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:

S1331 - Leisler's bat (*Nyctalus leisleri*)

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	**1331**
1.3 Species scientific name	**Nyctalus leisleri**
1.4 Alternative species scientific name	
1.5 Common name (in national language)	Leisler's 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?	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

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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	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	
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	
6.5 Type of estimate		
6.6 Population size Method used	Insufficient or no data available	
6.7 Short-term trend Period	2007-2018	
6.8 Short-term trend Direction	Unknown (x)	
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	No change	
	The change is mainly due to:	

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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)?	Unknown
	b) Is there a sufficiently large area of occupied AND unoccupied habitat of suitable quality (to maintain the species at FCS)?	Unknown
7.2 Sufficiency of area and quality of occupied habitat Method used	Insufficient or no data available	
7.3 Short-term trend Period	1999-2016	
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		

8. Main pressures and threats

8.1 Characterisation of pressures/threats

Pressure	Ranking
Removal of dead and dying trees, including debris (B07)	H
Removal of old trees (excluding dead or dying trees) (B08)	H
Clear-cutting, removal of all trees (B09)	H
Forest management reducing old growth forests (B15)	H
Wind, wave and tidal power, including infrastructure (D01)	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
Use of other pest control methods in agriculture (excluding tillage) (A23)	M
Conversion to other types of forests including monocultures (B02)	M
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	M

Threat	Ranking
Removal of dead and dying trees, including debris (B07)	H
Removal of old trees (excluding dead or dying trees) (B08)	H
Clear-cutting, removal of all trees (B09)	H

Forest management reducing old growth forests (B15)	H
Wind, wave and tidal power, including infrastructure (D01)	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
Use of other pest control methods in agriculture (excluding tillage) (A23)	M
Conversion to other types of forests including monocultures (B02)	M
Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (F02)	H

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		Long-term results (after 2030)

9.5 List of main conservation measures

Restore small landscape features on agricultural land (CA02)
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)
Stop forest management and exploitation practices (CB06)
Adapt/manage renewable energy installation, facilities and operation (CC03)
Maintain existing extensive agricultural practices and agricultural landscape features (CA03)
Other measures related to agricultural practices (CA16)
Adapt/change forest management and exploitation practices (CB05)
Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities (CF12)

9.6 Additional information

10. Future prospects

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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	
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	

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13.2 Trans-boundary assessment

