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:

S1334 - Mountain hare (*Lepus timidus*)

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	**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	1994-2018
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)	34348	38502	27542	649	486	369
Max. (raw, ie. not rounded)						
Unknown	No	No	No	No	No	No

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

Only minimum hunting bag data are available for the six years of the reporting period. There is a licensing system to allow legitimate control of mountain hares in the closed season (1 March - 31 July) in Scotland, where the majority of the UK population occurs, for specific purposes such as preventing serious damage to growing trees. The licensing system also allows for control of hares by otherwise illegal methods (such as shooting at night aided by spot-light) in certain limited circumstances, but the vast majority of hares that are legally shot each year do not fall into either of these categories and their control does not require a licence.
The data provided in field 3.3 are a combination of actual numbers killed under licence (values in hundreds) and estimates of the numbers killed outside the closed season according to approved methods and therefore not subject to licensing, where available. The estimates are rounded to the nearest 1000. They are extrapolated from summary information on changes in the hare abundance index (derived from confidential National Gamebag Census bag data). The raw data are privately held and unavailable. In years 4-6 where the value given is <1000, only the figure for the number of hares killed under licence is shown because no other information is available.

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

England
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.

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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
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
Scotland
AEBISCHER,N.J., DAVEY,P.D. & KINGDON,N.G. 2011. National Gamebag Census: Mammal Trends to 2009. Game & Wildlife Conservation Trust, Fordingbridge (www.gwct.org.uk/ngcmammals).
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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.
DAVIS, S.E., NEWSON, S.E., & NOBLE, D.G. 2007. The production of population trends for UK mammals using BBS mammal data: 1995-2005 update. BTO Research Report No. 462 http://jncc.defra.gov.uk/page-4309 (updated with additional data)
HARRISON, A., NEWEY, S., GILBERT, L., HAYDON, D.T. & THIRGOOD, S. 2010. Culling wildlife hosts to control disease: mountain hares, red grouse and louping ill virus. Journal of Applied Ecology 47: 926-930 http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2010.01834.x/abstract
IASON, G.R., HULBERT, I.A.R., HEWSON, R & DINGERKUS, K. 2008. Mountain Hare. Pages 220-228 In HARRIS, S & YALDEN, D.W. Mammals of the British Isles: Handbook, 4th edition. The Mammal Society, Southampton.799pp.
KINRADE, V., EWALD, J., SMITH, A., NEWEY, S., IASON, G., THIRGOOD, S. & RAYNOR, R. 2008. The distribution of Mountain Hare (Lepus timidus) in Scotland (2006/07). Scottish Natural Heritage Commissioned Report No.278 www.snh.org.uk/pdfs/publications/commissioned_reports/Report%2520No278.pdf
Massimino, D., Harris, S.J. & Gillings, S. 2018. Spatiotemporal trends in the relative abundance of selected terrestrial mammals as revealed by bird surveyors. Biological Conservation 226, 153-167
NEWEY, S., WILLEBRAND, T., HAYDON, D.T., DAHL, F., AEBISCHER, N.J., SMITH, A.A., & THIRGOOD,S.J. 2007. Do Mountain hare (Lepus timidus) populations cycle? Oikos, 116, 1547-1557.
NEWEY, S., DAHL, F., WILLEBRAND, T., & THIRGOOD, S.J. 2007. Unstable dynamics and population regulation in mountain hares: a review. Biological Reviews, 82, 527-549.
NORTON, L.R.; MURPHY, J.; REYNOLDS, B.; MARKS, S.; MACKEY, E.C. 2009

