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

2019-2024

Conservation status assessment for the species:

S1326 - Brown long-eared bat

(*Plecotus auritus*)

Wales

Cyfoeth Naturiol Cymru
Natural Resources Wales

JNCC

For further information please contact:

Natural Resources Wales, Welsh Government Offices, Cathays Park, King Edward VII Avenue, Cardiff, CF10 3NQ. https://naturalresources.wales

JNCC, Quay House, 2 East Station Road, Fletton Quays, Peterborough, PE2 8YY. https://jncc.gov.uk

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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: Brown long-eared bat

Distribution Map

Range Map

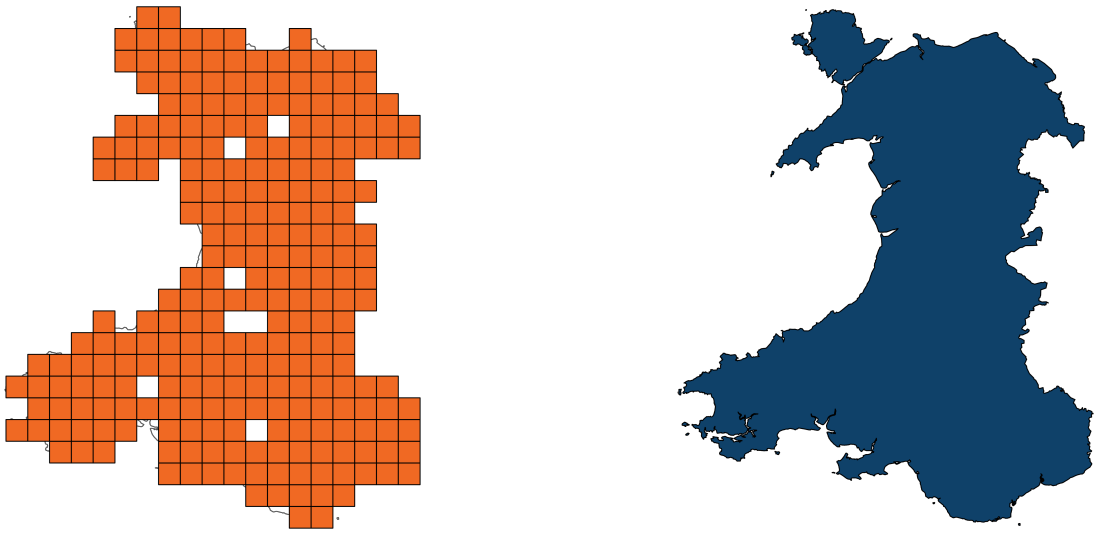

Figure 1: Wales distribution and range map for S1326 - Brown long-eared bat (*Plecotus auritus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority. 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 S1326 - Brown long-eared bat (*Plecotus auritus*). 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	S1326
1.3 Species scientific name	*Plecotus auritus*
1.4 Alternative species scientific name	
1.5 Common name	Brown long-eared bat
Annex(es)	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	Based mainly on extrapolation from a limited amount of data

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)	20,823.02
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	Based mainly on expert opinion with very limited data
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	5,370
c) Maximum	228,000

d) Best single value	96,600
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	799
e) Type of estimate	Best estimate
6.6 Population size; Method used	Based mainly on extrapolation from a limited amount of data
6.7 Short-term trend; Period	2017-2022
6.8 Short-term trend; Direction	Stable
6.9 Short-term trend; Magnitude	
a) Estimated minimum	
b) Estimated maximum	
c) Pre-defined range	
d) Unknown	
e) Type of estimate	
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	Stable
6.13 Long-term trend; Magnitude	

a) Minimum	−51.2
b) Maximum	64.1
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	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

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

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

a) Sufficiency of area of occupied habitat; Method used	Based mainly on expert opinion with very limited data
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
PA02: Conversion from one type of agricultural land use to another (excluding drainage and burning)	Ongoing and likely to be in the future	Medium (M)
PA03: Conversion from mixed farming and agroforestry systems to specialised (e.g. single crop) production	Ongoing and likely to be in the future	High (H)
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)
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)
PB07: Removal of dead and dying trees (including debris)	Ongoing and likely to be in the future	High (H)
PB09: Clear-cutting, removal of all trees	Ongoing and likely to be in the future	High (H)
PB14: Forest management reducing old growth forests	Ongoing and likely to be in the future	High (H)
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)

