

**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:

**S1303 - Lesser horseshoe bat (*Rhinolophus  
hipposideros*)**

**WALES**

## **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 (Wales information only)
1.2 Species code	1303
1.3 Species scientific name	Rhinolophus hipposideros
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Lesser horseshoe 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	Complete survey or a statistically robust estimate
2.5 Additional maps	No

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

3.1 Is the species taken in the wild/exploited?	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

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- Natural Resources Wales, 2013. Supporting documentation for the Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012. Conservation status assessment for Species: S1303 - Lesser horseshoe bat (*Rhinolophus hipposideros*).
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## 5. Range

5.1 Surface area (km <sup>2</sup> )	
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 (km <sup>2</sup> ) b) Operator c) Unknown d) Method
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	

## 6. Population

6.1 Year or period	2016-2017
6.2 Population size (in reporting unit)	a) Unit                      number of individuals (i) b) Minimum c) Maximum d) Best single value      30700
6.3 Type of estimate	Best estimate
6.4 Additional population size (using population unit other than reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value
6.5 Type of estimate	
6.6 Population size Method used	Complete survey or a statistically robust estimate
6.7 Short-term trend Period	2006-2017

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6.8 Short-term trend Direction	Increasing (+)
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval
6.10 Short-term trend Method used	Complete survey or a statistically robust estimate
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 The change is mainly due to: Genuine change
6.17 Additional information	

## 7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (to maintain the species at FCS)? b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Yes
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	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
Abandonment of grassland management (e.g. cessation of	H

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grazing or mowing) (A06)

Construction or modification (e.g. of housing and settlements) H  
in existing urban or recreational areas (F02)

Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01) H

Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05) H

Livestock farming (without grazing) (A14) H

Sports, tourism and leisure activities (F07) M

Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01) M

Logging without replanting or natural regrowth (B05) M

Conversion to other types of forests including monocultures (B02) M

Threat	Ranking
--------	---------

Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	H
---	---

Construction or modification (e.g. of housing and settlements) H in existing urban or recreational areas (F02)	
---	--

Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01)	H
--	---

Other natural catastrophes (M10)	H
----------------------------------	---

Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	H
---	---

Livestock farming (without grazing) (A14)	M
---	---

Sports, tourism and leisure activities (F07)	M
--	---

Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell) (C01)	M
---	---

Logging without replanting or natural regrowth (B05)	M
--	---

Conversion to other types of forests including monocultures (B02)	M
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## 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



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## 9.4 Response to the measures

Medium-term results (within the next two reporting periods, 2019-2030)

## 9.5 List of main conservation measures

Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)

Restore small landscape features on agricultural land (CA02)

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

Improvement of habitat of species from the directives (CS03)

Adapt/change forest management and exploitation practices (CB05)

Reduce impact of transport operation and infrastructure (CE01)

Manage/reduce/eliminate noise, light and other forms of pollution from transport (CE05)

Manage conversion of land for construction and development of infrastructure (CF01)

Reduce impact of outdoor sports, leisure and recreational activities (CF03)

## 9.6 Additional information

## 10. Future prospects

### 10.1 Future prospects of parameters

- a) Range
- b) Population
- c) Habitat of the species

### 10.2 Additional information

## 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

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12.1 Population size inside the pSCIs, SCIs and SACs network (on the biogeographical/marine level including all sites where the species is present)

a) Unit                      number of individuals (i)  
b) Minimum  
c) Maximum  
d) Best single value    6490

12.2 Type of estimate

Minimum

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

Increasing (+)

