ALONG THE MERSEY – THE 1974 ENTITIES OF "GREATER MANCHESTER" AND "MERSEYSIDE"

Although as made clear at the beginning of this book the author is a staunch believer in the concept of the historic counties, we here bow down a little to the adherents to the 1974 changes, to look at the above two in greater detail.

Within the historic counties of Lancashire and Cheshire, it is well known that the greatest concentrations of urban cover, and thus of industry, are in the north of Cheshire and the south of Lancashire within the Mersey basin, and especially the two large cities of Manchester and Liverpool and their environs, thus leading the brains behind the 1974 reorganisation to attempt to remove these conurbations from the two counties and create the "metropolitan" entities "Greater Manchester" and "Merseyside" out of them. Each is partly in Cheshire (VC58) and partly in (south) Lancashire (VC59); the central cities of each, Liverpool and Manchester, are both historically in Lancashire (though the second extends southwards into Cheshire). Accepting, albeit with some reluctance, that these entities have developed a degree of self-contained unity, as well as being central to the whole area, the butterflies in them have been mapped in greater detail, at 1 km resolution.

The river Mersey is formed by the confluence of the Goyt and the Tame in Stockport at SJ897908. With the exception of the Douglas, which rises on Winter Hill on the West Pennine Moors, and flows for 35 miles (56 km) through several towns and into the Ribble estuary past Tarleton, all the other rivers in Greater Manchester are, directly or indirectly, tributaries of the Mersey. The river has been vastly altered by man during the industrial revolution and afterwards, especially from 1894 when the Manchester Ship Canal was built. From its start, approximately SJ8297, the ship canal is in effect a canalisation of the river Irwell, though much straighter than the latter's original course; at Flixton, SJ7293, the Mersey flows into the ship canal, becoming in effect a tributary of the Irwell, although historically the Irwell is a tributary of the Mersey; and from this point until Bollin Point, SJ6888, there is in effect no river Mersey (or perhaps here the ship canal should be regarded as a canalisation of "Mersey+Irwell"). At Bollin Point, the river Bollin flows in on the left, and the Mersey recommences by flowing out on the right – though obviously there is no guarantee that any of the water which flowed into the ship canal at Flixton will flow out of it opposite Bollin Point. There are a number of places along the ship canal where the original courses of the Mersey and the Irwell can still be traced. From Bollin Point, the river Mersey and the ship canal both continue separately to the sea; from just below Warrington, around SJ5786, the Mersey is tidal and the estuary effectively starts.

Goyt/Tame confluence, SJ8990, 22.9.2014: start of Mersey

Micker Brook confluence, SJ8589, 21.4.2014: Lady/Micker Brook also good butterfly habitat

E. of metro railway, Chorlton, SJ8192, 5.1.2015: bank just reshaped, habitat temporarily damaged

Chorlton Brook confluence, SJ8093, 2.10.2015: woodland and grassland reserves nearby

W. of Stretford sewage farm, SJ7793, 1.4.2007: flood-defence banks provide S-facing grass habitat

W. from Millennium bridge, SJ7793, 7.1.2015: banks no longer built up, natural course of river

Near Urmston oxbow, SJ7693, 19.4.2016: ongoing erosion, changing course of river

Just W. of Urmston oxbow, SJ7693, 19.4.2016: islands forming, with alder carr on river sand

THE MERSEY, FROM STOCKPORT TO URMSTON

Old Eea Brook confluence, SJ7593, 19.4.2016: Urmston Meadows nearby

Mersey entering ship canal, SJ7293, 24.11.1985: from here to Bollin Point there is no river Mersey

Glaze/ship canal confluence, SJ7091, 10.3.2015

Pond near Warburton, SJ6989, 5.6.1985: denotes old course of Mersey

Bollin Point, SJ6888, 26.4.2011: Bollin enters left, Mersey recommences on right; Butchersfield ahead

Woolston Eyes, SJ6588, 15.2.2019: Mersey course is to left, ahead is a canal (which takes the flow)

Sankey Brook confluence, SJ5786, 24.11.2018: from here the Mersey is tidal; marshes, estuary

Riverside Walk, Liverpool, SJ3389, 30.5.2019: estuary side, clearly not butterfly habitat

Tame, Denton, SJ9293, 15.7.2014: lush riverside vegetation, woodland

Tame, near Reddish, SJ9092, 13.7.2014: good woodland, grassland (not just golf course)

Goyt/Etherow confluence, SJ9690, 12.7.2015: grassland (Brabyns Park) nearby

Etherow, Compstall, SJ9791, 27.3.2019: country park, former industry

Goyt, Offerton, SJ9289, 16.9.2014: woodlands and also in side valley (Poise Brook) nearby

