Mottisfont Bats Special Area of Conservation (SAC) Protocol for Planning Officers

Report to Natural England

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1 Introduction

1.1 What and where is the Mottisfont Bats SAC

The Mottisfont Bats SAC was designated in 2003 in accordance with the EU Habitats and Species Directive. It was selected a SAC to ensure the conservation of a population of the rare barbastelle bats *Barbastella barbastellus*. At the time of designation the SAC contained one of only six known breeding sites for these bats in the UK. The SAC comprises a mix of woodland types extending to an area of almost 200 ha on the western side of the Test Valley, near Mottisfont. The location of the SAC is shown in figure 1. The boundary of the SAC was defined to ensure the strict protection of known breeding sites used by the bats and the core area of habitat used for roosting, commuting and feeding.

1.2 What are barbastelle bats

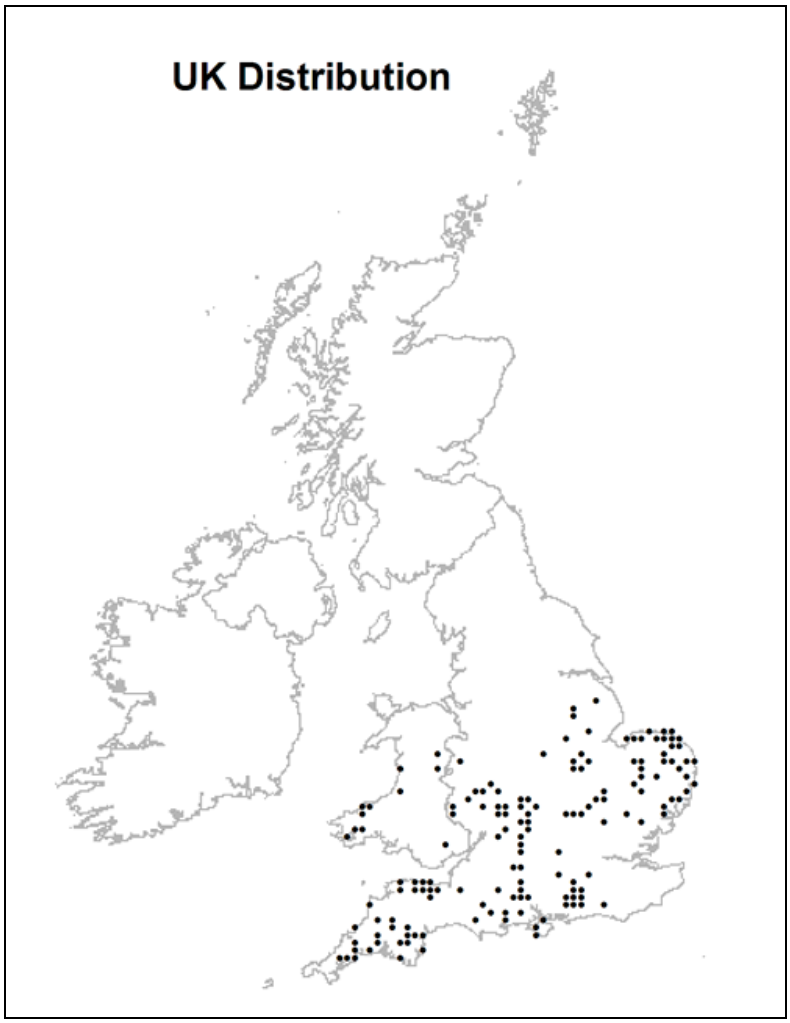
The barbastelle is a medium-sized bat that is easily identified by it's very distinctive appearance which is unlike any other in Europe. The fur is almost black, usually with very pale or golden brown tips to the hairs. The ears are very broad with the inner edges joined together across the forehead.

Barbastelle ecology is relatively poorly-known. In Europe it is believed to be mainly an upland and forest species; in the UK it seems to prefer wooded river valleys. The species forages in mixed habitats, usually over water. Barbastelles appear to select cracks and crevices in wood for breeding, mostly in old or damaged trees, but cracks and crevices in the timbers of old buildings may also be used. Maternity colonies may move between suitable crevices within a small area, such as a piece of woodland or a complex of buildings. Caves and underground structures may be used for winter hibernation. The species is very sensitive to disturbance, together with the loss of roost-sites and food resources.

The barbastelle is distributed throughout Europe, except Iceland, Northern Ireland, Scotland, most of Scandinavia, Estonia and much of southern Europe. The highest population density is probably in central Europe. It is one of the rarest bats in western Europe, and is regarded as endangered in several countries. A population decrease has been reported over most of its European range.

The barbastelle is one of the UK's rarest mammals. Few maternity roost sites are known in the UK. The great majority of other records come from caves or abandoned mines, which are important hibernation sites for a range of bat species. The barbastelle is widely distributed across southern England and across Wales but is

likely to have been significantly under-recorded within its range. Individual bats are sometimes discovered in buildings during summer.



