

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

**2019-2024**

Conservation status assessment for the species:

**S5009 - Soprano pipistrelle**  
**(*Pipistrellus pygmaeus*)**

**Wales**



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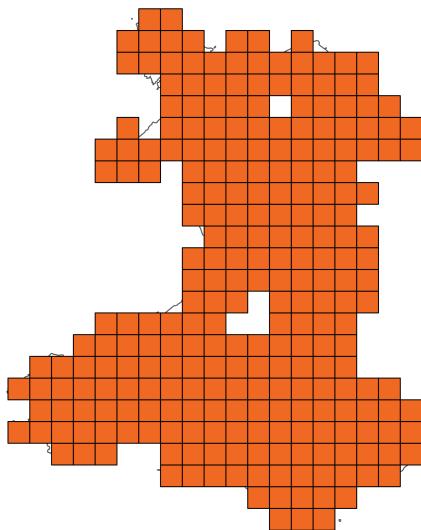
### **Important note - Please read**

- 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: Soprano pipistrelle

### Distribution Map



### Range Map



**Figure 1:** Wales distribution and range map for S5009 - Soprano pipistrelle (*Pipistrellus pygmaeus*). 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 S5009 - Soprano pipistrelle (*Pipistrellus pygmaeus*). 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)

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## National Level

### 1. General information

1.1 Country	Wales
1.2 Species code	S5009
1.3 Species scientific name	<i>Pipistrellus pygmaeus</i>
1.4 Alternative species scientific name	
1.5 Common name	Soprano pipistrelle
Annex(es)	IV

### 2. Maps

2.1 Sensitive species	No
2.2 Year or period	1997-2024
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

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

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

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

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#### **Other measures**

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#### **Other measures description**

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

#### **a) Unit**

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**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>b) Minimum</b>	-	-	-	-	-	-
<b>c) Maximum</b>	-	-	-	-	-	-
<b>d) Unknown</b>	-	-	-	-	-	-

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### **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 (km<sup>2</sup>) 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 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

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## 5.9 Long-term trend; Method used

### 5.10 Favourable Reference Range (FRR)

#### a) Area (km<sup>2</sup>)

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	high

### 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

Improved knowledge/more accurate data

### 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

202,000

#### c) Maximum

862,000

<b>d) Best single value</b>	478,000
<b>6.3 Type of estimate</b>	95% confidence interval
<b>6.4 Quality of extrapolation to reporting unit</b>	low
<b>6.5 Additional population size (using population unit other than reporting unit)</b>	
<b>a) Unit</b>	number of map 1x1 km grid cells
<b>b) Minimum</b>	
<b>c) Maximum</b>	
<b>d) Best single value</b>	1,625
<b>e) Type of estimate</b>	Minimum
<b>6.6 Population size; Method used</b>	Complete survey or a statistically robust estimate
<b>6.7 Short-term trend; Period</b>	2006-2017
<b>6.8 Short-term trend; Direction</b>	Uncertain
<b>6.9 Short-term trend; Magnitude</b>	
<b>a) Estimated minimum</b>	
<b>b) Estimated maximum</b>	
<b>c) Pre-defined range</b>	Increasing 13 - 25%
<b>d) Unknown</b>	No
<b>e) Type of estimate</b>	Pre-defined range
<b>f) Rate of decrease</b>	
<b>6.10 Short-term trend; Method used</b>	Based mainly on expert opinion with very limited data
<b>6.11 Long-term trend; Period</b>	
<b>6.12 Long-term trend; Direction</b>	
<b>6.13 Long-term trend; Magnitude</b>	

a) Minimum

b) Maximum

c) Confidence interval

d) Rate of decrease

**6.14 Long-term trend; Method used**

**6.15 Favourable Reference Population (FRP)**

a) Population size

iii) 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 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 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
PF12: Residential, commercial and industrial activities and structures generating noise, light, heat or other forms of pollution	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)
PE01: Roads, paths, railroads and related infrastructure	Ongoing and likely to be in the future	High (H)
PD01: Wind, wave and tidal power (including infrastructure)	Ongoing and likely to be in the future	High (H)
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)
PA14: Use of plant protection chemicals in agriculture	Ongoing and likely to be in the future	Medium (M)
PB02: Conversion from one type of forestry land use to another	Ongoing and likely to be in the future	Medium (M)
PB05: Logging without replanting or natural regrowth	Ongoing and likely to be in the future	Medium (M)
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	Medium (M)

