

**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:

S1330 - Whiskered bat (*Myotis mystacinus*)

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	1330
1.3 Species scientific name	<i>Myotis mystacinus</i>
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Whiskered bat

2. Maps

2.1 Sensitive species	No
2.2 Year or period	1995-2016
2.3 Distribution map	Yes
2.4 Distribution map Method used	Based mainly on extrapolation from a limited amount of data
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?	<table> <tr> <td>a) regulations regarding access to property</td><td>No</td></tr> <tr> <td>b) temporary or local prohibition of the taking of specimens in the wild and exploitation</td><td>No</td></tr> <tr> <td>c) regulation of the periods and/or methods of taking specimens</td><td>No</td></tr> <tr> <td>d) application of hunting and fishing rules which take account of the conservation of such populations</td><td>No</td></tr> <tr> <td>e) establishment of a system of licences for taking specimens or of quotas</td><td>No</td></tr> <tr> <td>f) regulation of the purchase, sale, offering for sale, keeping for sale or transport for sale of specimens</td><td>No</td></tr> <tr> <td>g) breeding in captivity of animal species as well as artificial propagation of plant species</td><td>No</td></tr> <tr> <td>h) other measures</td><td>No</td></tr> </table>	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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h) other measures	No																

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

a) Unit

b) Statistics/ quantity taken	Provide statistics/quantity per hunting season or per year (where season is not used) over the reporting period					
	Season/ year 1	Season/ year 2	Season/ year 3	Season/ year 4	Season/ year 5	Season/ year 6
Min. (raw, ie. not rounded)						
Max. (raw, ie. not rounded)						
Unknown	No	No	No	No	No	No

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

3.5. Additional information

BIOGEOGRAPHICAL LEVEL

4. Biogeographical and marine regions

4.1 Biogeographical or marine region where the species occurs

Atlantic (ATL)

4.2 Sources of information

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Jones KE, Altringham JD, Deaton R. 1996. Distribution and population densities of seven species of bat in northern England *Journal of Zoology*, 240, 788-798

Mathews F, Kubasiewicz LM, Gurnell J, Harrower C, McDonald RA, Shore RF. 2018. A review of the population and conservation status of British Mammals. A report by The Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage.

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5. Range

5.1 Surface area (km²)

5.2 Short-term trend Period

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5.3 Short-term trend Direction	Stable (0)	
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 (km ²) b) Operator c) Unknown d) Method	Range is calculated at UK level and 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 new method for calculating range from Mathews et. al., 2018 has not been used for this species because additional data for whiskered bat distribution in Scotland were included in the UK dataset after the Mathews report was published. It was not possible to revise the UK range calculations using the Mathews method and so the range surface area was calculated using the 2007/2013 method devised by JNCC whereby a 45km alpha hull value was used with a starting range unit of individual 10km squares .
5.11 Change and reason for change in surface area of range	Use of different method The change is mainly due to:	Use of different method
5.12 Additional information	The current distribution estimate for the species is based on all known records of whiskered/Brandt's bats since 1995 and is similar to that reported by Arnold (1993). The previous Article 17 Report (Joint Nature Conservation Committee 2013) is based on records described as whiskered bats only, whereas the current estimate combines both species due to the difficulties of identification.	

6. Population

6.1 Year or period	2016-2017	
6.2 Population size (in reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	number of map 1x1 km grid cells (grids1x1)
6.3 Type of estimate	Best estimate	
6.4 Additional population size (using population unit other than reporting unit)	a) Unit b) Minimum c) Maximum d) Best single value	number of individuals (i)

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6.5 Type of estimate	
6.6 Population size Method used	Based mainly on extrapolation from a limited amount of data
6.7 Short-term trend Period	1999-2016
6.8 Short-term trend Direction	Stable (0)
6.9 Short-term trend Magnitude	a) Minimum b) Maximum c) Confidence interval
6.10 Short-term trend Method used	Based mainly on extrapolation from a limited amount of data
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	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)? b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Yes
7.2 Sufficiency of area and quality of occupied habitat Method used	Based mainly on expert opinion with very limited data	
7.3 Short-term trend Period	2007-2018	
7.4 Short-term trend Direction	Unknown (x)	
7.5 Short-term trend Method used	Insufficient or no data available	
7.6 Long-term trend Period		
7.7 Long-term trend Direction		
7.8 Long-term trend Method used		
7.9 Additional information		

