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

Supporting documentation for the Third Report by the United Kingdom under Article 17

on the implementation of the Directive from January 2007 to December 2012
Conservation status assessment for

Species:

S1327 - Serotine (*Eptesicus serotinus*)

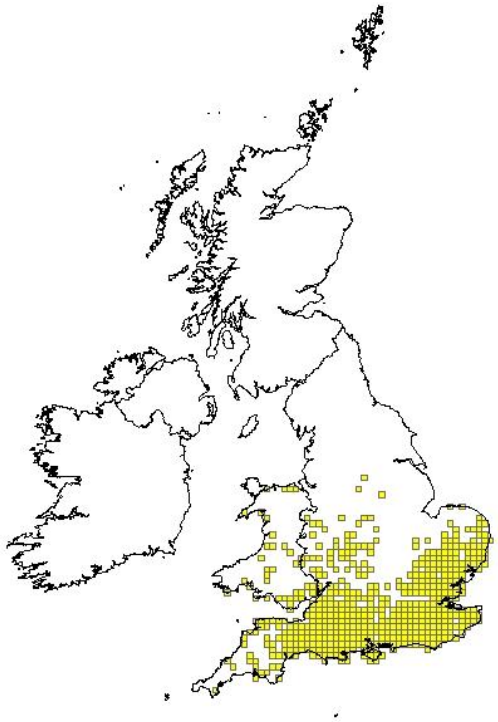
IMPORTANT NOTE – PLEASE READ

- The country-level reporting information contained in this document is a contribution to the Article 17 UK report for the habitat/species concerned.
- It has been provided by **Natural England** and refers only to the state of the habitat/species in **England** - it does not constitute an assessment for the whole of the UK.
- The Article 17 UK Approach document provides details on how this information has been used and, combined with information supplied by other Statutory Nature Conservation Bodies
- The format of the document is closely aligned to that set out by the European Commission for Member State reporting – as a result, some of the fields are not applicable at a country-level and have deliberately been left blank – in addition, the content of most fields is constrained by the EC reporting categories.

Reporting format on the 'main results of the surveillance under Article 11' for Annex II, IV & V species

Field name	*Brief explanations*	
0.2 Species	**0.2.1 Species code**	**S1327**
	0.2.2 Species scientific name	***Eptesicus serotinus***
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	**Serotine**

1.1 Maps			
1.1.1 Distribution map		**Sensitive**	**False**
	E. serotinus is most commonly recorded south of a line from the Wash to the Bristol Channel, though with a lower density of records throughout Wales and the west midlands of England. Records come from a combination of reports of bats in houses and bat detector surveys as part of the NBMP. The greater use of bat detectors has extended the known distribution northwards in recent years, though few roosts are known in much of this area.		



1.1.2 Method used - map	**Estimate based on partial data with some extrapolation and/or modelling**
1.1.3 Year or period	**2000-2012**

