SPECIES INFORMATION GUIDE

Fly Orchid

Ophrys insectifera

Fly Orchid is part of the Orchid (Orchidaceae) family and is an insect mimic. The shiny oblong-oval leaves are usually in a three, close to or at the base of the stem which can be 2-60 cm tall. The flowers are distinctive, resembling flies, with a narrow lip 15 mm long by 4-5 mm wide and two arm-like side lobes. The top and bottom of the lip are purple-red to blackish-purple and velvety. Between is a shiny blue patch. The sepals at the top of the flower are green and the upper petals are thread-like, velvety and blackish-purple resembling an insect's antennae. The whole flower resembles a fly sitting on a green flower. Each flowering spike may have between four and ten flowers, but due to the colouration they can blend into the background.

One similar orchid in the UK that could be confused with Fly Orchid is Early Spider-orchid *Ophrys sphegodes*. However, this plant has a much rounder lip, looking like a spider's abdomen and usually flowers a month before Fly Orchid.

Life cycle

Fly Orchid flowers between May to July. Although the flowers resemble flies, this is a mimicry for attracting two species of Digger Wasp - *Argogorytes mystaceus* and *A. fargeii*. Fly Orchids produce a pheromone similar to the female Digger Wasp attracting males, tricking them into attempting to mate with the plant and picking-up pollen in the process. The wasp, after failing to mate, tries another Fly Orchid flower, thereby pollinating the plants. Male Digger Wasps stop trying to mate with the Fly Orchid once female Digger Wasps emerge a few weeks after the males. Thus, there is a short window of opportunity when Fly Orchids may become pollinated. Pollination rates appear low, with only around 20% of flowers setting seed. However, as the seed is dust-like and produced in considerable quantity in individual seed capsules, it can spread far on wind, although the majority falls close to the parent plants.

The Fly Orchid is highly likely to have a mycorrhizal association for the seed to germinate, but the longevity of that association as well as the species of fungi are unknown. If this is the case, this might be one of the reasons why this species is so rare. Fly Orchid also has fleshy spreading roots which are infected with mycorrhizal fungus.

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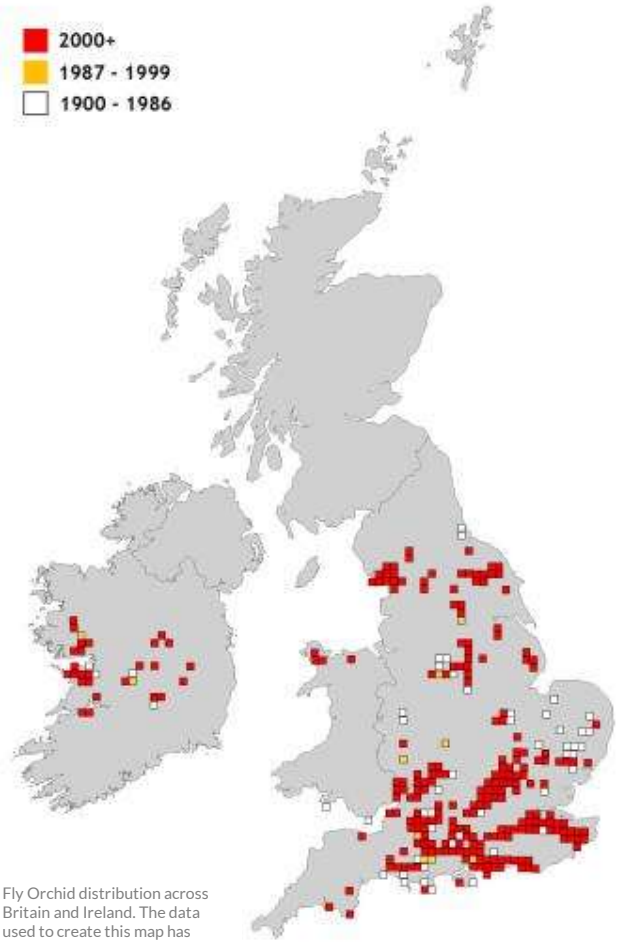
Habitat

Fly Orchid is usually found on chalk and limestone soils in a variety of vegetation types from dappled woodland floors, open calcareous grassland, flushes and fens. However, it has also been recorded in grasslands, quarries, spoil heaps, piles of railway ballast and on unstable coastal cliffs. It is a species that grows in habitats that are undergoing ecological succession from open habitats to woodland. It benefits in the short-term from intermittent disturbance, but is vulnerable in the medium-term to the decline in traditional management practices that historically maintained the open conditions.



