Bats
Species Action Plan

1. Introduction

Bat species in the UK are nocturnal mammals, all of which prey exclusively on insects. These highly adaptable mammals occur throughout Worcestershire, and readily exploit both man-made and semi-natural habitats. All species of bat in the UK are protected by both UK and European legislation. This Species Action Plan is a combined plan for all the bat species that occur in Worcestershire (table 1).

The following species occurring in Worcestershire were listed as UK BAP priority species and subsequently in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006: barbastelle; Bechstein's; noctule; soprano pipistrelle; brown long-eared; lesser horseshoe; greater horseshoe.

2. Current Status

2.1 Ecology and habitat requirements

Bats are highly evolved, long-lived (up to 30 years in the wild) sociable mammals, and are well adapted to the UK's climate and its range of habitats. All UK bat species have evolved as nocturnal feeders. This strategy enables them to avoid competing for food resources with other species

species to species their basic requirements are the same. The roost must provide the required micro-climate to enable the bats to minimise energy loss through body temperature regulation and to successfully rear their young. The roost must also be close to suitable foraging habitats and provide protection from potential predators.

Table 1: Bat species occurring in Worcestershire

Species	**Status in Worcestershire**
Barbastelle *Barbastella barbastellus*	Rare
Bechstein's bat *Myotis Bechsteinii*	Very rare.
Brandt's bat *Myotis brandti*	Very rare.
Brown long-eared bat *Plecotus auritus*	Widespread, common.
Daubenton's bat *Myotis daubentonii*	Widespread.
Leisler's bat *Nyctalus leisleri*	Uncommon.
Lesser horseshoe bat *Rhinolophus hipposideros*	Locally common
Greater horseshoe bat *Rhinolophus ferrumequinum*	Very rare
Natterer's bat *Myotis nattereri*	Uncommon

offences, any activities that would result in any of the above actions would need to be carried out under licence from Natural England.

Table 2: Legislation protecting bats in Europe and England.

European	National

The area holds a very significant ASNW resource and has a high number of very small ASNW, many of which are too small (<2ha) to appear on the Ancient Woodland Inventory. The area also has a high veteran tree resource associated with ancient woodland, wood pasture and a relatively intact ancient hedgerow system. The area also holds excellent foraging habitat including many traditional orchards, areas of unimproved/semi-improved species-rich grasslands and biologically rich road verges, all of which connect via the ancient hedgerow network.

Teme Valley
The Teme Valley contains significant areas of ASNW. These tend to be associated with dingle woodlands and incised stream valleys, which contain species-rich wetland habitats. The Teme Valley also contains significant areas of traditional orchard and old grassland. Many of these habitats are connected via a strong network of wildlife corridors associated with ancient hedgerows and the road verge and public right of way networks. This rich mosaic of well-connected habitats makes the Teme Valley a particularly important area for bats.

Malvern Hills
The Malvern Hills is an area of old countryside that contains large areas of semi-natural habitats and has a strong well connected wildlife corridor network. There are significant areas of ASNW flanking the hills and the rich geodiversity of the area has created a mix of woodland types. On the hills themselves there is moderate woodland cover, in large part due to recent natural regeneration.

The Malvern Hills hold large areas of nationally significant unimproved grassland communities. The majority of this grassland is acidic with locally dominant areas of bracken. However, the diverse geology of the area has given rise to areas of calcareous and mesotrophic grassland types. As well as grassland and woodland, the Malvern Hills and the surrounding landscape also contain areas of heathland, wetland and traditional orchards. The area also contains many ancient species-rich hedgerows and veteran trees often associated with the road verge and public right of way networks. Many of these species-rich hedgerows were derived from woodlands, often representing original woodland boundaries. Amongst other bat species, this area is known to support important populations of lesser horseshoe and barbastelle bats. Bechstein's bats have also been recorded.

Forest of Feckenham
The Forest of Feckenham area boasts good-to-high coverage of ancient woodland, unimproved meadows and pastures including calcareous grassland and MG5 meadows, good coverage of traditional orchards and remnant orchards, parkland, good open water networks and wetland. The area is important for a diversity of bat species including breeding colonies of Bechstein's bat.

