



Butterfly Report 2015

Gatekeeper on convolvulus Photo: Mike McCrea

Hi All,

This month's Biodiversity Newsletter comprises a report on the current status of butterflies in Stratford Park. It seems inconceivable that only eight years ago, the park was on the brink of losing many of its resident butterflies due to the absence of any biodiversity management plan, changes to their habitat and to a lesser extent, climate change. Since 2011 a cohesive management plan is now in place thanks to Stroud District Council, and combined with a more sympathetic approach to grounds maintenance and an ongoing program of habitat improvement, butterflies are once again thriving in Stratford Park.

Butterflies are sensitive environmental indicators, and due to their almost symbiotic relationship with flora, are usually the first organisms to be affected by environmental changes and loss of habitat. In view of this, the conservation of butterflies in the park remains high on the priority list of the management plan.

Stratford Park possesses many distinct habitats, and within these, butterflies have found their niche, but it is also of paramount importance that the flora that supports these species, is also preserved and protected through the current program of habitat management, for the loss of this will surely see a reduction of our butterflies.

During the past seven years, the key habitats for butterflies in Stratford Park have been identified and preserved, but there is still a great deal more to do. The woodland areas require ongoing coppicing and thinning. Further improvements to the grassland and planting of important species of flora relative to butterfly ecology will all be beneficial in sustaining the park's butterfly populations.

Such is the success of butterfly conservation in Stratford Park that we are now able to provide guided butterfly walks every year through our links with the Museum in the Park. These walks also engage schools and children with the natural world. It is therefore encouraging to see both the environment and general public benefitting and enjoying our butterflies here in Stratford Park through continuing management and responsible maintenance practices.

Mike



OVERVIEW

Throughout the UK many species of butterflies are in decline, particularly those that live in distinct colonies or groups of colonies, on a particular type of habitat and have limited ability to move to new sites. A lot of suitable habitat has been lost as land has been developed for housing, industrial use and new roads, or has been used to grow arable crops and for other agricultural uses.

The result is that much of the suitable habitat that remains is now in small patches that are separated by large areas of unusable habitat. The less mobile butterflies, of which there are many, are unable to move between to these habitat patches, so if they fail to prosper at one site there is no alternative area in the vicinity for them to move to. In the case of Stratford Park, due to its partial geographical separation from outlying habitats, several species have been lost over the succession of time.

A hundred years ago, before the development of the park, much of the open spaces in the northern part of the park would have been natural meadow and unimproved grassland, interspersed with deciduous trees. Many of the butterflies that currently populate local grassland sites undoubtedly occurred in Stratford Park. Pockets of unimproved grassland still exist between Edge Common and Whiteshill, both within two miles of the park.

The once thriving woollen industry throughout the Stroud District during the last century meant that much of the surrounding hills were grazed by sheep, and it is historically acknowledged that several species of butterflies, once present in the district became extinct following the decline of the woollen industry and consequent cessation of grazing.

Urbanisation in the area has had further impact on butterfly populations, and housing development has slowly encroached nearer to the park. However, Stratford Park is a public space owned by a local authority, affords it some element of protection and preservation, but over the last few decades, the conservation of butterflies in the park has not been a priority, or part of any biodiversity strategy due to the lack of knowledge that support the species present.

This does not imply ignorance on the part of those responsible for its upkeep and maintenance, but purely indicates a lack of suitable experts and resources to survey and collate data on the resident populations. To my knowledge, no past research has been carried out on the park's butterflies other than my own studies prior to my present employed tenure with The Landscape Group. Even my records and data only extend back to the early 1970s, but even then, butterfly populations were relatively healthy and stable in the park. Almost every butterfly species in Stratford Park has a different ecological requirement, such as height of grassland, amount of scrub and so on.

As many of these habitat requirements have been reduced in the park over many decades, a mosaic of different conditions has needed to be created to restore a balance. We must also consider that the park is not managed solely for butterflies, but also for the needs of other insects, flowers, birds and other groups that also need to be considered. We must also understand that Stratford Park is foremost, a public space to be used by members of the public for recreational and relaxation purposes, and with this comes a large amount of grounds maintenance, formality and uniformity.

As the recreational facilities spread out further into the park, this increases the impact on butterfly populations. Of the 56 acres that comprise Stratford Park, around 36 acres of this can be considered suitable habitat for butterflies. Naturally, most of this habitat lies within the woodland, rough grass and arboretum areas of the park.