Bollin, near Sunbank Wood, SJ7984, 2.5.2005: lush valley woodland and grassland

Bollin, near Bowdon, SJ7485, 30.12.2014: less woodland but including some elms

Bollin, S. of Dunham Park, SJ7386, 30.12.2014: landscape now more agricultural

MAJOR TRIBUTARIES OF THE MERSEY (WITHIN GREATER MANCHESTER)

Chorlton Brook, SJ8093, 10.4.2015: rises as Gore Brook, then Platt Brook

Barrow Brook, SJ8092, 5.1.2015: flows through Sale golf course and Sale Water-park

Stromford Brook, SJ7793, 7.1.2015: flows through Ashton golf course and Sale sewage works

Kickety Brook, SJ7893, 10.4.2014: original course (most water diverted to overflow river channel)

Ousel Brook, SJ7793, 4.5.2016: rises as Kickety Brook, becomes Old Eea Brook

Poise Brook, SJ9289, 16.9.2014: steep wooded valley, tributary of Goyt

Lady Brook ("Happy Valley"), SJ8886, 3.8.2014: becomes Micker Brook

River Dane, Woodford, SJ8981, 26.8.2014: tributary of Bollin

LESSER TRIBUTARIES OF THE MERSEY (PRIMARY AND SECONDARY)

There are good butterfly habitats along all these valleys

The Mersey has the following main tributaries (this list includes all those with "River" names but only three (the largest) of those with "Brook" names, and shows the six-figure grid reference for their confluence and whether they join on the left or right side):
Tame (Rs) SJ897908;
Goyt (Ls) SJ897908, secondary tributary **Sett** (R) SK001852, tertiary tributary **Kinder** (R) SK049870; secondary tributary **Etherow** (R) SJ961902;
Micker Brook (L) SJ853893;
Irwell (R) SJ722930 (original confluence) (secondary tributary **Roch** (L) SD801073, tertiary tributaries **Beal** (L) SD913146 and **Spodden** (R) SD890132; secondary tributary **Croa**l (R) SD747060, tertiary tributary **Tonge** (L) SD733079; secondary tributary **Irk** (L) SJ838989; secondary tributary **Medlock** (L) SJ825974, tertiary tributary (wholly culverted) **Tib** (R) SJ836974);
Glaze Brook (R) SD702911;
Bollin (L) SJ683889, secondary tributary **Dean** (R) SJ838822;
Sankey Brook (R) SJ575870;
Weaver (L) SJ500800, secondary tributary **Dane** (R) SJ656737, tertiary tributaries **Croco** (L) SJ700670 and **Wheelock** (L) SJ693669;
Gowy (L) SJ431775;
Dibbin (L) SJ349849;
Birket (L) SJ326902, secondary tributary **Fender** (R) SJ276910.

More of the tributaries with "Brook" names, including the Chorlton, Barrow, Stromford and Kickety/Old Eea Brooks illustrated in this section – are discussed in the section on the Mersey Valley and its warden service.

Of the tributaries, the most significant is the Irwell, the main river in the city of Manchester, which for part of its length forms the boundary between that city and Salford. Interestingly, the author can remember that in the late 1950s his mother described this river as a "stream of mud and filth"; in his diary entry for the 21st of January 2005 (when he was working in Salford and quite close to the river, and had just seen some Long-tailed Tits by it) he wrote "the river is like a strip of purity and reality through the loathsome buildings and ... masses of humanity". Sadly, since that date the buildings have encroached even more and the green on that stretch, where there also used to be Kingfishers, has all gone; however not all that far up the river there is still good green space. In the city zone, its banks have been built up as levees (in a similar manner to those of the Mersey between Stockport and Ashton-on-Mersey: see the *Mersey Valley and its Warden Service* section), including a stretch (SJ8399) where it was diverted and canalised in the 1960s. From its source, between Burnley and Bacup in south Lancashire (VC59) its length is approximately 63 kilometres/39 miles. It flows southwards through Bacup, Rawtenstall, Ramsbottom and Bury before its confluence with the Roch near Radcliffe. Turning westwards, it is joined by the Croal near Farnworth before turning south-eastwards through Kearsley, Clifton and the Agecroft area of Pendlebury. It then meanders around Lower Kersal and Lower Broughton and close to the Manchester and Salford city centres. The confluence with the Irk is near Victoria station, and that with the Medlock at Hulme Lock; then it turns west toward Irlam, as part of the ship canal. Its course ends just east of Irlam, where the Mersey comes in on the left.

