European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC)

Fourth Report by the United Kingdom under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the species:

S1334 - Mountain hare (*Lepus timidus*)

ENGLAND

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this species, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.
- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.
- The UK Report on the conservation status of this species is provided in a separate document.
- The reporting fields and options used are aligned to those set out in the European Commission guidance.
- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species) and/or (iv) the field was only relevant at UK-level (sections 9 Future prospects and 10 Conclusions).
- For technical reasons, the country-level future trends for Range, Population and Habitat for the species are only available in a separate spreadsheet that contains all the country-level supporting information.
- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (England information only)**
1.2 Species code	**1334**
1.3 Species scientific name	**Lepus timidus**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Mountain hare

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1995-2016
2.3 Distribution map	Yes
2.4 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
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	Yes
	b) temporary or local prohibition of the taking of specimens in the wild and exploitation	Yes
	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	Yes
	e) establishment of a system of licences for taking specimens or of quotas	No
	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)	200					
Max. (raw, ie. not rounded)	4000					
Unknown	No	Yes	Yes	Yes	Yes	Yes

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

Based mainly on extrapolation from a limited amount of data

3.5. Additional information

The only data available to report on, which covers 2012 (PACEC, 2006, 2014) has been generated from best estimates based on available data but the representativeness of the underlying data is not known. The data must be viewed within the 95% confidence limits within which they are set i.e. best estimate 900 (200 - 4000). The wide confidence limits indicates that the data may not be particularly reliable.

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

Anderson, P and Yalden, D.W. (1981). Increased sheep numbers and the loss of heather moorland in the Peak District, England. Biological Conservation, 20, 195-213

Harris, S. and Yalden, D. (2008). Mammals of the British Isles: handbook, Mammal Society.

Harrison, A., Newey, S., Gilbert, L., Haydon, D.T. and Thirgood, S. (2010). Culling wildlife hosts to control disease: mountain hares, red grouse and louping ill virus. Journal of Applied Ecology 47: 926-930

Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C., McDonald, R.A., Shore, R.F (2018). A review of the population and conservation status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage.

Newey, S., Iason, G. and Raynor, R. (2008). The conservation status and management of mountain hares. Scottish Natural Heritage Commissioned Report No. 287 (ROAME No. F05AC316)

Patton, V., Ewald, J.A., Smith, A.A., Newey, S., Iason, G.R., Thirgood, S.J. and Raynor, R. (2010). Distribution of mountain hares Lepus timidus in Scotland: results from a questionnaire. Mammal Review, 40, 313-326

Public and Corporate Economic Consultants (PACEC)(2014). The Value of Shooting - www.shootingfacts.co.uk

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Thulin, C.G., Tegelstrom, H and Fredga, K (2003). Halotype - diversity of mountain hare mtDNA among native mountain hares and introduced brown hares in Scandinavia. Annales Zoologici Fennici, 40, 45-52

5. Range

5.1 Surface area (km²)		
5.2 Short-term trend Period		
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		
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)	2423
	b) Operator	
	c) Unknown	
	d) Method	Range is based on presence data collected between 1995-2016. Areas that contain very isolated records may not have been included in the area of distribution. The approach to assessing Range is the same as taken in 2013 and 2007 whereby a 45km alpha hull value was used with a starting range unit of individual 10km squares.
5.11 Change and reason for change in surface area of range	Improved knowledge/more accurate data Use of different method	
	The change is mainly due to:	Use of different method
5.12 Additional information	As this is the first time the range has been calculated for the species at this level, the range has been set as the favourable reference range.	

6. Population

6.1 Year or period	1995-2016	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	1500
	c) Maximum	9500
	d) Best single value	
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	

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6.5 Type of estimate	
6.6 Population size Method used	Based mainly on extrapolation from a limited amount of data
6.7 Short-term trend Period	2007-2018
6.8 Short-term trend Direction	Decreasing (-)
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval
6.10 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data
6.11 Long-term trend Period	
6.12 Long-term trend Direction	
6.13 Long-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval
6.14 Long-term trend Method used	
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size b) Operator c) Unknown d) Method
6.16 Change and reason for change in population size	Genuine change Improved knowledge/more accurate data Use of different method The change is mainly due to: Improved knowledge/more accurate data
6.17 Additional information	Also a different method and genuine change. Even though a different methodolgy has been used to derive population estimates for this reporting round, the estimates still fall within those reported via the Peak District National Park Authority. Based on the surveys undertaken by organisations such as the Sorby Natural History Society it would seem that there has been a genuine decline in the species over recent years.