1.1.4 Additional distribution map	**False**
1.1.5 Range map	

2.1 Biogeographical region & marine regions	**ATL**
2.2 Published sources	**"BAT CONSERVATION TRUST, 2012. The National Bat Monitoring Programme. Annual Report 2011. Bat Conservation Trust, London. (www.bats.org.uk)** **BATTERSBY, J (Ed.). 2005. UK Mammals: Species Status and Population Trends. JNCC/Tracking Mammals Partnership.** **BOYE, P. & DIETZ, M. 2005. Research Report No 661: Development of good practice guidelines for woodland management for bats. English Nature, Peterborough.** **CATTO, C.M.C., HUTSON, A.M. & RACEY, P.A. 1994. The diet of Eptesicus serotinus in southern England. Journal of Zoology, London, 238, 623-632.** **CATTO, C.M.C., HUTSON, A.M., RACEY, P.A. & STEPHENSON, P.J. 1996. Foraging behaviour and habitat use of the serotine bat (Eptesicus serotinus) in southern England. Journal of Zoology, London, 235, 635-644** **HARRIS, S., MORRIS, P., WRAY, S. & YALDEN, D. 1995. A review of British Mammals: population estimates and conservation status of British mammals other than cetaceans. JNCC, Peterborough.** **HUTTERER, R., IVANOVA, T., MEYER-CORDS, C. & RODRIGUES, L. 2005. Bat Migrations in Europe: A review of banding data and literature. Federal Agency for Nature Conservation, Bonn.** **HUTSON, A.M. 2008. Serotine Eptesicus serotinus. Pp 356-360 in HARRIS, S. & YALDEN, D.W. Mammals of the British Isles: Handbook, 4th edition. The Mammal Society, Southampton.799pp.** **RICHARDSON, P. 2000. Distribution atlas of bats in Britain and Ireland 1980-1999. Bat Conservation Trust, London.** **SPEAKMAN, J.R. 1991. The impact of predation by birds on bat populations in the British Isles. Mammal Review, 21, 123-142."**
	Monitored by field survey and colony counts in the NBMP. Restricted distribution and low contact rates mean that sampling intensity remains an issue.

2.3 Range	
2.3.1 Surface area Range	
2.3.2 Method used Surface area of Range	**Estimate based on partial data with some extrapolation and/or modelling**

2.3.3 Short-term trend Period	**2001-2012**	
	Monitoring of selected maternity colonies and structured field surveys for the species have been undertaken since 1988 through the National Bat Monitoring Programme (NBMP). There has not been a full survey of every 10km square within the species range. However, the level of recording is high for this species as its often found in buildings when advice is sought for building or development work.	
2.3.4 Short term trend Trend direction	**increase**	
	The species appears to be expanding its range to the west, north and east since the last reporting round in 2007. Greater use of bat detectors in structured surveys, has lead to a change in range. This conclusion is supported by the fact that the increase in range has not been accompanied by a significant increase in population (BCT, 2011).	
2.3.5 Short-term trend Magnitude	**a) Minimum**	
	b) Maximum	
2.3.6 Long-term trend Period		
2.3.7 Long-term trend Trend direction		
2.3.8 Long-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
2.3.9 Favourable reference range	**a) Value in km²**	
	b) Operator for FRR	
	c) FRR is unknown (indicated by "true")	**False**

	d) Method used to set FRR	
2.3.10 Reason for change Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to…	**a) Genuine change?**	**False**
	This is due to greater use of bat detectors in structured surveys. This conclusion is supported by the fact that the increase in range has not been accompanied by a significant increase in population.	
	b) Improved knowledge/more accurate data?	**True**
	c) Use of different method (e.g. "Range tool")?	**False**

2.4 Population		
2.4.1 Population size estimation (using individuals or agreed exceptions where possible)	**a) Unit**	**number of individuals**
	b) Minimum	**14750**
	c) Maximum	**14750**
2.4.2 Population size estimation (using population unit other than individuals) Optional *(if 2.4.1 filled in)*	**a) Unit**	
	b) Minimum	
	c) Maximum	
2.4.3 Additional information on population estimates / conversion Optional	**a) Definition of "locality"**	
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	