## 8.2 Sources of information

See section 14 References

## 8.3 Additional information

No additional information

## 9. Conservation measures

### 9.1: Status of measures

<b>a) Are measures needed?</b>	Yes
<b>b) Indicate the status of measures</b>	Measures identified and taken
<b>9.2 Main purpose of the measures taken</b>	Maintain the current range, population and/or habitat for the species
<b>9.3 Location of the measures taken</b>	Both inside and outside National Site Network
<b>9.4 Response to measures</b>	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
MC03: Adapt/manage renewable energy installation, facilities and operation (excl. hydropower and abstraction activities)	High (H)
ME01: Reduce impact of transport operation and infrastructure	High (H)
MF07: Reduce/eliminate pollution (incl. noise, light, heat, soil pollution) from industrial, commercial, residential and recreational areas and activities	High (H)
MF01: Managing the impacts of converting land for construction and development of infrastructure	High (H)
MF04: Reduce/eliminate pollution to surface or ground waters from commercial, residential and recreational areas and activities, and from industrial activities and structures	Medium (M)
MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land	Medium (M)
MA14: Other measures related to agricultural practices	Medium (M)

MB01: Prevent conversion of (semi-) natural habitats into forests and of (semi-) natural forests into intensive forest plantation	Medium (M)
MB04: Adapt/manage reforestation and forest regeneration	Medium (M)
MA02: Restore small landscape features on agricultural land	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
ci) 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**

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**12.6 Short-term trend of habitat for the species inside the pSCIs, SCIs and SACs network; Direction**

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**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

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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	Pipistrellus pipistrellus (s.l) was divided into P. pipistrellus (s.s.) and P. pygmaeus in 1997, so field records prior to this cannot be assigned to either species with confidence.
2.4: Distribution map; Method used	P. pygmaeus commonly roosts in houses and many records come from requests for information or advice. The widespread use of bat detectors and structured surveys for the National Bat Monitoring Programme has increased the number of records in recent years. The technological improvements seen in bat detectors and sound analysis of bat calls has probably increased the accuracy of identification to species. P. pygmaeus is widely distributed throughout Wales, with gaps in distribution probably reflecting an absence of survey data rather than an absence of the species or reports of Pipistrelle spp, not confirmed to species.
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 20,643 km <sup>2</sup> (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

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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 km<sup>2</sup>. This small increase is a result of additional records collected since the last report, and is not thought to be a genuine change; *P. pygmaeus* is a widespread species occupying a wide variety of habitat types.

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6.2: Population size	Due to the statistically robust methodology used by Mathews et al. (2018) the unit of individuals is viewed as the best reflection of actual population over 1km x 1km Grid Squares.
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Mathews et al. 2018 population estimates were derived by first calculating the adult bat density (bats/km<sup>2</sup>) 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.

Details of calculations are as follows:

Adult bat density (bats/km<sup>2</sup>)

Median density=[(median n. bats/roost<sup>†</sup>) x (p<sub>♀‡</sub>) x (n roosts/typical km<sup>2</sup> average habitat)]x 2

Lower limit=[(lower plausible n. bats/roost) x (p<sub>♀min</sub>) x

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(plausible n. roosts/typical km<sup>2</sup> poor habitat)]x 2

Upper limit = [(upper plausible n. bats/roost) x (p<sub>♀max</sub>) x (plausible n. roosts/typical km<sup>2</sup> good habitat)]x 2

† roost is typical maternity roost in the pre-parturition period. n. is number of adults.