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (to maintain the species at FCS)?	Unknown
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Unknown
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on expert opinion with very limited data	
7.3 Short-term trend Period	1995-2016	
7.4 Short-term trend Direction	Uncertain (u)	
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		

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7.8 Long-term trend Method used

7.9 Additional information

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Conversion into agricultural land (excluding drainage and burning) (A01)	H
Intensive grazing or overgrazing by livestock (A09)	H
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Hunting (G07)	H
Illegal shooting/killing (G10)	H

Threat	Ranking
Conversion into agricultural land (excluding drainage and burning) (A01)	H
Intensive grazing or overgrazing by livestock (A09)	H
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Hunting (G07)	H
Illegal shooting/killing (G10)	H

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

Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land (CA01)

Adapt mowing, grazing and other equivalent agricultural activities (CA05)

Stop mowing, grazing and other equivalent agricultural activities (CA06)

Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)

Management of hunting, recreational fishing and recreational or commercial harvesting or collection of plants (CG02)

9.6 Additional information	Mountain hares benefit from moorland management, including areas of sustainably managed grouse moor. The continuing implementation of mooorland restoration schemes and the implementation of moorland management plans via agri-environment schemes should continue. Illegal harvesting of mountain hares should be prevented.

10. Future prospects

10.1 Future prospects of parameters	a) Range b) Population c) Habitat of the species
10.2 Additional information	Mountain hares still seem to be occupying the same range as they were in the previous reporting round (2007 - 2012). However, the population over recent years appears to be in decline possibly due to the harvesting of animals. There is some uncertainty around habitat prospects currently as the implementation of moorland restoration schemes may be improving habitat, though it may be some time before there is a measurable improvement in habitat quality on a large scale, however, if these schemes are to continue into the future the prospects for habitat look positive.

11. Conclusions

11.1. Range	
11.2. Population	
11.3. Habitat for the species	
11.4. Future prospects	
11.5 Overall assessment of Conservation Status	
11.6 Overall trend in Conservation Status	
11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status No change The change is mainly due to: b) Overall trend in conservation status No change The change is mainly due to:
11.8 Additional information	

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 b) Minimum c) Maximum d) Best single value

