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:

S1329 - Grey long-eared bat (*Plecotus austriacus*)

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	**1329**
1.3 Species scientific name	**Plecotus austriacus**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Grey long-eared bat

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?		No
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	No
	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	No
	f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens	No
	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

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)						
Max. (raw, ie. not rounded)						
Unknown	No	No	No	No	No	No

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

3.5. Additional information

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

Barlow, K. and Briggs, P. (2012). Grey long-eared bat surveillance 2012. JNCC Report No. 478

Frankham, R. (2010). Challenges and opportunities of genetic approaches to biological conservation. Biological Conservation, 143, 1919-1927

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.

Mitchell-Jones, T.J. (2010). Bats in houses - the conservation challenge. Pp 3965-378 in Species Management : challenges and solutions for the 21st century. Baxter, J.M. and Galbraith, C.A. TSO Scotland, Edinburgh

Razgour, O.N. (2012). From genes to landscapes: conservation biology of the grey long-eared bat, Plecotus austriacus, across spatio-temporal scales. PhD Thesis, University of Bristol

Razgour, O., Hanmer, J. and Jones, G. (2011b). Using multi-scale modelling to predict habitat suitability for species of conservation concern: the grey long-eared bat as a case study. Biological Conservation, 144, 2922-2930

Razgour, O., Whitby, D., Dahlberg, E., Barlow, K., Hanmer, J., Haysom, K., McFarlane, H., Wicks, L., Williams, C. and Jones, G. (2013). Conserving grey long-eared bats (Plecotus austriacus) in our landscape: a conservation management plan. Available to download from the Bat Conservation Trust http://www.bats.org.uk/

Waring, S.D., Essah, E., Gunnell, K, and Bonser, R (2013). Double jeopardy: the potential for problems when bats interact with breathable roofing membranes in the United Kingdom. Architecture and Environment, 1 1-3

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5. Range

5.1 Surface area (km²)	7338	
5.2 Short-term trend Period	2013-2018	
5.3 Short-term trend Direction	Uncertain (u)	
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)	7338
	b) Operator	
	c) Unknown	
	d) Method	The FRR has changed since 2013. The new value is considered to be large enough to support a viable population and no lower than the range estimate when the Habitats Directive came into force in the UK. The FRR value has been revised and is now equal to the current range surface area, which has been calculated using the method outlined in Mathews et. al., (2018) and 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 new, more robust method of calculating range has reduced estimated range size for this species since 2013. This does not represent a real reduction in range. 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	Short term trend in range has been assessed by using the 2019 distribution data and the 2013 method for calculating range and comparing that with range surface area in 2013. For further details please see the 2019 Article 17 UK Approach document and country assessments.	

6. Population

6.1 Year or period	1995-2016	
6.2 Population size (in reporting unit)	a) Unit	number of map 1x1 km grid cells (grids1x1)
	b) Minimum	
	c) Maximum	
	d) Best single value	108

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6.3 Type of estimate	Minimum	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit	number of individuals (i)
	b) Minimum	400
	c) Maximum	3000
	d) Best single value	
6.5 Type of estimate	95% confidence interval	
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	Uncertain (u)	
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		
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	More than (>)
	c) Unknown	
	d) Method	The FRP is the same as in 2013 and is no more than 25% above the current population in number of individuals. An FRP operator has been used because it had not been possible to calculate the exact FRP value. For further information see the 2019 Article 17 UK Approach document.
6.16 Change and reason for change in population size	No change	
	The change is mainly due to:	
6.17 Additional information	The 1km square population estimate has been calculated from the UK count of 1km squares where the species has been recorded. This is a minimum count because it only includes number of recorded occupied 1km squares. The confidence limits for the population estimate of number of individuals are wide and methodologies have changed (Mathews et. al., 2018), making it difficult to set an FRP value. A best single value for the population has not been provided because of the level of uncertainty around the population estimate. Instead the lower and upper confidence intervals provide minimum and maximum limits to the population estimate.	