PRESENT MANAGEMENT FOR BUTTERFLIES

As previously mentioned in my butterfly report for 2014, following the commissioning of the Stratford Park Landscape Management and Action Plan: Rutter, P. 2011, (Stroud District Council) the main breeding sites for butterflies within Stratford Park have been identified and suitable management and habitat improvement is now established and ongoing. This has

involved major enhancements to existing habitats that support butterflies, altering grass cutting regimes, closing fragmentation of micro habitats, woodland thinning and coppicing, preservation of important food plants, planting for pollinators (within the recreational areas and the orangery), tree planting, adopting sustainable flower planting and creation of new butterfly friendly habitats (Sensory Garden Project).

All of these positive practices form part of the ongoing Management Plan, yet despite this, butterflies are subject to large fluctuations, both short and long-term. Additionally, many species are in genuine decline outside of the park, both in terms of numbers and contraction in range. Much of this national decline can be attributed to other factors such as climatic conditions (climate change) and attack by parasites or diseases. It is therefore important that the species we have in Stratford Park are protected and conserved.

BUTTERFLY HABITATS IN STRATFORD PARK

- **WOODLAND**
- **HEDGEROWS AND MARGINS**
- **UNIMPROVED GRASSLAND AND SCRUB**
- **ARBORETUM**
- **HERBACIOUS AND FLOWER BEDS**

Woodland consists primarily of mixed deciduous and coniferous trees, although conifers dominate. The park's coniferous part of the woodland is rather sterile in terms of butterflies, although a few species are present in the areas of dappled sunlight, namely Speckled wood *paparge aegeria* and Green-veined white *Pieris napi*.

Orange tip *Anthocharis cardamines* is common along the woodland edge, mainly the damp areas adjacent to the stream where its food plant *Cardamines pratensis* grows. Most butterflies require clearings in woodlands where the sun can penetrate and provide a warmer microclimate, and present management work in the beech woodland is aiming to achieve this over the coming years by way of a program of tree thinning.

An example of how this can benefit butterflies is the example of the Pearl-bordered fritillary which occurred in small numbers in the beech wood until 1982 – 4. The colony was supported by the strong presence of its food plant *viola* which grew throughout the newly planted beech plantation in the 1960s and early 70s. When the beech expanded in height and breadth, the conditions became unsuitable for the butterfly, and it disappeared from the site in the early 1980s. Had a woodland management plan been in place prior to the 1970s, the species may have continued thriving there to this day.

Although some hedgerows and margins have been lost around the park, those that remain provide sources of food for butterflies and their caterpillars, essential shelter from wind and

rain, and green corridors along which butterflies can disperse. Much of the park's hedgerows consist of bramble *rubus*, Blackthorn *spinus* and Hawthorn *crataegus*. Gatekeeper *Pyronia tithonus* and Ringlet *Aphantopus hyperantus* can be seen flying around these hedges in summer and feeding on bramble blossoms. Hedgerow margins also allow areas of stinging nettles *dioca* to grow and dominate. Stinging nettles are the food plant of several *nymphalids* – Red admiral *Vanessa atalanta*, Small tortoiseshell *Aglais urticae* Peacock *Inachis io* and Comma *Polygonia c-album*.

Part of our habitat management is to allow large swaths of nettles to grow, especially in sunny locations, which has been a huge benefit to these species. Until 1972, many mature elm trees grew along the hedgerows around the park, and these supported colonies of White-letter hairstreak *Strydomonia w-album*. The butterfly was lost following the felling of the trees from Dutch elm disease, but was re-discovered in 2012 hanging on in small pockets of regenerating elm at Stratford Court. There is every possibility that the species is present among elm re-growth in the Salmon Springs part of the woodland.

Unimproved grassland and areas of managed scrub support the largest diversity of butterflies in Stratford Park; a total of 17 species. South facing banks of unimproved grassland, particularly the 'wildflower bank' adjacent to the sports pitch is dominated by grass feeding butterflies such as Small skipper *Thymelicus sylvestris*, Large skipper *Ochlodes venata*, Meadow brown *Maniola jurtina*, Gatekeeper *Maniola tithonus*, Ringlet *Aphantopus hyperantus*, Small heath *Coenonympha pamphilus* and Marbled white *Melanargia galathea*, also Common blue *Polyommatus icarus*, Brown argus *Aricia agestis*, Small copper *Lycaena phlaes*, Small white *Pieris rapae*, Green veined white *Pieris napi*, Small tortoiseshell *Aglais urticae*, Painted lady *Vanessa cardui*, Red admiral *Vanessa atalanta*, Peacock *Inachis io* and Comma *Polygonia c-album*.