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12.2 Type of estimate

12.3 Population size inside the network Method used

12.4 Short-term trend of population size within the network Direction

12.5 Short-term trend of population size within the network Method used

12.6 Additional information

13. Complementary information

13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

13.3 Other relevant Information

Distribution Map

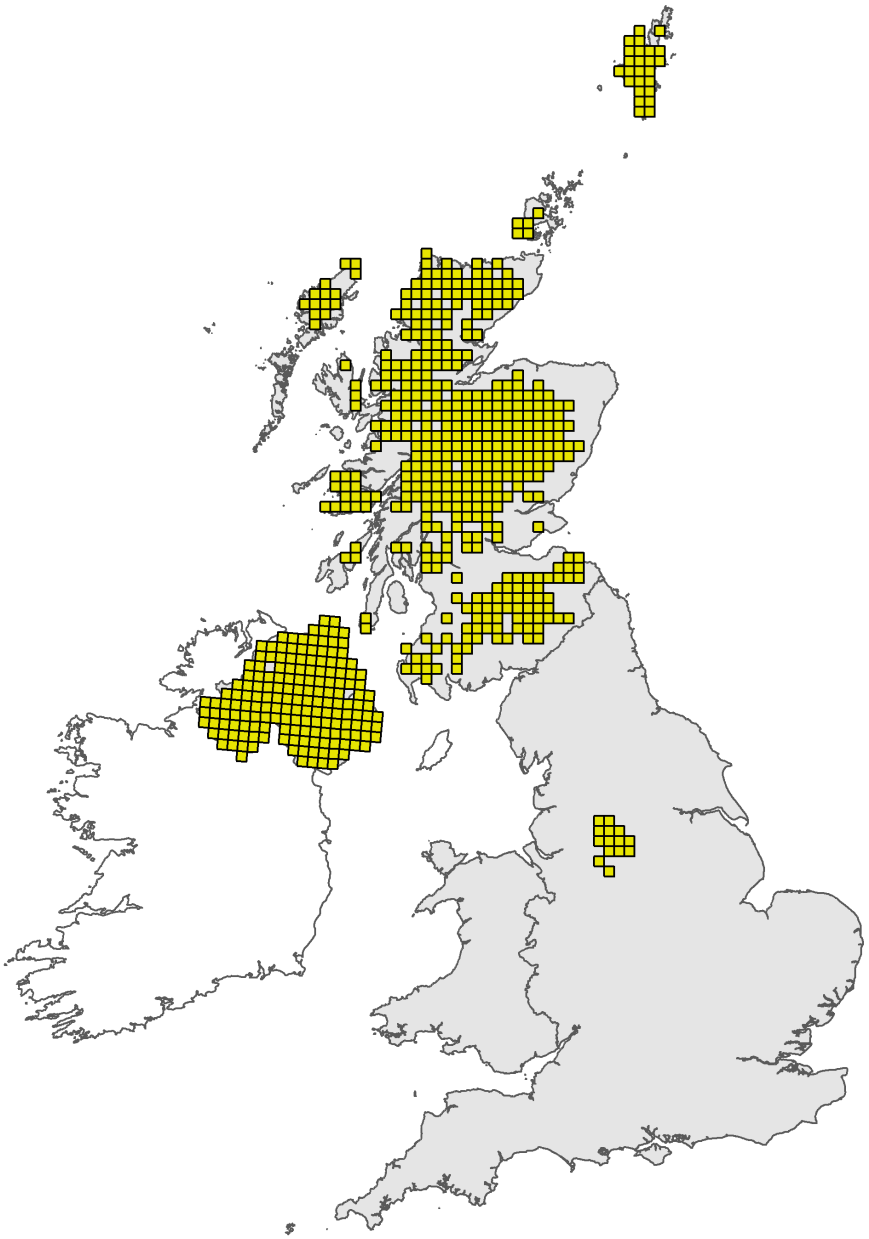

Figure 1: UK distribution map for S1334 - Mountain hare (*Lepus timidus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The 10km 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

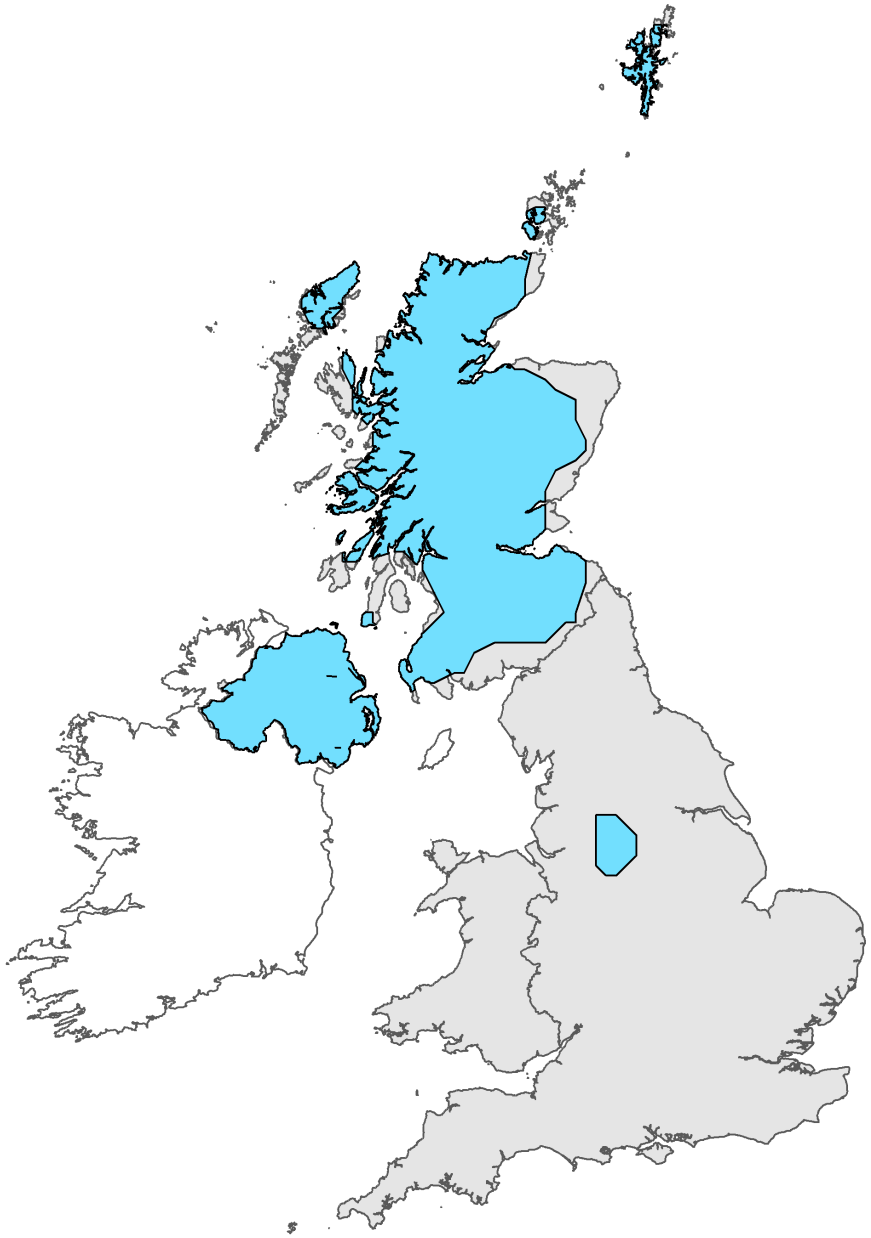

Figure 2: UK range map for S1334 - Mountain hare (*Lepus timidus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 25km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Species name: Lepus timidus (1334)

