ENGLISH NATURE

Managing landscapes for the greater horseshoe bat

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The greater horseshoe bat is one of Britain's rarest bats, with a total population of perhaps only 5,000 individuals. Numbers have declined significantly throughout northern Europe during this century and, in Britain, probably only 14 populations now survive, centred around summer maternity roosts in south-west England and south Wales.

Lifestyle and habitat requirements

- One of Britain's largest bats, with a wingspan of about 36cm (14") and weigh up to 30g ($1^{1}/_{4}$oz.).
- The distinctive horseshoe nose-leaf helps to focus the beam of ultrasound that the bat uses to 'see' in the dark.
- Bats are very long-lived compared to other small mammals and greater horseshoes can live for up to 30 years.
- All the breeding females from a population gather together in early summer to form a maternity colony, where they give birth and raise their single young.
- The babies are born in June or July and are generally weaned and independent by the end of August.
- The maternity roosts are usually found in old buildings, occasionally in caves or abandoned mines.
- During the winter the bats hibernate in caves, abandoned mines or other underground places.
- They are faithful to their traditional summer and winter roosts, returning to the same sites year after year.
- Greater horseshoe bats feed on a variety of insects, but cockchafers, dung beetles and moths are the most important components of their diet.
- The most important prey items change throughout the summer with breeding females depending on beetles from April to June and then moths from June to August.
- Beetles, particularly one species of dung beetle, *Aphodius rufipes*, are an especially important food source for young bats. Cow pats are necessary in the life cycle of these beetles, acting as both a food source and habitat for the larvae. Up to 100 larvae can be found in a single cow pat and this beetle is at its most abundant in early August when the young bats begin their first feeding flights.
- Late in August and through September, craneflies are eaten by all the bats as they fatten up for hibernation.

Conservation

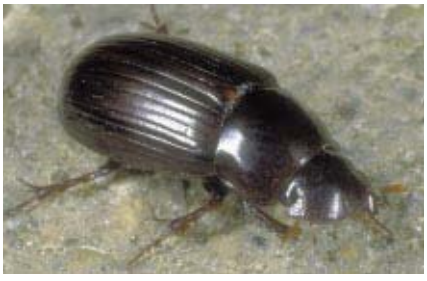
Feeding areas around the maternity roosts are specially important for the bats, providing food during the spring and summer months for pregnant and lactating females as well as for the young on their early foraging flights. Neither breeding females nor young can fly as far as non-breeding adults, which range over a wide area, so a good feeding area within a radius of about 4km around the maternity roosts is critical for the long-term survival of the population.

A landscape of permanent pasture and ancient woodland, linked with an abundance of tall bushy hedges, is the ideal habitat for greater horseshoes. This type of landscape provides the bats with both their insect food and the linear features such as woodland edges and hedges which they use as flight paths. They forage by hawking low over pasture and by 'fly catching' from feeding posts which are usually the lower branches of hedgerow or woodland edge trees. This means that the structure of the farmed landscape around the maternity roosts is important, in addition to an abundant supply of insect food.

Although the protection of important roosts and hibernation sites is important, the effective conservation of the greater horseshoe bat depends on the management of the farmed landscape around maternity roosts and other sites used by the bats.

The best way of promoting the recovery of the species is a whole farm approach, by adopting the sensitive management of the land with assistance through schemes such as Countryside Stewardship.

Dung beetle *Aphodius rufipes*, an important food for bats in late summer. Roger Key/English Nature