2.4.4 Year or period	**1995-**	
2.4.5 Method used Population size	**Estimate based on partial data with some extrapolation and/or modelling**	
	BAT CONSERVATION TRUST, 2012. The National Bat Monitoring Programme. Annual Report 2011. Bat Conservation Trust, London. (www.bats.org.uk) HARRIS, S., MORRIS, P., WRAY, S. & YALDEN, D. 1995. A review of British Mammals: population estimates and conservation status of British mammals other than cetaceans. JNCC, Peterborough. SPEAKMAN, J.R. 1991. The impact of predation by birds on bat populations in the British Isles. Mammal Review, 21, 123-142. The 1995 population estimate was based on very limited information, extrapolating from known size of Pipistrellus pipistrellus colonies in relation to size of Eptesicus serotinus colonies following the methods described by Speakman (1991) and Harris et al. (1995). Harris et al's (1995) reliability rating of the estimate was four, meaning that it is "based on a very limited amount of information on the species". The National Bat Monitoring Programme (BCT, 2011) detected no significant population trend in this species in the period 1999-2011, so there is no basis on which to revise the population estimate.	
2.4.6 Short-term trend Period	**1999-2011**	
2.4.7 Short-term trend Trend direction	**unknown**	
2.4.8 Short-term trend Magnitude	**a) Minimum**	
	b) Maximum	
	c) Confidence interval	
2.4.9 Short-term trend Method used	**Absent data**	
2.4.10 Long-term trend – Period		
2.4.11 Long-term trend Trend direction		
2.4.12 Long-term trend Magnitude	**a) Minimum**	

Optional		
	b) Maximum	
	c) Confidence interval	
2.4.13 Long term trend Method used		
2.4.14 Favourable reference population	**a) Number of individuals/agreed exceptions/other units**	**15000**
	The favourable reference population value has been derived using 1994 as the baseline and making a judgement on whether the population in 1994 was viable in the long-term, using the decision tree in Note 1 (see 'Assessing Conservation Status: UK Approach') as a guide. Historic and current information on population size, distribution and trends have been used in order to assess viability and, if the 1994 level was not viable, then consideration has been given to what would constitute a viable population. Population trends for this species appear to have been stable since 1997, according to surveillance information. The population for this species in 1995 was estimated to be 15,000 individuals (see section 2.3) and, with stable trends and no intensive conservation action for this species the species is judged to be maintaining itself in the long-term and to have been viable in 1994. The 1995 population estimate has, therefore, been set as the favourable reference population. This figure has been set with limited information and could be revised in the future if better information becomes available.	
	b) Operator	
	c) FRP is unknown indicated by "true"	**False**
	d) Method used to set FRP	**The favourable reference population value has been derived using 1994 as the baseline and making a judgement on whether the population in 1994 was viable in the long-term, using the decision tree in Note 1 (see 'Assessing Conservation Status: UK Approach') as a guide. Historic and current information on population size, distribution and trends have been used in order to assess viability and if the 1994 level was not viable, then**

		consideration has been given to what would constitute a viable population. Population trends for this species appear to have been stable since 1997, according to surveillance information. The population for this species in 1995 was estimated to be 15,000 individuals and with stable trends and no intensive conservation action for this species the species is judged to be maintaining itself in the long-term and to have been viable in 1994. The 1995 population estimate has, therefore, been set as the favourable reference population. This figure has been set with limited information and could be revised in future if better information becomes available.
2.4.15 Reason for change Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.5 Habitat for the species	
2.5.1 Area estimation	**49300**
	E. serotinus requires a complex mosaic of habitats to support foraging, roosting and commuting behaviour. Boye & Dietz (2005) provide a good overview of this species' habitat requirements. In most cases the foraging areas are open fields with woodland edge, but occasionally within woodland. In agricultural landscapes the bats prefer pasture with tree rows for protection from wind. In addition forest edges, river banks, parks, tree rows, gardens and amenity areas are appropriate foraging areas. The species also forages around streetlights. E. serotinus feeds mainly on beetles, especially ground chafer and dung beetles, moths and midges. In maternity colonies the bats commuted an average of 6.5 km to and from distinct foraging sites and used up to five sites per night (Catto et al, 1996). In towns the serotine rarely forages further than one km from the roost. Preferred summer roosts include crevices and other narrow

