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:

S1304 - Greater horseshoe bat (*Rhinolophus ferrumequinum*)

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	**1304**
1.3 Species scientific name	**Rhinolophus ferrumequinum**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Greater 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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5. Range

5.1 Surface area (km²)		
5.2 Short-term trend Period		
5.3 Short-term trend Direction	Increasing (+)	
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) b) Operator c) Unknown d) Method	
5.11 Change and reason for change in surface area of range	Genuine change 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	1965
	c) Maximum	3930
	d) Best single value	2751
6.3 Type of estimate	Best estimate	

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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
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 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)?	Yes
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	
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		

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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 grazing or mowing) (A06)	H
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	H
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) in existing urban or recreational areas (F02)	H
Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01)	H
Reduced fecundity / genetic depression (e.g. inbreeding or endogamy) (L05)	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)	M
Livestock farming (without grazing) (A14)	M
Sports, tourism and leisure activities (F07)	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

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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

Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production (CA09)
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)
Adapt mowing, grazing and other equivalent agricultural activities (CA05)
Restore small landscape features on agricultural land (CA02)
Improvement of habitat of species from the directives (CS03)
Adapt/change forest management and exploitation practices (CB05)
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

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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	number of individuals (i)
	b) Minimum	
	c) Maximum	
	d) Best single value	1795
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

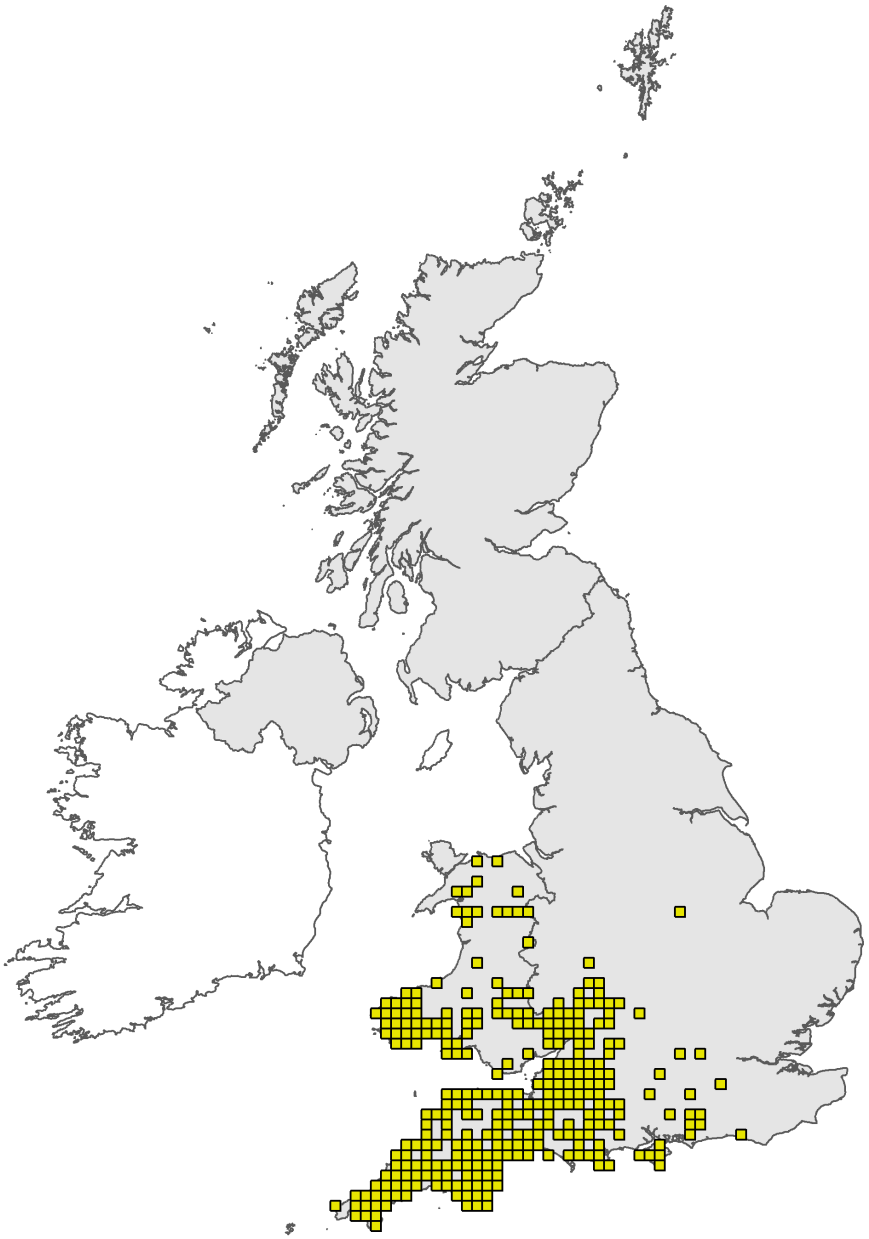

Figure 1: UK distribution map for S1304 - Greater horseshoe bat (*Rhinolophus ferrumequinum*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 S1304 - Greater horseshoe bat (*Rhinolophus ferrumequinum*).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 ferrumequinum (1304)