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Watson A, Wilson JD. 2018. Seven decades of mountain hare counts show severe declines where high-yield recreational game bird hunting is practised. J Appl Ecol. 2018;00:1-10. https://doi.org/10.1111/1365-
Mapping data were collated by the Mammal Scociety during the preparation of Mathews et al (2018) and include records from the NBN. Additional records collected for Kinrade et al (2008) are also included.
N.Ireland
Dingerkus, S.K. (1997) The distribution and ecology of the Irish hare L. t. hibernicus in Northern Ireland. Unpublished PhD Thesis. The Queen's University of Belfast, Belfast, UK.
Dingerkus, S. K. & Montgomery, W. I. (2002) A review of the status and decline in abundance of the Irish Hare (Lepus timidus hibernicus) in Northern Ireland, https://onlinelibrary.wiley.com/doi/pdf/10.1046/j.1365-2907.2002.00098.x
Environment and Heritage Service (2000) Biodiversity In Northern Ireland - Northern Ireland Species Action Plans; Irish Hare, Chough & Curlew, file:///U:/Article 17/Reports -- White Clawed Crayfish - Mountain Hare (Paul doing Marsh Saxifrage)/Mountian Hare References/NI Species Action Plans - Irish Hare, Chough & and Curlew 2000.pdf
Hall-Aspland, S., Sweeney, O., Tosh, D., Preston., P., Montgomery, W.I. & McDonald, R.A. (2006) Northern Ireland Irish hare survey 2006. Report prepared by Quercus for the Environment and Heritage Service (DOE, N.I.). UK.
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Reid, N. Irish hare (Lepus timidus hibernicus): Information and recommendations for farmers. Department of Environment (DOE NI). 2009, Leaflet.
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Reid, N., McDonald, R. A. & Montgomery, W.I. (2010) Homogeneous habitat can meet the discrete and varied resource requirements of hares but may set an ecological trap 143(7) 1701-1706, https://www.sciencedirect.com/science/article/pii/S0006320710001588?via%3Dihub
Reid, N., Caravaggi, A. & Montgomery, W.I. (2015) Range expansion and comparative habitat use of insular, congeneric lagomorphs: invasive european hares lepus europaeus and endemic irish hares lepus timidus hibernicus, 17(2):687-698, https://link.springer.com/article/10.1007%2Fs10530-014-0759-1
Reid, N., Sweeney, O., Wilson, C., Preston, S.J., Montgomery, W.I. & McDonald, R.A. (2007c) Developments in hare survey methodology - as applied to the NI Irish hare survey 2007. Report prepared by Quercus for the Environment and

Heritage Service (DOE, N.I.). UK.
Reid, N. (2006) Conservation ecology of the Irish hare Lepus timidus hibernicus. Unpublished PhD Thesis. The Queen's University of Belfast, Belfast, UK.
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Reid, N., Harrison, A.T. & Robb, G.N. (2011) Northern Ireland Irish hare survey 2010. Report prepared by the Natural Heritage Research Partnership, Quercus, Queen's University Belfast for the Northern Ireland Environment Agency. Northern Ireland Environment Agency Research and Development Series No. 11/10.

5. Range

5.1 Surface area (km²)	79384	
5.2 Short-term trend Period	2007-2018	
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)	73058
	b) Operator	
	c) Unknown	
	d) Method	The FRR value is the same as in 2013 and is considered to be large enough to support a viable population and no lower than the range estimate from when the Habitats Directive came into force in the UK. For further information see the 2019 Article 17 UK Approach document.
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	The range surface area for this species has been calculated using the UK 2013 approach and not the new approach outlined in Mathews et al. (2018). The trend in range is based on comparing current range with range in 2013. Any difference in the range surface area calculation between 2013 and 2019 is considered to be mainly due to a difference in the method of collecting distribution information and not due to genuine change. The current surface area is greater than the FRR value.	

6. Population

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6.1 Year or period	1994-2018	
6.2 Population size (in reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	93600
	c) Maximum	709300
	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	
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	393700 with unit number of individuals (i)
	b) Operator	
	c) Unknown	
	d) Method	The FRP is the same as in 2007 and 2013. The value is considered to be large enough for the population to be viable and no lower than the estimate when the Habitats Directive came into force in the UK. For further information see the 2019 Article 17 UK Approach document and relevant country-level reporting information.
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	UK population estimates have been derived from the GB estimate in Mathews et al. (2018) and the Northern Ireland estimate from the 2013 Article 17 report.	

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A combination of improved knowledge and genuine change suggest this species has a decreasing trend in some parts of the UK.

It is uncertain if the population is below the FRP, but the trend suggests the population status should be assessed as unfavourable-inadequate.

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)?	Yes
	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	1995-2018	
7.4 Short-term trend Direction	Stable (0)	
7.5 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information	There is no evidence that the extent and/or condition of supporting habitat during the period 2007-2018 has changed. Habitat quantity and quality is therefore considered to be sufficient and stable.	

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Other invasive alien species (other then species of Union concern) (I02)	M
Conversion into agricultural land (excluding drainage and burning) (A01)	M
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M
Mowing or cutting of grasslands (A08)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Hunting (G07)	H
Management of fishing stocks and game (G08)	H
Other activities related to extraction and cultivation of biological living resources not referred to above (G27)	M
Other human intrusions and disturbance not mentioned above (H08)	M

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Threat	Ranking
Conversion into agricultural land (excluding drainage and burning) (A01)	M
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M
Mowing or cutting of grasslands (A08)	M
Conversion to forest from other land uses, or afforestation (excluding drainage) (B01)	M
Hunting (G07)	H
Management of fishing stocks and game (G08)	H
Other human intrusions and disturbance not mentioned above (H08)	M
Other invasive alien species (other then species of Union concern) (I02)	M

8.2 Sources of information

8.3 Additional information

9. Conservation measures

9.1 Status of measures

a) Are measures needed? No

b) Indicate the status of measures

9.2 Main purpose of the measures taken

9.3 Location of the measures taken

9.4 Response to the measures

9.5 List of main conservation measures

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters

a) Range Good

b) Population Poor

c) Habitat of the species Good

10.2 Additional information

Future trend in Range is Overall stable; Future trend in Population is Negative - decreasing <=1% (one percent or less) per year on average; and Future trend in Habitat for the species is Overall stable. For further information on how future trends inform the Future Prospects conclusion see the 2019 Article 17 UK Approach document.