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

Complete survey or a statistically robust estimate

12.6 Additional information

## 13. Complementary information

13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

13.3 Other relevant Information

## Distribution Map

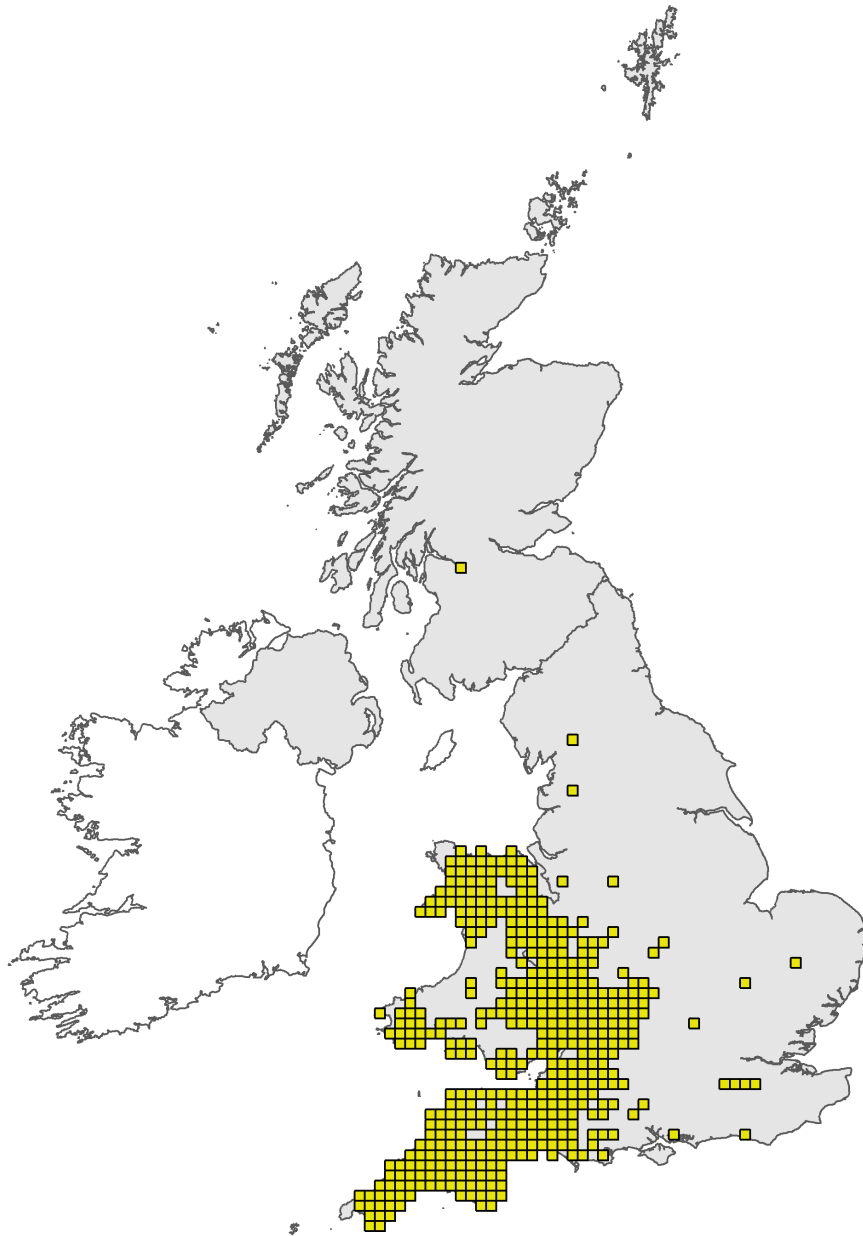


Figure 1: UK distribution map for S1303 - Lesser horseshoe bat (*Rhinolophus hipposideros*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 S1303 - Lesser horseshoe bat (*Rhinolophus hipposideros*). 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: *Rhinolophus hipposideros* (1303)

Field label	Note
2.2 Year or Period	The time period has been selected as distribution has been calculated using data from Mathews et al. 2018. The extended time period is not considered problematic as the species has shown range expansion. Data have been collected as part of long-term studies and structured long-term monitoring as well as on an ad hoc basis. This is a well-studied species and data quality is considered to be good.
2.4 Distribution map; Method used	This species has been subject to a high level of recording; coordinated monitoring of summer roosts in Wales and England has taken place since 1993 and 1998 respectively. Structured monitoring of some hibernation sites started in 1997 though some sites have been monitored on an ad hoc basis for many years. The distribution map is considered to accurately reflect the current distribution of the species and data quality is considered to be good. The horseshoe bats are easily identifiable using visual or bat detector identification. Their habit of roosting in the open (within the roost site), rather than in crevices means that the presence of colonies is likely to be noticed. Confusion is possible with the greater horseshoe ( <i>R. ferrumequinum</i> ) if roosting bats are not seen close up (e.g. in mines or cave chambers), however given the limited distribution and rarity of the greater horseshoe this is not likely to be a significant issue.