The arboretum supports few species, but two in particular, are present in good numbers – Holly blue *Celastrinus argiolus* and Brimstone *Gonepteryx rhamni*. The Holly blue is supported by a good supply of its food plant – Holly and Ivy throughout the arboretum.

The herbaceous shrub and flower beds are rich in suitable flowers and can attract many of the butterflies previously mentioned, especially the *nymphalids*. Marjoram and heather growing by the Bowling Green, attracts many butterflies in summer.

All of these habitats form an important landscape mosaic to the success of butterflies in Stratford Park. Much of the horticultural topography can be fine tuned to accommodate more pollinator friendly plants and sources of food for butterflies and their caterpillars. Identifying these requirements is important to the longevity and sustainability of our species in the park, which are evidently benefiting from the present maintenance regimes in place.

The possibility of re-introducing some species that have previously been lost (Pearl-bordered fritillary) to name but one, seems plausible if its habitat could be restored. The two species that have a tenuous hold in the park (Purple and White-letter hairstreak), will require further study and conservation considerations. At the time of writing, we are experiencing the mildest winter on record in the UK with daytime temperatures in some areas, peaking at

14C. This will undoubtedly have an adverse affect on the UK's butterflies that rely on cold winters to regulate the parasites that predate their larvae. With many trees and flowers being encouraged to produce blossom early, only to be hit by late frosts, butterflies as well as other pollinating insects will be hit hard, and this will have devastating results on populations.

The extreme rain we are experiencing this winter, if repeated next spring, could also have an adverse affect on pollination, as butterflies, along with bees and other insects will be unable to take to the wing. It would seem that butterflies are very much reliant on the normal cycle of weather to perpetuate their populations, and that the extremes which we are experiencing at present, only add to the many other factors that contribute to their decline.

If we can mitigate some of this natural harm, by providing a helping hand to the species resident in our park, then not only are we fulfilling our obligations as responsible custodians of the park's wildlife, but helping to support butterflies for future generations of visitors.

BUTTERFLY HABITATS WITHIN STRATFORD PARK



Managed grassland with flora



Mixed woodland and secondary scrub



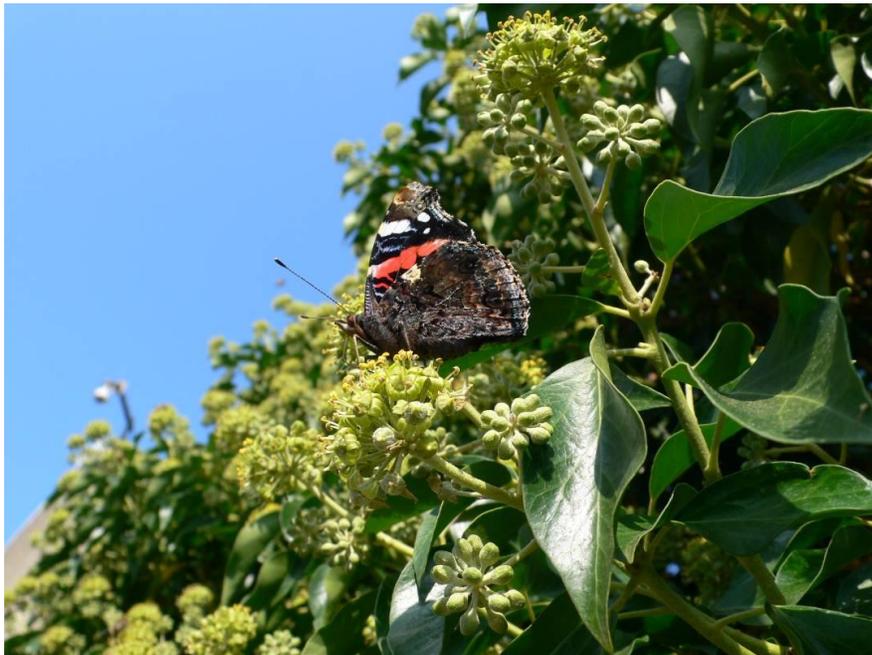
Arboretum



Nectar rich flower beds

These examples highlight some of the diverse habitats available to butterflies in Stratford Park.

