



Butterfly
Conservation



Large Heath

Coenonympha tullia

Conservation status

Priority Species in UK Biodiversity Action Plan.

Fully protected under the Wildlife (Northern Ireland) Order 1985

The Large Heath is restricted to wet, boggy habitats in northern Britain, Ireland and a few isolated sites in Wales and central England. The adults always sit with their wings closed and can fly in quite dull weather, providing the air temperature is higher than 14°C. The size of the underwing spots varies across its range; a heavily spotted form *davus* is found in lowland England, a virtually spotless race *scotica* in northern Scotland, and a range of intermediate races elsewhere referred to as *polydama*. The butterfly has declined seriously in England and Wales, but is still widespread in parts of Ireland and Scotland.

Life cycle

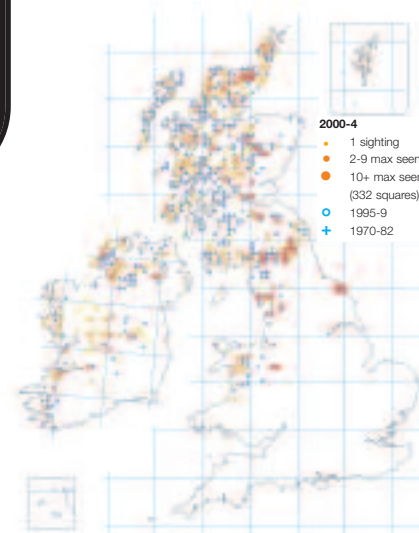
There is one generation a year with adults flying between mid to late June and early August, with a peak in mid-July. However, the precise dates vary considerably with altitude and latitude, and the butterfly can fly up to a month later in the mountains of north Scotland. The eggs are laid singly, usually on dead cottongrass. The larvae feed during the day on leaves of the foodplant from late July to late September. They hibernate low down in the vegetation while still small and emerge in March to continue feeding. Pupation occurs in April or May. Pupae suspend from the foodplant or surrounding vegetation. A small proportion of larvae have a two-year life cycle and remain as third instar larvae throughout their second summer. This flexibility may help the species to cope with unpredictable weather during the adult flight period.

Colony structure

The Large Heath is a colonial and sedentary butterfly, with adults, especially females, rarely seen outside their boggy habitats. Marking studies have shown a maximum recorded movement by males of approximately 650m, although distances covered by females are invariably much smaller. Some populations are very large, numbering 15,000 adults, but there is likely to be little interchange of adults unless populations occur very close together.

	J	F	M	A	M	J	J	A	S	O	N	D
Egg												
Caterpillar												
Pupa												
Adult												

NOTE larval stage occasionally lasts for up to 22 months



Foodplants

The main foodplant is Hare's-tail Cottongrass *Eriophorum vaginatum*, although females select areas for egg laying with mixed species rich swards of variable height rather than areas completely dominated by large, lush tussocks of the foodplant. Larvae have also been found on Common Cottongrass *E. angustifolium* and Jointed Rush *Juncus articulatus*. In the North York Moors Common Cottongrass is probably the principal foodplant, particularly in wetter areas.

Habitat

The butterfly breeds in open, wet areas where the foodplants grow: lowland raised bogs, upland blanket bogs and damp, acidic moorland. Sites are usually below around 500m (600m in the far north), and have a base of Sphagnum moss interspersed with dense tussocks of Hare's-tail Cottongrass. They also have abundant Cross-leaved Heath *Erica tetralix*, the main nectar source, and other plant species characteristic of high quality mire. Many degraded mires, in particular those subjected to drainage, burning or mechanical disturbance, are dominated by large, lush tussocks of Hare's-tail Cottongrass, making these areas only marginally suitable for Large Heath.

Habitat management for the Large Heath

The overall aim is to maintain a diverse mix of mire vegetation containing bog mosses, Hare's-tail Cottongrass and Cross-leaved Heath.

Hydrological Management

Desiccation of peat should be avoided as it results in habitats becoming overgrown by rank vegetation. Ideally, water tables should be maintained at or just below the peat surface. Drainage ditches should be blocked in order to retain water within the peat, while driving impermeable barriers into peat at mire perimeters will also enhance water retention. However, flooding of sites should be avoided, as larvae are susceptible to submersion.

Grazing

Overgrazing should be avoided although absence of grazing can result in a deterioration of habitat quality, particularly on drier mires. Stocking levels should reflect plant productivity: on sites where productivity is low (usually the wettest sites), no grazing will be needed. On drier mires, where productivity is likely to be higher, light sheep grazing will help prevent vegetation becoming dominated by single-species such as Heather *Calluna vulgaris*, Purple Moor-grass *Molinia caerulea* or oversized tussocks of the foodplant.

Forestry

Many mire habitats have been fragmented by afforestation. Conifers restrict the movement of adult butterflies between populations and impede colonisation of potential habitat. Additionally, conifer plantations within catchments will reduce water supply, often considerably. Removal of conifers from Large Heath sites is recommended to avoid this.

Heather Cutting

Sites dominated by tall stands of Heather are suboptimal but can be improved by Heather cutting. Cutting should only be considered on sites where grazing is not a viable management option. Heavy machinery should not be used for this operation, as trafficking of the peat surface is detrimental. Tall Heather only establishes when conditions are excessively dry; therefore cutting operations are best undertaken in conjunction with hydrological management. Burning on bog habitats is not recommended.

Scrub Control

Invasion by tall scrub usually indicates that a site is becoming too dry. Tall scrub should be removed, although hydrological management may also be required to restore habitat quality.

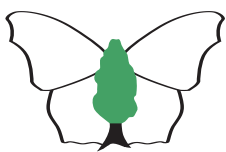
below Foodplant - Hare's-tail Cottongrass



below Suitable habitat in blanket bog, with Hare's-tail Cottongrass and Cross-leaved Heath



below Barriers enhance water retention



**Butterfly
Conservation**

Saving butterflies, moths and their habitats

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