UK Distribution of Annex II species 1308 Barbastelle *Barbastella barbastellus* **Data source:** Bat Conservation Trust Bat hibernation survey data; Bat Conservation Trust Distribution Atlas of Bats in Britain and Ireland (1980-1999): data spreadsheet; Biological Records Centre Mammals Database; Natural England Batsites inventory for Britain; Natural England T. Mitchell Jones, NE (pers. comm)

1.3 What does this protocol seek to achieve?

The Mottisfont Bats SAC protects the core habitat of a population of the rare barbastelle bat. The boundary of the SAC is thought to contain the main breeding roosts for the bats. However, radio tracking studies at Mottisfont and elsewhere in the UK have shown that barbastelle bats range widely from their roost sites. The distance the bats move and for what purpose is only partially understood. It is known that bats need a range of habitats during the year in response to the annual cycle of mating, hibernating, giving birth and raising young. Figure 2 summarises this cycle of activity through the year of a typical bat.

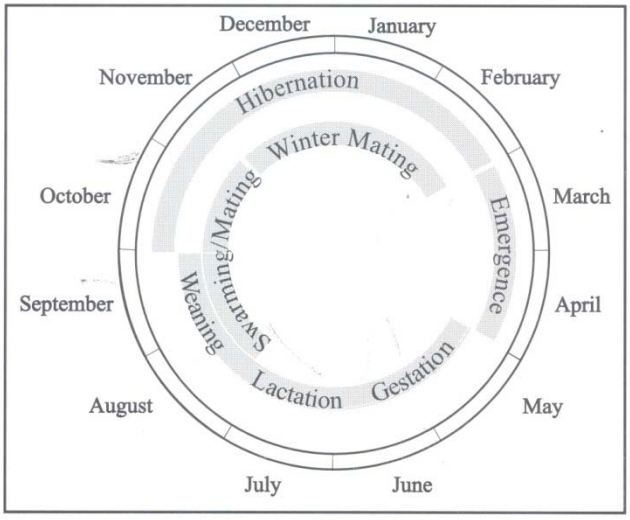


Figure 2: Annual cycle of activity of a typical bat in the UK

How far the Mottisfont barbastelle bats move through these annual life phases is only partially understood. To provide information on the movement of breeding barbastelle bats a series of radio tracking studies were undertaken in the summer (mostly in June and July) between 2002 and 2005 (Davidson-Watts, 2006). These have provided valuable information about the distance the bats move from their roost sites and the habitats most frequently visited during the breeding season. However, little information has been gained on where the bats find mates or where they hibernate during the winter. It is also interesting that no male barbastelle bats have yet been caught at Mottisfont and it may be that bats from this colony of breeding females move considerable distances in late summer to find a mate, however, where this occurs remains a mystery.

The radio tracking studies have shown that the survival of the Mottisfont barbastelle bat population is dependent upon the conservation of suitable habitat over a much wider area of countryside than that protected within the SAC boundary.

Regulation 61 of the UK Habitats Regulations (The Conservation of Habitats and Species Regulations 2010), requires that plans and projects including planning applications and development plans must be subject to an 'appropriate assessment' if it is considered that they are likely to have a significant effect on a SAC.

This protocol aims to provide planners and developers with guidance so that proposed plans and projects avoid having a 'likely significant effect' on the SAC, in particular it provides guidance on:-

- The area of countryside around the SAC these bats are most likely to be using.
- The variety of habitats that are most likely to be important to bats within this area.

- How proposed development may have impacts upon these habitats
- Potential ways of mitigating likely adverse effects of development
- What to do about residual effects that can't be mitigated.

If development is proposed that is likely to have a significant effect upon the Mottisfont Bats SAC, this protocol can also be used to provide competent authorities with information to help them prepare an appropriate assessment of the proposed plan or project. A flow diagram showing the stages of an appropriate assessment is reproduced in Appendix 1. Further advice on undertaking an appropriate assessment can be obtained from Natural England or Jonathan Cox Associates Ltd.

2 Range size and habitat selection

2.1 How far do they go?

Studies of the Mottisfont barbastelle bats since 2000 have shown that the average distance travelled by foraging females during the breeding season is 5.5km (*n* 14) (median 4.5 km). In August bats fly in excess of 16km from the maternity sites. A frequency distribution curve has been constructed using the Mottisfont radio tracking data (figure 3). This shows that 80% of foraging bats travel less than 7.28km from their roost site. It is proposed that a distance of 7.5km from the SAC should be used in which to identify plans and projects likely to have an impact upon habitats used by barbastelle bats from the Mottisfont Bats SAC. The map in Figure 4 shows the extent of the 7.5km zone around the SAC[1]. It is recommended that this zone should be applied as a GIS layer in relevant local planning authority's validation systems.

[1] This size of this zone is related to the radio tracking data from Mottisfont and may be dependent upon habitat suitability. It should not be assumed that a similar range size can be applied in other locations.

