European Community Directive
on the Conservation of Natural Habitats
and of Wild Fauna and Flora
(92/43/EEC)

Fourth Report by the United Kingdom
under Article 17

on the implementation of the Directive
from January 2013 to December 2018

Supporting documentation for the
conservation status assessment for the species:

S5009 - Soprano pipistrelle (*Pipistrellus pygmaeus*)

WALES

IMPORTANT NOTE - PLEASE READ

- The information in this document is a country-level contribution to the UK Report on the conservation status of this species, submitted to the European Commission as part of the 2019 UK Reporting under Article 17 of the EU Habitats Directive.

- The 2019 Article 17 UK Approach document provides details on how this supporting information was used to produce the UK Report.

- The UK Report on the conservation status of this species is provided in a separate document.

- The reporting fields and options used are aligned to those set out in the European Commission guidance.

- Explanatory notes (where provided) by the country are included at the end. These provide an audit trail of relevant supporting information.

- Some of the reporting fields have been left blank because either: (i) there was insufficient information to complete the field; (ii) completion of the field was not obligatory; (iii) the field was not relevant to this species (section 12 Natura 2000 coverage for Annex II species) and/or (iv) the field was only relevant at UK-level (sections 9 Future prospects and 10 Conclusions).

- For technical reasons, the country-level future trends for Range, Population and Habitat for the species are only available in a separate spreadsheet that contains all the country-level supporting information.

- The country-level reporting information for all habitats and species is also available in spreadsheet format.

Visit the JNCC website, https://jncc.gov.uk/article17, for further information on UK Article 17 reporting.

Report on the main results of the surveillance under Article 11 for Annex II, IV and V species (Annex B)

NATIONAL LEVEL

1. General information

1.1 Member State	**UK (Wales information only)**
1.2 Species code	**5009**
1.3 Species scientific name	**Pipistrellus pygmaeus**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Soprano pipistrelle

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1997-2016
2.3 Distribution map	Yes
2.4 Distribution map Method used	Complete survey or a statistically robust estimate
2.5 Additional maps	No

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

3.1 Is the species taken in the wild/exploited?	No	
3.2 Which of the measures in Art. 14 have been taken?	a) regulations regarding access to property	No
	b) temporary or local prohibition of the taking of specimens in the wild and exploitation	No
	c) regulation of the periods and/or methods of taking specimens	No
	d) application of hunting and fishing rules which take account of the conservation of such populations	No
	e) establishment of a system of licences for taking specimens or of quotas	No
	f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens	No
	g) breeding in captivity of animal species as well as artificial propagation of plant species	No
	h) other measures	No

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3.3 Hunting bag or quantity taken in the wild for Mammals and Acipenseridae (Fish)	a) Unit						
	b) Statistics/ quantity taken	Provide statistics/quantity per hunting season or per year (where season is not used) over the reporting period					
		Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
	Min. (raw, ie. not rounded)						
	Max. (raw, ie. not rounded)						
	Unknown	No	No	No	No	No	No

3.4. Hunting bag or quantity taken in the wild Method used	
3.5. Additional information	

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs	**Atlantic (ATL)**
4.2 Sources of information	Bat Conservation Trust. 2018. The State of the UK's Bats 2017. Bat Conservation Trust, London. Available at http://www.bats.org.uk/pages/results_and_reports.html

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Jones, G & Racey, P.A. 2008. Common pipistrelle Pipistrellus pipistrellus, Soprano pipistrelle Pipistrellus pygmaeus. Pages 343-351 In: Harris, S & Yalden, D.W. Mammals of the British Isles: Handbook, 4th edition. The Mammal Society, Southampton.799pp.

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5. Range

5.1 Surface area (km²)	
5.2 Short-term trend Period	
5.3 Short-term trend Direction	Uncertain (u)
5.4 Short-term trend Magnitude	a) Minimum b) Maximum
5.5 Short-term trend Method used	
5.6 Long-term trend Period	
5.7 Long-term trend Direction	
5.8 Long-term trend Magnitude	a) Minimum b) Maximum
5.9 Long-term trend Method used	
5.10 Favourable reference range	a) Area (km²) b) Operator c) Unknown d) Method
5.11 Change and reason for change in surface area of range	Improved knowledge/more accurate data Use of different method The change is mainly due to: Use of different method
5.12 Additional information	

6. Population

6.1 Year or period	2016-2017
6.2 Population size (in reporting unit)	a) Unit number of map 1x1 km grid cells (grids1x1) b) Minimum c) Maximum d) Best single value

