BACK FROM THE BRINK

SPECIES INFORMATION GUIDE

Moccas beetle

Hypebaeus flavipes

The Moccas beetle is a small beetle, approximately 2.5mm in length. Generally the female is slightly larger than the male. The species exhibits marked sexual dimorphism. It is one of the most endangered species of insect in Britain; the beetle and its habitat are protected under Schedule 5 of the Wildlife & Countryside Act 1981 and is listed as Vulnerable in Britain.

Distribution

The Moccas beetle is known only from Moccas Park National Nature Reserve, Herefordshire where it occurs on approximately 16 of the veteran oak trees. It was discovered in Britain in June 1934. The presence of the Moccas beetle and two other saproxylic beetles, initially only known to breed in Britain at Moccas Park (the Scarlet longhorn (*Pyrrhidium sanguineum*) and the bark beetle (*Ernoporicus caucasicus*) was a major factor in designating the area as a Special Site of Scientific Interest, and later as a National Nature Reserve. The Moccas beetle has a disjointed distribution in central Europe and southern Scandinavia.

Moccas beetle distribution in the United Kingdom

Habitat

This species is mainly associated with old growth oak. It is thought that the immature stages of the

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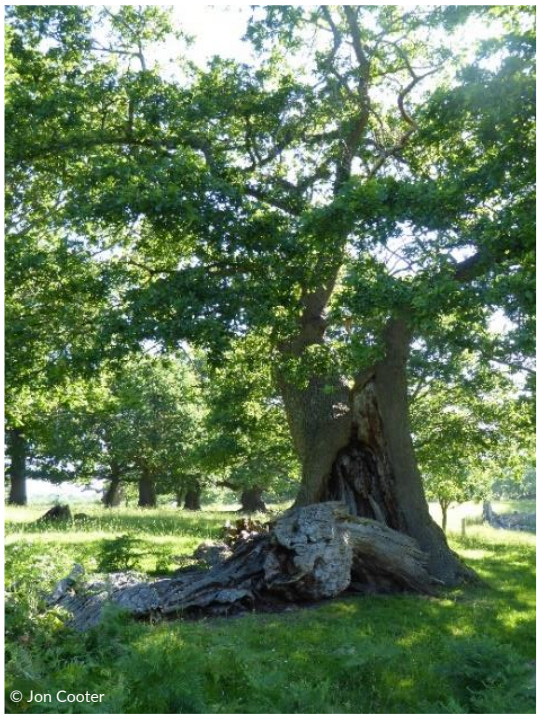
beetle live in abandoned burrows made by other saproxylic insects in the red-rotten interior of veteran oaks. The larvae may feed on other small invertebrates occupying this habitat. Red-rotten wood develops during natural heartwood decay through the actions of wood decay fungi. The first British specimens were captured by sweeping the grass under a veteran oak tree. Since then, it has always been found by beating foliage of certain veteran oaks. Often, but not always, they can be seen on the thin spindly growth surrounding a cavity or rot hole. They seem only to occur on growing branches; examination of those with loose bark has not produced adult beetles.

In the Nikolassee district, Germany, the Moccas beetle, frequents oak, but has also been beaten from old Hornbeam trees. The genus *Hypebaeus* is known from western Europe and the Russian Far East, the area in between being largely devoid of oak trees and *Hypebaeus* species inferring a strong association with oak. *Hypebaeus* species adults are invariably found in the crowns of host trees.



Veteran oak with cavity and whispy foliage adjacent

Life cycle

Little is known about the immature stages of the Moccas beetle. In Germany, the beetle has been recorded emerging from red-rotten oak wood mould removed from the parent tree and in Sweden from insect burrows in a large rotten Beech stump. The adult male beetle emerges first, the females appearing about a week later and live between 7 to 10 days after the males are no longer in evidence. Adults may use foliage as a "promenade" in order to find a mate and reproduce. The adults are carnivorous most likely preying on the various small invertebrates such as psocids and mites occupying the same habitat. They fly readily when disturbed but have never been recorded from blossoms or flowers. They seemingly remain in proximity of their breeding sites.