## Species name: *Rhinolophus hipposideros* (1303) Region code: ATL

Field label	Note
5.11 Change and reason for change in surface area of range	Area of land (including unsuitable habitat) contained within the range is given as 19,549 km <sup>2</sup> (Mathews et al. 2018). 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. Range has been taken from Mathews et al. 2018, whereby an alpha hull value of 20km was drawn around the presence records, which represented the best balance between the inclusion of unoccupied sites (i.e. where records are sparse but close enough for inclusion) and the exclusion of occupied areas due to gaps in the data (i.e. where records exist but are too isolated for inclusion). An additional 10km buffer was added to the final hull polygon to provide smoothing to the hull and to ensure that the hull covered the areas recorded rather than intersecting them. This revised alpha hull differs from that used in the previous article 17 report (Natural Resources Wales, 2013). There is better/more recording effort for bats in general due in part to the requirement to survey in advance of developments and better co-ordination of data through the local record centre (LRC) network in Wales. Bat detectors are also constantly improving allowing more accurate identification and longer term monitoring of sites. This is an easily identifiable species and because of its habit of roosting in the open, rather than in crevices, its presence is easily detectable. Roosts that have been present for many years continue to be discovered through additional surveys, so it appears that changes in range also reflect greater survey effort and more effective bat call recording technology.
6.1 Year or Period	The population data is derived from annual counts undertaken between 2016-17 as part of the National Bat Monitoring Programme lesser horseshoe summer colony roost counts.

## 6.2 Population size

Population estimate taken from Mathews et al. (2018): Based on expert opinion, the best single figure assumes that 70% of the individuals in maternity colonies are female. The population estimate is calculated on this basis. Mathews et al. (2018) state 'The lower limit uses a conservative assumption of 50% females, meaning that the entire population is counted at maternity sites [base on an assumed sex ratio of 1:1]; whereas the upper limit assumes that the maternity site contains only females, so the true population is double the number of animals observed at the maternity sites.' It has been assumed that there are equal numbers of male and female bats in the population overall, given the lack of any contrary evidence in the literature or from expert opinion. A main source of possible error within this population estimation method has been identified by Mathews et al. 2018, 'Little information is available on the sex ratio within maternity colonies pre-breeding. The overall estimate is based on a single expert opinion of 70% of the colony being female, with other experts indicating that they had no additional directly measured data. Unpublished data from recent research conducted using genotyping at 6 roosts in the Republic of Ireland indicate that the proportion of adult males within a colony varies from 7% to 72% (median 37%) (Mathews et al. 2018 - Harrington & O'Reilly pers com.). This means that the median proportion of females would be expected to be 63% (range 28% to 93%). If applicable in GB, this would reduce the estimated size of the population. Recent genotyping work at 19 colonies in northern France also indicates the presence of significant numbers of adult males within pre-breeding colonies, but here the median value was 25.8%, with only 5 sites having values greater than the expert opinion used here (Zarzo-Lacoste, Jan et al. 2017). It is notable that one of these was a large colony with >200 individuals, which implies that it is not just small or suboptimal colonies that may have large proportions of males.'

### 6.6 Population size; Method used

Whilst issues have been identified over the selection of male/female ratios in pre-breeding maternity roosts for population estimates, it is considered that in Wales we achieve a near complete survey count of maternity roosts to support the population estimates.