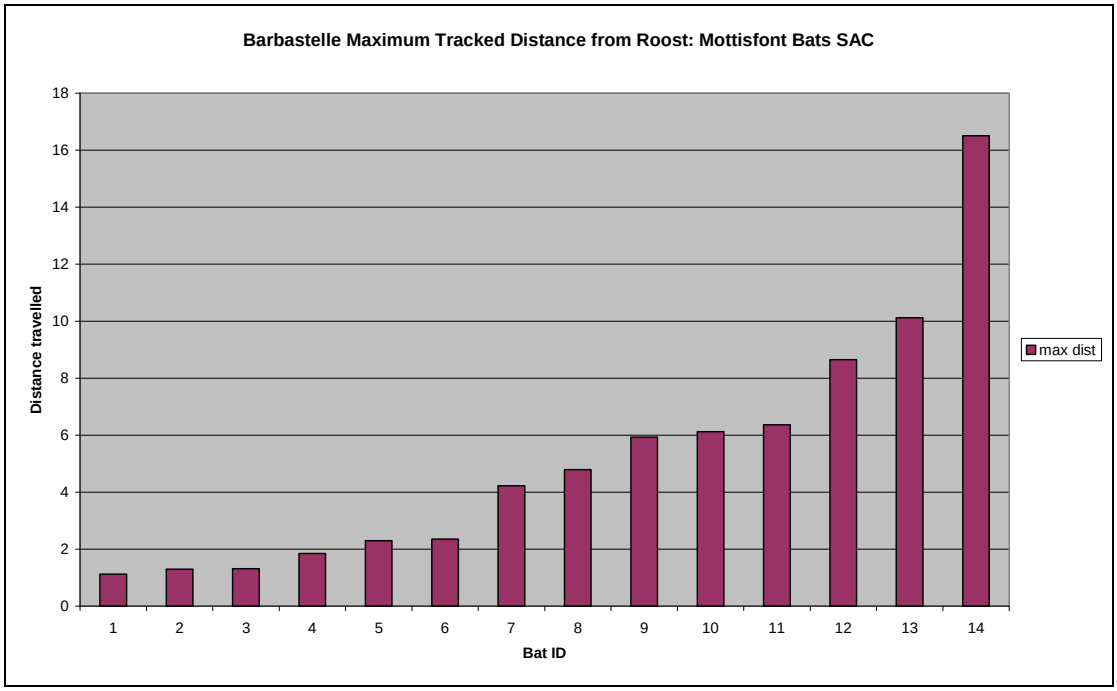


Figure 3: Frequency distribution of distance travelled from roost sites for radio tracked female Barbastelle bats