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	Long-term results (after 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
MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land	High (H)
MA02: Restore small landscape features on agricultural land	High (H)
MB04: Adapt/manage reforestation and forest regeneration	High (H)
MB05: Adapt/change forest management and exploitation practices	High (H)
MB06: Stop forest management and exploitation practices	High (H)
ME01: Reduce impact of transport operation and infrastructure	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)
MF10: Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities	High (H)

9.6 Additional information

No additional information

10. Future prospects

10.1a Future trends of parameters

ai) Range	Overall stable
bi) Population	Overall stable
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	Stable

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	
b) Minimum	
c) Maximum	
d) Best single value	
12.2 Type of estimate	
12.3 Population size inside the network; Method used	
12.4 Short-term trend of population size within the network; Direction	
12.5 Short-term trend of population size within the network; Method used	
12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction	
12.7 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Method used	

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.
2.4: Distribution map; Method used	P. auritus is a common and widespread species, found throughout Wales. Gaps in distribution probably reflecting an absence of survey data rather than an absence of the species, though it may be less common in upland areas. There have been no structured distribution surveys for this species and records are based on ad-hoc recording in the field, bat roost visits following enquiries to the statutory nature conservation agencies (SNCOs) and data from structured surveillance schemes. However, this species is often found in buildings and is easily recognised, so level of recording is likely to be high. The species has also been the subject of several extensive research projects (Stebbings 1966; Entwistle et al., 1996, 1997; Swift 1998). It is a low-intensity echolocator, so bat detector surveys have limited value because of short detection range. Other survey methods (counts at breeding and hibernation sites) are more resource-intensive and less statistically robust.
5.3: Short-term trend; Direction	P. auritus is a widely distributed species, found in all wooded landscapes but tree-roosts are critically under-recorded and acoustic surveys are also likely to substantially under-record the species because it has very quiet calls (Russ 2012). There is also potential for the species to be overlooked in open habitat surveys, such as those for wind farms, as its calls are substantially different from those used in more enclosed areas (Mathews et al. 2018); and because the calls can also be confused with those of Myotis spp., particularly when heterodyne detectors are used (Russ 2012). Because the species uses open areas such as parks and gardens, as well as woodland, habitable area within the range is expected to include all habitats except montane.

	Whilst this potentially overestimates the true habitable area, this broad habitat use suggests the range has not changed in the short-term.
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 20,643 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 20,823 km2. This very small increase in range is likely mainly due to a change in methodology rather than a genuine change in range. Whilst the increased use of advanced / full spectrum bat detectors is likely to have resulted in increased detector records of this species, it undoubtedly remains significantly under-recorded during detector surveys due to its quiet echolocation call.

6.2: Population size	Based on Mathews et al. 2018 methodology: Unit = Individuals Minimum = 5,370 Maximum = 228,000 Best Single Value: 96,600 There is no update of this estimate from the previous Article 17 reporting round. Mathews et al. 2018 population estimates were derived by first calculating the adult bat density (bats/km2) within poor, average and good habitat and then multiplying this with the total habitable area within their range to give lower, median and upper population estimates. Habitable area was defined as all habitats within the range excluding montane habitats since these are unlikely to provide suitable locations for roosts. Because of the landscape-wide movements of bats and their dependency on a matrix of habitats and roosting locations, it is not currently possible to make more refined estimates of the area of suitable habitat to be used for population calculations. Details of calculations are as follows: Adult bat density (bats/km2) Median density=[(median n. bats/roost†) x (p♀‡) x (n roosts/typical km2 average habitat)]x 2 Lower limit=[(lower plausible n. bats/roost) x (p♀min) x (plausible n. roosts/typical km2 poor habitat)]x 2 Upper limit = [(upper plausible n. bats/roost) x (p♀max) x

	(plausible n. roosts/typical km2 good habitat)]x 2 † roost is typical maternity roost in the pre-parturition period. n. is number of adults. ‡ p♀: proportion female. p♀min and p♀max are lowest and highest plausible proportions of adult females in typical maternity roost Population size Total Adult Population = Median adult density (bats/km2) x total habitable area within range (km2) Lower Limit=Lower limit adult density (bats/km2) x total habitable area within range (km2) Upper Limit=Upper limit adult density (bats/km2) x total habitable area within range (km2) There is uncertainty surrounding the population estimates for this species as demonstrated by the relatively wide confidence intervals. Given the absence of data on roost density in trees, it is difficult to compute a more accurate total population estimate. It is considered unlikely that most maternity roosts in Britain are known and therefore it was also not possible to make a total count. No population genetics study has been conducted to estimate regional or national population sizes, and therefore no alternative metrics of population size were available. Although a population estimate of approximately 17,500 individuals was given in Harris et al. 1995 this estimate was graded as having very poor reliability (score 4/5) and was largely derived from expert opinion on the ratio of Brown long-eared to pipistrelle bats (roosts and individuals). Direct comparison with current estimates is therefore not possible.
6.6: Population size; Method used	The reported figure in 6.2 is based mainly on extrapolation from a limited amount of data.