Field label	Note
1.5 Common name	Natural populations of mountain hares are absent from England. The species was introduced into the Peak District in Derbyshire, in the late 19th century for sport (Anderson and Yalden, 1981) and are found primarily in areas of Calluna and Eriophorum (Harris and Yalden, 2008)
3.1 Is the species take in the wild/ exploited	The main regulations/legislation protecting this species are the; EU Habitats Directive, Annex V, Wildlife and Countryside Act, (1981) as amended, Schedule 5A, 6A and 7, Hares Preservation Act (1892), Ground Game Act (1880), Game Act (1831) and the Bern Convention, Appendix III.

Species name: Lepus timidus (1334) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	Annual surveys are undertaken by the Sorby Natural History Society covering part of the Peak District. Data from the Moors for the Future Community Science Survey (2015-2017) has also been used to generate the range map. Although, some surveys have only partially covered the area thought to be the present range of the species, the species appears to be present in the same areas as those where it has previously been recorded, though the numbers of animals seen over the last couple of years in these areas appears to have reduced. A PhD is currently being undertaken at Manchester Metropolitan University, which is investigating the structure of the Peak District Mountain Hare Population, unfortunately the results of the PhD are not yet available. However, the study will confirm whether the range of the species has remained stable or has decreased recently.
6.1 Year or Period	Presence data was collected between 1995-2016 at 10km resolution or higher, gathered from the NBN gateway, local records centres, individual species experts, national and local monitoring schemes and iRecord for each species for the 'Review of the Population and Conservation Status of British Mammals (Mathews et al, 2018) used to determine population status for the species for this report. However, the population was determined between 2016-2017 and only data that had been verified by the source organisation was included in the distribution maps.
6.8 Short term trend; Direction	Mathews et al (2018) gives estimates of 1,500 individuals (lower plausible limit) to 9,500 (upper plausible limit). There are naturally wide annual fluctuations in mountain hare populations and there is often high winter mortality. The population estimate was calculated using population density estimates from one location on moorland managed for grouse in the central highlands. The estimates do not, therefore, represent the range of densities likely to be found over the species distribution but instead are based on areas with favourable habitat. Despite the considerable uncertainty surrounding the estimates of population size, surveys in the Peak District National Park suggest a population size of 1,500 - 5,000 individuals (Mathews et al, 2018). However, over recent years there is anecdotal evidence suggesting a decline in the population which may be associated with systematic shooting/culling. The current population estimate is likely to be in the region of the lower plausible limit given.
7.1 Sufficiency of area and quality of occupied habitat	The area and quality of habitat for the species has been assessed as unknown as there is insufficient information available for this species to undertake this assessment. Mountain hares in the Peak District are found primarily in areas of Calluna and Eriophorum (Harris and Yalden, 2008) i.e. heather moorland. This habitat type has been in decline, though due to moorland restoration schemes and the implementation of moorland management plans via agri-environment schemes, habitat may be improving.

7.2 Sufficiency of area and quality of occupied habitat; Method used	The species have persisted in this area for a considerable length of time and its thought that recent moorland restoration schemes and the implementation of moorland management plans via agri-environment schemes may be leading to improving habitat quality but the data is uncertain.
7.4 Short term trend; Direction	The trend has been assessed as uncertain as although it is thought that habitat may be improving in quality, there has been no recent targeted assessment to make this judgement.
7.5 Short term trend; Method used	There is insufficient information to assess the trend.
8.1 Characterisation of pressures/ threats	Hares benefit from moorland management, including areas of sustainably managed grouse moor. Altered land use, habitat fragmentation and loss of open moorland through afforestation can result in the loss of foraging opportunities and shelter, which may be detrimental to survival (Patton et al., 2010). Control measures are used to reduce damage to forestry and to reduce disease transmission of louping ill in grouse, as well as shooting for sport (Newey et al., 2008, Patton et al., 2010 and Harrison et al., 2010). Hybridisation and competitive exclusion may become a threat where ranges overlap and mountain hares may be susceptible to replacement by brown hares if climate change leads to warming/drying (Thulin et al., 2003).
9.5 List of main conservation measures	The continuing implementation of moorland restoration schemes and the implementation of moorland management plans via agri-environment schemes should continue. Illegal harvesting of mountain hares should be prevented.