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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	Insufficient or no data available	
7.3 Short-term trend Period	1995-2016	
7.4 Short-term trend Direction	Unknown (x)	
7.5 Short-term trend Method used	Insufficient or no data available	
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
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	H
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	H
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
Use of plant protection chemicals in agriculture (A21)	H
Conversion to other types of forests including monocultures (B02)	M
Logging without replanting or natural regrowth (B05)	M
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	H

Threat	Ranking
Conversion from one type of agricultural land use to another (excluding drainage and burning) (A02)	H
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	H
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
Use of plant protection chemicals in agriculture (A21)	H
Conversion to other types of forests including monocultures (B02)	M

Logging without replanting or natural regrowth (B05)	M
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	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		Restore the habitat of the species (related to '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)
Restore small landscape features on agricultural land (CA02)
Maintain existing extensive agricultural practices and agricultural landscape features (CA03)
Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures (CA04)
Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)
Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)
Adapt/manage reforestation and forest regeneration (CB04)
Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities (CF12)

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters	a) Range	Unknown
	b) Population	Unknown
	c) Habitat of the species	Unknown
10.2 Additional information		Future trend of Range is Unknown; Future trend of Population is Unknown; and Future trend of Habitat for the species is Unknown. 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)
11.2. Population	Unfavourable - Inadequate (U1)

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11.3. Habitat for the species	Unknown (XX)
11.4. Future prospects	Unknown (XX)
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 No change The change is mainly due to: b) Overall trend in conservation status No information on nature of change The change is mainly due to:
11.8 Additional information	Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is uncertain; and (ii) the current Range surface area is not less than the Favourable Reference Range . Conclusion on Population reached because: (i) the short-term trend direction in Population size is unknown; and (ii) the FRP for Population size is more than the current population. Conclusion on Habitat for the species reached because: (i) the area of occupied and unoccupied habitat is unknown and (ii) the habitat quality is unknown 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 the Future prospects for Range, Population and Habitat for the species are unknown. Overall assessment of Conservation Status is Unfavourable-Inadequate because one or more of the conclusions is Unfavourable-Inadequate. Overall trend is Unknown, based on trends for Range, Population and Habitat for the Species. Overall assessment of Conservation Status has not changed since 2013.. Overall trend in conservation status has changed from declining in 2013 to Unknown because trends in population and habitat for the species have changed from declining to 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 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	

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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 S1329 - Grey long-eared bat (*Plecotus austriacus*). 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 S1329 - Grey long-eared bat (*Plecotus austriacus*).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 The Mammal Society applying a range mapping tool as outlined in Matthews et al. (2018), to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 20km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Species name: Plecotus austriacus (1329)

Field label	Note
1.5 Common name	The Grey long-eared bat is a cryptic species, very similar in morphology and flight pattern to the Brown long-eared bat. Very few colonies are known in GB and these are almost exclusively found in lowland regions of Southern England, close to the coast (Mathews et al, 2018). The recorded distribution of the species is along the south coast of England, north Devon and north Somerset. There are thought to be approximately 10 maternity colonies in England. All maternity roosts in England are in the loft spaces of residential buildings. The roof spaces tend to be large and include a roof lining of wood or bitumastic felt, no hibernation roosts are known in England (Mathews et al, 2018). Ecological niche modelling suggests that the distribution of the Grey long-eared bat in the UK is mainly limited by low winter temperatures, high summer rainfall, the availability of grasslands and suitable environmental conditions that do not extend much beyond the current distribution. However, future climate change may alter this situation (Razgour et al., 2011b).