Although the flower beds and more formal planting sites do not support specific species, they provide important food sources for common butterflies that are not restricted in their range by special habitat requirements. These areas also provide gateways for dispersal throughout the park, and between the other primary habitats. Summer bedding schemes currently employed in the park, have a strong emphasis on pollinator friendly flowers, not just for Lepidoptera, but other orders of insects. Strong fliers such as Peacocks, Red Admirals, Small tortoiseshells and Painted Lady are the dominant species visiting flower beds outside of their breeding areas around the park. Plants such as ivy are encouraged as they provide an important source of nectar for late flying butterflies such as Red Admiral (below).



(A Red admiral butterfly feeding on ivy blossom in the works compound Photo: Mike McCrea)

Buddleias or 'butterfly bush' is another shrub that is very rich in nectar, and these have been planted at key sites in the park such as the orangery (below). Photos: Mike McCrea.



SYSTEMATIC LIST OF BUTTERFLIES

A total of 26 species are represented to date in Stratford Park, half of the total British fauna. Of these, 23 are considered resident and 3 immigrants. Nomenclature follows that of 'Bradley & Fletcher' A Recorder's Log Book and Label List of British Butterflies: Curwen Press, 1981.

SUPERFAMILY HESPERIOIDEA

Family HesperIIDae

Small skipper *Thymelicus sylvestris* Resident. Common, inhabits the rough grass areas around the northern green corridors and wildflower bank. Flies from mid-June to mid-August in most years. Caterpillar feeds on grasses.

Large skipper *Ochlodes venata* Resident. Common, Flies in the same habitat as small skipper, but more often seen basking on larger vegetation adjacent to nettle beds and trees along the top park perimeters. Flies from late May to August. Caterpillar feeds on grasses.

SUPERFAMILY PAPILIONOIDEA

Family Pieridae

Clouded yellow *Colias croceus* Immigrant. Summer/early autumn visitor. Occurs most years, but not in 2014. Large numbers were recorded at Stratford Court fields in September 2011. The species arrives from Continental Europe in suitable years, especially during heat waves where warm air is blown up from North Africa. The caterpillar feeds on various trefoils and clovers.

Brimstone *Gonepteryx rhamni* Resident. Occurs in small numbers mainly in and around the arboretum and woodland where its food plant Buckthorn grows.

Large white *Pieris brassicae* Resident and immigrant. Very common to abundant in some years. Can be seen almost anywhere in the park where nectar bearing flowers grow, especially the Orangery where the caterpillars feed on greater sea kale *Crambe cordifolia* and around the Bowling Green. Is supplemented most years by large influxes from the continent.

Small white *Pieris rapae* Resident. Common. Produces several broods each year, peaking in late summer. A pest of cultivated brassicas, though the absence of these in the park means that it is only seen whilst passing through.

Green-veined white *Pieris napi* Resident. Common. Often mistaken for one of the 'cabbage whites', this butterfly is however, a true woodland edge species. It has two generations each year, the first from April to June and the second from July to September. Occurs mainly in open

areas of the woodland and along the stream where its food plants garlic mustard and cuckoo flower grows.

Orange tip *Anthocharis cardamines* Resident. Common. Mainly found along the woodland edge adjacent to the stream where its food plant cuckoo flower grows. Flies from late April to late May. Eggs have been located on cuckoo flower growing on the wildflower bank. The female lacks the distinctive orange on the fore wing that the male possesses, and is often overlooked as one of the 'cabbage whites'.

Family Lycaenidae

Green hairstreak *Callophrys rubi* Resident. Local. Seen most years, but rarely in good numbers. Most sightings are in the shrub areas below the museum and orangery, usually in May and early June. Possibly overlooked in the adult stage. Caterpillars feed on a wide range of plants including rock rose, dogwood, bramble and bird's foot trefoil.

Purple hairstreak *Quercus quercusia* Resident. Very scarce and localised. A colony was only discovered in 2012 by accident, whilst observing Little owls on the main field. The butterflies, confirmed by Chris Tracey from Butterfly Conservation, were flying over the top of one of the main oak trees on the main field, early on the evening of July 16th at 6.00pm. The occurrence of this colony remains a mystery as the habitat is not characteristic of this species. Further observation is required to establish its present status in the park.

White-letter hairstreak *Stridimonium w-album*. Resident. Scarce. Small colonies once existed in the mature elms that surrounded the park. Re-discovered in 2012 on suckering elms at Stratford Court. Adults were observed basking on adjacent hazel. A more thorough search for this species is required to establish its status. Only one butterfly seen in 2015, again, at Stratford Court 28.7.2015.