Fly Orchid distribution across Britain and Ireland. The data used to create this map has been provided under license from the Botanical Society of Britain and Ireland (BSBI) and accessed from the Society's online database.

Distribution

The species declined dramatically before 1930, especially in East Anglia. The losses have continued since, but at a reduced rate. Populations show a clear correlation with the chalk of the North Downs, South Downs, Salisbury Plain, Yorkshire Wolds and Chilterns as well as the limestone soils of the Cotswolds, Peak District and Cumbria.

GB status and rarity

Vulnerable

Protection under the law

This plant is included as a species "of principal importance for the purpose of conserving biodiversity" under Section 41 (England) of the Natural Environment and Rural Communities Act 2006. It is also listed as being of "principal importance" under Section 7 of the Environment (Wales) Act 2016.

It was classified as Vulnerable in the Great Britain Vascular Plant Red List and the England Vascular Plant Red List as the more southern populations are in decline.

Survey method

Individual flowering spikes should be counted between May to July, with the best show of flowering spikes usually during June. Surveys for leaf rosettes should also be undertaken and recorded at the same time. Fly Orchid can be difficult to find in dense stands of Dog's Mercury or if browsed.

Reasons for decline

The decline in Fly Orchid is associated with changes in management over time. Across the countryside, the abandonment of small scale quarries and pits, loss of calcareous grassland, decline in stock-droving (maintaining verges), and the decline of ditch and bank maintenance in woods have all lead to the loss of Fly Orchid populations. Underpinning it all, is the loss of wild boar approximately 1000 years ago and the ground disturbance they caused which provided ideal habitat for Fly Orchid.

Within woodland, the lack of management of rides and glades and the decline of coppicing has resulted in scrub encroachment, a closed canopy and thick leaf litter potentially restricting germination of Fly Orchid seeds. Lack of management of calcareous grassland, particularly mixed grazing, leading to rank swards, and the drainage of fens has also led to declines. Deer browsing is also considered a concern where there are large populations.

Pollinator availability may also be a limiting factor affecting successful reproduction, while light has been found to increase pollination of plants. Light may also restrict mycorrhizal associations although further research is required on this matter.

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Habitat management for Fly Orchid

The Fly Orchid has the potential to respond rapidly to management, increasing moderately well given the opportunity. The aim of management is to create thin grassland under an open scrub or grassland canopy, particularly along woodland edges or within woodland glades. Management is required to keep the ground flora relatively thin and short, and to remove build-up of grassy thatch and leaf litter under trees.

In woodland habitats, scrub management along the edges of rides and glades to restore dappled light conditions should be undertaken. Experimental work to increase populations in woodland areas has found that individual plants respond to increased light by increasing their size and the number of flowers, but this does not always result in new individuals. This may be due to the amount of bare ground, which is a requirement for the Digger Wasp, and thus creation of bare ground near Fly Orchid colonies would also benefit this species. In situations where thick mulch has developed, the leaf litter may need to be scraped away exposing soil for seed to germinate. This is most productively done close to Fly Orchid populations in case there is a mycorrhizal association which this orchid depends upon for germination and growth. Management in the Buckinghamshire Chilterns has worked well for this this species where glades have been opened up in woodland, through removal of some tree and scrub cover, and the mineral soil has been exposed.

In grassland situations, livestock grazing, particularly using traditional cattle and sheep breeds, outside of the flowering season, will reduce rank vegetation and also scrub encroachment.

Fly Orchid particularly favours thin woodland, wood margin and thin scrub with sparse grassland vegetation below. To maintain these situations, the best approach may be through a managed calcareous wood pasture system, or by implementing an annual wood meadow hay cut.