Introducing Butterflies and Moths in Bushy & Richmond Parks

Butterflies and moths belong to the insect Order Lepidoptera – which means 'scaly-winged'. The tiny scales that cover the wings absorb and reflect light to give butterflies and moths their beautiful and complex colour patterns. Some moths, the 'clearwings' have few scales on their wings. The wings of caddis flies (Order Trichoptera) are covered in tiny hairs (not scales); these insects can be confused by the unwary with some of the smaller moths ('microlepidoptera').

Worldwide, over 165,000 species of Lepidoptera are known, but many more await discovery. In Britain, we have about 59 species of resident butterflies (plus another half-dozen regular visitors) and roughly 2,500 species of moths, 900 of which are 'larger' moths, or 'macrolepidoptera'.

Butterflies and moths are very closely related – there is no simple clear division between them (see "Moth Myths" below) but the following three characteristics are quite useful.

Butterflies	Moths
Antennae are always club-shaped	Have many shapes of antennae, and may differ between sexes, but only burnet moths have clubbed antennae
Most are day-flying	Most fly at dusk or at night but quite a few are day-active.
No 'frenulum'	Most moths have a 'frenulum' - a hook-like device that connects the front and hind wings.

Conservation issues

Most British butterflies are at the northern limit of their range so we have less than a quarter of the number of species found on the continent. However, factors like habitat destruction, intensive farming and countryside management as well as climate change mean that 71% of our butterflies have declined dramatically in the last 20 years. In the last 150 years 5 species of butterfly have become extinct (e.g. Large Tortoiseshell, Large Blue) and many more are in serious trouble, such as the High Brown Fritillary and the Heath Fritillary both of which have declined by over 90% since the 1950's. Moths are suffering in a similar way, 11 moths became extinct during the twentieth century, about two-thirds of species are declining, and about 20% of all species are seriously threatened e.g. the Dusky Thorn and the Hedge Rustic have declined by more than 90% (from 35 years of data collected at Rothamsted).

Life Cycles of Butterflies and Moths

All butterflies and moths are 'holometabolous' insects, that is to say that the life cycle involves a complete metamorphosis from the larval to the adult stage - which looks nothing like the larva and has a completely different life-style. The life-cycle has 4 distinct stages:
egg ➔ larva (caterpillar) ➔ pupa (chrysalis) ➔ adult (imago – plural 'imagines').

There is a huge variety of life-histories among butterflies and moths. Most larvae are herbivores, grazing on grasses and other flowering plants, but some moth larvae feed on detritus in animal nests, a few others are carnivorous and some even feed under bark and on decaying wood. The latter include some of the clearwing moths and species like the Goat Moth (Cossus *cossus*) the larvae of which could perhaps be mistaken by some for a stag beetle larva.

Which stage of the life cycle over-winters varies - the egg, larva pupa or adult may be the over-wintering stage depending on the species (see table). Some species breed many times in the season, while other others concentrate their reproductive effort into one or two particular

periods. Butterflies usually feed and fly for some time after hatching and some may even hibernate as adults over-winter. Many moths do the same, although some are sexually mature on hatching, then mate, lay eggs and die within a few days.

Some butterflies have interesting changes in food plant over the season. The Holly Blue's spring generation of larvae feeds on the flower buds, berries and terminal leave of Holly, but the summer generation uses Ivy. As with many of the other blues, the larvae and pupae are often tended by ants, which protect them from insect predators in exchange for sugary secretions from special glands. Some of the other blues have even closer associations with ants – for example the pupae of the Common Blue and Silver-studded Blue (found on heathland) may even be taken by the ants into their nest where they complete their development, still under the protection of the ants. The larvae of the Large Blue (very rare in the UK), drop to the ground after their fourth moult at which time they are collected by ants and taken into the nest. The larvae then become carnivorous - feeding voraciously on the ant larvae and eventually pupating while the ants continue to protect them and harvest their sweet secretions.

The status of lepidoptera in Bushy and Richmond Parks

Thanks to the efforts of volunteer and professional recorders we know quite a lot about the lepidoptera of Richmond Park, although new species crop up quite frequently. Around 21 butterfly species and something over 525 species of moths are known. Richmond Park is a stronghold for the UK BAP Priority Double-Line Moth (*Mythimna turca*) just one of 21 nationally scarce or threatened moths occurring in the Park and one that has also recently (2005) been recorded in Bushy Park.

Like Richmond, Bushy has a rich and varied range of habitats – particularly important are the areas of acid grassland and mature woodland, water-bodies and wet areas. Volunteer recorders are currently monitoring about 20 species of butterfly, but we know less about the moths pending professional survey work being carried out 2005-7. Preliminary data suggest it to be an important and rich site comparable to Richmond Park.

At a national level, the status of two familiar and widespread species, the Painted Lady and Red Admiral butterflies, is of interest because we owe their presence in the UK to migrations from Continental Europe. Although they breed here, few (if any) survive the winter, although perhaps some adults may be surviving in the warmer winters of recent years. Our populations are therefore replenished almost entirely by immigration of new breeding adults from the Continent.