Reasons for decline

Since its discovery in Britain in 1934 and regular monitoring during the 1970s and 1980s, the Moccas beetle has existed as a more or less stable population. The species requires the continuous presence of sufficient old oak trees in Moccas Park. Reasons for decline include:

- Inappropriate management works to neighbouring trees of known beetle locations may result in adverse modification to microhabitats, light levels and exposure.
- The natural or deliberate loss of decaying oak trees, particularly the potential loss of habitat continuity if replacement trees are not available close by.
- Heart wood decay and 'hollowing' of the interior of the tree occurs and continues to develop in trees aged 200 years and older.
- Threats to old trees include under-management, intensive land use practices, tree diseases and climate change. For

example, cessation of traditional management such as pollarding has left many old trees at risk of collapse due to top heavy crowns (e.g. lapsed pollards).

- Intensive activity around the roots of old trees, such as heavy grazing, ploughing, chemical spraying and visitor footfall can lead to direct damage of roots and soil compaction, as well as disrupting the vital mycorrhizal (fungal) associations that help sustain trees.
- The arrival of novel pathogens and warmer, drier summers may mean that some tree species are no longer able to reach the age at which wood mould and other late-stage decay habitats develop.

Moccas Park National Nature Reserve, Herefordshire

Habitat management

The aim of the following management advice is to ensure the long-term continuity of veteran trees at Moccas Park National Nature Reserve. The veteran trees in the Reserve are the foundation upon which the rich and varied saproxylic flora and fauna depend and the reason for their presence.

The best method for maintaining the current population of the Moccas beetle is to preserve their parent trees by a policy of non-intervention (unless the life of the tree is unquestionably at risk for example part uprooted during a gale, an adjacent tree falling onto a known host tree, or regular flooding of the area around the tree).

Management may also be required to reverse species decline but management implemented must be directed at the cause of that population decline, based on sound evidence.
Veteran trees, which for hundreds of years have grown in harmony in proximity with their neighbours, should never be subjected to 'haloing' which can only result in adverse modification to microhabitats as described above.

Other General advice:

- Ascertain whether tree recruitment rates have been sufficient to prevent an age gap in the availability of red-rotten oak trees, and that recruitment is still taking place.
- Maintain longevity of existing old trees (both dead and alive).
- Resist urge to tidy away pieces of fallen decaying wood or to remove old standing dead trees.
- Allow natural regeneration or plant trees in places where they can be allowed to persist for hundreds of years to provide the next generation of old trees.
- Acorns can also be collected and distributed into suitable areas.
- Establishment will be greatest where the trees are protected by thorn bushes. If grazing is preventing regeneration, it may be necessary to establish temporary stock-exclosures.
- Establishment of new trees near old oak trees needs to be carefully planned, as oak is a light-demanding tree and sensitive to overcrowding.
- Consider veteranizing younger trees to accelerate development of decay and help plug existing age gaps.

Moccas beetle survey in 2020

Survey methods

The Moccas beetle and its habitat are protected under Schedule 5 of the Wildlife & Countryside Act 1981. Under the Act it is an offence to collect specimens (adults or larvae) or disturb or damage trees where it is known to occur without a licence from Natural England. Red-rotten substrate should not be disturbed due to the disruptive effect this will have on the condition of the rotten wood. Any monitoring undertaken should therefore be through indirect techniques only. Methods employed have been restricted to investigating the population of the adult beetle. This involves beating crown foliage that can be reached from ground level. It is not known if the Moccas beetle is diurnal, to date all monitoring of the population has taken place during daylight hours. There appears to be no consistency in the saproxylic beetle fauna accompanying the Moccas beetle on its host trees, other than a diverse range of other saproxylic species also associated with the red-rotten interior of ancient oaks.

The Back from the Brink Ancients of the Future project is led by Buglife in partnership with Plantlife and the Bat Conservation Trust.

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