Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A

2019-2024

Conservation status assessment for the species:

S1303 - Lesser horseshoe bat

(*Rhinolophus hipposideros*)

Wales

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JNCC

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This report was produced by JNCC in collaboration with Natural Resources Wales.

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Important note - Please read

- The information in this document represents the Wales Report under The Conservation of Habitats and Species Regulations 2017 (as amended), Regulation 9A, for the period 2019-2024.
- It is based on supporting information provided by Natural Resources Wales, which is documented separately.
- The Habitats Regulations reporting 2019-2024 Approach Document provides details on how this supporting information contributed to the UK Report and the fields that were completed for each parameter.
- Maps showing the distribution and range of the species are included.
- Explanatory notes (where provided) are included at the end. These provide additional audit trail information to that included within the assessments. Further underpinning explanatory notes are available in the related country reports.
- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; and/or (iii) the field was not relevant to this species (section 12 National Site Network coverage for Annex II species).

Further details on the approach to the Habitats Regulations Reporting 2019-2024 are available on the JNCC website.

Assessment Summary: Lesser horseshoe bat

Distribution Map

Range Map

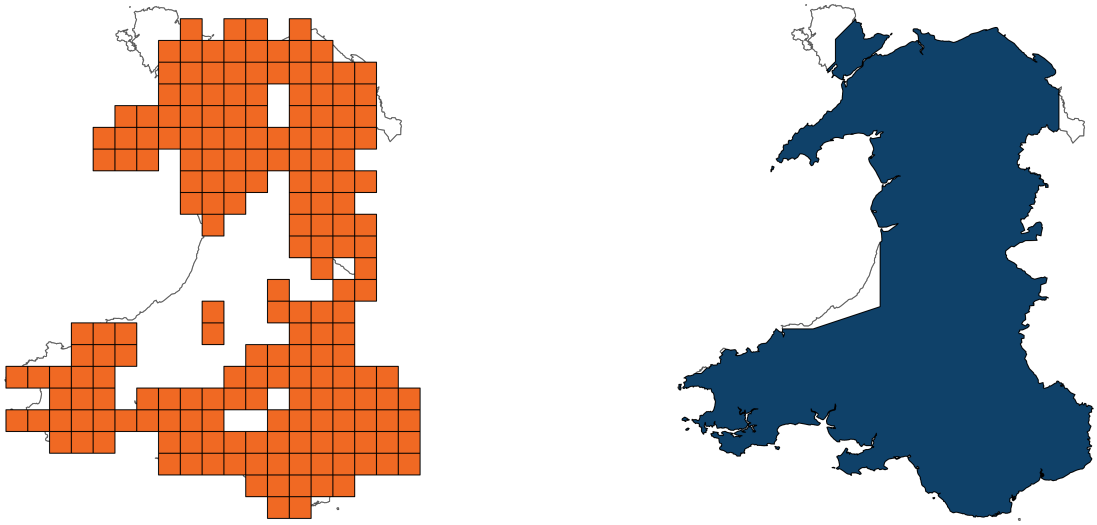

Figure 1: Wales distribution and range map for S1303 - Lesser horseshoe bat (*Rhinolophus hipposideros*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. The 10km grid square distribution map is based on available species records within the current reporting period.

Table 1: Table summarising the conservation status for S1303 - Lesser horseshoe bat (*Rhinolophus hipposideros*). Overall conservation status for species is based on assessments of range, population, habitat for the species, and future prospects.

Overall Conservation Status (see section 11)

Favourable (FV)

Breakdown of Overall Conservation Status

Range (see section 5)	**Favourable (FV)**
Population (see section 6)	**Favourable (FV)**
Habitat for the species (see section 7)	**Favourable (FV)**
Future prospects (see section 10)	**Favourable (FV)**

List of Sections

National Level

1. General information

1.1 Country	Wales
1.2 Species code	S1303
1.3 Species scientific name	*Rhinolophus hipposideros*
1.4 Alternative species scientific name	
1.5 Common name	Lesser horseshoe bat
Annex(es)	II, IV

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1995-2024
2.3 Distribution map	Yes
2.4 Distribution map; Method used	Complete survey or a statistically robust estimate