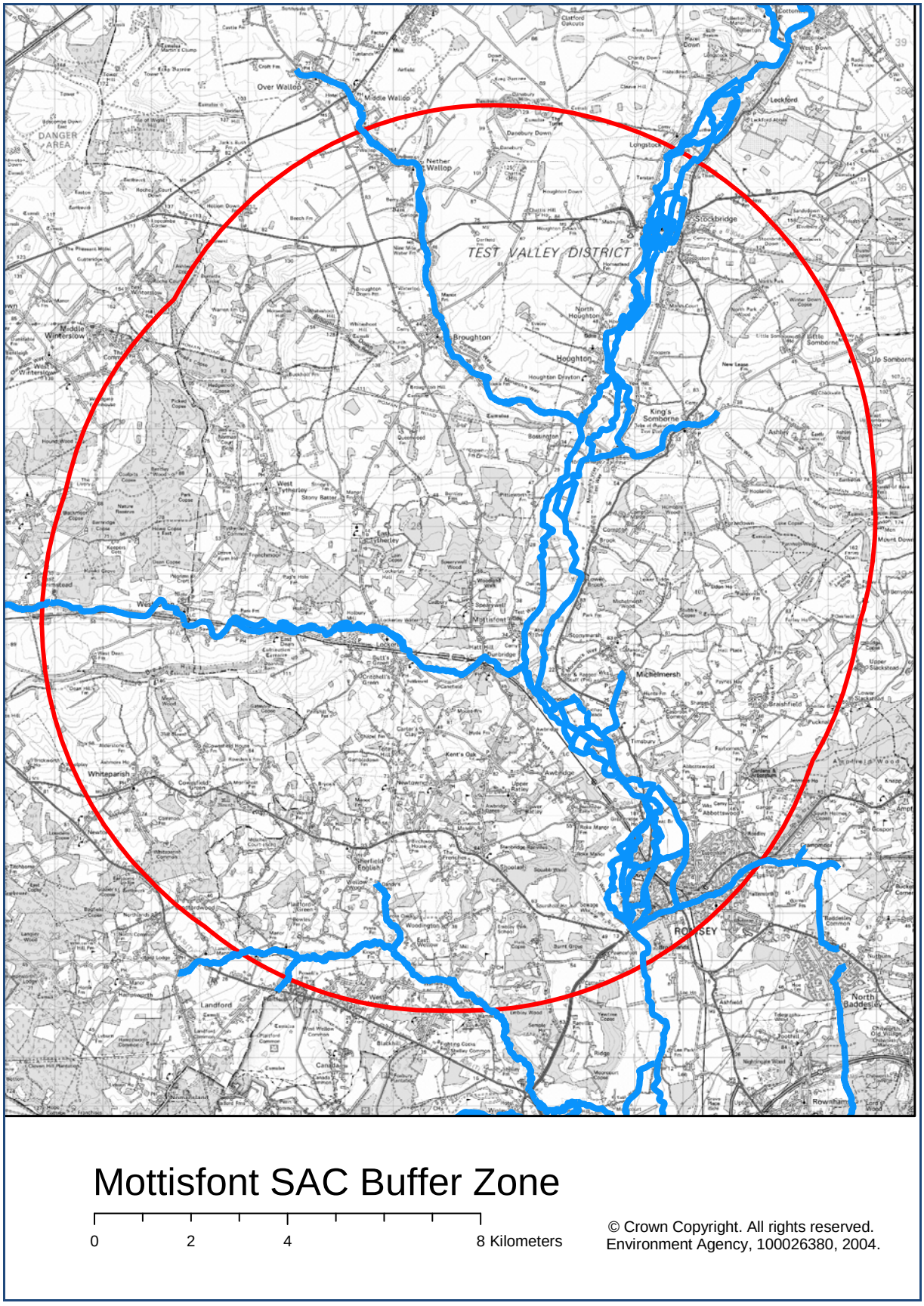


Figure 4: 7.5km zone around the Mottisfont Bats SAC

2.2 What are they doing?

2.2.1 Roosting

Barbastelle bats are largely tree roosting within this SAC and more generally are thought of as a forest bat species. The most important roosts are those used for breeding (nursery roosts) whilst other roosts may be used occasionally or solely by males. It appears that female Barbastelle bats are rather sedentary and do not normally travel far from their breeding roosts. Male bats may commute long distances to winter underground hibernation sites. However, as yet, no male bats have been caught at Mottisfont so their use of the site remains a mystery. It is the tree roosting bats that are of primary concern to the bats at Mottisfont as these are the most important for breeding activity and for maintaining the largely sedentary female population.

Barbastelle bats tend to be relatively specialised in their roost selection. Selection is dependent upon a number of factors including proximity to feeding habitats, links and commuting routes to and from feeding habitats and temperature and humidity within the tree roost. They are a largely tree-roosting species, roosting under loose bark or in small cracks or splits in trees. However, they have been reported only to select trees in unmanaged and ancient woodlands, avoiding more open woodlands and pasture areas. Such habitat has become increasingly rare over the last century owing to significant changes in forestry practice. Barbastelles switch roosts frequently, tending to be faithful to an area of woodland rather than a particular roost site.

2.2.2 Commuting

Bats use significant landscape features along which to commute between feeding and roosting habitats and possibly to find mates. These linear features can be hedges, woodland edges or streams and rivers. Often these can be combined, for example wooded rivers or hedge lined ditches.

2.2.3 Feeding

Feeding habitats are those rich in flying invertebrates occurring in relatively sheltered situations. These include woodlands, grasslands, marshes and open water. Complex habitats or habitat mosaics are likely to be particularly important. These are a feature of landscapes such as the Test flood plain and associated parklands and wood pastures.

Key foraging times are during late pregnancy and lactation (Figure 2). Young are on the wing by mid-August when a rich food resource close to the breeding roost is needed.

2.2.4 Mating

In August, adult females seem to travel greater distances, possibly to visit males at mating sites. Where these are is as yet a mystery as no male barbastelle bats have been caught at Mottisfont. However, the old quarries at Chilmark in Wiltshire, some 35 km to the west of Mottisfont, are known to attract male barbastelle bats and sites such as this might be where mating takes place. Long distance movements of female bats to mate have been recorded in other bat species, most notably greater horseshoe bats.

2.3 What are they eating?

All the published literature on this subject and recent microscopic analysis of droppings taken from Mottisfont, show that barbastelles predominantly eat moths. Recent DNA analysis of prey items from droppings has also identified large moths as being an important component of their diet. Although current information suggests that moths are the prime food resource for barbastelle bats, it is possible that other large flying insects are also important. In the Test valley this may include the abundant aquatic insects life, including the mayflies, that emerge from the river Test and its chalk stream tributaries.

2.4 What habitats do they require?

Statistical analysis of radio tracking data for foraging bats has been undertaken to rank the importance of eight broad habitats types in which the bats were located (Davidson-Watts & Mckenzie, 2006). This has shown the importance of open water habitats (rivers, ponds and lakes). Deciduous woodland and unimproved grasslands were the next preferred habitats, this included chalk grassland/woodland mosaics as well as river-side (riparian) woodland. Although arable and agriculturally improved grassland covered a significantly larger area of the range area used by the foraging bats, these habitats were not preferred.