11. Conclusions

11.1. Range

Favourable (FV)

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11.2. Population	Unfavourable - Inadequate (U1)
11.3. Habitat for the species	Favourable (FV)
11.4. Future prospects	Unfavourable - Inadequate (U1)
11.5 Overall assessment of Conservation Status	Unfavourable - Inadequate (U1)
11.6 Overall trend in Conservation Status	Deteriorating (-)
11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status Genuine change Improved knowledge/more accurate data The change is mainly due to: Genuine change b) Overall trend in conservation status Genuine change Improved knowledge/more accurate data The change is mainly due to: Improved knowledge/more accurate data
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 more than the Favourable Reference Range. Conclusion on Population reached because: (i) the short-term trend direction in Population size is decreasing; and (ii) the current Population size is approximately equal to the Favourable Reference Population. Conclusion on Habitat for the species reached because: (i) the area of occupied habitat is sufficiently large and (ii) the habitat quality is suitable for the long-term survival of the species; and (iii) the short-term trend in area and quality of habitat is stable. 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 good. Overall assessment of Conservation Status is Unfavourable-inadequate because one or more of the conclusions are Unfavourable-inadequate. 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 – stable. Overall assessment of Conservation Status has changed between 2013 and 2019 because the conclusion for Population has changed from Favourable to Unfavourable-inadequate and the conclusion on Future Prospects has changed from Favourable to Unfavourable-inadequate. Overall trend in conservation status was not assessed in 2013 because the overall conclusion was Favourable. The overall trend would likely have been assessed as stable. The Overall trend has changed since 2013 because the trend in Population has changed from stable to decreasing

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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
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