Near Summerseat, SD7914, 10.2.1991: river completely iced-over in brief very cold spell

Just south of Bury, SD7910, 5.9.2014: lush valley but some invasive vegetation

Roch confluence, SD8007, 1.6.2017: valley woodlands and grassland nearby

Croal confluence, SD7406, 12.10.2014: Nob End and Moses Gate country park nearby

Near former Manchester racecourse/"the Cliff", SD8201, 30.7.2014: woodland on steep left bank

Near Peel Park, SJ8299, 30.7.2014: built-up bank provides grassland habitat, but frequently mown

Near Salford university, SJ8299, 13.9.2019: just after severe mowing. Some butterflies survive this

E. of Great Clowes Street, SJ8399, 6.6.2014: river canalised and re-routed here in the 1960s

THE IRWELL, FROM NORTH OF BURY TO SALFORD

Former course of river, SJ8399, 6.6.2014: some habitat around run-down buildings

Irk confluence, SJ8398, 15.9.2017: abundant buddleias provide early-autumn nectar

Bridge Street, SJ8398, 5.3.2005: ivy formerly good *C. argiolus* habitat; since drastically reduced

Nr. Hampson Street, SJ8298, 5.3.2005: was good grassland habitat; since destroyed

Medlock confluence, SJ8297, 11.1.2015: little in the way of habitat

Near Pomona Docks, SJ8297, 11.1.2015: where the Irwell becomes the ship canal

The ship canal from the motorway bridge, SJ7597, 23.2.2019: looking upstream

Confluence with Irwell old course/Salteye Brook, SJ7496, 23.4.2015: original Salteye/Irwell confluence was at SJ749971, further north-east

Roch, near Jericho, SD8311, 15.4.2011: valley with woodlands as well as industry

Spodden, Healey Dell, SD8815, 29.3.1987: tributary of Roch; confluence is at SD8913

Croal, near Moses Gate, SD7406, 12.10.2014: country park, woodlands on sloping banks

Croal, near Nob End, SD7406, 30.5.2005: close to nature reserve on former soda waste tip

Irk, SD8502, 2.6.2014: wooded valley below housing, confluence with Boggart Hole Brook

Irk, near St. Catherine's, SJ8499, 10.3.2005: remnants of industrial use

Medlock, Boodle Wood, SD9200, 3.6.2005: Daisy Nook country park

Medlock, Ardwick, SJ8497, 15.5.2014: vegetation trying to gain a hold on banks amidst industry

MAJOR TRIBUTARIES OF THE IRWELL (WITHIN GREATER MANCHESTER)

Eagley Brook, SD7212, 27.4.2014: joins Bradshaw Brook to form river Tonge, tributary of Croal

Cheesden Brook, SD8213, 14.5.2014: mid-altitude grass/moorland; tributary of Roch

Approximate source of river Tib, SJ8599, 12.4.2019: wholly culverted tributary of Medlock

Corn Brook, SJ8797, 7.11.2013: mostly culverted tributary of Irwell/ship canal

Course of culverted Corn Brook, SJ8296, 7.1.2014: St. George's Park, not far from Irwell confluence

Course of culverted Crofts Bank Brook, SJ7595, 4.5.2014: rises Longford Brook, later Bent Lanes

Bent Lanes Brook, SJ7495, 24.2.2014: tributary of Irwell/ship canal, Davyhulme Millennium reserve

Westleigh Brook, SJ6498, 21.4.2015: joins Pennington Brook and becomes Glaze Brook

LESSER TRIBUTARIES OF THE IRWELL (PRIMARY, SECONDARY, TERTIARY)
There are good butterfly habitats along or near these valleys

The expression “Greater Manchester” does not seem to have been in use prior to 1974. With “Merseyside” the situation is different: the name had certainly been in use, perhaps unofficially, at least since 1960, as it was in that year that the present author (then aged 14) obtained his first Ian Allan *British Railways Locomotives* spotting book, on the front cover of which is a picture of Stanier Pacific (4-6-2) 46207 *Princess Arthur of Connaught* with a headboard reading “The Merseyside Express”; this was an express passenger train which operated between London Euston and Liverpool Lime Street. In those times, the expression “Merseyside” was perhaps usually thought of as meaning Liverpool and Birkenhead with their docks systems; ironically, at this point the Mersey is an estuary rather than a river, its main drainage basin lying further upstream.

The area of the 1974 entity of “Merseyside”, divided between VC58 and VC59, is 648.5 square kilometres (250.39 square miles) and comprises five metropolitan districts (Knowsley, Liverpool, St. Helens, Sefton and Wirral); that of the 1974 entity of “Greater Manchester” is 1,284 square kilometres (495.76 square miles), with ten metropolitan districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan). Greater Manchester, though mainly in VCs 58 and 59, includes 91.75 square kilometres (35.42 square miles) in VCs 57 and 63; these latter are included in the Greater Manchester maps in this work, but not in the Lancashire/Cheshire maps. Although the area of “Greater Manchester” is double that of “Merseyside”; the two rival cities of Manchester and Liverpool do not differ greatly in size: the area of the city of Manchester is 115.6 square kilometres (44.6 square miles), and of Liverpool 111.8 square kilometres (43.2 square miles); and in mid-2018 the human populations were not greatly different, being estimated at 547,627 for Manchester and 494,894 for Liverpool. In this work, we have selected a 6 km X 5 km rectangle around the centre of each city for mapping at 100 m scale.