2.5 Additional information

No additional information

3. Information related to Annex V Species

3.1 Is the species taken in the wild / exploited?

3.2 What measures have been taken?

a) Regulations regarding access to property
b) Temporary or local prohibition on the taking of specimens in the wild and exploitation
c) Regulation of the periods and/or methods of taking specimens
d) Application of hunting and fishing rules which take account of the conservation of such populations

e) Establishment of a system of licences for taking specimens or of quotas

f) Regulation of the purchase, sale, offering for sale, keeping for sale, or transport for sale of specimens

g) Breeding in captivity of animal species as well as artificial propagation of plant species

Other measures

Other measures description

3.3: Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)

a) Unit

Table 2: Quantity taken from the wild during the reporting period (see 3.3a for units). For species with defined hunting seasons, Season 1 refers to 2018/2019 (autumn 2018 to spring 2019), and Season 6 to 2023/2024. For species without hunting seasons, data are reported by calendar year: Year 1 is 2019, and Year 6 is 2024.

	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
b) Minimum	-	-	-	-	-	-
c) Maximum	-	-	-	-	-	-
d) Unknown	-	-	-	-	-	-

3.4: Hunting bag or quantity taken in the wild; Method used

3.5: Additional information

No additional information

Biogeographical Level

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs ATL

4.2 Sources of information

See section 14 References

5. Range

5.1 Surface area (km²)	20,001.87
5.2 Short-term trend; Period	2013-2024
5.3 Short-term trend; Direction	Stable
5.4 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
f) Rate of decrease	
5.5 Short-term trend; Method used	Complete survey or a statistically robust estimate
5.6 Long-term trend; Period	
5.7 Long-term trend; Direction	
5.8 Long-term trend; Magnitude	
a) Minimum	
b) Maximum	
c) Rate of decrease	

5.9 Long-term trend; Method used	

5.10 Favourable Reference Range (FRR)

a) Area (km²)	
b) Pre-defined increment	Current range is less than 2% smaller than the FRR
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	moderate

5.11 Change and reason for change in surface area of range

a) Change	Yes
b) Genuine change	No
c) Improved knowledge or more accurate data	Yes
d) Different method	Yes
e) No information	No
f) Other reason	No
g) Main reason	Use of different method

5.12 Additional information

No additional information

6. Population

6.1 Year or period	2019-2024

6.2 Population size (in reporting unit)

a) Unit	number of individuals
b) Minimum	22,342
c) Maximum	44,684

d) Best single value	31,279
6.3 Type of estimate	Best estimate
6.4 Quality of extrapolation to reporting unit	

6.5 Additional population size (using population unit other than reporting unit)

a) Unit	number of map 1x1 km grid cells
b) Minimum	
c) Maximum	
d) Best single value	647
e) Type of estimate	Best estimate
6.6 Population size; Method used	Complete survey or a statistically robust estimate
6.7 Short-term trend; Period	2017-2022
6.8 Short-term trend; Direction	Increasing
6.9 Short-term trend; Magnitude	
a) Estimated minimum	18.5
b) Estimated maximum	49.8
c) Pre-defined range	
d) Unknown	No
e) Type of estimate	95% confidence interval
f) Rate of decrease	
6.10 Short-term trend; Method used	Complete survey or a statistically robust estimate
6.11 Long-term trend; Period	1999-2023
6.12 Long-term trend; Direction	Increasing
6.13 Long-term trend; Magnitude	

a) Minimum	49.2
b) Maximum	115.9
c) Confidence interval	95
d) Rate of decrease	
6.14 Long-term trend; Method used	Complete survey or a statistically robust estimate

6.15 Favourable Reference Population (FRP)

ai) Population size	
aii) Unit	
b) Pre-defined increment	Current population is less than 5% smaller than the FRP
c) Unknown	No
d) Method used	Reference-based approach
e) Quality of information	moderate

6.16 Change and reason for change in population size

a) Change	Yes
b) Genuine change	Yes
c) Improved knowledge or more accurate data	Yes
d) Different method	No
e) No information	No
f) Other reason	No
g) Main reason	Genuine change

6.17 Additional information

No additional information

6.18 Age structure, mortality and reproduction deviation	Unknown

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat (for long-term survival)

a) Is area of occupied habitat sufficient?	Yes
b) Is quality of occupied habitat sufficient?	Unknown
c) If No or Unknown, is there a sufficiently large area of unoccupied habitat of suitable quality?	Yes