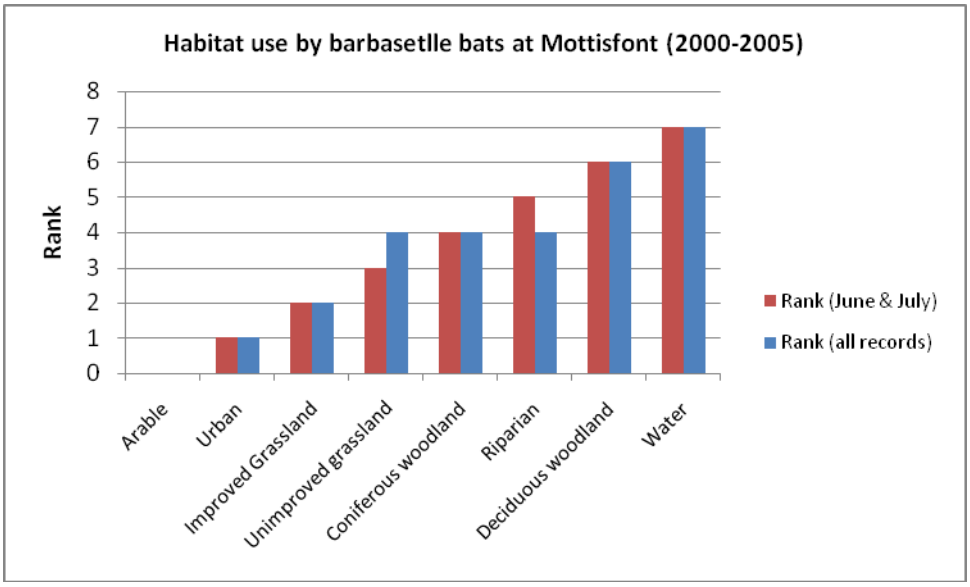


Figure 4: Ranking of main habitat types used by foraging barbastelle bats at Mottisfont (from radio tracking studies between 2002 and 2005)

3 Development likely to have an adverse effect on the Mottisfont Bats SAC

3.1 Vulnerability of habitats to development

3.1.1 Water

Open water was ranked the most important habitat for foraging barbastelle bats. It is not clear if these were feeding over the open water itself or along the margins of rivers, ponds and lakes with overhanging trees and marginal swamp and fen vegetation. Developments that damage or destroy open water habitats and their associated marginal swamp, fen, trees, woodland and scrub are all likely to have adverse effects on their value for foraging bats. In addition, this habitat is vulnerable to a range of indirect impacts in particular light pollution, water pollution and changes in water levels. Barbastelle bats are also vulnerable to disturbance and some forms of development may damage open water habitats as a result of noise or other forms of disturbance.

3.1.2 Trees and woodland

Trees and deciduous woodland are very important to barbastelle bats both for feeding and for roosting. Tree roosts are located under loose bark or in tree splits and crevices. Trees with these characteristics may be damaged or unstable and can be vulnerable to tree surgery and safety felling associated with development. Trees are used as breeding roosts in summer but may also be important for hibernation during the winter months. Trees used by barbastelle bats are more likely to be within woodland but may also be isolated trees or in small groups. All trees with potential roosting characteristics should therefore be considered as potential roost sites. Trees and woodland used by barbastelle bats are vulnerable to direct impacts

of habitat loss and damage not only through loss or damage to trees but also damage to the woodland ground flora and shrub layer. Equally important are indirect effects including light and air pollution, changes to ground and surface water flows and quality, changes to woodland micro-climate in particular humidity and temperature, disturbance from people or machinery and predation by domestic cats.

3.1.3 Riparian habitats

Riparian habitats are those associated with rivers, they include the narrow fringes of marginal reeds and reed like grasses that line water courses but extend from these to include flood plain fens, reed beds and marshes as well as wet woodlands and areas of scrub. These habitats are often rich in invertebrate life and in particular moths and provide a very important habitat for foraging bats. In addition to direct effects of habitat destruction they are also vulnerable to changes in water levels and flows and pollution of water courses, air pollution and light pollution. Riparian vegetation can often occur as narrow lines of tall fen vegetation along old ditches and drains. These can be particularly vulnerable to ditch clearance and drainage operations.

3.1.4 Grassland

Agriculturally unimproved grassland is that which has not been significantly affected by the application of artificial fertilisers and herbicides and has usually been unploughed for many years. Several different types of grassland occur within the Test Valley ranging from chalk grassland on the downs, dry neutral grasslands on clay soils and a range of wet grasslands on the alluvial and peaty soils of the flood plain. They are generally managed as pasture by grazing livestock although some meadows are mown for hay. These different grassland types support characteristic groups of insects and may be used by feeding bats at different times of year. Where these grasslands form mosaic habitats with patches of scrub, woodland, old hedges and trees, drainage ditches and patches of fen they provide a very rich foraging habitat for bats.