There are two post-1974 districts that do not quite fit into the scheme of things, both being on either side of the Mersey/ship canal and thus partly in Cheshire (VC58) and partly in south Lancashire (VC59), but not in either “Merseyside” or “Greater Manchester”. These are “Halton”, of which the area is 79 square kilometres (30 square miles) and “Warrington”, of 180 square kilometres (69 square miles). In this work, these have not been included in the 1 km scale mapping areas, though they are of course within the tetrad-scale maps showing the whole of Lancashire and Cheshire.

The extreme northern point: SD912210, above Ramsden Clough

The extreme southern point (1974 boundary): SJ891809, near Woodford

The extreme western point (1974 boundary): SD497020, near Billinge

Near (but not quite at) the eastern extremity: SE053016, Laddow Moss

GREATER MANCHESTER

The extreme northern point: SD369227, Marshside

The extreme southern point: SJ260782, Gayton Sands

The extreme western point: SJ183882, Hilbre Island

The extreme eastern point: SJ617945, north of Winwick

MERSEYSIDE

Regarding the environment, it may seem logical to assume that as Greater Manchester and Merseyside contain so much in the way of built-up areas compared with the other parts of Cheshire and Lancashire there are fewer suitable habitats for butterflies. By mapping the butterflies at a finer scale, however, it is clear that the greater urban cover in these regions does not necessarily mean that. The 1974 entity of Greater Manchester, as well as housing, offices, shops and industry, contains a broad range of semi-natural habitats: mature woodland, semi-mature woodland, newly planted woodland, woodland rides, glades and edges, woodland arising from natural succession, scrubland, grassland, high moorland (the highest point is Black Chew Head, at 542 metres/1,778 feet, SE055019), hill sides, hill tops, mossland, former tips which have become revegetated, spoil heaps from mining, quarries, agricultural land, lakes, wetlands, river valleys (from those with steeply wooded sides through those running through flat land and requiring to have their banks built up as levees to prevent flooding, to small brooks through suburban or agricultural land; all the rivers except the Douglas drain directly or indirectly into the Mersey, and many of their valleys provide excellent natural wildlife habitats, as there is usually some land, even if only a narrow strip, on either side of the river on which it has been impracticable to build), parkland, canal sides, railway and motorway embankments and cuttings, suburban and city gardens and green space, waste land within and around industrial areas, and innumerable combinations. Some of these sites may not be immediately obvious, and they are constantly changing, especially within the cities. It is quite amazing how quickly, when left alone for a while, a site which initially looks to be quite unsuitable because of being almost completely covered by tarmac or concrete, will be colonised by pioneering vegetation including butterfly hostplants and nectar sources, especially Buddleias. Often indeed islands of habitat amidst industrial areas are richer than much of the open countryside. The butterflies' powers of searching out and locating small "islands" of habitat amidst heavily built-up areas should not be underestimated; even very small habitats, tiny scraps of revegetating waste, have often proved to be worth searching. Many of the railway lines abandoned in the 1960s turned for a time into linear strips of quite good habitat, many of them however later became too shaded as natural succession continued and a dense growth of saplings developed; others were turned into cycle ways, and one (between Worsley and Leigh) even into a "guided busway": both undoubtedly useful for travel, but not as good for wildlife because of constant disturbance. Other habitats developed from former railway goods yards, or abandoned gas works and power stations, often quite close to the city centres. In older-established but still active industrial areas, there are often scraps of ground between sites, or even quite often the edges of the less sophisticated car-parks, where a bit of wild vegetation manages to take root: Buddleias readily establish a hold in such locations, and if there are Nettles and Thistles close by, it is likely that the colourful Nymphalines will appear in season. With changes in fuel, and with waste-disposal having become so much more efficient, many former rubbish tips, and in the parts of the area coal mines, as well as other heavy industrial sites, have gone "back to nature", and in many cases have introduced a new geological element and associated flora and fauna quite different from the surrounding countryside. This is especially the case where limestone has been introduced, as has occurred by way of railway ballast, tips containing roadstone, hard standings around the foundations of demolished buildings, and the like. The Common Blue *Polyommatus icarus* is a

species which has benefited as a result. In some places habitats have developed from abandoned sports fields, or even (though rarely) golf courses, which have revegetated naturally for a few years before being reclaimed for building, an example of the latter (still intact at the end of period 3) being the large Acre Gate & William Wroe golf course in Flixton, SJ7494/7594. There are a number of locations where former school sites, with or without associated playing fields, have been left alone for a few years following demolition and replacement by a new school elsewhere, and again these have developed, without any assistance, into worthwhile habitats. When an area of previously mown grass such the above ceases to be mown, it initially develops into a cover of assorted medium-length grasses interspersed with a few vigorous flowering plants, such as Buttercups and Ragwort, and, whilst not as species-rich as some of the sites described in the above paragraphs, can provide a habitat for grassland Hesperiids and Satyrines.