3. Current factors affecting bat species in Worcestershire

Loss of corridor habitat
Bat species in the UK have adapted to foraging in a complex landscape, within a mosaic of habitats (woodland, grassland, open/running water, hedgerows and scrub) rich in invertebrates. Within the landscape bats use linear habitats such as hedgerows and watercourses to navigate through the countryside from their roost sites to suitably insect-rich foraging habitats. However, during the second half of

the 20th century this type of high quality corridor habitat became increasingly rare and fragmented within the county, and the UK as a whole. With the push to improve agricultural productivity hedgerow removal was a common practice.. Of the hedgerows that remain, many have become degraded, defunct and sterile through a process of over-cutting, spray drift and close ploughing.

Like hedgerows, watercourses have also been affected by agricultural intensification, suffering through a combination of 9.18 452(u)4(r)-10(a)4(l)3( )-96(p)m[9.18 4557-[ )

species to species, reproductive condition and the time of year

Natural England carries out annual monitoring (including hibernation counts) of bats within the disused Colwall Railway Tunnel.

In 2010-2011 Worcestershire Bat Group surveyed 23 woodlands as part of a national Bechstein's Bat Survey Project co-ordinated by the Bat Conservation Trust. The project aimed to establish baseline distribution data and information on habitat preferences. Prior to the start of the survey, there were no records of breeding female Bechstein's bats in Worcestershire. Twenty-three woodlands within the county were surveyed and a total of 160 bats caught comprising a minimum of 10 species. A total of 12 Bechstein's bats were caught in six woodlands: Grafton, Park, Oakley, Romer, Trench and Little Goosehill. Breeding females were caught in Grafton, Oakley, Trench and Romer.

In 2012 Worcestershire Wildlife Trust commissioned a radio-tracking study to identify bat foraging areas and roost sites in and around Grafton Wood nature reserve. The information from the study enables WWT to adapt reserve management, such as creation and maintenance of woodland glades and open rides, which can negatively impact on the Bechstein's bat population, and undertake habitat enhancements for this species. The radio-tracking project was funded by a grant from People's Trust for Endangered Species and was carried out by a team of voluntary bat surveyors led by two professional ecologists.

Data collected from bats in Grafton Wood in 2016 were included in a collaborative study by the Vincent Wildlife Trust and the University of Exeter that aimed to investigate size, structure and change in the British population of Bechstein's bats using a combination of molecular and landscape ecology approaches. A paper published by Wright *et al* (2018) concluded that high levels of diversity occurred across Britain and Europe, although diversity was lower in Britain.

The 2017-2019 **Finding Rare Species in the Malvern's** project, a partnership between Worcestershire Biological Records Centre and the Malvern Hills AONB Partnership, is engaging with volunteers and landowners within the northern part of the AONB to collect data on some of the areas rarest wildlife, with lesser horseshoe bat being a target species.

In 2004 the Vincent Wildlife Trust (VWT) installed 120 boxes of four different designs in the largely privately owned Tinkers Hill Wood in the Malvern Hills. The project aimed to improve understanding of barbastelle bats and was triggered by the first recording of this species in the wood in 2003. The VWT has continued to maintain and monitor the boxes and recently initiated a ringing study of barbastelles. At least nine bat species in addition to barbastelle have been recorded using the boxes.

Worcestershire County Council is trialling street lighting of a 'high red' lighting recipe as manufactured by Phillips. Recent research undertaken in the Netherlands indicates this lighting recipe has a neutral effect on foraging and commuting activity of the light sensitive long-eared and horseshoe bat species.

5. Associated Plans

Woodland, Wet Woodland, Grassland, Lowland Heathland, Ancient and Veteran Trees, Hedgerows, Traditional Orchards, Rivers and Streams, Ponds and Lakes, Canals, Urban.

6. Conservation Aims

The status of all bat species found within Worcestershire has been maintained or improved.

7. Conservation Objectives

Carry out regular research, surveys and submission of records to WBRC to continuously improve our knowledge and understanding of the distribution of bat species in Worcestershire

Continue monitoring at key sites including Knapp and Papermill, Grafton Wood and Worcester Cathedral

Complete icehouse audit and survey project

Up to date bat species data informs all site management and land management decision-making by environmental professionals, landowners and local authorities

Worcestershire Bat Group continues to train, coordinate and lead a network of volunteers within the county to collect and submit quality bat data to WBRC

Worcestershire Bat Group to carry out public engagement and awareness raising activities

Worcestershire Bat Group to create or refurbish at least one 'bat house' within the public realm

References and further information

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