Some good sources for further information and identification

Asher J et al. (2001) *The Millennium Atlas of Butterflies in Britain & Ireland*, Oxford University Press
Porter J. (1997) *The Colour Identification Guide to the Caterpillars of the British Isles*, Viking
Thomas J. & Lewington R. (1991) *The Butterflies of Britain & Ireland*, Dorling Kindersley & National Trust
Waring P. *et al.* (2003) *Field Guide to the moths of Great Britain & Ireland*, British Wildlife Publishing.

Also the following websites

www.butterfly-conservation.org
www.ukmoths.co.uk
www.ukbutterflies.co.uk
www.whatsthiscaterpillar.co.uk
www.nhm.ac.uk/research-curation/projects/hostplants (a world host plant database)

Nigel Reeve March 2007

Some butterflies and day flying moths you may well see

Key: G = N° generations per year; Ov = overlapping/indistinct
W = over-wintering as **E**gg, **L**arva, **P**upa, **A**dult

	Months when most likely to be seen flying																	
Butterfly Species	**M**		**A**		**M**		**J**		**J**		**A**		**S**		**O**		**Typical Larval Food-plants**	**G**	**W**
Brimstone																	Buckthorn and Alder Buckthorn	1	A
Comma																	Hop, Common Stinging Nettle	2	A
Common Blue																	Bird's Foot trefoil, + other trefoils, Black Medick, Rest Harrow.	2	L
Essex Skipper																	Grasses mainly Cock's-foot, Creeping Soft Grass, + others	1	E
Gatekeeper																	Fine/medium grasses e.g. bents, fescues, meadow grasses	1	L
Green-veined White																	Water Cress, Lady's Smock, Garlic Mustard, Hedge Mustard.	2	P
Holly Blue																	Mainly Holly (1st brood) and Ivy (2nd brood) but also other species.	2	P
Large Skipper																	Cock's-foot	1	L
Large White																	A range of brassicas, including Cabbage	2-3	P
Meadow Brown																	Fine/medium grasses e.g. meadow grasses, bents, fescues	1	L
Orange Tip																	Garlic Mustard, Lady's Smock and other crucifers e.g. Honesty	1	P
Painted Lady																	Mallows, Artichoke, Nettles, Spear Thistle, Marsh Thistle.	Ov	-
Peacock																	Common Stinging Nettle	1	A
Purple Hairstreak																	Oak	1	E
Red Admiral																	Common & Small Stinging Nettle.	Ov	-
Small Copper																	Common and Sheep's Sorrel	3	L
Small Heath																	Fine/medium grasses especially fescues plus e.g. meadow grasses	2	P
Small Skipper																	Yorkshire Fog	1	L
Small Tortoiseshell																	Common and Small Stinging Nettles. 2 broods quite distinct	2	A
Small White																	A range of brassicas, including Cabbage	2	P
Speckled Wood																	Grasses e.g. Wood False Brome, Cock's-foot, Yorkshire Fog. Broods overlap	3	L P
Moth Species																			
Brown silver-line																	Bracken	1	P
Nar.Brd.5-spot Burnet																	Meadow Vetchling, Red Clover, Sanfoin, Greater Bird's-Foot Trefoil	1	L
6-spot Burnet																	Bird's-Foot Trefoil, sometimes Greater Bird's-Foot Trefoil	1	L
Burnet Companion																	Clovers, Black Medick, Lucerne, Bird's-Foot Trefoil, + Cock's-foot	1	P
Cinnabar																	Common Ragwort, occasionally other ragworts and groundsels	1	P
Mother Shipton																	Clovers, Bird's-Foot Trefoil, Black Medick, Lucerne trefoils/ vetches	1	P

Moth Myths
from the Butterfly Conservation website: **www.butterfly-conservation.org**

There are many myths about the differences between moths and butterflies:

Butterflies are more colourful than moths

This is just not true! Some species such as the Scarlet Tiger, the Green Silver-lines and the Peach Blossom are very colourful. Others are less colourful, but have cryptic patterns which have evolved to aid camouflage, e.g. the Buff-tip.

Moths fly by night

It is true that most species do, but many, such as the Speckled Yellow, the Mother Shipton, the Chimney Sweeper iridescent green Foresters, fly by day. Some butterflies, such as the Red Admiral, are known to fly at night.

Only butterflies have clubbed antennae

Some moths have club-like antennae, for example the day-flying burnets.

Only butterflies rest with their wings held closed over their backs

A few moths hold their wings butterfly-like, e.g. the Bordered White or the Dingy Shell, many others will do so when alert. Not all butterflies do, for example some skippers.

Moths are furrier and hairier than butterflies

This varies from species to species, but some butterflies have distinctly furry bodies.

Another myth is that all moths eat clothing

In fact, only a few species do, and they require clothes that are preferably dirty and hidden away in dark, sheltered places where they are not disturbed. Silk webbing is usually associated with moth damage. Many of the holes in clothes are not attributable to moths. Clothes moths don't like being 'spring-cleaned'!

Perhaps the most consistent difference is that nearly all moths have a hook-like structure, which is not present in the majority of the butterflies, joining the hind wing to the forewing.