13.3 Other relevant Information

Distribution Map

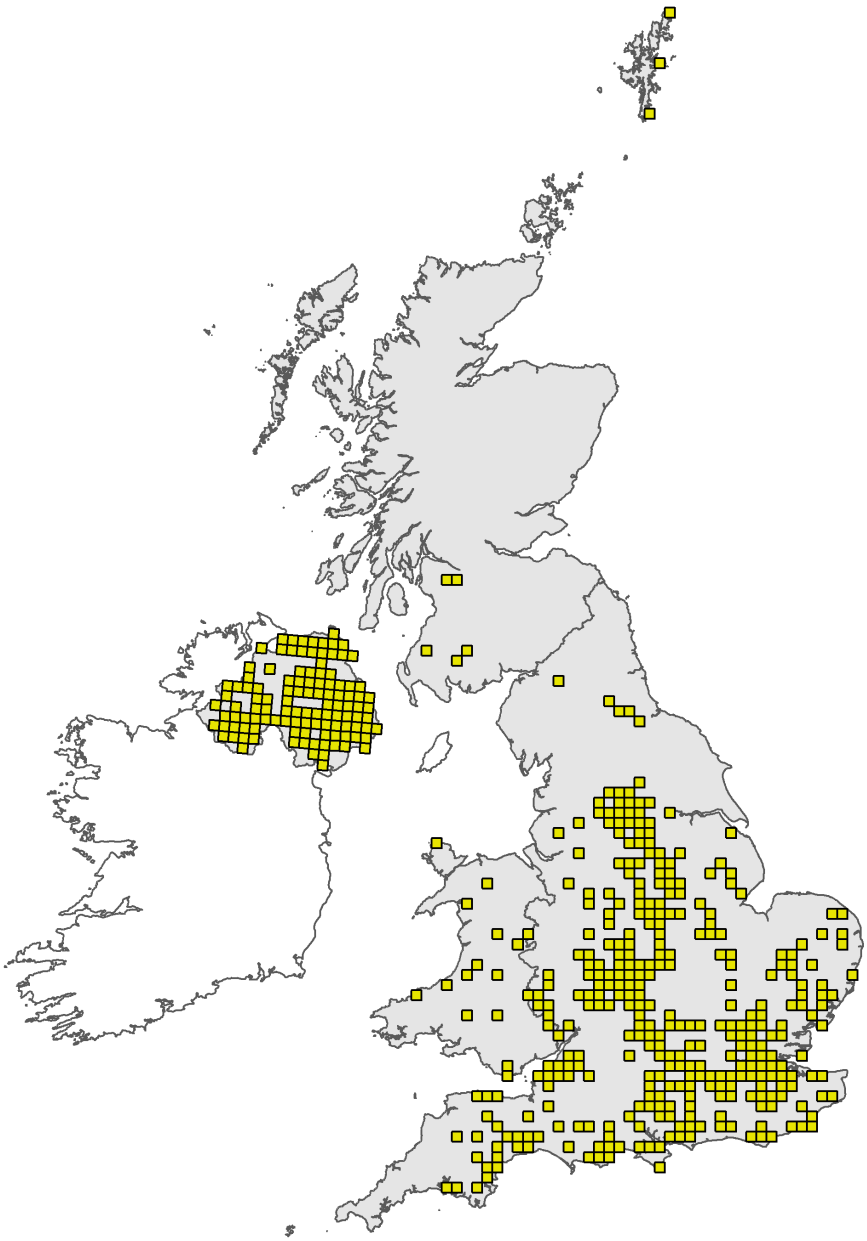

Figure 1: UK distribution map for S1331 - Leisler's bat (*Nyctalus leisleri*). Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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