Agriculturally improved grassland may not support as rich diversity of insects and may not be as valuable for foraging bats as unimproved grassland. However, despite this, some improved grasslands can be structurally diverse with taller grasslands mixed with patches of shorter grassland. Where these also form a mosaic with other woodland and scrub habitats improved grasslands can provide a good foraging habitat for bats. These can be damaged in much the same way as improved grasslands.

Any development that destroys grassland habitats can be damaging to their value for bats. These habitats are also vulnerable to changes in management either through the cessation of grazing as a result of a change from grazing to mowing and from applications of fertiliser and herbicide. Grassland mosaic habitats are also vulnerable to habitat simplification through clearance of scrub or tree cover or heavy

trimming of hedges and ditch clearance. Due to their more open aspect, grasslands can easily be damaged by lighting and light pollution, particularly outdoor lights. Developments that fragment grasslands can also be damaging, for instance through the construction of roads or tracks across them, as this the habitat in smaller and potentially unusable patches. Lighting and traffic along roads may also fragment grassland habitat again leaving potentially unusable habitat patches. Wet grasslands within the flood plain are also vulnerable to land drainage.

3.1.5 Urban

Urban landscapes were the second least attractive to foraging bats in the survey. This may be due to a combination of factors including noise and disturbance, light pollution, lack of suitable insect prey and the relatively limited extent of urban areas in proximity of the SAC.

3.1.6 Arable landscapes

Despite the dominance of arable land within the vicinity of the SAC, this was the least favoured habitat used by foraging bats. This reflects the relatively impoverished invertebrate fauna found in these habitats. However, where arable fields have wide headlands and associated hedges and woodlands they can form part of a landscape mosaic that is of some value to foraging bats. In these instances, development that damages or simplifies this mosaic can be damaging to its value for foraging bats or to the passage of bats through this landscape commuting to other preferred feeding areas.

3.2 Types and size of development likely to have adverse effects on the SAC

It is very difficult to specify what types of development are likely to have adverse effects on habitats used by bats. However, any development that results in direct loss of, or changes to, the habitats described above has the potential to have adverse effects. Equally, any development that fragments habitats used by bats is likely to have adverse effects for instance, construction of roads or tracks.

Any development that effects the ground or surface water, either in terms of its quality or abundance, within the important bat habitats is likely to have effects on the bat SAC and should be carefully considered.

Barbastelle bats are sensitive to disturbance so developments in the vicinity of potentially important habitats that produce noise, either temporarily during construction or permanently following construction, may affect the use of the habitat by bats. Important habitats likely to be sensitive to noise disturbance are deciduous

woodland, water, riparian habitat, unimproved grassland and mosaics of improved grassland with these habitats.

Bats are sensitive to lighting, particularly where this illuminates their roosts or areas used for community or feeding. The Bat Conservation Trust has produced comprehensive guidance on bats and lighting in the UK[2]. This should be referred to if development is likely to produce lighting that affects habitats of importance to bats within the 7.5km zone around the SAC.

The size of development likely to have adverse effects on the SAC will vary depending on their proximity to sensitive habitats and the scale of impact they are likely to have. A small development in a sensitive location may have greater impact than a much larger one a long distance from sensitive habitats. As a general rule, any loss or damage of open water, riparian, deciduous woodland, unimproved grassland and mosaics of these habitats should not be permitted unless there is sufficient offsetting measures incorporated into the plan or project to fully mitigate such losses. Damage or destruction of roosting habitat is illegal without a license from Natural England. Such licenses can only be granted for plans or projects where there is no alternative and there are overriding reasons of public interest for granting consent.

The timing of development can also have different effects on bats. Development that causes disturbance to habitats likely to affect sensitive habitats in the breeding season may have adverse effects whilst the same activity undertaken in winter may be acceptable. An understanding of how different habitats may be used by barbastelle bats at different times of year is needed to make an assessment.

3.3 Assessment requirements

The objective of this protocol is to aid decision makers in assessing whether plans or projects are likely to have a significant effect on the Mottisfont Bats SAC. Wherever possible, plans and projects should be designed to avoid damage or potential harm to barbastelle bats and the habitats that are important for their survival. However, it is not always clear how bats utilise areas of countryside or individual features within it, for example groups of trees or even individual trees in which there may be roosting bats. Proper assessment of these features is needed not only to satisfy the requirements to protect the SAC but also the species protection requirements for all bats arising from the Habitats Regulations.

[2] http://www.bats.org.uk/data/files/bats_and_lighting_in_the_uk__final_version_version_3_may_09.pdf

Recent judgements[3] have demonstrated that it is imperative that sufficient information is provided to planning authorities to assess the likely effects of the proposal before planning consent is granted. In particular planning authorities must obtain sufficient information to satisfy the three 'tests' set out in article 16 of the Habitats Directive. In particular, the proposed development must meet a purpose of 'preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'.

In addition the authority must be satisfied that, (a) 'that there is no satisfactory alternative[0] and (b) 'that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range[0] .