Although the area of the 1974 entity of "Merseyside" is only half that of the 1974 entity of "Greater Manchester", and it comprises five metropolitan districts as against Greater Manchester's ten, it nevertheless also holds a fair range of habitat types. There are some important differences in these, Merseyside having some very significant biotope which Greater Manchester lacks, in the form of a coastline (in both the Lancashire and Cheshire parts), consisting largely of sand dunes, foremost among them being the Ainsdale national nature reserve, though there are further sandhills in the Wirral especially near West Kirby, and sandstone cliffs in the west Wirral. On the other hand there is little in the way of high ground (the only significant hill being Billinge Hill at 179 metres/587 feet, SD525014); therefore there is no high moorland, though there is some lower-altitude heathland (c. 65 metres/200 feet) in the Wirral, mostly around Thurstaston. Another notable difference from Greater Manchester is Merseyside's lack of river valleys and their associated biotopes: the Mersey, which separates the Lancashire portion including Liverpool from the Cheshire (Wirral) portion including Birkenhead, is at this point a tidal estuary and effectually sea rather than river and decidedly not a valley, the same being true of the Dee which borders the Wirral to the south-west. These estuaries, formed from iceways, have their associated biotopes of estuarine mud-flats and salt marshes, as also does the Ribble estuary north of Southport, which rather paradoxically just comes within Merseyside. Apart from these estuaries, the only stream in the Lancashire part of Merseyside bearing the title of "River" is the Alt, which rises in Huyton and flows in a circuitous course around the northern suburbs of Liverpool to reach the Irish Sea near Hightown. In the Wirral, there are the Dibbin (which some maps show as "Dibbinsdale Brook" and some as the "River Dibbin"), and the Birket and its tributary the Fender; these are small rivers which discharge into the Mersey estuary. As with Greater Manchester, there is much in the way of former industrial sites which have become wildlife havens – witness the transformation of towns such as St. Helens following the cessation of coal-mining and chemical industries such as copper smelting, the only major industry remaining in this town being glass production. Agricultural land is mainly in the south Wirral and around Knowsley, plus meadows in the Sefton district away from the coast, as around Maghull.

Parks, rural and urban, are numerous, in both Greater Manchester and Merseyside. In Greater Manchester, the largest municipal park is Heaton Park, with Wythenshawe Park running to a close second; both these are former estates around stately homes, which have become public. Dunham Park, also around a stately home, is a deer-park administered by the National Trust, and although it is just within Greater Manchester has far more of a feel of rural Cheshire about it. A different former estate round a stately home, in this case one built by wealthy industrialists, is Haigh Hall country park, near Wigan. Other significant public parks, most of which contain some worthwhile butterfly habitat, include two Philips Parks (one in east Manchester and one in Prestwich), Boggart Hole Clough, Platt Fields Park, Birchfields Park, Whitworth Park, Fog Lane Park and Alexandra Park in Manchester, Buile Hill Park and Peel Park in Salford. In Merseyside, the largest expanse of any sort of parkland is Knowsley Park, which again contains a stately home, Knowsley Hall, but is only open to the public for special events, conferences and weddings, or for visitors to the safari park; there is some accessible woodland close to the latter, but in most of the park visitors have to remain in their cars or the park minibuses so that recording of butterflies is virtually impossible. Another stately home, more accessible, is Speke Hall, in National Trust ownership; then there are country-parks including Croxteth, and Stadt Moers in Huyton, the former once again having developed from a large country estate around a stately home, whereas the latter in complete contrast developed from a former brick-works and rubbish tip; Halewood Triangle developed from a former railway junction. Some former collieries, such as Sutton Manor and Clock Face, both near St. Helens, have developed into country-parks. According to Wikipedia, “the purpose of a country park is to provide a place that has a natural, rural atmosphere for visitors who do not necessarily want to go out into the wider countryside. Visitors can enjoy a public open space with an informal atmosphere, as opposed to a formal park as might be found in an urban area. For this reason country parks are usually found close to or on the edge of built-up areas, and rarely in the wider countryside”. Significant municipal parks within Liverpool are Everton Park, Calderstones Park, Sefton Park, Princes Park, Newsham Park, Stanley Park and Walton Hall Park; the first of these in particular contains a fair assortment of biotopes ranging from sandstone outcrop to woodland, and also extensive planted wild-flower meadows, although from several visits in 2019 it was noted that the mowing scheme appeared perhaps a little too severe. (This park is of much more recent origin than the others, having been a densely-built housing estate until the early 1980s.) Further out from the city centre are such sites as Childwall Woods (this contains grassland as well as woodland), the Rimrose Valley country park, Otterspool Park, Woolton Woods and the Festival Gardens, a park developed from the site of the 1984 Liverpool garden festival.