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6.3 Type of estimate	Best estimate	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit	number of adults (adults)
	b) Minimum	
	c) Maximum	
	d) Best single value	478000
6.5 Type of estimate	Best estimate	
6.6 Population size Method used	Complete survey or a statistically robust estimate	
6.7 Short-term trend Period	2006-2017	
6.8 Short-term trend Direction	Uncertain (u)	
6.9 Short-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.10 Short-term trend Method used	Insufficient or no data available	
6.11 Long-term trend Period		
6.12 Long-term trend Direction		
6.13 Long-term trend Magnitude	a) Minimum	
	b) Maximum	
	c) Confidence interval	
6.14 Long-term trend Method used		
6.15 Favourable reference population (using the unit in 6.2 or 6.4)	a) Population size	
	b) Operator	
	c) Unknown	
	d) Method	
6.16 Change and reason for change in population size	Genuine change	
	Improved knowledge/more accurate data	
	Use of different method	
	The change is mainly due to: Use of different method	
6.17 Additional information		

7. Habitat for the species

7.1 Sufficiency of area and quality of occupied habitat	a) Are area and quality of occupied habitat sufficient (to maintain the species at FCS)?	Yes
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on extrapolation from a limited amount of data	
7.3 Short-term trend Period	1997-2016	
7.4 Short-term trend Direction	Unknown (x)	
7.5 Short-term trend Method used	Based mainly on expert opinion with very limited data	

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Residential or recreational activities and structures generating noise, light, heat or other forms of pollution (F24)	H
Conversion to other types of forests including monocultures (B02)	M
Logging without replanting or natural regrowth (B05)	M
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M

Threat	Ranking
Conversion to other types of forests including monocultures (B02)	M
Logging without replanting or natural regrowth (B05)	M
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M

8.2 Sources of information

8.3 Additional information

9. Conservation measures

9.1 Status of measures	a) Are measures needed?	Yes
	b) Indicate the status of measures	Measures identified and taken

9.2 Main purpose of the measures taken	Maintain the current range, population and/or habitat for the species
9.3 Location of the measures taken	Both inside and outside Natura 2000
9.4 Response to the measures	Medium-term results (within the next two reporting periods, 2019-2030)

9.5 List of main conservation measures

Adapt/manage renewable energy installation, facilities and operation (CC03)
Reduce/eliminate diffuse pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities (CF05)
Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land (CA01)
Other measures related to agricultural practices (CA16)

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Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation (CB01)	
Adapt/manage reforestation and forest regeneration (CB04)	
Restore small landscape features on agricultural land (CA02)	

9.6 Additional information

10. Future prospects

10.1 Future prospects of parameters	a) Range
	b) Population
	c) Habitat of the species

10.2 Additional information

11. Conclusions

11.1. Range

11.2. Population

11.3. Habitat for the species

11.4. Future prospects

11.5 Overall assessment of Conservation Status

11.6 Overall trend in Conservation Status

11.7 Change and reasons for change in conservation status and conservation status trend	a) Overall assessment of conservation status
	No change
	The change is mainly due to:
	b) Overall trend in conservation status
	No change
	The change is mainly due to:

11.8 Additional information

12. Natura 2000 (pSCIs, SCIs and SACs) coverage for Annex II species

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

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

12.6 Additional information

13. Complementary information

13.1 Justification of % thresholds for trends

13.2 Trans-boundary assessment

13.3 Other relevant Information

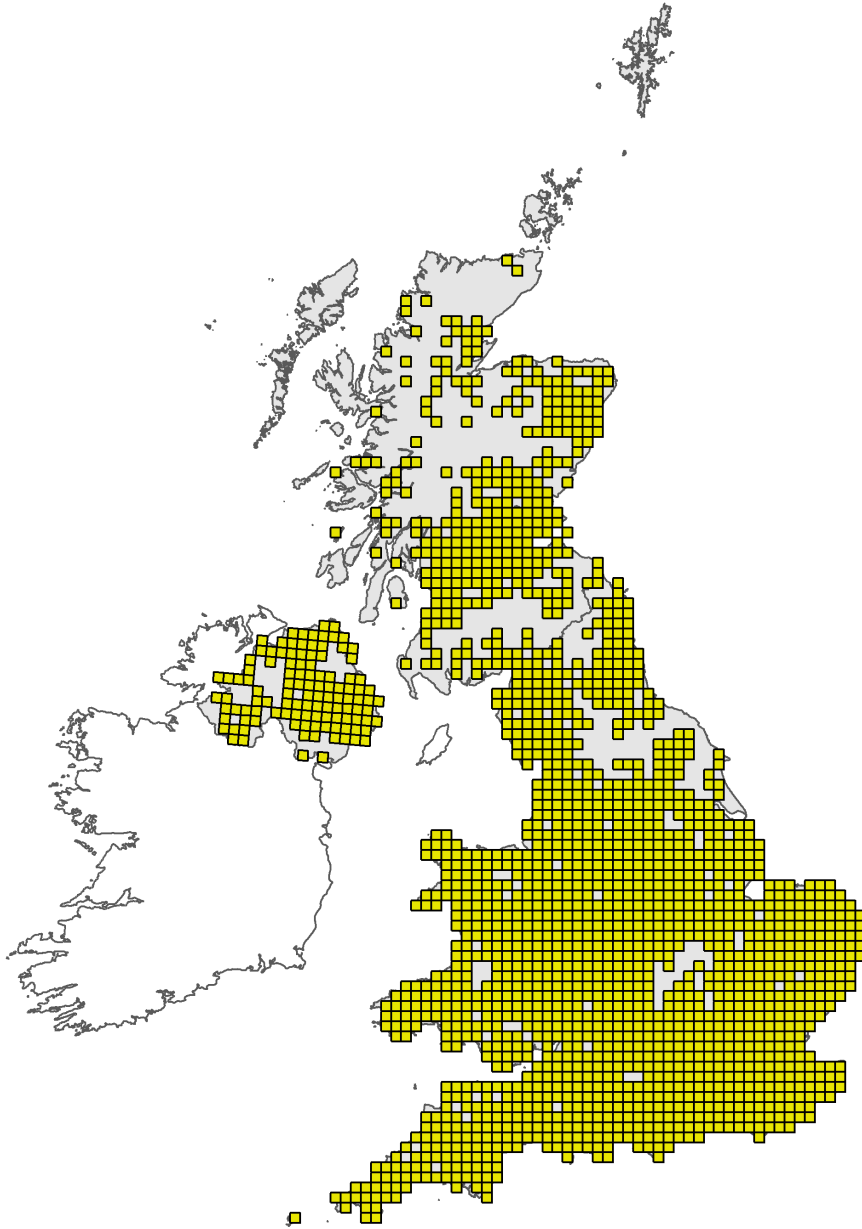12.5 Short-term trend of population size within the network Method used

Distribution Map

Figure 1: UK distribution 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. For further details see the 2019 Article 17 UK Approach document.

Range Map
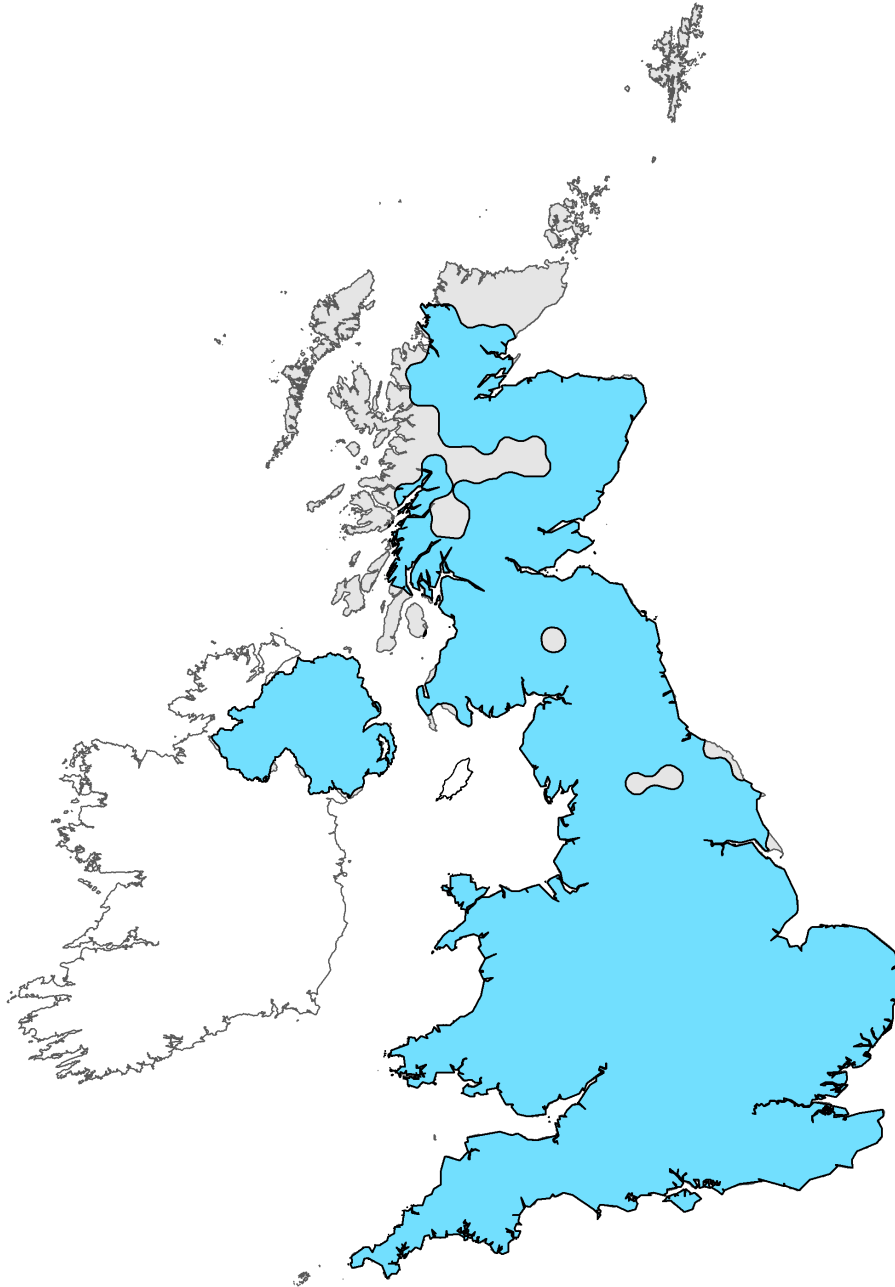
Figure 2: UK range map for S5009 - Soprano pipistrelle (*Pipistrellus pygmaeus*).Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