Small copper *Lycaena phlaeas*. Resident. Scarce. Has declined significantly in recent decades due to the loss of suitable habitat, ruderal areas, rough and waste ground. Previously common in the park pre 1975. Last known population in the Walled Garden (2013) prior to development. Occasional individuals seen on the wildflower bank where it imbibes on ragwort. Food plant is mainly Sorrel *Rumex acetosa*.

Small copper (right) in copulation Walled Garden 2103
(Photo: Mike McCrea)



Brown argus *Aricia agestis* Resident. Scarce. Although this species can be found in small numbers on calcareous grassland sites around the Stroud District, it has only been recorded twice in the park, both times on the wildflower bank. There is two generations each year, the first in May and June and the second in August. The main food plant on calcareous soils is Rock rose *Helianthemum nummularium*.

Common blue *Polyommatus icarus* Resident. Common. This butterfly has increased in recent years due to new grassland management in place. We are now mowing around pockets of Bird's foot trefoil *Lotus corniculatus* which is the species' chief food plant and the expansion of green corridors has also benefitted this butterfly. During 2012 there was a population explosion in the park, with many hundreds seen throughout the northern perimeters of the park. However, its main site in the park is the wildflower bank, where, along with trefoil, other vetches are growing. There is usually two, sometimes three generations each year, so the butterfly may be seen anytime from mid-May to late September. Remains strongly represented in the park.

Holly blue *Celastrina argiolus* Resident. Common. Stratford Park would seem the perfect habitat for this butterfly, with its wide variety of Holly trees and bushes, together with large pockets of ivy. The species is double brooded and often one of the first spring butterflies to be seen in April. It inhabits almost exclusively, the arboretum areas below the museum and orangery, although individuals have been seen amongst shrubs along the A46 corridor. Remains a regular species in the park.

Family Nymphalidae

Red Admiral *Vanessa atalanta* Immigrant. Common. Occurs mainly around the orangery, bowling green and other areas where flowers grow. This is a species which is benefitting from habitat management in the park. Its caterpillars feed on stinging nettles *Urtica dioica*. Large tracts of stinging nettles have been allowed to grow around the green corridors and these are producing large numbers of red admirals each year. The butterfly is on the wing throughout the summer and into the autumn, where it can be seen nectaring on ivy blossom throughout the arboretum and around the service yard.

Painted Lady *Vanessa cardui* Immigrant. Another migratory species arriving in good numbers some years, but in other years, absent from the park. A population explosion occurred in 2011, since then, only singletons are seen in the park, mainly on the wildflower beds and orangery. The caterpillars feed on varieties of thistles. A good place to see this butterfly in the park is the heather growing next to the bowling green. It can often be seen feeding along with Red admirals and Small tortoiseshells on buddleias at the orangery and by the sports pitch.



(Painted lady Photo: Mike McCrea)

Small tortoiseshell *Aglais urticae* Resident. Common. There had been a national decline in this species during the early 2000s due mainly from predation of a parasitic fly (*Sturmia bella*), which parasitises the caterpillar. Populations crashed, as damp wet summers also took their toll. Small tortoiseshells appear to be on the increase again, and the park has recorded record numbers between 2010 -15. Again, this has been helped by allowing large expanses of stinging nettles to grow, which the caterpillars feed on. With these plants previously considered a weed, and annually flailed and controlled (pre 2008), the species was almost absent from the park. Today, stable populations exist throughout the green corridors, where there is a good supply of nettles and basking spots for the adult butterflies.

Larval webs can be seen in May after the adult butterflies emerge from hibernation. These produce a second generation in summer, and often a third. The adult butterflies have benefitted from the sustainable planting currently in place in the park, and can be seen in almost every location, particularly the orangery flower beds and around the bowling green.



(Small tortoiseshell caterpillars feeding in a web Stratford Park 2013)

Peacock *Inachis io* Resident. Common. Although a common species, the peacock is not as frequent as the two previous species, but found throughout the park, especially the orangery beds where it is a beautiful sight at buddleias in late summer. The caterpillars also feed on stinging nettles, and larval webs can be seen throughout the green corridor areas of the park.

Comma *Polygonia c-album* Resident. Common. A regular visitor to ivy blossom in the autumn. Post hibernation adults fly in late March and April, occasionally earlier, and breed to produce more butterflies in July. This generation is not seen as commonly as the autumn generation. Large expanses of ivy in the works service compound attract large numbers in October. This is another nettle feeder, although elm *Ulmus spp* is also used. The adult butterfly is also regular at buddleias. Remains a common species.