‡ p<sub>♀</sub>: proportion female. p<sub>♀min</sub> and p<sub>♀max</sub> are lowest and highest plausible proportions of adult females in typical maternity roost

#### Population size

Total Adult Population = Median adult density (bats/km<sup>2</sup>) x total habitable area within range (km<sup>2</sup>)

Lower Limit=Lower limit adult density (bats/km<sup>2</sup>) x total habitable area within range (km<sup>2</sup>)

Upper Limit=Upper limit adult density (bats/km<sup>2</sup>) x total habitable area within range (km<sup>2</sup>)

The estimates excluded colonies that contained less than 30 bats in order to ensure that counts did not include individuals in formation roosts that were then counted again at maternity sites. This may have led to some over-estimation of population size; when all roosts were included the bat population density estimate fell by approximately a third. Reliability is affected by an extreme lack of data on the density of roosts. Examination of all the data available to Mathews et al. 2018 showed a ratio of common pipistrelle to soprano pipistrelle as approximately 2:3. The expert opinions for the two species also gave a 2:3 ratio. Hence if roost densities are correct for common pipistrelle bats, then the estimates for soprano pipistrelle bats also appear reasonable. Habitability area was defined as all area within the range excluding montane habitat since this is unlikely to include suitable locations for maternity roosts.

6.7: Short-term trend; Period	Based on Bat Conservation Trust (2024) NBMP short-term period of 5 years.
	Bat Conservation Trust, 2024. The National Bat Monitoring Programme Annual Report 2023. Bat Conservation Trust, London. Available at <a href="https://www.bats.org.uk/our-work/national-bat-monitoring-programme/reports/nbmp-annual-report">https://www.bats.org.uk/our-work/national-bat-monitoring-programme/reports/nbmp-annual-report</a> NBMP Annual Report - Reports - Bat Conservation Trust
6.8: Short-term trend; Direction	<p>The soprano pipistrelle National Bat Monitoring Programme trend for Wales is based on the Roost Count index and shows significant decline from the baseline year of monitoring (1999) and over the last five years. However, as soprano pipistrelle switches roosts frequently the Roost Count index is not considered a reliable measure of population change for this species, and therefore a trend cannot be drawn for Wales.</p> <p>The trend for Great Britain is also based on the Field Survey methodology which is considered a reliable measure of population change. Based on Field Surveys, the population of soprano pipistrelle in Great Britain is considered to have increased 75.1% (95% CI 13.6% to 148%) in the long-term (since 1999) and to have been stable in the short-term (since 2017) with a none statistically significant increase of 22% (95% CI -6.9% to 52.8%). The GB trend is likely to be reflective of that in Wales.</p> <p>Mathews et al. (2018) notes that consideration must be given to the fact that acoustic detectors used to record bat activity in the field have changed considerably over time and have become much more sensitive. There is also considerable misidentification between the common pipistrelle and soprano pipistrelle especially when using heterodyne detectors and there is also confusion with the <i>Myotis</i> species. The true trend probably lies between the percentage trends that has been reported for the two phonic types (common and soprano pipistrelle).</p>

6.9: Short-term trend; Magnitude	A reliable trend cannot be drawn for Wales due to insufficient available data.  The GB trend is statistically robust and likely to be reflective of Wales.
6.10: Short-term trend; Method used	A reliable trend cannot be drawn for Wales due to insufficient available data.  The GB trend is statistically robust and likely to be reflective of Wales.
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.  While Welsh trends cannot be drawn based on NBMP data, GB trends are likely to be reflective of those in Wales and show short-term (since 2017) increase of 22% (95% CI -6.9% to 52.8%) although this is not significantly significant and is reported as 'stable'.
7.1: Sufficiency of area and quality of occupied habitat	Habitat area  20,600 km2. Habitable area 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.  Habitat quality  No or insufficient reliable information is available on the quality of the habitable area. However, the species is widespread, using a broad variety of habitats and population trend for the species is not declining and therefore the quality of occupied habitat is likely to be sufficient to maintain the species at FCS.