The range map has been produced by The Mammal Society applying a range mapping tool as outlined in Matthews et al. (2018), to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 20km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Species name: Pipistrellus pygmaeus (5009)

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.

Species name: Pipistrellus pygmaeus (5009) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	Given the significant change to the method for range determination we are uncertain of the nature and degree of change in short-term range trend for this species.
5.11 Change and reason for change in surface area of range	Area of land (including unsuitable habitat) contained within the range is given as 20,643 km2 (Mathews et al. 2018). Range is based on presence data collected between 1995-2016. Areas that contain very isolated records may not have been included in the area of distribution. The range has been taken from Mathews et al. 2018, whereby an alpha hull value of 20km was drawn around the presence records, which represented the best balance between the inclusion of unoccupied sites (i.e. where records are sparse but close enough for inclusion) and the exclusion of occupied areas due to gaps in the data (i.e. where records exist but are too isolated for inclusion). An additional 10km buffer was added to the final hull polygon to provide smoothing to the hull and to ensure that the hull covered the areas recorded rather than intersecting them. This differs from the approach taken in 2013 and 2007 whereby a 45km alpha hull value was used for all species with a starting range unit of individual 10km squares. The new method has led to much finer detail maps being produced underpinned by data gathered at a much finer resolution, leading to the production of a more accurate FRR. Added to which acoustic detectors have changed considerably over the years in both accuracy and sensitivity, which also adds to the production of this value. As P. pygmaeus is a widespread species occupying a wide variety of habitat types it is assumed that the range is equal to the favourable reference range.

6.4 Additional population size	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. Details of calculations are as follows: Adult bat density (bats/km2) Median density=[(median n/ bats/roost[1]) * (p female [2]) * (n roosts/typical km2 average habitat)]* 2 Lower limit=[(lower plausible n. bats/roost) * (p female min) * (plausible n. roosts/typical km2 poor habitat)]* 2 Upper limit = [(upper plausible n. bats/roost) * (p female max) * (plausible n. roosts/typical km2 good habitat)]* 2 [1] roost is typical maternity roost in the pre-parturition period. n. is number of adults. [2] p female : proportion female. p female min and p female max are lowest and highest plausible proportions of adult females in typical maternity roost Population size Total Adult Population = Median adult density (bats/km2) * total habitable area within range (km2) Lower Limit=Lower limit adult density (bats/km2) * total habitable area within range (km2) Upper Limit=Upper limit adult density (bats/km2) * total habitable area within range (km2) 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.Habitable 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 2018a NBMP Short term period for Great Britain.
6.8 Short term trend; Direction	The only soprano pipistrelle trend for Wales that can be drawn is for roosts counts and shows a significant decline based on National Bat Monitoring Programme data. Roost counts are considered less statistically robust than field counts due to frequent roost switching resulting in a negative bias in roost count data. The GB soprano pipistrelle National Bat Monitoring Programme trend is positive although not statistically significant (Bat Conservation Trust 2018a); this is likely to be more reflective of the actual trend in Wales. 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 Myotis species. The true trend probably lies between the trend that has been reported for the two phonic types (common and soprano pipistrelle).
6.10 Short term trend; Method used	A reliable trend cannot be drawn for Wales due to insufficient available data.
6.16 Change and reason for change in population size	Data from the NBMP indicates that there has been an increase in P. pygmaeus between 2006-2017 at a GB level and this is assumed to also be reflected in Wales. Also improved knowledge; acoustic detectors used to record bat activity in the field have changed considerably over time and have become much more sensitive. Primarily the change is due to Mathews et al. 2018 utilising a different method of calculating population size.