Pearl-bordered fritillary *Boloria euphrosyne* Extinct in Stratford Park post 1982. Very scarce in other parts of the Stroud District. Stratford Park once supported a small colony of Pearl-bordered fritillary, and this has been mentioned in a previous Biodiversity Newsletter. Changes to habitat are the reason for its decline and extinction in the park. Present woodland habitat is unsuitable without future coppicing and clearance.

Dark green fritillary *Argynnis aglaja* Scarce in Stratford Park, local elsewhere in the Stroud District. Only one record in 2013 near the Model Railway woodland corridor. (P.Woodward). Probably an individual passing through the park. No further records.

Subfamily Satyrinae

Undoubtedly, butterflies of this sub-family have benefited most from changes to grounds maintenance and habitat management in the park. All are grass feeding species, and they have re-colonised all of the green corridors, fragments of grass and scrub, and the wildflower bank. Until 2008, most of the species now present in the park were having a tenuous hold in the adjacent fields, extending to Whiteshill. Three species are now well established in the park, and two further species are slowly re-colonizing.

Speckled wood *Paparge aegeria* Resident. Common.

A woodland species found commonly throughout Stratford Park. It has two, sometimes three generations, with a flight period extending from April to October. The best place to see this butterfly is along the recently restored woodland paths adjacent to the Model Railway. Here, it can be seen on sunny days basking in the dappled light. A well established butterfly.

Marbled white *Melanargia galathea* Resident. Local. Found in good numbers on calcareous grassland sites throughout the Stroud District, the Marbled white has only just started to appear in the park. These are undoubtedly stragglers. However, with good amounts of *fescue grasses*, it may become established as a resident species. Individuals have been recorded on the wildflower bank.

Gatekeeper *Pyronia tithonus* Resident. Common. Well established on the wildflower bank where it can be seen feeding on Ragwort *Senecio jacobaeae* and Knapweed *Centaurea maculosa*. Also flies throughout the green corridors extending down to the far beech wood.



(Gatekeeper on the wildflower bank)



(Gatekeeper on scabious) Photos: Mike McCrea



(An example of established knapweed on the wildflower bank. August 2015. Covering an area of 20 sq m, it is the main source of nectar for the Gatekeeper and many other species of butterflies.)

Meadow brown *Maniola jurtina* Resident. Abundant. The commonest Satyrid in the park, the Meadow brown has re-colonised every area of established grassland. The butterfly is on the wing from mid-May to September, and is also heavily attracted to knapweed on the wildflower bank. It is also common in the adjacent fields prior to harvesting. Remains very common to abundant.

Ringlet *Aphantopus hyperantus* Resident. Common. This is another grass feeding species that has benefited from habitat management. It is common throughout the green corridors extending down to the far beech wood. Has also become established within the new tree planting zones.

Small Heath *Coenonympha pamphilus* Resident. Uncommon in the park but common on grassland sites around the Stroud District. There are two generations normally, and singletons turn up in the park most years. This species, like the Marbled white may become established in Stratford Park in the future. It is on the wing from May until August.

HOW WE CAN HELP BUTTERFLIES IN STRATFORD PARK

The introduction to this report indicates the measures that Stroud District Council, The Landscape Group staff and Stroud Valleys Project volunteers are doing to manage habitats for butterflies. This is important in sustaining the species present.

The Biodiversity & Landscape Action Plan identifies this need and sets clear objectives for habitat restoration and conservation. It is very reassuring this is in place for those with an interest in the park's biodiversity and butterflies. Education is another important factor, and this is now being addressed through the annual butterfly walks and moth events organised with the Museum in the Park. We are now attracting more people to the park, who had previously been unaware of its butterfly fauna.

When one considers that within 7 years of The Landscape Group's tenure in Stratford Park, 23 species of butterflies, many of which had almost been lost, are now established and thriving, it ticks a very important box for butterfly conservation, and should serve as a barometer of success for other contracts delivered by The Landscape Group to engage in biodiversity projects.

We can continue to protect those plants, previously considered as weeds, which support butterflies, such as ivy and stinging nettles, establish pollinator friendly flowers and plants to the more formal parts of the park, and continue to promote butterfly conservation through interpretation or even a dedicated 'butterfly trail'. Although restriction of man hours and time belies a more extensive work by the writer, I feel that this report gives a fairly accurate representation to date of the park's butterfly fauna, which for now, looks healthy.

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(Small skipper Photo: Mike McCrea)



(Comma on buddleia orangery 2012)