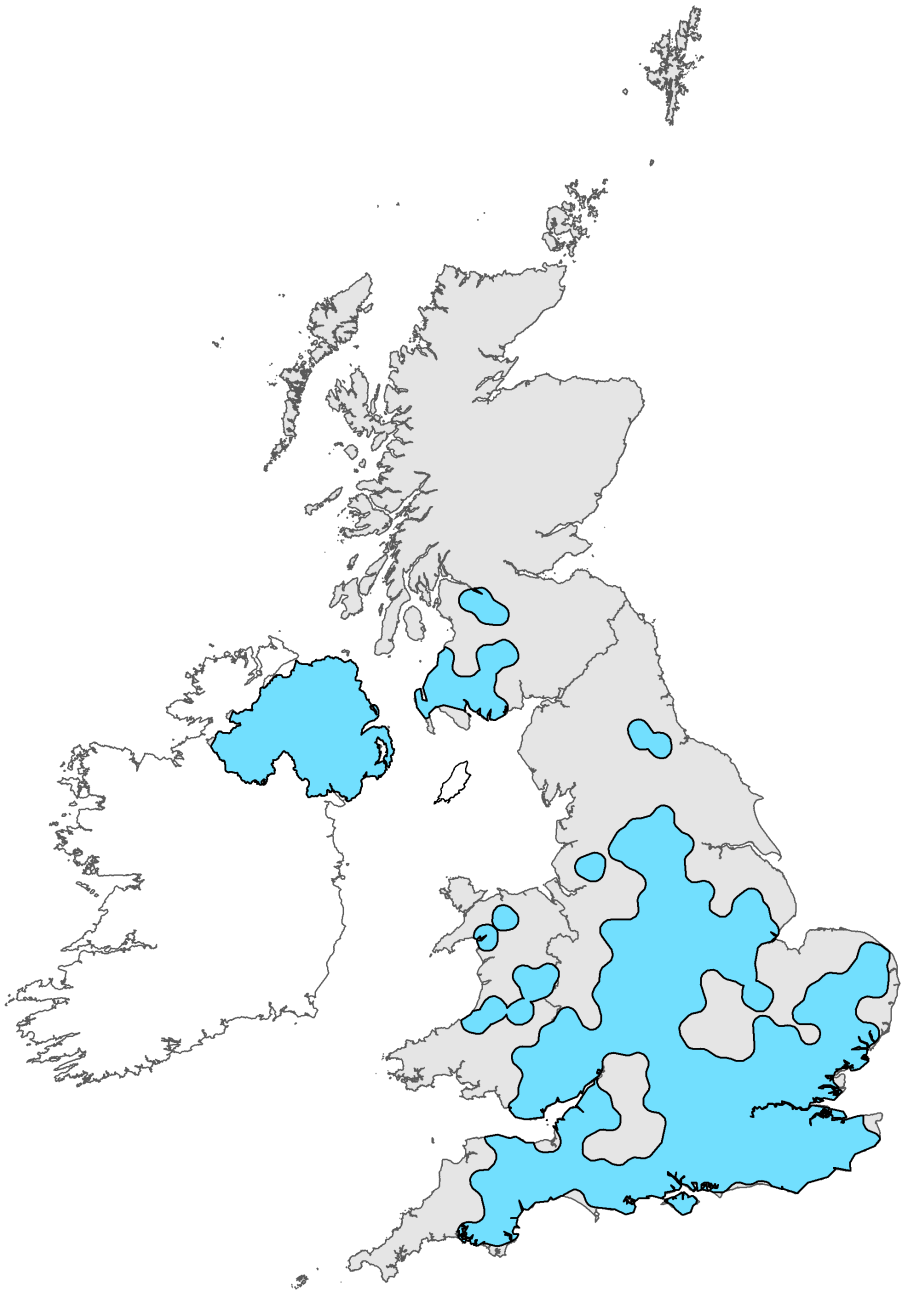

Figure 2: UK range map for S1331 - Leisler's bat (*Nyctalus leisleri*).Coastline boundary derived from the Oil and Gas Authority's OGA and Lloyd's Register SNS Regional Geological Maps (Open Source). Open Government Licence v3 (OGL). Contains data © 2017 Oil and Gas Authority.

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: Nyctalus leisleri (1331)

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	Nyctalus leisleri is a rare bat throughout Wales, though with a concentration of records in the south-east. Leisler's bat is considered migratory in Europe and transient individuals have been widely recorded. Its status in Wales is unclear. Historically, this is a poorly-recorded species, though the widespread use of broadband bat detectors has significantly increased the number of records and extended the known distribution of Leisler's bat in the UK. However, while the species makes loud echolocation calls that are readily recorded on modern broadband bat detectors, there is considerable overlap in the call parameters of the other Nyctaloid bats, N. noctula and Eptesicus serotinus. Many acoustic records are not supported by regional records of bats identified in the hand (or by molecular analysis of droppings), raising doubts about their validity. Leisler's bat is considered migratory in Europe, but thought to undergo only local dispersal within the UK (Shiel et al. 1999).

Species name: Nyctalus leisleri (1331) 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 6,740 km2 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 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.

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 = zero) was based largely on expert opinion, taking into account the ratio of Leisler's roosts to pipistrelle roosts or the ratio of Leisler's bats to serotines. The estimate was considered to have poor reliability. The estimated population of 0 for Wales given in Harris is clearly too low, now that the presence of the species has been confirmed, although no roost records have yet been made, there are no data on which to base population estimates so population for Wales must be reported as unknown with regard to the unit of 'individuals' as reported in NRW. 2013.
6.8 Short term trend; Direction	No trend data is available for Wales and therefore unknown has been selected. The species is included in the iBats UK survey and the National Bat Monitoring Programme however too few data are currently available to permit the calculation of a trend at the UK level.
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	There is no new information or sufficient data available on which to base a new population estimate for Wales. NRW 2013 did not estimate the population.
7.1 Sufficiency of area and quality of occupied habitat	Area: 6,740 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: Unknown. We do not have a reliable measure of the quality of the occupied habitat. Without trend data it is also difficult to infer if habitat is of sufficient quality to maintain FCS. Leisler's bats forage in woodland, pasture and riparian habitats and along woodland margins, even close to major roads and around street lights. It has been seen foraging over beaches and sand dunes and shows no clear habitat associations (Shiel and Fairley 1999, Shiel et al. 1999, Waters et al. 1999, Mathews et al. 2015). The average home range area can approach 18 square km and foraging flights can be up to 13km from the roost. Leisler's bats are not as dependent on tree roosts as N. noctula and use a wide range of buildings. Leisler's have occasionally been found in caves, tunnels and buildings during the hibernation period (McAney 2006), but tree roosts are likely to be utilised the most with roosts in deciduous trees being used almost exclusively after November in Ireland (Russ et al. in prep). 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. Overall = Unknown
7.2 Sufficiency of area and quality of occupied habitat; Method used	The habitable area has been taken from 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. The habitable area within the range is noted as 6,740 km2, but it is unlikely that the entirety of this area forms suitable habitat. Leisler's bat shows no clear habitat associations. To obtain a proper estimate of suitable habitat used by the species, it would be necessary to first identify all of the foraging and roosting habitat located within the current range boundary; determine whether or not each of these features were being used; and subsequently calculate the combined area of all currently used habitats. This process would require very detailed habitat information at a fine scale across the UK. We do not currently have this level of information.