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8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Logging without replanting or natural regrowth (B05)	H
Intensive grazing or overgrazing by livestock (A09)	H
Clear-cutting, removal of all trees (B09)	H
Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01)	H
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	H
Removal of old trees (excluding dead or dying trees) (B08)	M
Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01)	M
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	M
Sports, tourism and leisure activities (F07)	M
Threat	Ranking
Logging without replanting or natural regrowth (B05)	M
Intensive grazing or overgrazing by livestock (A09)	H
Clear-cutting, removal of all trees (B09)	M
Roads, paths, railroads and related infrastructure (e.g. bridges, viaducts, tunnels) (E01)	H
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	H
Removal of old trees (excluding dead or dying trees) (B08)	H
Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions) (F01)	H
Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) (A05)	M
Abandonment of grassland management (e.g. cessation of grazing or mowing) (A06)	M
Sports, tourism and leisure activities (F07)	M

8.2 Sources of information

8.3 Additional information

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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

Long-term results (after 2030)

9.5 List of main conservation measures

Adapt/manage reforestation and forest regeneration (CB04)

Reduce impact of transport operation and infrastructure (CE01)

Maintain existing extensive agricultural practices and agricultural landscape features (CA03)

Manage conversion of land for construction and development of infrastructure (CF01)

Restore small landscape features on agricultural land (CA02)

Reduce impact of outdoor sports, leisure and recreational activities (CF03)

Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities (CF12)

Adapt/change forest management and exploitation practices (CB05)

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

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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