### 6.7 Short term trend; Period

Based on Bat Conservation Trust NBMP Annual Report 2017 (Bat Conservation Trust. 2018a)

### 6.8 Short term trend; Direction

Bat Conservation Trust. 2018a states that the Welsh short term trend based on hibernation data shows an index increase of 51.9 from 2006 and this trend is statistically significant. In addition, new maternity sites are discovered from time to time, so there is an improvement in knowledge. Data from 174 maternity roost sites and 162 hibernation sites contribute to the trend analysis in Wales (sites surveyed in at least two years). The hibernation counts are currently considered to be more statistically robust over maternity roost counts and given trends are statistically significant.

### 6.16 Change and reason for change in population size

Population size estimates are calculated using roost count data. Monitoring by the NBMP (Bat Conservation Trust. 2018a) shows that the lesser horseshoe bat is increasing in numbers at known sites in Wales, so there is a genuine increase in the population. In addition, new maternity sites are discovered from time to time, so there is an improvement in knowledge. This data supports the trends drawn from hibernation data. The drivers for this change include legislative protection of maternity roosts preventing destruction / disturbance, allowing interventions to improve thermal conditions which improves reproductive success, and mild winters permitting population growth. The main reason for the positive increase in lesser horseshoe bat population between reporting periods is genuine change; breeding success at known and monitored roost sites has led to an increase in population.

### 6.17 Additional information

Whilst there have been studies on many areas of lesser horseshoe ecology, current information on all aspects of reproduction, mortality and age structure is not available.

## 7.1 Sufficiency of area and quality of occupied habitat

- area = 19,500 km<sup>2</sup>. Habitable area for Wales as given by Mathews et al. (2018) has been used as a proxy for occupied habitat. The habitable area calculation defined all the area within the range as habitable excluding montane habitat since this is unlikely to include suitable locations for maternity roosts and is considered to be unoccupied. This estimate is different from the 2013 reporting round figure (11,600 km<sup>2</sup>) as previously the figure was calculated by estimating area of habitat from the area of the filled 10km squares in the distribution map (see Natural Resources Wales, 2013) which is a different method from that used by Mathews et al. 2018. Whilst the habitat requirements of the species have been well-studied the total extent of suitable habitat is currently unknown. It may be possible to model the area of suitable habitat for the species, but this has not yet been done. Ground truthing of any models would also be required. -quality = Although we do not have a robust measure of the quality of the occupied habitat the population trend for the species is increasing and therefore the quality is considered to be sufficient to maintain the species at FCS. *R. hipposideros* requires a complex mosaic of habitats to support foraging, roosting and commuting behaviour. Boye & Dietz. 2005, provide a good overview of this species' habitat requirements. Woodlands play a predominant role as foraging habitats for the species, especially in spring when *R. hipposideros* almost exclusively forages there. Foraging areas are close to summer roosts (distances up to 4.2 kilometres) and the animals spend about half of their activity time within a radius of 600 metres. The high importance of semi or unimproved wet pasture bounded by hedgerows has been found in the main foraging areas of one of the largest European colonies at Glynllifon in Gwynedd, Billington & Rawlinson, 2006. Summer roosts are usually situated close to woodland or a park. If this is not the case a system of continuous linear landscape elements, such as hedges or walls, provide guidance to the bats when flying to their foraging areas. Undisturbed hibernation sites in underground caves, mines or cellars must be available at a maximum distance of 30 kilometres from the summer roosts. Night roosts are important in extending the foraging area available to a colony and occasionally it may be advantageous for bats to remain in these satellite roosts during the day to conserve energy levels rather than return to the maternity roost that same night, Billington & Rawlinson 2006, Knight & Jones 2009. As this is a generalist species, using a mosaic of habitats, the area of distribution is used as an estimate of habitat area and as a proxy for the area of suitable habitat in the absence of specific data.