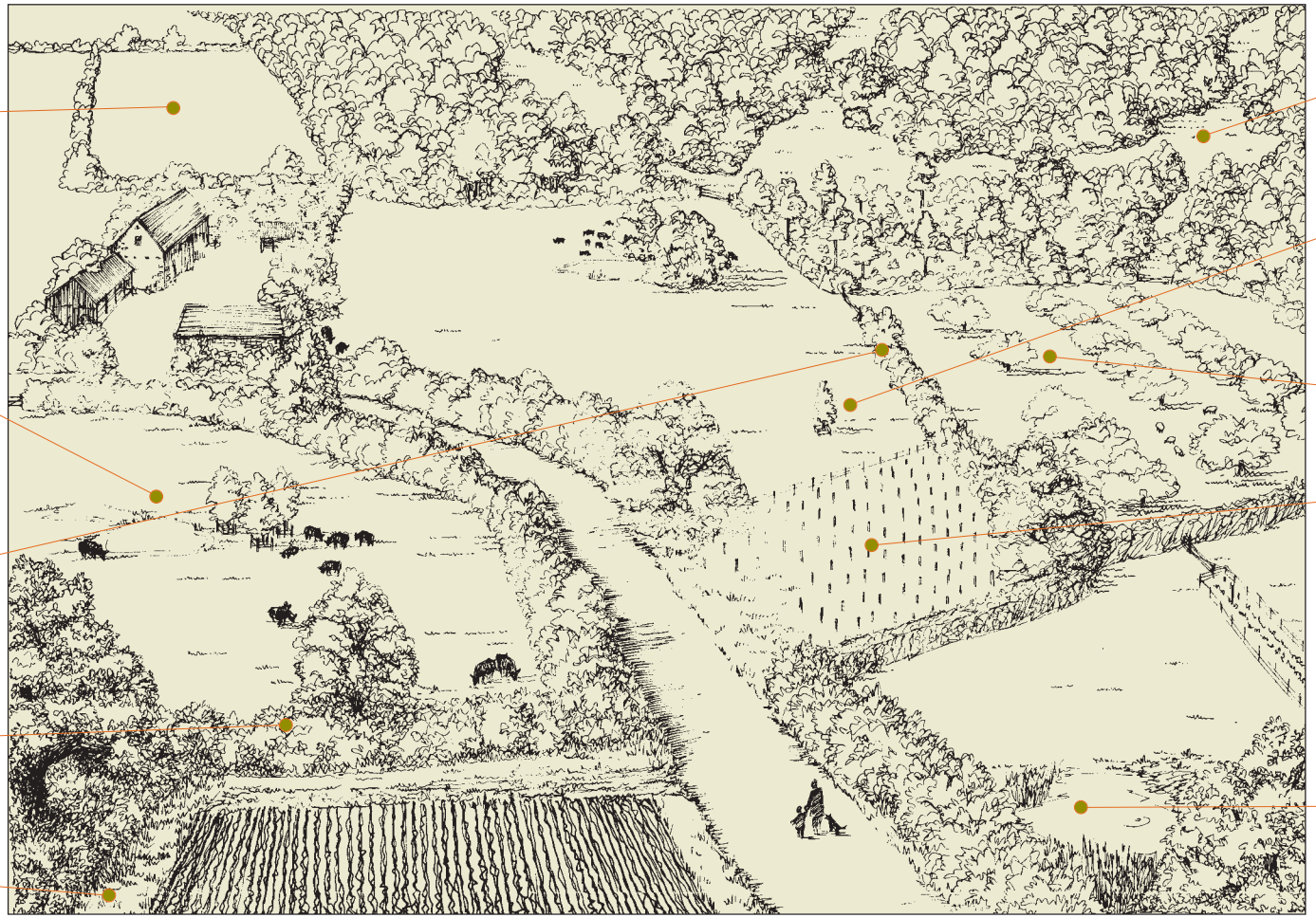


Pasture

- Retain existing grazed permanent pasture and create further areas of botanically diverse pasture to promote high densities of insect prey.
- Maintain pasture as small fields separated by substantial hedges containing larger trees; minimise insecticide use against cutworms, wireworms and leatherjackets to avoid disrupting insect life cycles.
- Avoid chain-harrowing, scarifying or rolling permanent pasture.
- Grazing regimes should be sympathetic to insect food production and keep pasture in good condition. High stocking densities (up to 2-3 cattle or 11-16 sheep per hectare) should be maintained within 1km of maternity roosts during July and August, with stock rotated between fields rather than ranched throughout the farm to help control parasites.
- Manage stock without the use of wormers based on Avermectin compounds (eg. Ivermectin) as such chemicals remain active in the dung, preventing colonisation by dung beetles.

Hedges

- Replant or reinstate hedgerows and tree lines across large open areas of permanent pasture, linking with existing hedges and woodland blocks to improve the network of flight paths. New hedges should be broad (3-6m across) with an average height of 3m. Hedgerow trees should be dotted along the length of the hedge.
- Maintain all hedges, managing them to create tall, bushy structures, ideally with a broad base of between 3 and 6 metres to provide sheltered flight paths for bats. Leave mature trees and encourage young saplings to grow on into hedgerow trees to provide shelter and feeding perches.
- Leave uncultivated arable field margins adjacent to hedgerows to provide insect food for the bats.