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

a) Sufficiency of area of occupied habitat; Method used	Complete survey or a statistically robust estimate
b) Sufficiency of quality of occupied habitat; Method used	Based mainly on expert opinion with very limited data

7.3 Short-term trend; Period	2013-2024
7.4 Short-term trend; Direction	Stable
7.5 Short-term trend; Method used	Based mainly on expert opinion with very limited data

7.6 Long-term trend; Period	
7.7 Long-term trend; Direction	
7.8 Long-term trend; Method used	

7.9 Additional information

No additional information

8. Main pressures

8.1 Characterisation of pressures

Table 3: Pressures affecting the species, including timing and importance/impact ranking. Pressures are defined as factors acting currently and/or during the reporting period (2019–2024). Rankings are: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Pressure	Timing	Ranking
PA04: Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.)	Ongoing and likely to be in the future	High (H)
PA05: Abandonment of management/use of grasslands and other agricultural and agroforestry systems (e.g. cessation of grazing, mowing or traditional farming)	Ongoing and likely to be in the future	High (H)
PA10: Livestock farming (without grazing)	Ongoing and likely to be in the future	High (H)
PB02: Conversion from one type of forestry land use to another	Ongoing and likely to be in the future	High (H)
PB05: Logging without replanting or natural regrowth	Ongoing and likely to be in the future	High (H)
PC01: Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell)	Ongoing and likely to be in the future	Medium (M)
PE01: Roads, paths, railroads and related infrastructure	Ongoing and likely to be in the future	High (H)
PF02: Construction or modification (e.g. of housing and settlements) in existing built-up areas	Ongoing and likely to be in the future	High (H)
PF05: Sports, tourism and leisure activities	Ongoing and likely to be in the future	High (H)
PM06: Other natural catastrophes	Only in future	High (H)

8.2 Sources of information

See section 14 References

8.3 Additional information

No 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 National Site Network
9.4 Response to measures	Medium-term results (within the next two reporting periods, 2025–2036)

9.5 List of main conservation measures

Table 4: Key conservation measures addressing current pressures and/or anticipated threats during the next two reporting periods (2025–2036). Measures are ranked by importance/impact: High (direct/immediate influence and/or large spatial extent) and Medium (moderate direct/immediate influence, mainly indirect and/or regional extent).

Conservation measure	Ranking
MA02: Restore small landscape features on agricultural land	High (H)
MA05: Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	High (H)
MA09: Manage the use of natural and synthetic fertilisers as well as chemicals in agricultural for plant and animal production	High (H)
MB05: Adapt/change forest management and exploitation practices	High (H)
ME01: Reduce impact of transport operation and infrastructure	High (H)
ME05: Manage/reduce/eliminate noise, light and other forms of pollution from transport	High (H)
MF01: Managing the impacts of converting land for construction and development of infrastructure	High (H)
MF03: Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	High (H)
MS03: Restoration of habitat of species from the directives	Medium (M)

9.6 Additional information

No additional information

10. Future prospects

10.1a Future trends of parameters

ai) Range	Overall stable
bi) Population	Very Positive - increasing >1% (more than one percent) per year on average
ci) Habitat for the species	Overall stable

10.1b Future prospects of parameters

aii) Range	Good
bii) Population	Good
cii) Habitat for the species	Good

10.2 Additional information

No additional information

11. Conclusions

11.1 Range	Favourable (FV)
11.2 Population	Favourable (FV)
11.3 Habitat for the species	Favourable (FV)
11.4 Future prospects	Favourable (FV)
11.5 Overall assessment of Conservation Status	Favourable (FV)
11.6 Overall trend in Conservation Status	Improving

11.7 Change and reason for change in conservation status

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

11.7 Change and reason for change in conservation status trend

This field is not reported as the period 2019-2024 marks the first instance in which conservation status has been assessed at the national level, meaning no comparisons to previous reports can be drawn.

11.8 Additional information

No additional information

12. UK National Site Network (pSCIs, SCIs, SACs) coverage for Annex II species

12.1 Population size inside the pSCIs, SCIs and SACs network

a) Unit	number of individuals
b) Minimum	
c) Maximum	
d) Best single value	5,750
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	Based mainly on expert opinion with very limited data
12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction	Stable

12.7 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Method used	Based mainly on expert opinion with very limited data

12.8 Additional information

No additional information

13. Complementary information

13.1 Justification of percentage thresholds for trends

No justification information

13.2 Trans-boundary assessment

No trans-boundary assessment information

13.2 Other relevant information

No other relevant information

14. References

Biogeographical and marine regions

4.2 Sources of information

Aderyn, LERC Wales' Biodiversity Information & Reporting Database. Data downloads under NRW licence 2024.