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

There is some detailed information on the habitat requirements/limitations of this species, but the total area of suitable habitat is complex to determine as the species depends on a matrix of habitats in a landscape. To obtain a proper estimate of suitable habitat used by the 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 the UK. We do not currently have this level of information. As this is a generalist species, using a mosaic of habitats, the area of distribution is used as an estimate of habitat area. Previously calculated from the area of the filled 10km squares in the distribution map, the estimate given for occupied habitat is now derived from Mathews et al. 2018, where the habitable area calculation defined all the area within the range as habitable excluding montane habitat since this is unlikely to include suitable locations for maternity roosts, and range calculation utilises an alpha hull value of 20km was drawn around the presence records, which represented the best balance between the inclusion of unoccupied sites (i.e. where records are sparse but close enough for inclusion) and the exclusion of occupied areas due to gaps in the data (i.e. where records exist but are too isolated for inclusion). An additional 10km buffer was added to the final hull polygon to provide smoothing to the hull and to ensure that the hull covered the areas recorded rather than intersecting them.



<p>7.4 Short term trend; Direction</p> <hr/> <p>8.1 Characterisation of pressures/ threats</p>	<p>There is insufficient data on any trend in the level of suitable habitat or quality of habitat for the species. This is extremely difficult question to answer as this is a generalist species, using a mosaic of habitats across a large area.</p> <hr/> <p>Pressures: A06- Abandonment of grassland management &amp; A14 - Livestock farming (without grazing): Abandonment of pastoral systems and lack of grazing, particularly of cattle grazing (Ransome, 1996) compounded by use of anthelmintics. (McCracken, 1993). Dung beetles form a key component of the bats diet (A14). F02 - Construction or modification in existing urban or recreational areas, A05- Removal of small landscape features: Demolition and conversion of buildings can result in loss of roost sites. This species requires large open roof spaces with large access points which are easily lost when converted. Although roosts are strictly protected, <i>R. hipposideros</i> has quite specific summer roosting requirements that are not provided by most modern buildings. In addition, changes in building practices to improve energy efficiency mean that new buildings may offer fewer roosting opportunities. Roost sites are often in old agricultural buildings or large rural dwellings subject to deterioration or to conversion to alternative use. There is good understanding of the roosting conditions and habitat required for the species (Schofield, 2008). However mitigation for developments affecting roosts and habitat is not always undertaken as proposed thus compromising its likelihood of success. Increasing urbanisation results in loss of foraging habitat, severance of commuting routes and isolation of colonies. <i>R. hipposideros</i> commute and forage along linear features, over wet grassland and in woodland. Agricultural and forestry practices that remove or simplify these habitats or affect the biomass of insect prey could negatively affect populations. E01 - Roads, paths, railroads and related infrastructure: These pressures also act via construction of new infrastructure or widening/realignment of existing linear structures. The species is low flying and likely to be vulnerable to mortality through direct collision with vehicles (Fensome &amp; Mathews, 2016). Lighting from urbanisation and infrastructure can sever commuting routes, impact foraging areas and delay emergence times. F07 - Sports, tourism and leisure activities &amp; C01 - Extraction of minerals: Use of underground sites for recreational purposes (e.g. caving, adventure trips, coasteering) cause disturbance to hibernating bats, affecting their ability to survive the winter, or causing them to abandon sites. Modern mineral extraction methods are unlikely to create suitable mines and galleries for roosting. B05 - Logging without replanting &amp; B02 - Conversion to other types of forests including monocultures : Loss/reduction in value and extent of woodland habitat is a moderate pressure on this species (see 7.2). Threats: M10 - Other natural catastrophes: Regarding natural catastrophes, long-term research has shown that the greatest threat to populations is mass starvation in late cold springs (Ransome, 1989). The impact of these events can be ameliorated by providing good quality habitat close to hibernation sites. F02 - Construction or modification in existing urban or recreational areas: The rate of demolition and conversion of buildings resulting in loss of roost sites is unlikely to decrease. C01 - Extraction of minerals: Mine collapse and flooding and reopening of mines can all threaten the species. A06- Abandonment of grassland management &amp; A14 - Livestock farming (without grazing): Abandonment of pastoral systems and lack of grazing, particularly of cattle grazing compounded by use of anthelmintics is likely to remain a threat. A05 - Removal of small landscape features: loss of foraging habitat, severance of commuting routes and isolation of colonies is likely to remain a threat. E01 - Roads, paths, railroads and related infrastructure, during construction of new, and widening/realignment of existing linear infrastructure projects in the future is likely to continue. C01 - Extraction of minerals: Mine collapse and flooding and reopening of mines can all threaten the species. F07 - Sports, tourism and leisure activities, the use of underground sites for recreational purposes will continue to threaten the species. B05 - Logging without replanting &amp; B02 - Conversion to other types of forests including monocultures : loss/reduction in value of woodland habitat will also continue.</p>