Woodland, parkland and old orchards

- Woodlands should contain grassy rides and glades, managed without insecticides. Foraging bats need glades at least 10 to 15 metres across. Coppice coupes should be small, to provide the maximum woodland edge habitat.
- Promote the development of a parkland landscape by planting additional standard trees in pasture areas (but do not plant trees or shrubs on unimproved or semi-improved pasture without seeking conservation advice). Newly planted trees should be adequately guarded against stock damage and managed to grow well developed crowns.
- Old orchards, with rows of mature fruit trees over a grazed under storey, can be valuable hunting areas for bats, provided insecticide use is restricted.
- Retain existing mature ancient semi-natural deciduous woodland and create further blocks of deciduous woodland, shelter belts or small woods adjacent to grazed pasture. Areas of high conservation value, such as unimproved grassland, should not be converted to woodland.
- Large old trees (‘veteran trees’) are particularly valuable to a wide range of wildlife, including bats. Try to retain these wherever possible, seeking specialist advice where necessary.

Marshy and aquatic habitats

- Retain existing and, where appropriate, create new areas of marshy and aquatic habitats, such as ponds, to support good populations of craneflies and other insects. Avoid areas of high conservation value for creating ponds.

Other environmental benefits

In addition to helping the recovery of populations of the greater horseshoe bat, a key species in the UK Biodiversity Action Plan, the management of the farmed landscape according to these prescriptions will produce many other wider environmental benefits. For example, the hedgerow prescriptions will benefit a wide range of declining farmland birds such as the linnet.

This approach will also help with the maintenance of a landscape characterised by small pasture fields, hedges, woodland blocks, parkland and other semi-natural features typical of much of south-west England. Many of these landscape features are part of our historic heritage and also support other wildlife interests.

Left: A hibernating greater horseshoe bat. These can be found in caves, abandoned mines or buildings.
Tony Mitchell-Jones/English Nature

Below: A typical South Cotswold Farm, Gloucestershire.
Paul Glendell/English Nature 22,945

Rough grassland can be particularly rich in insects such as cockchafers, but grazed pasture is an important source of dung beetles.
(Photo taken from Haresfield Beacon, Gloucestershire). Paul Glendell/English Nature 22,947

Further advice and information can be obtained from:

English Nature offices

Advice about bat conservation

Cornwall and Isles of Scilly
Trevint House
Strangways Villas
Truro TR1 2PA
Tel: 01872 265710

Devon
Level 2
Renslade House
Bonhay Road
Exeter EX4 3AW
Tel: 01392 889770

Hereford,
& Worcestershire
Bronsil House
Eastnor nr Ledbury
Herefordshire HR8 1EP
Tel: 01531 638500

Hampshire
& Isle of Wight
1 Southampton Road
Lyndhurst
Hampshire SO43 7BU
Tel: 023 8028 6410

Dorset
Slepe Farm, Arne
Wareham BH20 5BN
Tel: 01929 557450

Somerset and Gloucestershire
Roughmoor
Bishop's Hull
Taunton TA1 5AA
Tel: 01823 283211

Countryside Council for Wales offices

Advice about bats and Tir Gofal

West Area
Plas Gogerddan
Aberystwyth
Ceredigion SY23 3EE
Tel: 01970 821100

South Wales Area
Unit 4, Castleton Court
Fortran Road
St Mellons
Cardiff CF3 0LT
Tel: 02920 772400

Countryside Stewardship Scheme

Advice about the Countryside Stewardship Scheme can be obtained from the Department for Environment, Food and Rural Affairs.

Woodland Grant Scheme

Advice about the Woodland Grant Scheme can be obtained from your local Forestry Commission office.

A mosaic of grazed pasture and woodland linked by tall hedges provides the ideal habitat for greater horseshoe bats.
(Photo taken in the Slad Valley, Gloucestershire). Peter Wakely/English Nature 19,330

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Greater horseshoe bat in flight.
Stephen Dalton/NHPA

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