Field label	Note
2.2 Year or Period	R. ferrumequinum has a restricted and fragmented distribution in Great Britain, with populations scattered across south-west and southern England and south and south-west Wales. Individuals, perhaps vagrants or colonisers, have been recorded more widely, particularly in north Wales and the Welsh borders. There have been more such records in recent years, but it is not yet clear if these represent established populations. This 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. 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 more common and widespread lesser horseshoe bat (R. hipposideros) if roosting bats are not seen close up (e.g. in mines or cave chambers). In such circumstances, records are not considered as valid unless confirmed using another method.

Species name: Rhinolophus ferrumequinum (1304) 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 Welsh range is given as 13,230 km2 (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). An increasing number of records of small numbers of animals at the edge of their range indicates that the range may be expanding. 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. However there does appear to be a genuine change as the sites where individuals or small numbers of animals are recorded are often sites that have been monitored for many years for their lesser horseshoe bat colonies and where the presence of R. ferrumequinum bats would have been recorded if observed. An increase in range may be due in part to climate change as the species in Wales is on the northern and western edges of its range. It may also be due to more effective protection and management of roost sites for the more widespread lesser horseshoe bats (R. hipposideros) bat which have similar roost requirements. Increased breeding success is also promoting dispersal of young further afield. Mathews et al. 2018 states 'Comprehensive monitoring of cave and mine hibernation sites for lesser horseshoes in North Wales during the mid-1980s, nor monitoring of lesser horseshoe roosts by the Vincent Wildlife Trust from 1990 onwards resulted in any records of greater horseshoes. The discovery of greater horseshoes breeding in the Tanat Valley and areas of Herefordshire over the past decade indicate a real shift in the population to the north.'

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 greater horseshoe summer colony roost counts.
6.2 Population size	There are a number of approaches to population estimates. Mathews et al. 2018 bases a minimum population size estimate on the assumption that 50% of bats are female bats and 50 % are male within the counted maternity roosts, similarly the maximum estimate assumes 100% of counted bats are female. Based on expert opinion, the best single figure assumes that 70% of the individuals in maternity colonies are female.
6.4 Additional population size	Based on Mathews et al. (2018) methodology and updated count information from the 2017 NBMP data: Mathews et al. (2018) state 'The Best estimate provided here is therefore based on expert opinion that 70% of the individuals in maternity colonies are female. The lower limit uses a conservative assumption of 50% females, meaning that the entire population is counted at maternity sites; 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.`
6.7 Short term trend; Period	Based on National Bat Monitoring Programme 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 rise of 58.6 since 2006 but it is not statistically significant. The GB short term trend based on maternity roost count data shows a 63.3 index increase since 2006 which is statistically significant. Trends based on hibernation counts are currently considered to be more statistically robust over maternity roost counts.
6.16 Change and reason for change in population size	Surveillance of the 5 known Welsh maternity roosts is undertaken annually and creates accurate data giving a minimum count with a high degree of confidence. This data supports the trends drawn from hibernation data, and that the increase in population reported is genuine. 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.
6.17 Additional information	Is reproduction, mortality and age structure deviating from normal? UNKNOWN There have been no studies in the last 7 years to enable a conclusion to be drawn.