7.1 Sufficiency of area and quality of occupied 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. Quality: No or insufficient reliable information is available. Although we do not have a reliable measure of the quality of the occupied habitat, the population trend for the species population is increasing and therefore the area and quality of occupied habitat is likely to be sufficient to maintain the species at FCS. 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.
7.2 Sufficiency of area and quality of occupied habitat; Method 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. The habitable area given by Mathews et al. 2018 is 20,600 km2, 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.
7.4 Short term trend; Direction	The trend for area would appear to be stable as the estimates are broadly in line with each other. The 2013 Article 17 report for this species calculated the habitat for the species at 17,585 km2, calculated from the area of the filled 10km squares in the distribution map. The given estimate for 2016 is 20,600 km2 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. However due to the poor information on quality of occupied habitat, unknown must be selected for short term trend direction.

| 8.1 Characterisation of pressures/ threats | Pressures: Pressures can generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). A02 - Conversion from one type of agricultural land use to another (excluding drainage and burning), A05 - Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.), A21 - Use of plant protection chemicals in agriculture, B02 - Conversion to other types of forests including monocultures, B05 - Logging without replanting or natural regrowth. P. pygmaeus forage across a mosaic of habitat types, 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. D01 - Wind, wave and tidal power, including infrastructure and E01 - Roads, paths railroads and related infrastructure (e.g. bridges, viaducts, tunnels): 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). F02 - Construction or modification (of e.g. housing and settlements) in existing urban or recreational areas, F24 - Residential or recreational activities and structures generating noise, light, heat or other forms of pollution and F25 - Industrial or commercial 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). A31 (Drainage) & J01 (Mixed source pollution) are considered low pressures and consequently not formally reported in line with JNCC guidance. Threats: Threats can also generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). A02 - Conversion from one type of agricultural land use to another (excluding drainage and burning), A05 - Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.), A21 - Use of plant protection chemicals in agriculture, B02 - Conversion to other types of forests including monocultures, B05 - Logging without replanting or natural regrowth: P. pygmaeus forage across a mosaic of habitat types, 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 and this is a situation that is unlikely to change in the future. D01 - Wind, wave and tidal power, including infrastructure and E01 - Roads, paths railroads and related infrastructure (e.g. bridges, viaducts, tunnels): 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). Construction of new turbines along with the continued widening/realignment of existing linear infrastructure projects in the future is likely to continue. F02 - Construction or modification (of e.g. housing and settlements) in existing urban or recreational areas, F24 - Residential or recreational activities and structures generating noise, light, heat or other forms of pollution and F25 - Industrial or commercial 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). The rate of developments and building works which may impact bats is likely to increase in the future. A31 (Drainage) & J01 (Mixed source pollution) are considered |

low level threats and consequently not formally reported in line with JNCC guidance.

9.5 List of main conservation measures	CC03 - Adapt/manage renewable energy installation, facilities and operation: Guidance is being developed and will shortly be available from the agencies 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 manage their land holdings for bats. Addressing D01. CE01 - 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 E01. CF09 - Reduce/eliminate noise, light, heat or other forms pollution from industrial, commercial, residential and recreational areas and activities, CF01 - Manage conversion of land for construction and development of infrastructures, CB01 - Prevent conversion of (semi-) natural habitats into forests and of (semi-)natural forests into intensive forest plantation, CB04 - Adapt/manage reforestation and forest regeneration, CF05 - Reduce/eliminate diffuse pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities: 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 F02, F24 and F05. CF05 - Reduce/eliminate diffuse pollution to surface or ground waters from industrial, commercial, residential and recreational areas and activities, CA01 - Prevent conversion of natural and semi-natural habitats, and habitats of species into agricultural land, CA16 - Other measures related to agricultural practices, CA02 - Restore small landscape features on agricultural land: Agricultural related measures are implimented via agri-environmental schemes. Addressing A05, A02, A21, J01, A31.