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9.5 List of main conservation measures	<p>CF03 Reduce impact of outdoor sports, leisure and recreational activities &amp; CF01 Manage conversion of land for construction and development of infrastructures: Legal and administrative measures continue to be required to ensure that the protection provided by the legislation is effective and that protected habitats for the species are managed appropriately. This helps to address Pressures/Threats F02, L05, F07, C01.</p> <p>CE01 Reduce impact of transport operation and infrastructure &amp; CE05 Manage/reduce/eliminate noise, light and other forms of pollution from transport: Road design, construction and operation need to take into account the likely impact on bats, e.g. in relation to the provision of safe crossing structures and the loss of and severance of bat habitat and lighting. This helps to address Pressures/Threats E01 &amp; A05. CA09 Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production; CA02 Restore small landscape features on agricultural land; CA05 Adapt mowing, grazing and other equivalent agricultural activities; CS03 Improvement of habitat of species from the directives; CB05 Adapt/change forest management and exploitation practices: R. hipposideros requires a complex mosaic of habitats to support foraging, roosting and commuting behaviour. Woodlands and semi or unimproved wet pasture bounded by hedgerows have been shown to be important foraging habitats for the species. Foraging areas are close to summer roosts (distances up to 4.2 kilometres) and the animals spend about half of their activity time within a radius of 600 metres. Roost sites are often in buildings that are subject to deterioration or to conversion to alternative use. There is good understanding of the roosting conditions and habitat required for the species (Schofield 2008). However, mitigation for developments affecting roosts and habitat, if not implemented as proposed, can compromise likelihood of success. Planning at landscape scale is required to conserve commuting routes and foraging areas along with effective management of habitats through agri-environmental schemes and sympathetic forest management plans. This helps to address Pressures/Threats A06, A14, B05 &amp; B02.</p>
10.1 Future prospects of parameters	<p>The future prospects of range for this species is considered to be overall stable in Wales. Range reported is comparable with range values given in Natural Resources Wales, 2013. There is little evidence to show significant change in range; although it is a species that may benefit from climate change predictions (Mathews et al. 2018) in terms of population and range, it is unknown if this will result in measurable changes within the next 12 years. The future prospects of population for this species is considered to be very positive in Wales. There is no reason to assume that the current reported increasing population trend will not continue over the next 12 years. The future prospects of habitat of the species is considered to be overall stable in Wales. Currently available habitat is considered sufficient to maintain the species at FCS and there are no specific wide scale threats to the habitat for the species. There is therefore no reason to assume that the current reported trend will not continue over the next 12 years.</p>
12.1 Population size inside the pSCIs, SCIs and SACs network	<p>Based on roost counts of 29 maternity sites in 2016/2017 - NBMP data: In Natural Resources Wales (2013), the number given used the same methodology for population calculations however this assumed all males born within a roost stay within the confines of a SAC. This is unlikely, so the 2018 estimate given is a 'best value' based on actual observed individuals counted within maternity roosts, however the figure is likely to be closer to a minimum value as it also does not take into account additional occurrences away from the maternity roosts within SACs where lesser horseshoe bats are a designating feature or occurrences within SACs where lesser horseshoe bats are not a designated feature. It should also be noted that this estimate is only applicable during the maternity season and the number within the winter hibernation season may be lower.</p>
12.3 Population size inside the network; Method used	<p>See 6.7</p>

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

See 6.7

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

See 6.7

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