Heaton Park, SD8203/8304, 8.10.2019: large former hall estate, some woodland and grassland

Boggart Hole Clough, SD8602, 2.6.2014: wooded brook valley, some rough grassland

Wythenshawe Park, SJ8089/8189, 24.4.2014: brook valley, much mature woodland, grassland

Platt Fields Park, SJ8594, 4.10.2019: wooded brook valley, artificial lake, some grassland

Birchfields Park, SJ8694, 4.10.2019: brook valley, woodland, recent rough grassland

Whitworth Park, SJ8495, 4.10.2019: mainly formal park with art gallery, some woodland

Fog Lane Park, SJ8591, 9.10.2019: some woodland and recently some rough grassland

Alexandra Park, SJ8394/8395, 9.10.2019: small ornamental lake, mature & more recent woodland

MAJOR MANCHESTER PARKS (OUTSIDE THE 6 X 5 KM ZONE)
all these parks contain some areas of suitable butterfly habitat

Stanley Park, SJ3593/3693, 21.10.2019: formal, ornamental lake, some woodland

Walton Hall Park, SJ3694/5, 21.10.2019: formal, lake, trees, shrubs; token wild-flower meadow

Otterspool Park, SJ3785/6, 16.11.2019: narrow mature woodland sloping down to estuary

Croxteth Country Park, SJ3993, 4093-5, 4194, 2.10.2019: former hall estate; woods/grassland

Childwall Woods, SJ4188, 2.11.2019: mature woodland, also some rough grassland

Calderstones Park, SJ4087, 2.11.2019: mainly formal, some mixed woodland

Woolton Wood & Camp Hill, SJ4285/6, 2.11.2019: woodland on slope above over-mown grassland

Festival Gardens, SJ3686, 16.11.2019: site of 1984 garden festival, now largely semi-natural

MAJOR LIVERPOOL PARKS (OUTSIDE THE 6 X 5 KM ZONE)
all these parks contain some areas of suitable butterfly habitat

Turning now to the vegetation, it is difficult to assess what the natural vegetation of much of Greater Manchester and Merseyside really is, either in the cities and towns, where many alien plants have been introduced or have become naturalised, or indeed in more rural parts where any forest has long since been cleared and agriculture dominates. In suburban and urban gardens, which take up a considerable proportion of the space, the vast majority of the flowering plants, trees and shrubs are non-indigenous. The same is still true of most formal parkland and public gardens; and although some local authority-controlled warden services have planted native trees and shrubs in and around the river valleys, sadly the majority of "amenity" landscaping around newly "re-developed" sites is still with exotic trees and shrubs, and further in such locations the grass around the trees tends to be mown like a lawn, which effectively precludes the development of any undergrowth; a wood without any understorey is unlikely to harbour many butterflies. Within urban areas, the nearest approach to natural vegetation, perhaps, is to be seen in those places where industry has moved out, or in locations where the terrain is not level enough to be either built on or farmed. Most of the former are short-lived; after several years as excellent wildlife oases many have been built over again, either with warehouses or other industry or huge blocks of flats; however although there are not as many now in Manchester as there were prior to the huge construction boom which was carried out during the first decade of the twenty-first century (period 2), there nevertheless are still some, and indeed new ones continue to appear. Abandoned industrial sites, left untouched for a few years, are colonised without any human assistance: they regularly develop a mixture of grasses, including *Holcus lanatus*, and wild flowers including Clovers *Trifolium* spp. and Trefoils (Bird's-foot *Lotus corniculatus*, Lesser *Trifolium dubium*), Sorrel *Rumex acetosa/acetosella*, Nettle *Urtica dioica* and Thistles (Creeping *Cirsium arvense* and Spear *C. vulgare*), which between them support fifteen of the butterfly species recorded in the area; crucifers which are pioneering plants on disturbed land support a further four species, and other flowers colonise which serve as nectar sources including Tufted Vetch *Vicia cracca* and Meadow Vetchling *Lathyrus pratensis* (hostplant of the Narrow-bordered Five-spot Burnet moth *Zygaena lonicerae*), Ragwort *Senecio jacobaea* (hostplant of the Cinnabar moth *Tyria jacobaeae*) and Knapweed *Centaurea nigra*. Depending on the fertility of the soil, Brambles *Rubus fruticosus* agg. will probably follow, then shrubs especially Birch *Betula* spp., Sallow *Salix caprea/cinerea* and sometimes Alder *Alnus glutinosa*; whilst not butterfly hostplants and tending to shade-out butterfly habitats these are indigenous and part of the natural succession system.