This protocol does not seek to advise local authorities on the application of the Habitats Directive in cases where other bat species may be present. Advice in these circumstances is available on the Natural England website, for example, http://naturalengland.etraderstores.com/NaturalEnglandShop/product.aspx?ProductID=77002188-97f9-45a5-86a6-326a7ea3cd69. However, the tests needed to meet the requirements for European Protected Species in terms of assessment are very similar to those that might be needed to meet the obligations of article 6 of the Habitats Directive in relation to the Mottisfont Bats SAC.

To obtain sufficient information on the use of habitats by barbastelle bats, it may be necessary to commission surveys to assess bat activity. Advice on specific survey details will vary according to the development proposed and its location. However, in sensitive locations where barbastelle bat activity is known to occur or where data shows there to be a high possibility of bats roosting, it is likely that detailed survey information will be needed. This can only usefully be obtained in the period May – September.

4 Mitigation of effects

Where possible developments should be located away from sensitive habitats where barbastelle bats are likely to be foraging or roosting. Wherever possible damage or destruction of these habitats should be avoided as a first option.

Damage to known roost sites would require a license from Natural England. Such licenses cannot be granted unless there are overriding reason public interest.

[3] Wooley vs Cheshire East Borough Council, May 2009.
http://www.naturalengland.org.uk/Images/WoolleyVsCheshireEastBC_tcm6-12832.pdf

Damage and destruction of potentially important foraging habitat or habitats used for commuting bats would need to be carefully assessed by a bat ecologist. If there is likely to be a significant effect, the first step is to consider whether the impact can be avoided. This may include consideration of alternative locations and design.

Where it is not possible to move and alter the design of the plan or project to avoid damage to habitats, it may be possible to use mitigation or offsetting to cancel out any adverse effects. In many instances, changes in the management of existing habitats can result in them being significantly improved as foraging habitat for bats, for example, changing the management of an agriculturally improved grassland or arable field to create and area of structurally diverse pasture. Equally, woodland may be improved for bats by removing non-indigenous conifer species to restore broadleaved woodland.

The alternative to changing the management of a habitat is habitat creation. Habitat creation may include the creation of additional areas of open water and riparian habitat, the creation of new woodland/scrub mosaics or the linking of existing woodland with planting of new hedges or woodland strips. Due to the uncertainty involved in habitat management and creation projects and the potential time delay before they are fully functional, it is normal to require a significantly larger area of new habitat to offset that which is damaged or lost.

5 Residual effects

If there are any residual adverse impacts, even after mitigation, then these should feedback to a revision of the plan or project such that:-

a) the location, scale or nature of the proposal is revised in order to ensure that the risks of impacts can be avoided altogether ; or

b) the proposal is changed so as to enable the risks to be mitigated, with no residual adverse impacts.

If the impacts cannot be fully avoided or mitigated, an Appropriate Assessment under the Habitats Regulations may indicate an adverse impact on the integrity of the SAC. Where this is the case, the plan or project can only be adopted or permitted where it passes the exception tests set out in Habitats Regulation 62.