	holes in houses. Until now maternity colonies have only been recorded in buildings. The bats roost below the ridge of a roof, behind fascia boards, in ventilation holes of new housing blocks, or in the extension slits of bridges. Single animals, males in most cases, sometimes use tree holes or bat boxes. The serotine changes its roost site or hanging place if the microclimate in the roost becomes uncomfortable, e.g. if temperatures rise too much. Winter roosts are in cellars, mines and caves, in old buildings and crevices in walls. Bats occasionally hibernate in their summer roosts. Summer and winter roosts are thought to be less than 50 km apart, but there is little evidence to support this, though Hutterer et al (2005) described the species as 'sedentary but occasionally performs dispersal flights'. 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. There is thought to be a sufficient amount of habitat in the UK to support a viable population of the species.
2.5.2 Year or period	**2012-**
2.5.3 Method used Habitat for the species	**Estimate based on expert opinion with no or minimal sampling**
2.5.4 Quality of the habitat	**a) Habitat quality** **Unknown** BAT CONSERVATION TRUST, 2012. The National Bat Monitoring Programme. Annual Report 2011. Bat Conservation Trust, London. (www.bats.org.uk) BOYE, P. & DIETZ, M. 2005. Research Report No 661: Development of good practice guidelines for woodland management for bats. English Nature, Peterborough. CATTO, C.M.C., HUTSON, A.M., RACEY, P.A. & STEPHENSON, P.J. 1996. Foraging behaviour and habitat use of the serotine bat (Eptesicus serotinus) in southern England. Journal of Zoology, London, 235, 635-644 HUTTERER, R., IVANOVA, T., MEYER-CORDS, C. & RODRIGUES, L. 2005. Bat Migrations in Europe: A review of banding data and literature. Federal Agency for Nature Conservation, Bonn. HUTSON, A.M. 2008. Serotine Eptesicus serotinus. Pp 356-360 in HARRIS, S. & YALDEN, D.W. Mammals of the British Isles: Handbook, 4th edition. The Mammal Society, Southampton.799pp. There is some detailed information on the habitat requirements/limitations of this species, but the total area of suitable habitat is unknown 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. Therefore, area estimate is Unknown.	
	b) Assessment method	**BAT CONSERVATION TRUST, 2012. The National Bat Monitoring Programme. Annual Report 2011. Bat Conservation Trust, London. (www.bats.org.uk)** **BOYE, P. & DIETZ, M. 2005. Research Report No 661: Development of good practice guidelines for woodland management for bats. English Nature, Peterborough.** **CATTO, C.M.C., HUTSON, A.M., RACEY, P.A. & STEPHENSON, P.J. 1996. Foraging behaviour and habitat use of the serotine bat (Eptesicus serotinus) in southern England. Journal of Zoology, London, 235, 635-644** **HUTTERER, R., IVANOVA, T., MEYER-CORDS, C. & RODRIGUES, L. 2005. Bat Migrations in Europe: A review of banding data and literature. Federal Agency for Nature Conservation, Bonn.** **HUTSON, A.M. 2008. Serotine Eptesicus serotinus. Pp 356-360 in HARRIS, S. & YALDEN, D.W. Mammals of the British Isles: Handbook, 4th edition. The Mammal Society, Southampton.799pp.** **There is some detailed information on the habitat requirements/limitations of this species, but the total area of suitable habitat is unknown 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. Therefore, area estimate is Unknown.**
	As this is a generalist species using a mosaic of habitats, the area of distribution is used as an estimate of habitat area. This is calculated from the number of occupied 10km squares in the distribution map.	
2.5.5 Short-term trend Period	**2001-2012**	

2.5.6 Short-term trend Trend direction	**unknown**	
2.5.7 Long-term trend Period		
2.5.8 Long-term trend Trend direction		
2.5.9 Area of suitable habitat for the species	**a) Value in km²**	**49300**
	b) Absence of data indicated as '0'	
2.5.10 Reason for change Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.6 Main pressures		
a) Pressure	**b) Ranking**	**c) Pollution qualifier**
	H = high importance M = medium importance L = low importance	
A10: Restructuring agricultural land holding	H	
G05: Other human intrusions and disturbances	H	
A02: modification of cultivation practices	M	
A07: use of biocides, hormones and chemicals	M	
B02: Forest and Plantation management & use	M	
B07: Forestry activities not referred to above	M	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	