7.1 Sufficiency of area and quality of occupied habitat	- area = 13,200 km2. 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. This estimate is different from the 2013 reporting round figure (6049 km2) 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 = Unknown - No or insufficient reliable information available Although we do not have a reliable measure of the quality of the occupied habitat the population trend for the species is increasing and therefore the area and quality of occupied habitat is likely to be sufficient to maintain the species at FCS. Overall = Yes R. ferrumequinum mainly occupies lowlands, usually below 800m. The species requires a mosaic of grazed pasture and woodlands within a radius of 4km from roost sites. This should provide enough food during the spring and summer months for pregnant and lactating females, as well as for the young on their early foraging flights; usually within 1km from the roost. The ideal habitat is a landscape mosaic of permanent pasture and ancient, deciduous woodland, linked with an abundance of tall bushy hedges with a good supply of insect food (Ransome. 1997; 2000). A study on the preferred habitat of R. ferrumequinum carried out over a number of different sites suggests in order of preference, habitats most often visited are: Cattle pastures (39%), Ancient semi-natural woodland (19%) > Meadows (10%) > Other pastures (10%) > Broad leaved woodlands > Others (Ransome & McOwat. 1994). The order of preference changes throughout the seasons with woodlands being utilised more frequently in cooler months, possibly as they maintain a 1 - 1.5 degree C higher temperature than open pasture which may be enough to encourage insect flight. R. ferrumequinum has quite specific roosting requirements. Maternity roosts are usually in attics of old buildings, but caves and mines will also be utilised. The species hibernates underground in caves and disused mines and occasionally cellars and tunnels. It prefers warmer sites than those chosen by other bat species, 11 degree C in October down to 7 degree C in February (Ransome. 1990) ideally with a high humidity >90% (Harris et al. 1995). If the temperature fluctuates individuals will awake from hibernation to search for a more suitable site. When hibernating they are especially prone to arousal by lights or noises when at 9 degree C or above, or at dusk (Ransome & Jones. 2008). R. ferrumequinum is very faithful to its roosts and hibernation sites are generally close to maternity roosts.

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 unknown 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.
7.4 Short term trend; Direction	There is insufficient data on any change in the level of suitable habitat or any change in the 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.

8.1 Characterisation of pressures/ threats	Pressures: A06- Abandonment of grassland management & 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 species diet (A14). F02 - Construction or modification in existing urban or recreational areas, A05- Removal of small landscape features: Increasing urbanisation results in loss of foraging habitat, severance of commuting routes and isolation of colonies. Demolition and conversion of buildings results in loss of roost sites. This species requires large open roof spaces with large access points which are easily lost when converted. E01 - Roads, paths, railroads and related infrastructure: These pressures also act via construction of new, and widening/realignment of existing linear infrastructure projects. The species is low flying and likely to be vulnerable to mortality through direct collision with vehicles (Fensome & Mathews, 2016). Lighting from urbanisation and infrastructure can sever commuting routes, impact foraging areas and delay emergence times. F07 - Sports, tourism and leisure activities & 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 future occupation when previously abandoned mine sites are re-opened or re-engineered. B05 - Logging without replanting & 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: L05 - Reduced fecundity / genetic depression: The loss of mating roosts may lead to inbreeding (Rossiter et al., 2001). 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. 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 can be ameliorated by providing good quality habitat close to hibernation sites. C01 - Extraction of minerals: Mine collapse and flooding and reopening of mines can all threaten the species. A06- Abandonment of grassland management & 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, threats during construction of new, and widening/realignment of existing linear infrastructure projects in the future is likely to continue. F07 - Sports, tourism and leisure activities, the use of underground sites for recreational purposes will continue to threaten the species. B05 - Logging without replanting & B02 - Conversion to other types of forests including monocultures : loss/reduction in value of woodland habitat will also continue.

9.5 List of main conservation measures	CF03 Reduce impact of outdoor sports, leisure and recreational activities & 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. CE01 Reduce impact of transport operation and infrastructure & 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 & 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; CF01 Manage conversion of land for construction and development of infrastructures: R. ferrumequinum hunts over cattle-grazed pasture and in deciduous or mixed woodland. Environmental land management schemes in the agricultural and forestry sectors are now widely used to ensure these habitats in the vicinity of roosts are well-managed and provide appropriate insect food at the correct time of year. All maternity roosts are protected, many as Natura 2000 sites, and are managed to maintain appropriate conditions for the bats. Planning at landscape scale is required to conserve commuting routes and foraging areas. These measures help to address Pressures/Threats A06, A14, B05 & B02.
10.1 Future prospects of parameters	The future prospects of range for this species is considered to be positive in Wales given the reported increasing population trend, the recently observed changes in range northward (Mathews et al. 2018), there is no reason to assume that the increase in range will not continue over the next 12 years.The future prospects of population for this species is considered to be 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.
12.1 Population size inside the pSCIs, SCIs and SACs network	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 greater horseshoe bats are a designating feature or occurrences within SACs where greater 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.
12.3 Population size inside the network; Method used	See 6.7
12.4 Short term trend of the population size within the network; Direction	See 6.7
12.5 Short term trend of population size within the network; Method used	See 6.7