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Main pressures

8.2 Sources of information

No sources of information

15. Explanatory Notes

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, and updated with recent records from Aderyn. 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 (R. ferrumequinum) 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.
5.3: Short-term trend; Direction	Although mapping may display small changes in range since the 2019 report (based on Mathews et al. 2018), there is no evidence of a genuine change to range for this widespread species. Any minor expansions are due to surveyor effort/additional data rather than genuine change.
5.11: Change and reason for change in surface area of range	In the 2019 Article 17 report, the area of land (including unsuitable habitat) contained within the range was given as 19,549 km2 (Mathews et al. 2018). Mathews et al. 2018, applied an alpha hull value of 20km 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 differs from the approach taken in this reporting round, and also the 2013 and 2007 reports, whereby a 45km alpha hull value was used for all species with a starting range unit of individual 10km squares. To produce the range maps JNCC were provided with any additional 10km x 10km grid squares where bats roost records were located between 2018 and 2024, along with the 2019 Article 17 report data. No grid squares have been removed as there have not been any widespread surveys that could indicate loss of a species from any area. The resulting updated maps produced by JNCC indicate a range of 20,001 km2. The increase in range indicated is likely mainly due to a change in methodology and some additional records rather than a genuine change in range. 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.
6.2: Population size	Unit = Individuals

Minimum = 21305 (based on 50% male occupancy)

Maximum = 42610 (based on 100% female occupancy)

Best Single Value = 29827 (based on 70% female occupancy)

The population data is derived from annual counts undertaken between 2021-24 (as available) as part of the National Bat Monitoring Programme Lesser horseshoe summer colony roost counts.

Population estimate methodology taken from Mathews et al. (2018) and updated count information from NBMP data:

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 [based 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. Calculations excludes roosts of less than 30 bats.

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 (Zarzoso-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 regarding male/female ratios within pre-breeding maternity roosts which are used to calculate population estimates, annual counts of a significant proportion of maternity roosts in Wales are achieved to support the population estimates.
6.7: Short-term trend; Period	Based on Bat Conservation Trust (2024) NBMP short-term period of 5 years (Bat Conservation Trust 2024)
6.8: Short-term trend; Direction	Bat Conservation Trust. 2024 states that the Welsh short term trend (2017 - 2022) based on hibernation count data has increased significantly by 31.2% (95% CI 18.5% to 49.8%). Based on maternity roost data, the trend has increased by 6.5% (95% CI -3.7% to 17%), however this change is not statistically significant. The last Article 17 reporting round reported a best single value population of 30,700 individuals based on data from counts up to 2017. This Regulation 9a report states Best Single Value has been calculated as 31,279 individuals based on data from 2022-24 counts. This small increase does not reflect the trends identified within Bat Conservation Trust. 2024, it is the result of the best data available at the time of population calculation and therefore

	the NBMP trend is viewed as a more reliable reflection of the true trend. Preliminary regional analysis of trend suggests that the rate of increase may be driven by rapidly increasing population in the northern parts of their range in Wales, while the picture is not as positive in the south. While this should be kept in mind, it requires further analysis and interpretation to understand implications.
6.12: Long-term trend; Direction	Between 1999 and 2023 the smoothed survey index has increased in Wales significantly by 227.3% (95% CI 163.7% to 296.3%) based on hibernation site survey data, and has increased significantly by 79.1% (95% CI 49.2% to 115.9%) based on Maternity roost site survey data. From 1999-2023 on average 87 hibernations sites and 94 maternity sites per year contribute to the overall trend analysis (sites surveyed in two or more years with lesser horseshoe bat present in at least one year).
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, 2024) 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.

6.18: Age structure, mortality and reproduction	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	Habitat area 19,500 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 and is considered to be unoccupied. 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. Habitat 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; Methods 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.
7.4: Short-term trend; Direction	There is insufficient data on any trend in the level of suitable habitat or quality of habitat for the species. Given the increase in population it is assumed that habitat is likely to be at least stable.
8.1: Characterisation of pressures	Pressures: PA05: Abandonment of management/use of grasslands and other agricultural and agroforestry systems (e.g. cessation of grazing, mowing or traditional farming) & PA10: 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 PA10).