Species name: Plecotus austriacus (1329) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	The Grey long-eared bat is a rare and poorly recorded species. There is insufficient data at present to allow for any confidence in an estimation of trend. However, there have been no recent records in previously positive tetrads on the edge of the species range. (Mathews et al, 2018). Additionally, at least two maternal colonies have been lost for unknown reasons in Sussex and Dorset (Razgour, 2012).
5.10 Favourable reference range	The species is thought to be under recorded particularly due to its cryptic nature leading to confusion with the brown long-eared bat. Ecological modelling suggests that the species has probably always been at the edge of its range in the UK. It's likely that the FRR is lower than it would need to be to sustain the long term survival of this species should a substantial change in habitat availability and roosting opportunities occur.
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.
6.4 Additional population size	Mathews et al (2018) provides estimates of 400 individuals (lower plausible limit) to 3,000 (upper plausible limit) and a main estimate of 1,000 individuals for the adult population size. Although, plausible estimates for the adult population size could be as high as 3,000 bats (Razgour, 2012), this is based on the broad principle that for mammals generally, effective population sizes are approximately 10 times lower than true population sizes for populations in Hardy-Weinberg equilibrium (true populations being on average 10 times larger than the effective population size)(Frankham, 2010). However, in this species because most adult females appear to breed (F Mathews pers obs) in a given year, there is no evidence of staging of reproduction and it is unclear whether the population is in equilibrium. In addition, the estimated effective population size takes into account the genetic contribution of migrants: given the genetic connectivity between the bats in England and France, this influence may be quite high. So, whilst the molecular data are consistent with a population of around 1,000 individuals, the true number may be much lower (Razgour pers comms).

6.8 Short term trend; Direction	There are thought to be approximately 10 maternity colonies in England (8 sites studied by Razgour in 2012, which were visits to previously identified maternity colonies and 2 new colonies identified in Devon. There have also been a small number of additional sites confirmed by molecular analysis (including 2 in East Devon, 1 in S Devon, 1 in N Somerset and 1 in Pembrokeshire, Barlow & Briggs 2012; F Mathews pers obs, C williams pers com). It's unclear as to whether these are maternity sites. However, it's also notable that most of the sites historically recorded as having Grey long-eared bat roosts no longer had any evidence of the species when they were revisited by Razgour (2012). Therefore, the short term trend direction for this species is uncertain.
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. The grey long-eared bat is primarily an open or edge habitat forager. The species prefers to forage in semi-unimproved (unmanaged) lowland grasslands including meadows and marshes, woody riparian vegetation and broadleaved woodland. Out of the available habitats within the colony range, they use to the least extent arable fields, conifer woods and open water. When foraging within the agricultural landscape, grey long-eared bats mainly use field margins, hedgerows and scattered trees (Razgour et al 2013). This habitat niche occupancy is related to the species being a specialist moth feeder. However, in order to assess whether there is sufficient area and quality of habitat for this species, it would be necessary to first identify all of the foraging and roosting habitat located within the current range boundary; determine whether or not each of these features were being used and subsequently calculate the combined area of all currently used habitats. This process would require very detailed habitat information at a fine scale across England, which we do not currently have.
7.2 Sufficiency of area and quality of occupied habitat; Method used	It is currently not possible to assess this parameter as we do not have the information required at a fine enough scale in order to undertake a meaningful assessment.
7.4 Short term trend; Direction	As the area and quality of known occupied and unknown habitat cannot be assessed the short term trend direction is unknown.
7.5 Short term trend; Method used	There is insufficient information to assess the trend.
8.1 Characterisation of pressures/ threats	The Grey long-eared bat is primarily an open or edge habitat forager. Grey long-eared bats across England prefer to forage in semi-unimproved (unmanaged) lowland grasslands (including meadows and marshes), woody riparian vegetation and broadleaved woodland (Razgour et al., 2013). Agricultural practices that remove or simplify these habitats or affect the biomass of insect prey could negatively affect populations. Although, roosts are strictly protected through legislation a variable number of licences are issued every year permitting exclusion, destruction and damage. Changes to building regulations and efforts to make buildings more energy-efficient have tended to reduce their accessibility and thermal suitability for bats. Breathable roofing membranes also pose a threat of entanglement, (Mitchell-Jones, 2010 and Waring et al, 2013).
9.5 List of main conservation measures	Legal and administrative measures continue to be required to ensure that the protection provided by the legislation is effective. The HLF Back from the Brink project will aim to ensure that four of the most vulnerable maternity roosts have sufficiently high quality foraging habitats surrounding them to support these colonies, to facilitate landscape connectivity between roosts to prevent isolated colonies declining due to inbreeding. This project is proactively working within the conservation measures set out in the list of measures.