7.3 Short term trend; Period	range information taken from Mathews et al. 2018
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 leisler's show no clear habitat associations.
8.1 Characterisation of pressures/ threats	Pressures: B07 - Removal of dead and dying trees, including debris, B08 - Removal of old trees (excluding dead or dying trees), B09 - Clear-cutting, removal of all trees, B15 - Forest management reducing old growth forests, B02 - Conversion to other types of forests including monocultures: Leisler's bat is primarily a tree-roosting species, so would be vulnerable to loss of roost opportunities in dead, dying or damaged trees. F02 - Construction or modification (of e.g. housing and settlements) in existing urban or recreational areas: The species also utilises buildings as maternity sites, so are vulnerable to roost loss through the demolition or alteration of buildings or changes to construction methods (Mitchell- Jones, 2010). A06 - Abandonment of grassland management (e.g. cessation of grazing or of mowing), A23 - Use of other pest control methods in agriculture (excluding tillage): Pressures that affect the biomass of flying insects, such as the widespread use of pesticides and changes in water quality, also affect this species. A05 - Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.): Despite the fact that Leisler's bats will forage high above the ground, when light levels are high on emergence from roosts, they will follow linear landscape elements such as hedgerows (Russ et al., 2003), indicating the importance of these features within the landscape. Therefore the loss of these features might be expected to impact on the species. D01 - Wind, wave and tidal power, including infrastructure: Leisler's bats have a high risk of collision with wind turbines as they fly and forage in open areas and are known to be killed by wind turbines in Europe (Rodrigues et al. 2014, Rydell et al. 2010). Threats: B07 - Removal of dead and dying trees, including debris, B08 - Removal of old trees (excluding dead or dying trees), B09 - Clear-cutting, removal of all trees, B15 - Forest management reducing old growth forests, B02 - Conversion to other types of forests including monocultures: Leisler's bat is primarily a tree-roosting species, so would be vulnerable to loss of roost opportunities in dead, dying or damaged trees. Tree works are an ongoing threat. F02 - Construction or modification (of e.g. housing and settlements) in existing urban or recreational areas: The species also utilises buildings as maternity sites, so could be vulnerable to roost loss through the demolition or alteration of buildings or changes to construction methods (Mitchell-Jones, 2010). Development is likely to accelerate in future years and this is therefore an ongoing threat. A06 - Abandonment of grassland management (e.g. cessation of grazing or of mowing), A23 - Use of other pest control methods in agriculture (excluding tillage): Threats that affect the biomass of flying insects, such as the widespread use of pesticides, deterioration of water quality or the removal of uncultivated land, such as hedgerows or woodland, will continue to affect this species. A05 - Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.): Despite the fact that Leisler's bats will forage high above the ground, when light levels are high on emergence from roosts, they will follow linear landscape elements such as hedgerows (Russ et al., 2003), indicating the importance of these features within the landscape. Therefore the loss of these features might be expected to impact on the species and this is a threat that is likely to continue in the future. D01 - Wind, wave and tidal power, including infrastructure: Leisler's bats have a high risk of collision with wind turbines as they fly and forage in open areas and are known to be killed by wind turbines in Europe (Rodrigues et al. 2014, Rydell et al. 2010). Development of wind power will continue into the future.

9.5 List of main conservation measures	CA02 Restore small landscape features on agricultural land, 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, CB06: Stop forest management and exploitation practices, CA03: Maintain existing extensive agricultural practices and agricultural landscape features, CA16: Other measures related to agricultural practices, CB05 Adapt/change forest management and exploitation practices: Leisler's bats hunt over cattle-grazed pasture and in deciduous or mixed woodland. Roosts are often within trees. 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. Planning at landscape scale is required to conserve commuting routes and foraging areas. CC03: Adapt/manage renewable energy installation, facilities and operation, CF12: Other measures related to residential, commercial, industrial and recreational infrastructures, operations and activities: 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. Wind turbine design and operation needs to take into account the likely impact on bats, e.g. in relation to mortality and habitat fragmentation.
10.1 Future prospects of parameters	10.1a Future prospects of -range. The future prospects of range for this species is considered to be stable in Wales. N. lesleri range is restricted in 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 previously unknown populations are located. 10.1b Future prospects of -Population The future prospects of population for this species is considered to be unknown in Wales. There is insufficient data to draw trends for Wales however no specific short-term drivers for population change have been identified. 10.1c Future prospects of -Habitat of the species The future prospects of habitat of the species is considered to be overall stable in Wales. We do not have a reliable measure of the quality of the occupied habitat, however N. leisleri 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.