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

Distribution Map

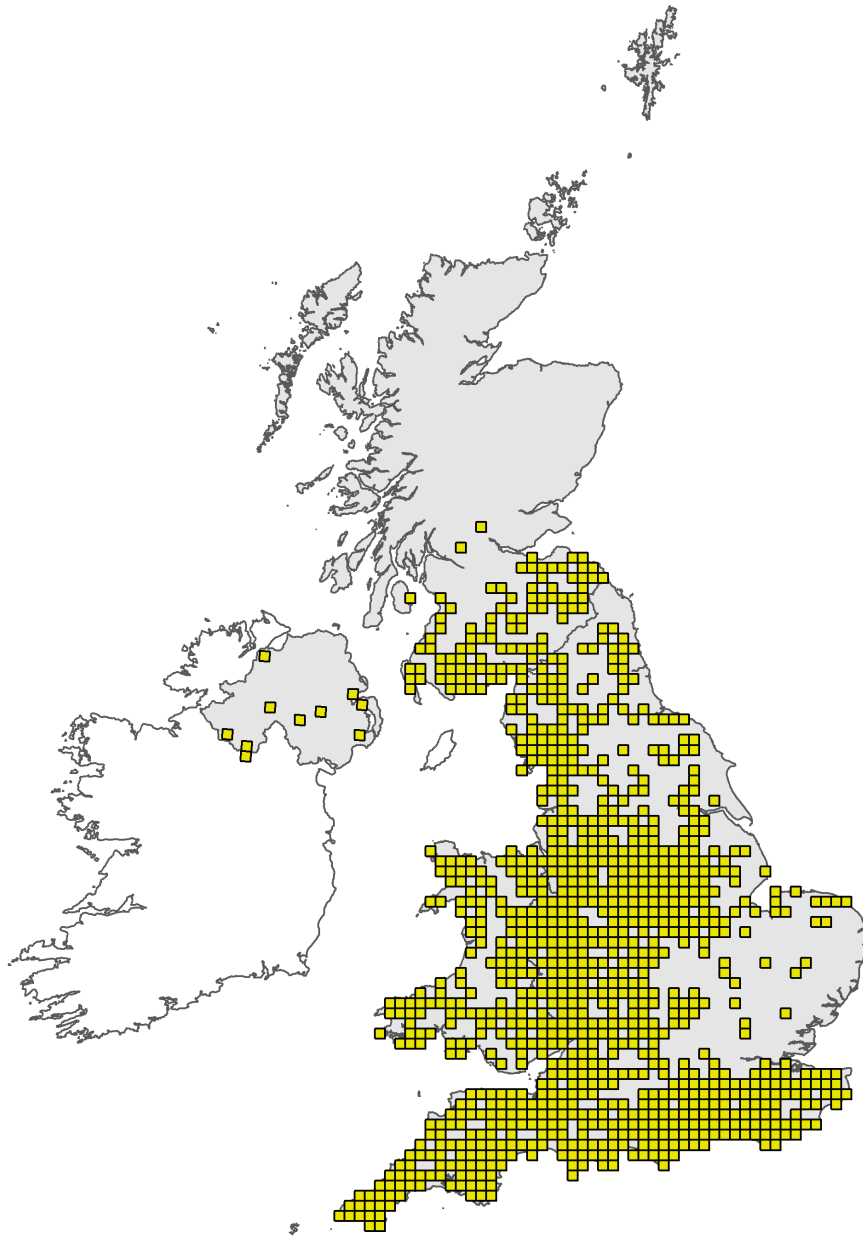


Figure 1: UK distribution map for S1330 - Whiskered bat (*Myotis mystacinus*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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 S1330 - Whiskered bat (*Myotis mystacinus*). 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 applying a bespoke range mapping tool for Article 17 reporting (produced by JNCC) to the 10km grid square distribution map presented in Figure 1. The alpha value for this species was 45km. For further details see the 2019 Article 17 UK Approach document.

Explanatory Notes

Species name: *Myotis mystacinus* (1330)

Field label	Note
2.2 Year or Period	This time period has been selected as distribution has been calculated using data from Mathews et al. 2018.
2.4 Distribution map; Method used	Whiskered bats are widely distributed across Wales. Some gaps in range in Wales are likely due to a lack of records rather than true absence. Because of the high probability of misidentification, a joint species' range was derived using all available data for whiskered and Brandt's bats combined. However, it should be noted that records from both swarming sites and roosts are patchier for Brandt's than for whiskered bats. The estimated range is therefore likely to more closely represent the true range for whiskered than Brandt's bats (Mathews et al. 2018). The two species are both morphologically similar and their echolocation calls are also difficult to differentiate. Current monitoring through NBMP is undertaken by counting <i>M. mystacinus</i> / <i>M. brandtii</i> in hibernation sites, but this may not give an unbiased trend estimate. Trends are not available for the two species separately. The species is often found in buildings, so its presence may be noted, however it can be difficult to observe within the roost and to confirm identification, so may be overlooked if present with other species or misidentified as one of the more commonly found species (common or soprano pipistrelle).

Species name: *Myotis mystacinus* (1330) Region code: ATL

Field label	Note
5.3 Short term trend; Direction	The difficulty of separating whiskered bats from Brandt's bats in terms of physical appearance and via echolocation calls limits the availability of data. Both <i>M. brandtii</i> and <i>M. mystacinus</i> are monitored through the National Bat Monitoring Programme, however, the data is combined from the two species which limits its use. Because of this high probability of misidentification, a joint species range was derived using all available data for whiskered and Brandt's bats combined. However, it should be noted that records from both swarming sites and roosts are patchier for Brandt's than for whiskered bats, so the estimated range is likely to more closely represent the true range for whiskered rather than Brandt's bats. Expert opinion suggested that there is a ratio of approximately 10:1 of captures of whiskered compared with Brandt's bats at swarming sites, woodland and hedgerows (Mathews et al 2018). The precise degree of overlap of the distributions of the species is unknown but genotyping of bats captured at swarming sites across England confirms the previously reported general pattern of the ratio of Brandt's: whiskered bats increasing from West to East and from South to North in Britain (Richardson 2000). There is no evidence to suggest that this species range has declined for the specified time period.
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 20,488 km ² for Wales (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 new method for calculating range from Mathews et. al., 2018 has not been used for this species because additional data for whiskered bat distribution in Scotland were included in the UK dataset after the Mathews report was published. It was not possible to revise the UK range calculations using the Mathews method and so the range surface area was calculated using the 2007/2013 method devised by JNCC whereby a 45km alpha hull value was used with a starting range unit of individual 10km squares. Acoustic detectors have changed considerably over the years in both accuracy and sensitivity, and have added to information on distribution.