HUTSON, A.M. 2008. Serotine Eptesicus serotinus. Pp 356-360 in HARRIS, S. & YALDEN, D.W. Mammals of the British Isles: Handbook, 4th edition. The Mammal Society, Southampton.799pp. MITCHELL-JONES, T.J. 2010. Bats in houses – the conservation challenge. Pp 365-378 in Species Management: challenges and solutions for the 21st century. BAXTER, J.M. & GALBRAITH, C.A. TSO Scotland, Edinburgh. Pressures can generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). Although roosts are strictly protected, a small number of licences permitting exclusion or roost destruction is issued every year. In addition, changes in building practices to improve energy efficiency mean that new buildings may offer fewer roosting opportunities (Mitchell-Jones, 2010). Serotines forage over lowland farmland, parkland and woodland edges, Agricultural and forestry practices that remove or modify these habitats, or affect the biomass of suitable insect prey could negatively affect populations

2.6.1 Method used – Pressures	**mainly based on expert judgement and other data**

2.7 Threats		
a) Threat	**b) Ranking**	**c) Pollution qualifier**
	H = high importance M = medium importance L = low importance	
A10: Restructuring agricultural land holding	H	
G05: Other human intrusions and disturbances	H	
A02: modification of cultivation practices	M	
A07: use of biocides, hormones and chemicals	M	
B02: Forest and Plantation management & use	M	
B07: Forestry activities not referred to above	M	
C03: Renewable abiotic energy use	M	
H01: Pollution to surface waters (limnic & terrestrial, marine & brackish)	L	

Threats can generally be divided into those that affect roosts and those that affect commuting and foraging (including prey availability). Although roosts are strictly protected, a small number of licences permitting exclusion or roost destruction is issued every year. In addition, changes in building practices to improve energy efficiency mean that new buildings may offer fewer roosting opportunities (Mitchell-Jones, 2010). Serotines forage over lowland farmland, parkland and woodland edges, Agricultural and forestry practices

that remove or modify these habitats, or affect the biomass of suitable insect prey could negatively affect populations. In addition this species is one that is considered to be at medium risk from fatalities associated with wind farms from studies in the European Continent, but the threat at the population level was considered to be low, Mitchell-Jones and Carlin, 2009. Current research is considering this, but it is too soon to assess the risk that wind turbines pose to serotine populations in England and Wales.

2.7.1 Method used – Threats	**expert opinion**

2.8 Complementary information	
2.8.1 Justification of % thresholds for trends	
2.8.2 Other relevant information	
2.8.3 Trans-boundary assessment	

2.9 Conclusions *(assessment of conservation status at end of reporting period)*
Please refer to the United Kingdom assessment for this species.

3 Natura 2000 coverage & conservation measures - Annex II species
(only applies to species listed under Annex II of the Directive)

3.1 Population		
3.1.1 Population size Estimation of population size included in the SAC network	**a) Unit**	
	b) Minimum	
	c) Maximum	
3.1.2 Method used		
3.1.3 Trend of population size within the network (short-term trend)		

3.2 Conservation measures														
Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.														
3.2.1 Measure	**3.2.2 Type**					**3.2.3 Ranking** H = high importance M = medium importance L = low importance	**3.2.4 Location** where the measure is PRIMARILY applied			**3.2.5 Broad evaluation of the measure**					
	a) Legal/statutory	**b) Administrative**	**c) Contractual**	**d) Recurrent**	**e) One-off**		**a) Inside**	**b) Outside**	**c) Both inside & outside**	**a) Maintain**	**b) Enhance**	**c) Long term**	**d) No effect**	**e) Unknown**	**f) Not evaluated**