BACK FROM THE BRINK

SPECIES INFORMATION GUIDE

Royal splinter cranefly

Gnophomyia elsneri

The Royal splinter cranefly ranks among the rarest and most threatened insects in Europe.

Distribution

The Royal splinter cranefly was discovered new to science in 1973 in Windsor Forest and five years later one was caught in a forest in Slovakia (within the then Czechoslovakia). Larvae have been found in Britain and reared through to adult, the only knowledge of its life history and ecology.

Craneflies have been well recorded in Britain both before and especially after 1973, the year when coincidentally the Cranefly Recording Scheme was launched. The cranefly fauna of Czechoslovakia (since 1993 split into Slovakia and the Czech Republic) has been well studied yet there it is still only known from a single male caught in a light trap at Zemberovice, in the Levice region, dated 3rd September 1978.

Distribution of Royal splinter cranefly in the United Kingdom

Habitat

The breeding niche is specialised and at any one time rare, detected in very few ancient Beech (in

heritage lottery fund
LOTTERY FUNDED
PEOPLE'S POSTCODE LOTTERY
Esmée Fairbairn FOUNDATION
Garfield Weston FOUNDATION
RETHINK NATURE
NATURAL ENGLAND

Britain) within the overall population of old trees. Larvae develop in porridge-like and black sodden wood mould, in one case with apparent impregnation with fungal hyphae. In general, during the summer wood-mould at the base of hollow trees and within stumps is only damp, indeed often very dry. Wet porridge-like consistency is exceedingly scarce and reduced to small patches in a dry spring/summer.
Perhaps relevant is the fact that bramble has provided some shade to several situations where larvae and adults have been found. Certainly bramble provides some shade from high temperatures in exposed glades and a resting place for adults.

Royal splinter cranefly beech stump, Windsor Forest

Life cycle

In Britain the adults have been found in July (August and September search has not been so focused but it is likely that July is the peak). Females have very short ovipositors, of a type only suited to laying eggs on or immediately under the surface of suitable medium. Eggs are likely to hatch in late July/August since it is normal for cranefly eggs to hatch within a week or two. Larvae probably grow slowly until the following spring so in that period may be difficult to detect. Well grown larvae are present late spring/early summer. The pupal stage is short, about a week or so (temperature dependent).

Some saproxylic hoverflies are known to breed in decaying tree roots, especially where deliquescent fungal hyphae maintain wet conditions. In theory this cranefly could do likewise, providing the larvae are capable of mining down to suitable conditions, and equally have the ability to tunnel their way back to the surface to pupate. Certainly the long legs of the adult are not designed for crawling up through debris. Larvae have only been found in 'porridge' at or just below the surface and it is assumed that situation is essential.

Wood-mould at base of hollow tree

Reasons for decline

Prior to 1973, much of the ancient wood pasture within Windsor Forest had been converted to plantation, mainly with conifers. By the early 1960s, the High Standing Hill areas with Beech had almost reduced to the Badgers Brook valley system and a conservation concessionary area on the north easterly steep slope, whilst the flatter areas were more ideal for plantations. As far as Diptera were concerned, it was the more humid and milder Badgers Brook system that was of prime importance, rather than the dry and colder north east facing area set aside for conservation. Dead wood used to be removed as firewood.

The population of ancient Beech trees has been in substantial decline since 1973. In part this has been via death from old age, accelerated by episodes of severe drought. The Great Gale of October 1987 felled many of the ancient Beech trees, leaving surviving trees exposed to the rigours and tolls of subsequent gales. Some Beech was shaded-out or weakened by being out-competed by conifer plantations (though perhaps pollarded oak suffered more greatly).

The current residual representation of ancient Beech is now so low that extinction for the most finicky dependent insects may well be imminent since only a small proportion of a population of trees is likely to be in a suitable state, and that state is transient.

Windsor Forest is on the flank of the Thames Valley, an area of relatively low rainfall and high summer temperatures. Also, the shallow clay soil and subsoil is prone to becoming very dry in the summer. Severe drought summers have been adverse to a cranefly with such a high risk 'porridge' niche.

Habitat management

- The life span of living ancient trees needs to be extended as far as is possible, mainly a matter of reducing risks of demise, such as preventing undue competition for canopy space (without increasing exposure to gale damage).
- Stumps of Beech, and dead or living hollow tall stumps and pollards perhaps should not be overshaded, though bramble is acceptable if not over-dense. Shade/exposure tolerance levels are based on few observations so need further investigation and trials.
- There is an urgent need to devise trials to create artificial larval habitat; porridge wood-mould, including some prone to infiltration by fungal hyphae; in containers placed in hollow trees and stumps. This might be a matter of a less wet medium than trialled for saproxylic hoverflies, though preventing drying-out is a challenge. It is possible that deliquescent fungi are responsible for moisture levels in the wild.

Survey methods

Current survey methods have been searching for adults and larvae at potentially suitable trees. Only one adult has been found by sweeping low vegetation, close to the stream in Badgers Brook. Malaise traps could be deployed but that would require attendance at intervals and could create a substantial quantity of material to sort through (were the material identified, it is pretty certain a substantial number of extra species of flies (and other insects) would be added to the known fauna). Emergence traps may also be instructive for the wider fauna, and may reveal otherwise undetected breeding locations, but at the risk of killing a major peak emergence of the cranefly unless attended daily. Interception traps, such as vane traps would be less risky (catching a small portion of the population), though may be difficult to apply to stumps.

The most urgent requirement is to devise artificial niche habitat. A trial option would be an adaptation of designs for aquatic and subaquatic saproxylic hoverflies.

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

LOTTERY FUNDED