6.4 Additional population size	Mathews et al. 2018 was unable to give an updated population estimate. They state 'Given the absence of data on roost density it was not possible to compute a 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, and therefore no alternative metrics of population size were available.' The estimate by Harris et al. 1995 (population estimate for Wales = 8000) was based largely on expert opinion, based on very limited information, extrapolating from known size of <i>Pipistrellus pipistrellus</i> colonies in relation to size of <i>M. mystacinus</i> colonies following the methods described by Speakman, 1991 and Harris et al, 1995. Harris et al's, 1995 reliability rating of the estimate was 5, indicating that little confidence can be placed on the estimate. Better data are needed to provide a reliable alternative population estimate.
6.6 Population size; Method used	The reported figure in 6.2 is based on occupied 1km grid squares and is therefore reliant on existing records. This species is likely to be under recorded and the issue is compounded by the lack of separation between whiskered and Brandt's bat records. The reported figure in 6.4 is based mainly on extrapolation from a limited amount of data.
6.8 Short term trend; Direction	The combined populations of whiskered and Brandt's bat are considered to have been stable in Wales over the period 1999-2016: 'The smoothed index is currently 1.4% below the 1999 base year value, equivalent to an annual decrease of 0.1%. The index has remained below the baseline since 2003, although recent years have seen a gradual upward trend back to baseline level. Overall there has been no significant change in the smoothed index since the baseline year.' (BCT 2018a). However, this trend should be interpreted with caution as it combines data from two species with differing ecological requirements and potentially differing conservation status. This uncertainty has been compounded by the discovery of <i>Alcathoe</i> bat in the UK in 2010, a third cryptic species in this species group. The distribution of <i>Alcathoe</i> bat in the UK is poorly known although it is thought to be localised and rare. It is likely to have occurred in the UK prior to its discovery in 2010, so it is possible that counts of whiskered/Brandt's bat made during the Hibernation Survey may also include <i>Alcathoe</i> bat. Further work is required to facilitate the reliable identification of these species and their differing ecological needs.
6.16 Change and reason for change in population size	In NRW 2013, population was reported as number of individuals however the given EU reporting unit for the current report is 1x1km grid squares. This is based on the supporting datasets produced by Mathews et al. 2018. The reported Alternative Population estimate is 8000 individuals and remains unchanged as there are no new population estimates available and thus Harris et al. 1995's value is given.

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/NO/Unknown Area: 20,500 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: 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. *M. mystacinus* requires a complex mosaic of habitats to support foraging, roosting and commuting behaviour. In England, one radiotracking study indicated a preference for farm woodlands, hedgerows and wetlands in Yorkshire (Aegerter, 2003); and a further radiotracking study in SW England indicated a preference for woodlands and semi improved and improved grassland habitats (particularly cattle-grazed pasture with hedgerows) with avoidance of urban and arable habitats (Berge, 2007). They are frequently captured in mist nets placed along linear features such as tall hedgerows, woodland edges and small waterways enclosed by trees (Mathews et al. 2018). In Ireland whiskered bats selectively favoured mixed woodland and riparian habitats both with respect to home range and foraging area selection (Buckley et al. 2013). Elsewhere in Europe, the species uses a diversity of habitats including forests, gardens, orchards, riparian corridors and open areas, and can also forage within the crowns of trees (Dietz and Keifer 2016). Wing morphology and echolocation calls indicate that whiskered bats are adapted to forage in edge or cluttered habitats although Brandt's bats tend to have higher wing loadings than Whiskered bats (Jones 1991, Norberg and Rayner 1987), perhaps allowing Brandt's to be more manoeuvrable in more forested environments. Maximum foraging distances of females from maternity roosts have been recorded as 2.3km (Berge 2007) and 3.5km (Aegerter, 2003), but are usually much less. Maternity roosts are usually located in buildings, though they are sometimes rarely found in trees and bat boxes (Schober and Grimmberger 1989). Hibernation sites include underground tunnels, ice-houses and caves (Jones, 1991). As with other *Myotis* species, whiskered bats frequently visit swarming sites such as cave entrances in the autumn (Parsons et al. 2003, Glover and Altringham 2008). Although the precise function of swarming is unknown, it is likely to play a role in social communication and mating display, and is therefore important to species conservation. Therefore these sites should be considered important habitat features for 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. We do not at present have a reliable measure of habitat quality across the species range in Wales, 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.

