation however, there is no evidence to confirm the cause of this.
8.1: Characterisation of pressures	PG09 Management of fishing stocks and game: 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 2017 - 2020 (last available returns information publicly available), 92 harbour seals were reported as shot under licenses (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, https://www.gov.scot/publications/marine-licensing-seal-licensing-records-2011-present/). In 2020, the PBR for common seals was calculated at 1,147 individuals, thus the 27 individuals removed (2.3% 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 seals was permitted under the Conservation of Seals Act 1970 until March 2021, 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, with no requirement to report seals taken the extent of pressure was unknown. Changes to the legislation now prohibits 'netsman's defence.' Similarly under the Marine (Scotland) Act 2010, it was permitted take seals under a licence for the purpose of 'preventing serious damage to fisheries and fish farms" and 'to protect the health and welfare of farmed fish" until February 2021 when legislation removed these as grounds of which Scottish Ministers could grant licences to take or kill seals. With changes to the legislation and the number of licences granted and number of seals shot declining since 2011, the future threat is unlikely to worsen.
8.1: Characterisation of pressures	PG01 Marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species. A reduction in prey quality and/or availability has previously been proposed as a potential driver for the declining harbour seal population on the East coast of Scotland (Arso Civil et al., 2017) and 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), however further investigation is required before conclusions can be drawn (Wilson and Hammond, 2016). Five harbour seals

	necropsied by SMASS between 2019 and 2022 (Davison et al., 2020; Davison & ten Doeschate, 2022; Scottish Marine Animal Stranding Scheme, 2022; 2023) died of starvation however, there is no evidence to confirm the cause of this.
8.1: Characterisation of pressures	PF12 Industrial or commercial activities and structures generating noise, light, head, or other forms of pollution: 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 result in behavioural changes (Trigg et al., 2020; Mikkelsen et al., 2019), 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.
8.1: Characterisation of pressures	PI03 Problematic native species (competition, predation, parasitism, pathogens). 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 2009-2022, with 63 of harbour seals confirmed a cause of death of predation (Davison et al., 2020; Davison & ten Doeschate, 2022; Scottish Marine Animal Stranding Scheme, 2022; 2023). 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 (Brownlow et al., 2017). Further investigation into competition with grey seals is required.
8.1: Characterisation of pressures	PD01 Wind, wave and tidal power, including infrastructure. Studies show potential collision risk for renewables such as tidal turbines (Band et al., 2016; Hastie et al., 2018) and possible exclusion/displacement of animals from suitable habitats due to physical or perceived barriers. Harbour seals show local scale displacement in response to both tidal turbine noise (Hastie et al., 2018; Robertson et al., 2018; SCOS, 2022) and operational turbines (Savidge et al., 2014; Sparling et al., 2017; Joy et al., 2018, SCOS, 2022; Onoufriou et al., 2021), however, the avoidance behaviour is only fine scale with no overall barrier effect observed. More recent studies have highlighted that the response of seals to tidal turbines is likely context-dependent and that previous collision risk modelling may be overestimating the risk (Onoufriou et al., 2021; Hastie et al., 2021). 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; Whyte et al., 2020). 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	PJ04 Sea-level rise due to climate change. Increased storm frequency and sea level rises leave those pinniped species which breed or haul-out along low-lying coastal areas particularly vulnerable to storm surges (Evans & Bjorge, 2013; Zicos et al., 2018; Backe et al., 2021). Current increases in sea level are small compared to previous ice ages and therefore, breeding areas should remain largely unimpacted by current monitoring. However, previous sea level rise has not also been in combination with human infrastructure development and so impacts to breeding and hauling out sites might occur (e.g., flood defences and increased sea rises limits the intertidal space available) (SCOS, 2021)
8.1: Characterisation of pressures	PJ07 Cyclones, storms or tornados due to climate change. While the impact may be larger for grey seals due to differences in pup development, increased storm frequency and intensity (and resulting flooding) due to climate change leave both pinniped species which breed or haul-out along low-lying coastal areas particularly vulnerable to storm

	surges (Evans & Bjorge, 2013; Zicos et al., 2018; Backe et al., 2021).
9.5: List of main conservation measures	MG03 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.
9.5: List of main conservation measures	MC02 Adapt/manage exploitation of energy resources: Guidance for the protection of marine European Protected Species from deliberate injury, killing and disturbance has been drafted (JNCC 2010a; Marine Scotland, 2014). Marine Industries generate a variety of noise through activities such as geophysical surveys (e.g. seismic surveys (JNCC 2017)), construction (e.g. pile driving (JNCC 2010b)) and decommissioning (e.g. use of

	explosives (2010c)). As part of the licencing procedures, developers and operators are required to utilise JNCC guidelines to minimise the risk of injury to cetaceans when undertaking such activities (JNCC, 2010b, 2010c; 2017; 2023; 2025; JNCC, Natural England & Cefas, 2025). The guidelines advise on conducting marine mammal observations prior to and during the activity and, where suitable, utilising procedures such as soft start (gradual introduction of the sound) to reduce and avoid direct harm to animals. A review of the marine mammal observer data demonstrated the effectiveness of soft start approach (Stone et al, 2017).
9.5: List of main conservation measures	MC03 Adapt/manage renewable energy installation, facilities and operation (excl. hydropower and abstraction activities): Guidance for the protection of marine European Protected Species from deliberate injury, killing and disturbance has been drafted (JNCC 2010a; Marine Scotland, 2014). Marine Industries generate a variety of noise through activities such as geophysical surveys (e.g. seismic surveys (JNCC 2017)), construction (e.g. pile driving (JNCC 2010b)) and decommissioning (e.g. use of explosives (2010c)). As part of the licencing procedures, developers and operators are required to utilise JNCC guidelines to minimise the risk of injury to cetaceans when undertaking such activities (JNCC, 2010b, 2010c; 2017; 2023; 2025; JNCC, Natural England & Cefas, 2025). The guidelines advise on conducting marine mammal observations prior to and during the activity and, where suitable, utilising procedures such as soft start (gradual introduction of the sound) to reduce and avoid direct harm to animals. A review of the marine mammal observer data demonstrated the effectiveness of soft start approach (Stone et al., 2017).
8.1: Characterisation of pressures	PI04 Plant and animal diseases, pathogens and pests. The future outbreak of disease in UK harbour seals has been highlighted as a concern. Two previous outbreaks of phocine distemper virus (PDV) have significantly impacted UK populations of seals; a first outbreak in 1988 with

mortality rates of around 50% in some area (i.e., south-east England) and a second smaller outbreak in 2002 with mortality rates up to 30% in the same areas (Pomeroy et al., 2005; Thompson et al., 2019). As it is now 22 years since the last outbreak, an epizootic may be imminent and could cause further depletion of harbour seal populations. There are also concerns about an outbreak of Highly Pathogenic Avian Influenza (HPAI) after isolated incidences reported in Scotland through the Scottish Marine Animal Stranding Scheme and large-scale outbreak in other parts of the world (SCOS, 2024). Mouth rot may also pose a risk (Bojko & Arrow, 2024). However, disease monitoring in UK seal populations does not allow a full assessment of the current pressure of these on harbour seal populations.