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*P. pygmaeus* is an extremely widely distributed species and is found in almost any habitat type ranging from grasslands to urban and suburban environments. However, the species requires a complex mosaic of habitats to support foraging, roosting and commuting behaviour. Boye & Dietz (2005) and Jones & Racey (2008) provides a good overview of this species' habitat requirements. Although, most maternity colonies are in buildings, forests of any type are used as roosting and foraging areas. *P. pygmaeus* bats are frequently reported to make particular use of riparian habitat (Davidson-Watts and Jones, 2006, Nicholls and A. Racey, 2006, Lintott et al., 2016). In woodlands, activity of *P. pygmaeus* is positively linked with the amount of habitat fragmentation, possibly because they utilise edge environments (Fuentes-Montemayor et al., 2013). *P. pygmaeus* home ranges are reported to be much larger than *P. pipistrellus*, *P. pygmaeus* lactating females have been reported to make flights of >10km, whilst using conifer plantations as their primary habitat (Kirkpatrick, 2017). *P. pygmaeus* roosts tend to be located in areas close to waterways (Jenkins et al., 1998, Oakley and Jones, 1998), particularly in the case of large roosts (Mathews et al. 2018). In summer the roost sites are predominantly in crevices in buildings, especially between tiles and the underlying roofing felt or behind boards on the gable. Furthermore, individuals and maternity colonies use tree holes, wood crevices and bird or bat boxes as roosts. The species disperses to temporary sites and mating roosts during the autumn post weaning period.

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7.2: Sufficiency of area and quality of occupied habitat; Methods used

As a widespread, common species, using a mosaic of habitats, it has been assumed that the area of distribution can be used as a proxy for the area of suitable habitat in the absence of other information. 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. supporting data set which is more accurate and gives occupied 1km squares.

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	<p>The habitable area given by Mathews et al. 2018 is 20,600 km<sup>2</sup>, which defined all the area within the range as habitable excluding montane habitat since this is unlikely to include suitable locations for maternity roosts , and range calculation utilises an alpha hull value of 20km was drawn around the presence records, which represented the best balance between the inclusion of unoccupied sites (i.e. where records are sparse but close enough for inclusion) and the exclusion of occupied areas due to gaps in the data (i.e. where records exist but are too isolated for inclusion). An additional 10km buffer was added to the final hull polygon to provide smoothing to the hull and to ensure that the hull covered the areas recorded rather than intersecting them.</p>
7.4: Short-term trend; Direction	<p>The estimate for the 2019 Article 17 report was 20,600 km<sup>2</sup> which is taken form the habitable area given by Mathews et al. 2018, which defined all the area within the range as habitable excluding montane habitat since this is unlikely to include suitable locations for maternity roosts. Whilst range has increased by a small degree due to surveyor effort rather than genuine change, the species is widespread, using a broad variety of habitats and therefore the area and quality of occupied habitat is unlikely to have changed significantly.</p>
8.1: Characterisation of pressures	<p>Pressures can generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability).</p> <p>PA02 - Conversion from one type of agricultural land use to another (excluding drainage and burning), PA04: Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.), PA14 - Use of plant protection chemicals in agriculture, PB02: Conversion from one type of forestry land use to another, PB05: Logging without replanting or natural regrowth.</p>

*P. pygmaeus* forage across a mosaic of habitat types,

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though they are frequently found foraging over pasture, especially at sites with grazing livestock (Fuentes-Montemayor et al, 2013). Agricultural and forestry practices that remove or simplify these habitats or affect the biomass of insect prey could negatively affect populations.