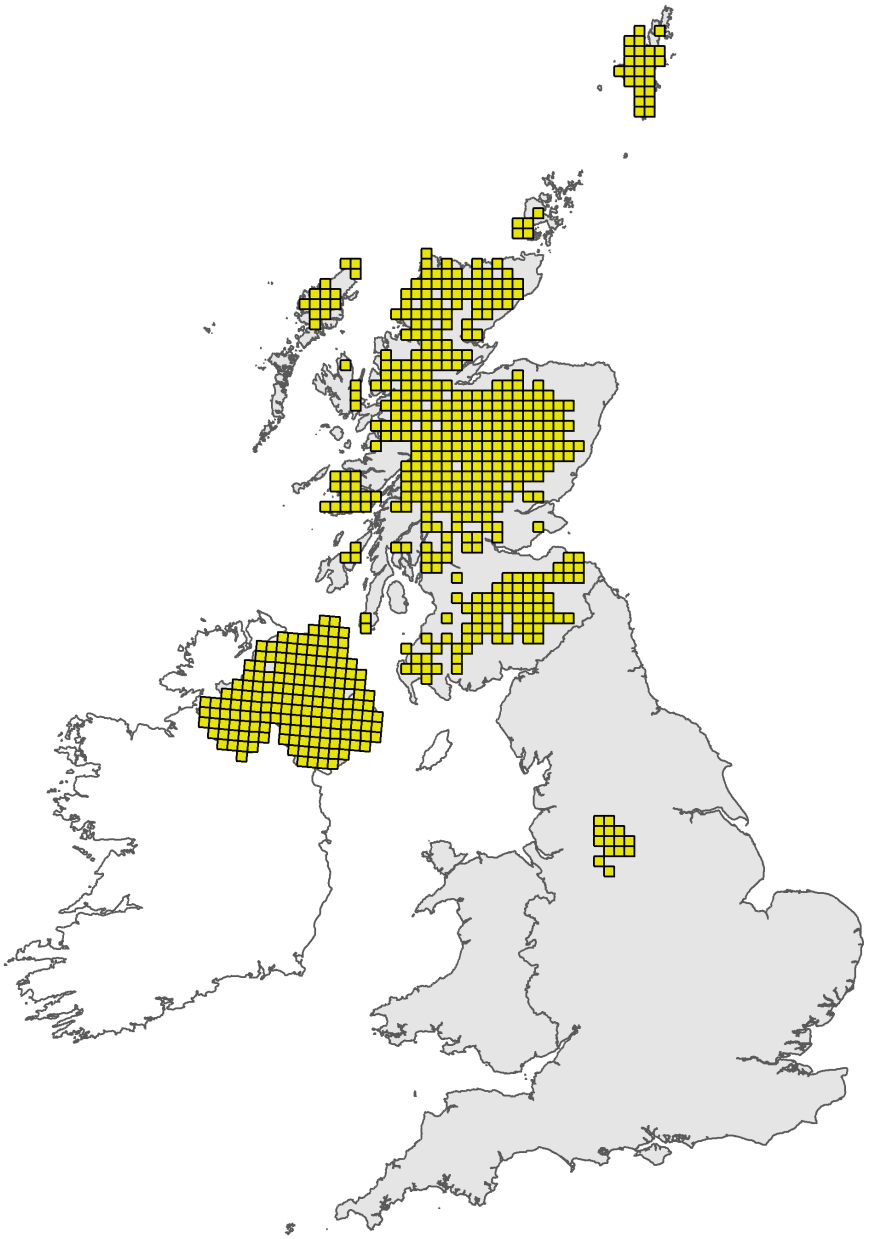

Figure 1: UK distribution map for S1334 - Mountain hare (*Lepus timidus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

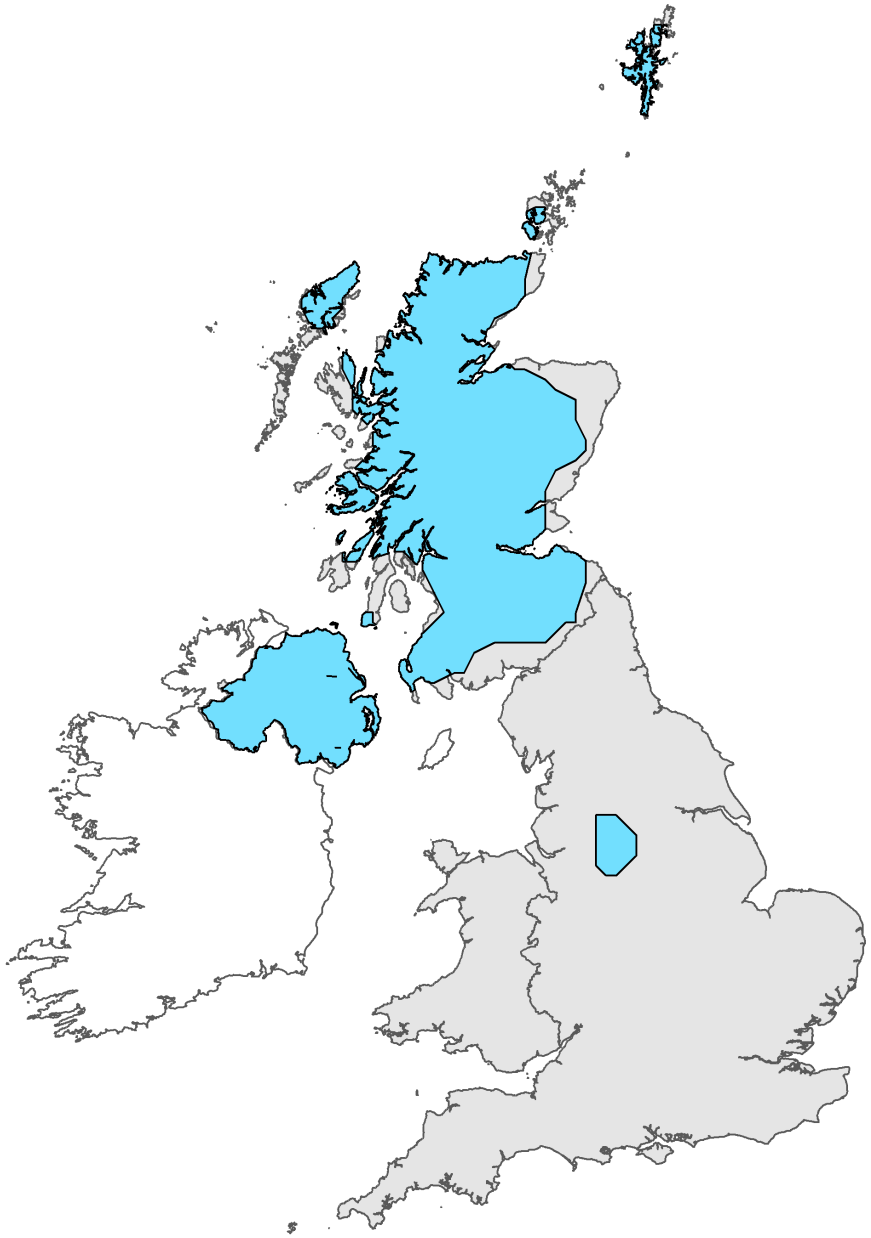

Figure 2: UK range map for S1334 - Mountain hare (*Lepus timidus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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.