PF02: Construction or modification (e.g. of housing and settlements) in existing built-up areas, PA04: Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.):

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, R. hipposideros 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. R. hipposideros 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.

PE01 - 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 & Mathews, 2016). Lighting from urbanisation and infrastructure can sever commuting routes, impact foraging areas and delay emergence times. PF05 - Sports, tourism and leisure activities & PC01: Extraction of minerals (e.g. rock, metal ores, gravel, sand, shell): 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. PB05: Logging without replanting or natural regrowth & PB02: Conversion from one type of forestry land use to another & PB02: Conversion from one type of forestry land use to another: Loss/reduction in value and extent of woodland habitat is a pressure on this species (see 7.2). PM06: 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.
9.5: List of main conservation measures	MF03: Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats) & MF01: Managing the impacts of converting land for construction and development of infrastructure:

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 PF02, PF05, PC01.

ME01: Reduce impact of transport operation and infrastructure & ME05: 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 PE01 & PA04.

MA09: Manage the use of natural and synthetic fertilisers as well as chemicals in agricultural for plant and animal production; MA02: Restore small landscape features on agricultural land; MA05: Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning); MS03: Restoration of habitat of species from the directives; MB05: 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 PA05, PA10, PB05 & PB02.
10.1: Future trends and prospects of parameters	Future prospects of range The future prospects of range for this species is considered to be overall stable in Wales. 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. Future prospects of population 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. Future prospects of habitat for species 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.
11.1: Range	Conclusion on Range reached because: (i) the short-term trend direction in Range surface area is stable; and (ii) the current Range surface area is approximately equal to the Favourable Reference Range.

11.2: Population	Conclusion on Population reached because:(i) the short-term trend direction in Population size is increasing; (ii) the current Population size is approximately equal to the Favourable Reference Population; and iii) reproduction, mortality and age structure does not have data available.
11.3: Habitat for the species	Conclusion on Habitat for the species reached because: i) the area of occupied habitat is sufficiently large for the long-term survival of the species (ii) it is unknown whether the quality of occupied habitat is suitable for the long-term survival of the species; and iii) there is a sufficiently large area of occupied and unoccupied habitat of suitable quality for long term survival (iv) the short-term trend in area of habitat is stable.
11.4: Future prospects	Conclusion on Future prospects reached because: (i) the Future prospects for Range are good; (ii) the Future prospects for Population are good; and (iii) the Future prospects for Habitat for the species are good.
11.5: Overall assessment of Conservation Status	Overall assessment of Conservation Status is Favourable because all of the conclusions are Favourable.
12.1: Population size inside the pSCIs, SCIs and SACs network	Best single value = 5750 (Actual Observed individuals) Best value. Based on NBMP data roost count data of 33 maternity sites, between 2023 and 2024: In Natural Resources Wales (2013), the reported count 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 gave a 'best single value' based on actual observed individuals counted within maternity roosts. This method has again been adopted for this report. It should be noted that this 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 notified feature, or SACs for hibernating lesser horseshoe bats only, 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 vary significantly.
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 Although the reported figure is below the previous Article 17 report, the trend across Wales is likely to be reflective of that within the SACs network; a general short and long term increase, despite some short term roosts losses due to rectifiable issues. NRW Baseline Assessments of SACs concluded that for the 5 SACs with lesser horseshoe bats listed as a primary reason for site selection, 4 were in favourable condition due to breeding populations being at least stable or increasing.
12.5: Short-term trend of population size within the network; Method used	See 6.7
6.15: Favourable Reference Population (FRP)	The UK-level FRV for population was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive reports and reflects the full rationale used for the 2019 Article 17 reporting. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current population trends and abundance.
5.10: Favourable Reference Range (FRR)	The UK-level FRV for range was developed by JNCC using an audit trail based on the year the FRV was first established and any changes made in subsequent reporting rounds. The audit may draw from any combination of the 2007, 2013, or 2019 Habitats Directive

reports and reflects the full rationale used for the 2019 Article 17 reporting. This FRV was reviewed by Welsh experts and considered appropriate for use in Wales based on current distribution and trends.