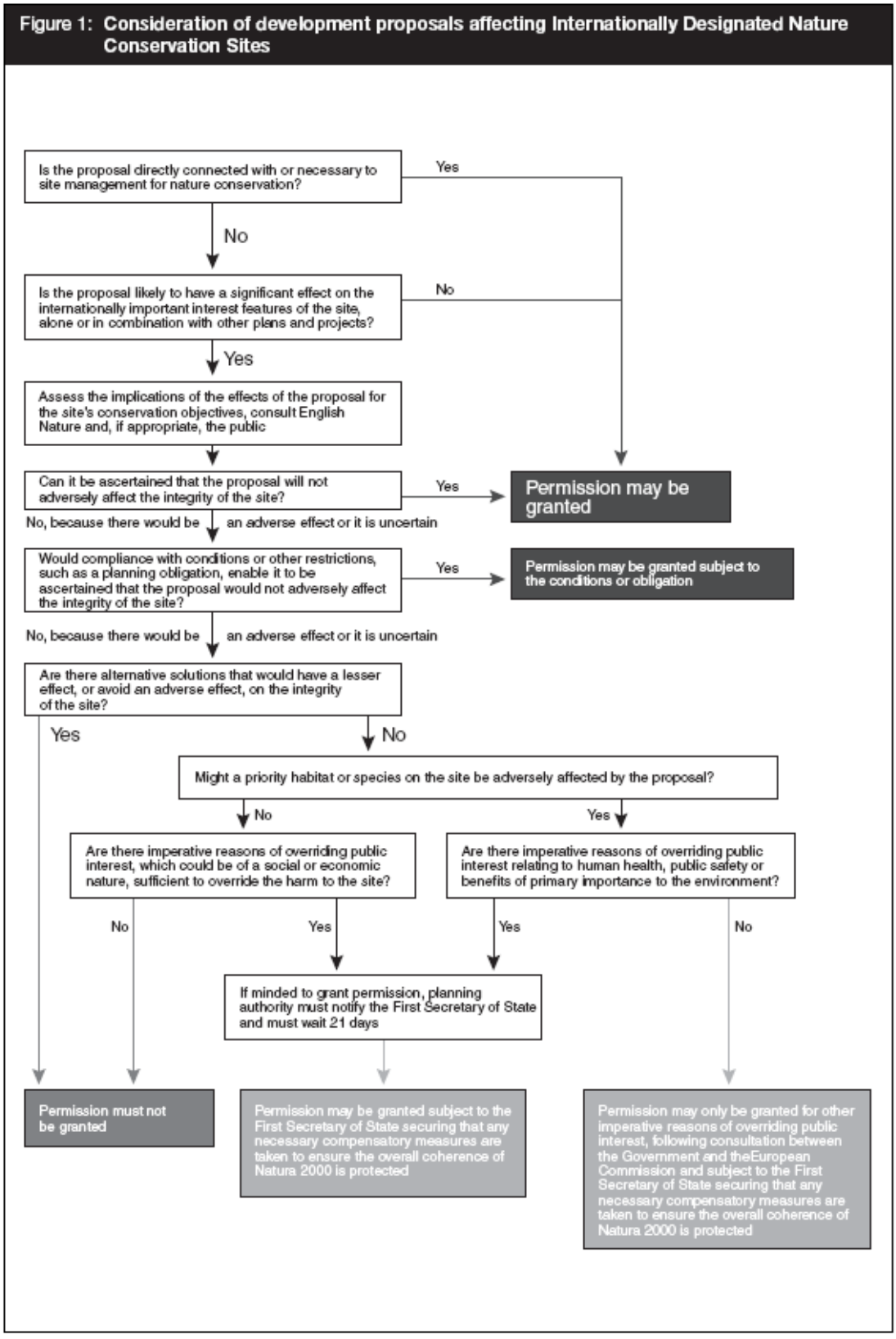
6 Other action likely to enhance and improve conditions for barbastelle bats

In addition to and separate from consideration of risks above, **all** development within the 7.5km zone should also aim to create and exploit opportunities to:

a) Enhance/improve habitat types (Appendix 2), as appropriate, where they occur on or close to the proposed development site; and/or

b) Create new habitat within or close to the development.

Appendix 1



Extract from Circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within the Planning System

Appendix 2

Table of Barbastelle bat use by habitat (as mapped by the HCC phase 1 habitat survey)

WR = habitat vulnerable to changes in water regime, i.e. water availability,
WQ = habitat vulnerable to changes in water regime, i.e. water quality,
✓ = habitat used by bats but not vulnerable to either WQ or WR,
X = habitat not used by bats for this purpose.

		Habitat use		
Code	**Phase 1 habitat type**	**Roosting**	**Commuting**	**Feeding**
AQ2	Tall marginal vegetation (inc reeds) along water courses	X	X	WQ &WR
AQ3	Swamp vegetation surrounding pools (inc reeds)	X	X	WQ &WR
AQ4	Base rich fen with patches of tall plants (inc reeds)	X	X	WQ &WR
AQ5	Pond < 0.5 ha	X	X	WQ & WR
AQ6	Ponds > 0.5 ha	X	X	WQ & WR
AQ7	Running water including canals	X	✓	WQ & WR
GL1	Neutral/semi-improved neutral grassland	X	X	✓
GL12	Unimproved neutral grassland	X	X	✓
GL13	Semi-improved neutral grassland	X	X	✓
GL2	Calcareous unimproved/semi-improved neutral grassland	X	X	✓
GL21	Unimproved calcareous grassland	X	X	✓
GL22	Semi-improved calcareous grassland	X	X	✓
GL5	Marshy grassland (fresh water)	X	X	WR
GL7	Tall herb	X	X	✓
QR6	Operational ponds and settling areas	X	X	WR
ST2	Scattered scrub	X	X	✓
ST3	Parkland/scattered trees over unknown grassland (<30% tree cover)	X	X	✓
ST31	Parkland/scattered trees over unimproved/semi-improved grassland	X	X	✓
ST32	Parkland/scattered trees over improved grassland	X	X	✓

W1	Broadleaved woodland inc. carr woodlands	WR	✓	WQ &WR
W10	Felled woodland	X	X	WR
W12	Forestry scrub	X	X	✓
W2	Broadleaved plantation	WR	✓	WR
W3	Active coppice without standards	X	X	✓
W4	Active coppice with standards	X	X	✓
W5	Coniferous woodland	X	✓	✓
W6	Coniferous plantation	X	✓	✓
W7	Mixed woodland	WR	✓	WR
W8	Mixed plantation	WR	✓	WR
	Hedges[4]		✓	✓

[4] Hedges are not identified within the phase 1 habitat survey. They can provide important habitat for barbastelle bats, particularly for feeding and commuting.