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

There is some detailed information on the habitat requirements/limitations of this species, but the total area and overall quality of suitable habitat poorly understood as the species depends on a matrix of habitats in a landscape. To obtain a proper estimate of suitable habitat used by the species, it would be necessary to first identify all of the foraging and roosting habitat located within the current range boundary; determine whether or not each of these features were being used; and subsequently calculate the combined area of all currently used habitats. This process would require very detailed habitat information at a fine scale across the UK. We do not currently have this level of information. However the population trend is considered stable and the species is widespread, using a mosaic of habitats; it is therefore assumed on the basis of expert judgement that both the area and quality of occupied habitat is sufficient to support a viable population of the species and maintain FCS.

7.4 Short term trend; Direction

There is insufficient data on any change in the level of suitable habitat or any change in the quality of habitat for the species. This is extremely difficult question to answer as this is a generalist species, using a mosaic of habitats across a large area.

8.1 Characterisation of pressures/ threats

Pressures: Pressures can generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). B05 - Logging without replanting or natural regrowth, B09 - Clear-cutting, removal of all trees, F02 - Construction or modification (of e.g. housing and settlements) in existing urban or recreational areas, B08 - Removal of old trees (excluding dead or dying trees), F07 - Sports, tourism and leisure activities: The species is vulnerable to loss of roosts through development, renovation or conversion of buildings and to disturbance at (underground) hibernation and swarming sites. In addition, changes in building practices to improve energy efficiency mean that new buildings may offer fewer roosting opportunities (Mitchell-Jones, 2010). A09 - Intensive grazing or overgrazing by livestock, E01 - Roads, paths railroads and related infrastructure (e.g. bridges, viaducts, tunnels), F01 - Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions), A05 - Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.), A06 - Abandonment of grassland management (e.g. cessation of grazing or of mowing): Whiskered bats forage over lowland farmland, woodland parkland and woodland edges. Agricultural and forestry practices that remove, modify or fragment these habitats, or affect the biomass of suitable insect prey (including changes to water quality) could negatively affect populations. Threats: Threats can also generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). B05 - Logging without replanting or natural regrowth, B09 - Clear-cutting, removal of all trees, F02 - Construction or modification (of e.g. housing and settlements) in existing urban or recreational areas, B08 - Removal of old trees (excluding dead or dying trees), F07 - Sports, tourism and leisure activities: The species is vulnerable to loss of roosts through development, renovation or conversion of buildings and to disturbance at (underground) hibernation and swarming sites. In addition, changes in building practices to improve energy efficiency mean that new buildings may offer fewer roosting opportunities (Mitchell-Jones, 2010). Threats to roost will continue into the future. A09 - Intensive grazing or overgrazing by livestock, E01 - Roads, paths railroads and related infrastructure (e.g. bridges, viaducts, tunnels), F01 - Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions), A05 - Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.), A06 - Abandonment of grassland management (e.g. cessation of grazing or of mowing): Whiskered bats forage over lowland farmland, woodland parkland and woodland edges. Agricultural and forestry practices that remove, modify or fragment these habitats, or affect the biomass of suitable insect prey (including changes to water quality) could negatively affect populations. Threats to habitats and prey availability will continue into the future.

9.5 List of main conservation measures	<p>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. CE01: 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. CB04: Adapt/manage reforestation and forest regeneration, CA03: Maintain existing extensive agricultural practices and agricultural landscape features, CF01: Manage conversion of land for construction and development of infrastructures, CA02: Restore small landscape features on agricultural land, CB05: Adapt/change forest management and exploitation practices: Brandt's bats hunt within woodland and field boundaries. Environmental land management schemes in the agricultural and forestry sectors are now widely used to ensure these habitats in the vicinity of roosts are well-managed and provide appropriate insect food at the correct time of year. CF12: 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. CF03: Reduce impact of outdoor sports, leisure and recreational activities: Impacts of recreation (caving) on swarming and hibernation sites need to be limited.</p>
10.1 Future prospects of parameters	<p>10.1a Future prospects of -range. The future trend in the range for this species is considered to be overall stable in Wales. <i>Myotis mystacinus</i> 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. 10.1b Future prospects of -Population The future trend in the population of this species is considered to be overall stable in Wales. Whiskered/Brandt's trends for Wales currently which show a stable population and no specific short-term drivers for population change have been identified. 10.1c Future prospects of -Habitat of the species The future trend in extent and quality 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 <i>Myotis mystacinus</i> 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.</p>