	The reported figure in 6.5 is based on occupied 1km grid squares and is therefore reliant on existing records.
6.7: Short-term trend; Period	Based on Bat Conservation Trust (2024) NBMP short-term period of 5 years.
6.8: Short-term trend; Direction	The National Bat Monitoring Programme (BCT 2018a) draws trends for Wales based on hibernation survey data. The population of brown long-eared bat in Wales is considered to have been stable in the short-term (since 2017). Over the last five years (2017 - 2022) the smoothed survey index has decreased by 19.9% (95% CI -48.2% to 16.3%), however this change is not statistically significant and is therefore reported as stable.
6.12: Long-term trend; Direction	The NBMP coordinates long-term hibernation studies in Wales to give trend data for the species. The population of brown long-eared bat in Wales is considered to have been stable in the long-term (since 1999). Between 1999 and 2023 the smoothed survey index has increased by 8.1% (95% CI -51.2% to 64.1%), however this change is not statistically significant.
6.16: Change and reason for change in population size	The best available population estimate remains unchanged as Mathews et al. 2018 has not been updated, however reported 1km x 1km grid squares have changed due to changes in methodology and surveyor effort between reporting time periods.
6.18: Age structure, mortality and reproduction	There is no evidence to suggest reproduction, mortality or age structure is deviating from normal .
7.1: Sufficiency of area and quality of occupied habitat	Occupied habitat area 20,600 km2. Habitable area as given by Mathews et al. 2018 has been used as a proxy for occupied habitat and is considered sufficient. 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.

Occupied habitat quality

Whilst we do not have a reliable measure of the quality of the occupied habitat, the population trend is not showing a decline and the species continues to be widespread across a mosaic of habitats. It is therefore assumed that quality is sufficient to support a viable population of the species and maintain FCS.

P. auritus 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.

The species is commonly associated with trees, particularly broadleaved and mixed woodland, but less structured woodlands (including the edges of coniferous forests), forest edges, bushes and hedges, orchards, parks and gardens are used for foraging (Dietz and Keifer 2016, Entwistle et al. 1996). It is adapted to foraging in cluttered habitats and makes extensive use of sight, passive listening, and short duration echolocation (Anderson and Racey 1991, Anderson and Racey 1993, Eklöf and Jones 2003). P. auritus gleans approximately half its prey from vegetation, with the remainder being caught in the air (Swift and Racey 1983, Anderson and Racey 1991, Anderson and Racey 1993). The species has highly manoeuvrable flight and gleaning is facilitated by its capability to hover in addition to using slow horizontal flight (Norberg 1976). It has been reported to use linear features such as treelines and large hedgerows to move between roosts and alternative foraging areas (Howard 1995, Murphy et al. 2012).

P. auritus is a woodland bat that naturally roosts in tree holes but has adapted very well to using loft spaces of large old buildings such as churches, barns and old houses. The species is also frequently found in bat boxes where they are located in woodland. Maternity roosts are

located in trees, bat boxes and buildings – predominately barns, churches and dwelling houses with large internal flight spaces, preferably with a source of water nearby (Boyd and Stebbings 1989, Dietz and Keifer 2016). There is a high degree of fidelity to building roosts by both sexes (Entwistle et al. 2000; Park et al. 1998), with evidence of natal philopatry, yet colonies do not appear to be inbred (Burland et al. 1999; 2001). Swarming sites, and associated genetic exchange, therefore appear particularly critical for Brown long-eared bat conservation (Burland et al. 2001; Furmankiewicz & Altringham 2007; Veith et al. 2004) yet the species forms only a very low proportion of total captures at swarming sites (Glover & Altringham 2008; Parsons et al. 2003). Winter roosts are in caves, mines and cellars, where animals prefer a temperature around 7oC, and occasionally in tree holes (Boye and Dietz 2005). P. auritus flies very frequently during the winter (sometimes daily (Hays et al. 1992) so habitat quality around hibernacula is therefore likely to be very important to their conservation.