Some alien plants, introduced long ago sometimes under the impression that they would be welcome as garden flowers, have run wild and become an integral part of the flora, whether welcome or not. Perhaps any plant which colonises without deliberate human assistance could be regarded as "natural" vegetation; this would include the less than welcome Himalayan Balsam *Impatiens glandulifera* which has become established in most of the river valleys and indeed many other nutrient-rich sites, Japanese Knotweed *Fallopia japonica* and Giant Hogweed *Heracleum mantegazzianum* (all three introduced in 1839 as garden plants), as well as, for example, the Fig trees which have long occurred on the warm banks of the river Irwell close to the Salford/Manchester centre. Other non-indigenous colonising plants are much more welcome to butterfly recorders: these include Buddleia

Buddleja davidii, which in towns and cities has become very abundant on "waste" ground and is a highly significant nectar source, taking root readily in cracks in concrete surfaces and even between bricks in old walls, and producing a blaze of nectar-rich flowers from late June until, in a good year, September. The same used to be true of Michaelmas Daisy *Aster x salignus*, which used to colonise former tips in vast swathes but in latter years has become much scarcer. These plants are discussed more fully in the section *Adult Nutrition – Nectar and Other Sources*.

To look briefly at some examples of the regeneration and successional changes of former industrial sites in more detail: near to the city centre, at Pomona Docks, SJ8196/8296, close to where the cities of Manchester and Salford and the "metropolitan borough" of "Trafford", all meet, is perhaps the most noteworthy of all the inner-city sites, where, during the three decades here under consideration, on several occasions all the vegetation has been bulldozed down as though the site were about to be built over, but has then been left alone and regenerated; the disturbances have prevented succession to scrub and woodland and the grassland butterflies have survived. The site is of immense value botanically, entomologically and ornithologically, but Birch, Willow and also Sea Buckthorn *Hippophae rhamnoides* tend to dominate if not checked. It must regrettably be added here that in spite of very vigorous objections by wildlife groups, in the later years of period 3 some "developers" eventually managed to get their way; although much of the site still remained at the end of 2019 blocks of flats had encroached at both ends, and total destruction in the not distant future is all too probable. Another formerly superb site, which has been completely destroyed, was Barney's Tip, Great Horrocks: tipping had ceased in the 1980s and in period 1 the site supported a strong colony of *P. icarus*, an immense colony of *Z. lonicerae*, and numbers of grassland Hesperiids and Satyrines; the western section was built over early in period 3 and much of the remainder disturbed; for a few years the ground settled again and formed a welcome biotope for one of the sporadic appearances by the Clouded Yellow *Colias croceus* in 2006; it was also a noted botanical site with abundant Bee Orchids. In period 3, more buildings encroached on to the habitat, and the entire tip had gone by 2019.

In some places where good regenerating habitat has been destroyed and built over, it has been made a condition of granting planning permission that some alternative biotope should be provided, though interpretation of what constitutes a suitable alternative biotope may vary somewhat. A former site known as "Birley Fields" in Hulme, Manchester, once a good habitat for several butterfly species, was destroyed during period 3 by the building of an extension of the Manchester Metropolitan university. Most of what was for years regenerating green space following demolition is now either built over or turned into mown grass with borders of non-indigenous shrubs and flowering plants, and although some trees have been retained which are probably suitable for birds it is of no value to butterflies. A small "wetland" has been constructed, complete with a fair array of aquatic and stream-side vegetation, primarily for educational purposes to illustrate the principle of "sustainability" which the university claims to promote; nearby, close to a "community" orchard a very small piece of woodland has been retained, with an understorey including nettles and some cruciferous plants, and a little further away is another small pocket of woodland adjacent to a bank covered in tall herbs. Small

numbers of resilient butterfly species including the Small and Green-veined Whites *Pieris rapae* and *P. napi*, and the Speckled Wood *Pararge aegeria*, are still able to use these biotopes, but all the grassland species which used to occur on the "Fields", especially a once strong colony of the Common Blue *Polyommatus icarus*, have been extirpated and there is a world of difference between a "habitat" created by man and a biotope which evolved without any human assistance on a piece of land, such as a former demolition site, which has been left alone for a few years.

Just as not all built-up environment is necessarily bad for butterflies, "green" space on a map is not always good for them, and in some cases may be decidedly less suitable, and this applies in the open countryside as well as within cities: agricultural "improved" fields, which constitute a large proportion of the countryside, are not good habitats; they are green, but a butterfly desert. In towns and cities, cemeteries and formal parks, although they form large "green lungs", are poor habitats unless they contain areas where the grass and wild flowers are allowed to grow. Some of the allotments which are popular in suburban areas provide better habitats than gardens; the Brassica-feeding Pierids are the species which benefit most but other species also sometimes find a home in them.

