

Queen's executioner

Megapenthes lugens



The Queen's executioner beetle is about 9mm long and black in colour. It is classified as Near Threatened on the European Red List of Saproxyllic Beetles (2010). It is a Red Data Book species in Britain.

Distribution

Currently only found at Windsor Forest and Great Park (Berkshire) with an additional recent record nearby at Silwood Park (Berkshire) and in the new Forest. The importance of these sites for saproxyllic invertebrates is reflected in their designation as a Special Areas of Conservation (SAC), and in the case of Windsor Forest and Great Park as a Site of Special Scientific Interest (SSSI). Records before 1990 are from Epping Forest (Essex), the New Forest (Hampshire), Highgate (Middlesex) and Stockwell (Surrey).

Habitat

Larvae develop in hollowing elm and Beech trees. Suitable rotten wood develops during heartwood decay through the actions of wood decay fungi. At Windsor, the Queen's executioner is associated with Beech trees in a high forest setting, and previously with elm trees in the same situation. Larvae have been recorded in elm and Beech, in addition to the importance of the quality of the substrate and stage of decay.



Distribution of the Queens executioner in the United Kingdom
Black: post -1990 Yellow: pre -1990



High Standing Hill, Windsor Forest, Berkshire

Life cycle

Adults are found in the larval habitat, or males visiting Hawthorn and Holly blossom. Adult diet is unknown but they have been seen at Hawthorn and Holly so may feed on pollen or nectar, or else rely on stores laid down during the larval period. The larvae feed within hard, dry, little-rotted wood, or rotten wood lining cavities in trunks and boughs, and are probably predators of wood-boring Cossoninae weevil larvae. The usual period required for larval development is probably one summer. Pupation takes place in late summer and adults hibernate over the winter. Pupal chambers are formed within chunks of dead wood within the cavity lining. The newly formed adults remain in their pupal chambers over winter before emerging the following spring to copulate and lay eggs. The oviposition site is presumably in cracks within the decaying wood.

Reasons for decline

- The Queen's executioner requires the continuous presence of old decaying elm or Beech trees in a landscape.
- It is likely to have already become rarer because of Dutch Elm disease, which prevents most elm trees developing beyond about 20 years growth.
- The natural or deliberate loss of decaying Beech trees is now the greatest threat the beetle faces, particularly the potential loss of continuity if replacement trees are not available.
- Although the beetle can fly it may have poor dispersal abilities, which may prevent it colonising suitable habitat away from its current stronghold.
- Old trees are under threat from a wide range of factors including under-management, tree diseases, and climate change.
- Increasing canopy density due to lack of grazing can lead to some old trees being shaded out by younger trees, leading to premature death.
- 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 vital mycorrhizal (fungal) associations that help sustain trees.
- The arrival of novel tree pathogens, increased temperatures, extended periods of drought, or heavy rainfall causing soil instability, may mean that some tree species die prematurely, or are no longer able to reach the age at which red-rot develops.
- Cessation of traditional management has left old pollards at risk of collapse due to top heavy crowns.

Habitat management

The aim of the following management advice is to ensure the long-term continuity and connectivity of Beech across a landscape through the provision and protection of old trees.

- Ascertain whether tree recruitment rates have been sufficient to prevent an age gap in availability of rotten Beech trees, and that recruitment is still taking place.
- Maintain longevity of existing old trees (both dead and alive).

- The complete felling of any tree should be a last resort and where possible routes should be modified to avoid potentially hazardous trees.
- Allow natural regeneration or plant Beech trees in places where they can be allowed to persist for hundreds of years to provide the next generation of old trees.
- Beech mast 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-exlosures.
- Resist urge to tidy away pieces of fallen decaying wood or to remove old standing dead trees.
- Where important trees are experiencing crown competition from adjoining younger trees, the younger trees should be removed gradually over a period of years.
- Consider veteranising trees to accelerate the development of decay and help prevent gaps in the availability of suitable trees.
- Veteranisation techniques could include pollarding a new generation of young trees.
- There is also a need to study the potential of fungal inoculation to start the development of suitable rotten wood; this requires the tree to be of sufficient age to have developed a core of heartwood.
- Maintain or plant nectar sources such as Hawthorn and Holly which may provide food for adults.



Hawthorn blossom may provide food for adults

Searching potential/known trees for adults may produce results, although substrate should not be disturbed due to the disruptive effect this will have on the condition of the rotten wood. Adults are encountered in the larval habitat, and on tree trunks or visiting blossom in May. Apart from the wood-boring weevil *Stereocorynes truncorum* as a potential prey species, there are no accounts of other species recorded in rotten wood or cavities occupied by the Queen's executioner, which inhabits harder and drier wood than that preferred by other click beetles including *Procrærus tibialis* and *Ampedus* species.

Nieto.A and Alexander.K.N.A. (2010) European Red List of Saproxyllic Beetles, IUCN

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



Survey methods

The best method available for landowners and site managers is to monitor the availability of trees based on their suitability.