Individual home ranges are related to habitat structures and prey abundance and vary between one and forty hectares (Boye and Dietz 2005). Individual foraging areas may overlap to a minor extent and during foraging flights bats usually stay close to the roost, travelling a maximum distance of about 3 kilometres, with core areas up to 1.5 kilometres from the roost. In England, females in the maternity period have been found to return repeatedly to non-overlapping core foraging areas which averaged 2.1ha (range 0.7-5.4; Murphy et al. 2012). There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species.

In order to obtain an estimate of actual occupied habitat, 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. However the population trend is stable and the species is widespread, using a mosaic of habitats; it is therefore assumed that quality is sufficient to support a viable population of the species and maintain FCS.
8.1: Characterisation of pressures	Pressures: Pressures can generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). PB05: Logging without replanting or natural regrowth, PB07: Removal of dead and dying trees, including debris, PF02: Construction or modification (e.g. of housing and settlements) in existing built-up areas, PB09: Clear-cutting, removal of all trees, PB14: Forest management reducing old growth forests - Although roosts are strictly protected, a small number of licences permitting exclusion or roost destruction are issued every year. In addition, changes in building practices to improve energy efficiency mean that new buildings may offer fewer roosting opportunities (Mitchell-Jones 2010). P. auritus has quite specific summer roosting requirements that are not provided by newer buildings, so roost availability may eventually be limiting, and current roosts must be maintained. It is particularly susceptible to loss of roost sites through barn conversions and loft conversions. It avoids lit areas and is detrimentally affected by increased lighting, both directly on the roost access and also in the wider habitat. Roosts are also located with trees, so practices impacting potential roosts within trees are negative for the species. PB05: Logging without replanting or natural regrowth, PB07: Removal of dead and dying trees, including debris, PF02: Construction or modification (e.g. of housing and settlements) in existing built-up areas, PB09: Clear-cutting,

	removal of all trees, PB14: Forest management reducing old growth forests, PE01: Roads, paths railroads and related infrastructure - P. auritus forage along linear features, within woodland, over grazed pasture / grassland and wetland habitats. Agricultural and forestry practices that remove, modify or fragment these habitats, or affect the biomass of suitable insect prey can negatively affect populations as will developments that result in loss or severance of habitat (Murphy et al. 2012). PE01: Roads, paths railroads and related infrastructure - As a low, slow flying species, it is also vulnerable to mortality through collision with vehicles.
9.5: List of main conservation measures	Legal and administrative measures continue to be required to ensure that the protection provided by the legislation is effective and that protected habitats for the species are managed appropriately. ME01: Reduce impact of transport operation and infrastructure: 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. MB04: Adapt/manage reforestation and forest regeneration, MB06: Stop forest management and exploitation practices, MF01: Managing the impacts of converting land for construction and development of infrastructure, MA02: Restore small landscape features on agricultural land, MB05: Adapt/change forest management and exploitation practices, MB06: Stop forest management and exploitation practices, MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land: P. auritus forage along linear features, within woodland, over grazed pasture / grassland and wetland habitats. It

	roosts within buildings and trees. Environmental land management schemes and appropriate management practices in the agricultural and forestry sectors are now widely used to ensure these habitats are well-managed and provide appropriate insect food at the correct time of year and roosts and appropriately protected. Such practices are required to continue in order to achieve conservation goals. MF10: Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities: Planning at landscape scale is required to conserve commuting routes and foraging areas. MF03: Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats): Impacts of recreation (caving) on swarming and hibernation sites need to be limited.
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. P. auritus range is widespread through Wales; no specific short-term drivers for expansion or contraction have been identified and therefore there is no reason to assume that range will vary significantly within the next 12 years unless population crashes occur. Future prospects of population The future prospects of population for this species is considered to be overall stable in Wales. The population appears to be stable as shown through the National Bat Monitoring Programme trend data however for Wales this should be viewed with caution in the future as declines are noted, they are simply not statistically significant. Future prospects of habitat of the species

	The future prospects of habitat of the species is considered to be overall stable in Wales. We do not have a reliable measure of the quality of the occupied habitat, however P. auritus is widespread and uses a mosaic of habitats and there are no specific identified drivers of change across these habitats. 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 stable; (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) the quality of occupied habitat is suitable for the long-term survival of the species; and (iii) 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.
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.