

Case study: White letter Hairstreak *Satyrium w-album*

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A largely sedentary species, White Letter-Hairstreak has suffered a decline of ~96% in the UK particularly in Southern England where during the 1970's and early 1980's the prevalence of dutch elm disease led to the loss or removal of elms, the larval foodplant. Like most species of this genus White letter-Hairstreak forms small colonies (generally 12-20 adults) centered around either one or a small group of the host tree. Adult butterflies, which fly in July rarely leave the immediate proximity of the trees and spend most of their time in the canopy, occasionally flitting down to feed on nectar-rich flowers such as bramble or creeping thistle. After courtship and pairing the females lay their dome shaped ova on the elm twigs, favouring the underside of the girdle scar, where the most recent growth meets the older wood, on old leaf scars or at the base of buds. The ova remain on the twigs all winter before hatching early March the following year. Emerging larvae initially crawl into a flower bud and continue to feed on the flowers before the leaves break out after a few weeks. In Sheffield, Wych Elm is most commonly used, usually mature trees that are a minimum of 15 years old and which bear flowers. The larvae feed on the trees until they pupate in late May, under leaves or twigs and emerge as adult butterflies in late June or July.

In Sheffield, White Letter Hairstreak does not appear to have suffered as large a decline as in other parts of the country. This is partly attributed to the higher resistance of Wych Elm to disease which is the dominant elm species in Sheffield. In recent years small colonies of the butterfly have been found throughout the city in all habitats where elms are found, including parks, gardens and roadsides. In many cases colonies are associated with single trees with no other mature elms in the immediate proximity, leaving the butterfly extremely vulnerable.

New disease resistant elms have recently been developed, a new variety called New Horizon derived from *Ulmus japonica* and *Ulmus pumila* being of particular interest. The possibility of planting disease resistant elms alongside or close to vulnerable trees could be an option. More research is needed to prove the long term sustainability of colonies to breed unsupported on untested elm varieties. Some mature street elms planted across Sheffield in the late 1800's and recently identified as Huntingdon Elm have also proven to support colonies of the butterfly. As another largely disease resistant variety, it is suggested that new Huntingdon Elms could be propagated and planted close to older trees, to facilitate the continuation of the butterfly colonies long term.

Translocation of ova onto new host trees is also a possibility to ensure the continuation of existing colonies or to encourage expansion. Translocation has been successfully achieved with other species in the genus such as Brown Hairstreak *Thecla Betulae* and Black Hairstreak *Satyrium Pruni* but blackthorn is the host tree for these species rather than elm. Blackthorn does not present as many difficulties for translocation due its compact size and more bushy growth and there has been very little research to prove if using similar methodologies for White Letter Hairstreak would be successful. More research is needed to ensure that translocation of White Letter Hairstreak in any of its immature stages onto new trees would be successful and sustainable beyond the first generation.