PD01: Wind, wave and tidal power (including infrastructure) and PE01: Roads, paths, railroads and related infrastructure: This is one of the primary species killed at wind turbine sites and in road collisions. It is unclear whether the scale of casualties is sufficient to impact on local populations, Mathews et al., (2016) and Fensome & Mathews, (2016).

PF02: Construction or modification (e.g. of housing and settlements) in existing built-up areas, PF12: Residential, commercial and industrial activities and structures generating noise, light, heat or other forms of pollution and PF12: Residential, commercial and industrial activities and structures generating noise, light, heat or other forms of pollution: Although, roosts are strictly protected through legislation a variable number of licences are issued every year permitting exclusion, destruction and damage. Changes to building regulations and efforts to make buildings more energy-efficient have tended to reduce their accessibility and thermal suitability for bats. Breathable roofing membranes also pose a threat of entanglement, (Mitchell-Jones, 2010 and Waring et al., 2014).

PA22: Drainage for use as agricultural land & PK01: Mixed source pollution to surface and ground waters (limnic and terrestrial) are considered low pressures and consequently not formally reported in line with JNCC guidance.

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9.5: List of main conservation measures

MC03: Adapt/manage renewable energy installation, facilities and operation (excl. hydropower and abstraction activities): Guidance is available to help planners, developers and ecological consultants to consider the potential effects of onshore wind energy developments on bats. Guidance is available for land managers on how to

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manage their land holdings for bats. Addressing PD01.

ME01 - Reduce impact of transport operation and infrastructure: Road design construction and operation need to take into account the likely impact on bats, for example, in relation to the provision of safe crossing structures and the loss and severance of bat habitat and lighting. Addressing PE01.

MF07: Reduce/eliminate pollution (incl. noise, light, heat, soil pollution) from industrial, commercial, residential and recreational areas and activities, MF01: Managing the impacts of converting land for construction and development of infrastructure, MB01: Prevent conversion of (semi-) natural habitats into forests and of (semi-) natural forests into intensive forest plantation, MB04: Adapt/ manage reforestation and forest regeneration, MF04: Reduce/eliminate pollution to surface or ground waters from commercial, residential and recreational areas and activities, and from industrial activities and structures: Legal and administrative measures continue to be required to ensure that the protection provided by the legislation is effective. If roosts are to be destroyed, damaged or lost due to development, adequate mitigation/compensation methods must be put in place to maintain the favourable conservation status of the species. Addressing PF02, PF12 and PF02.

MF04: Reduce/eliminate pollution to surface or ground waters from commercial, residential and recreational areas and activities, and from industrial activities and structures, MA01: Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land, MA14: Other measures related to agricultural practices, MA02: Restore small landscape features on agricultural land: Agricultural related measures are implemented via agri-environmental schemes. Addressing PA04, PA02, PA14, PK01, PA22.

10.1: Future trends and prospects of parameters	<p><b>Future prospects of - range</b></p> <p>The future prospects of range for this species is considered to be overall stable in Wales. <i>P. pygmaeus</i> is widely distributed throughout Wales, with gaps in distribution probably reflecting an absence of survey data rather than an absence of the species therefore the future range is likely to remain as overall stable</p> <p><b>Future prospects of - population</b></p> <p>The future prospects of population for this species is considered to be Overall Stable in Wales. <i>P. pygmaeus</i> is a common species within Wales, although we cannot draw trends for Wales, trend data for GB from the NBMP indicates the species to have been stable in the short-term (since 2017) with a none statistically significant increase of 22% (95% CI -6.9% to 52.8%).</p> <p><b>Future pressures from changes in legislation, planning policy and increasing development will hold unknown challenges for the species in the future.</b></p> <p><b>Future prospects of - Habitat for species</b></p> <p>The future prospects of habitat of the species is considered to be overall stable in Wales. <i>P. pygmaeus</i> is widely distributed throughout 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 situation will not continue over the next 12 years.</p>
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 uncertain; (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.