Over the years, there have been attempts by well-meaning conservationists to replace damaged or lost habitat. In the former mosses to the west of Manchester, some former agricultural land has been restored to woodland: examples are Dainewell Woods in Carrington Moss and New Moss Wood in Cadishead Moss (a section of the huge complex including Chat Moss), and the far more ambitious attempt to restore a section of Chat Moss/Little Woolden Moss to wetland has already been mentioned in the Lancashire and Cheshire Geography section. In the early 1990s, an organisation entitled "Manchester Wildlife" attempted to move all the significant flora from a meadow about to be built over, near the airport, and re-plant it in nearby Painswick Park, on the edge of suburban Wythenshawe: whilst for a few years the attempt probably seemed partly successful there is nothing there now to indicate anything notable. The environmentally-conscious "green" movement of the 1970s and 1980s has quite definitely passed its peak, and in many minds "familiarity has bred contempt" for the often-repeated conservation message. Cutbacks in local authority expenditure on warden services and environmental education, along with the ever-increasing trend towards "market-testing" and privatisation, result in every available scrap of land being looked at with a calculation of how much profit it could generate if put to commercial use. There is also too much of a tendency to regard patches of naturally revegetated land as "eyesores" needing "tidying up", a reluctance to let Nature carry out the restoration and an obsession with artificially "restoring" disturbed ground by planting, often with totally inappropriate vegetation; land which escapes being built over risks being converted into monotonous mown grass or planted with non-native trees and shrubs, useless from a wildlife point of view. There has been, and indeed still is, some planting of wild-flower meadows, including near the city centres and along road verges, and in some urban and suburban parks. These usually look very beautiful in season, but unless they contain appropriate hostplants they do not form good habitats for many butterflies, and they need constant management to keep them in presentable condition. It also seems to have become a problem in recent years that sometimes authorities have been planting

tree whips unnecessarily and inappropriately, not only far too close together but frequently on land which would much better be left as grassland. Environmental education, with which the countryside warden services were of great assistance, seems to have become a concept of the past. Nothing like it seems to be on the "national curriculum" for schools; some schools do have token wildlife patches in their grounds, but many certainly do not, and there is a world of difference between such little scraps and the true "great outdoors".

The future of our butterflies depends a lot on public attitude, and on the strength of conservation-minded bodies against commercialism, and against general public apathy and abuse. The continuing trend towards private transport results in more and more schemes for building new roads and widening existing ones, and development of new industrial sites and shopping precincts, sometimes in what had appeared to be sacrosanct "green belt" locations. Also, all too often, conservation takes second place to recreation in the eyes of local authorities and the public. Far more of the general public regard areas of green space in and around residential districts as of more "use" as playing fields or golf courses, or even as plain expanses of closely-mown grass between blocks of flats, than as wildlife haunts. Open land around towns and cities, especially in the less affluent districts, is also subject to abuse such as rubbish-dumping, motor-cycle "scrambling" (and, formerly, shooting with air-rifles, though, thankfully, this last has mainly died out). Some control over these practices by countryside wardens has certainly been achieved; it is also accepted that they are not as harmful to butterflies as to the more easily disturbed wildlife such as birds. Regarding the dumping of rubbish, this is probably the reason why many derelict inner-city sites, in both Manchester and Liverpool, but noticeably more so in the latter, tend to be fenced off so that persons intent on dumping can not enter (or can only enter with extreme difficulty); unfortunately this also makes it impossible or very difficult for wildlife-recorders to enter the sites. Here, it may be appropriate to suggest that although dumped rubbish is unpleasant, it is far preferable for a site to have a bit of rubbish dumped on it and continue to exist in otherwise semi-natural condition than to be destroyed and built over. Yet another threat to habitats, a less obvious one and rather sad, lies in making them too obvious. Whilst some improvement of public footpaths and the creation of signposted walks are undoubtedly good, it can happen that widening and resurfacing of paths to make them more attractive to persons who would otherwise be unable or reluctant to use them may significantly reduce the width of available habitat, and is frequently accompanied by severe moving of the path-side vegetation, and trampling and cycle wheels have a further impact, made worse still when the path becomes wet. Wild sites away from any human disturbance are usually far richer than those under constant pressure from visitors; on the other hand it has to be accepted that it is sometimes only by encouraging such visitors – including cyclists, runners, pram-pushers, dog-walkers – that campaigners can make a case to save a site.

There have been minor changes to the boundaries since 1974, especially around Billinge and St. Helens where Merseyside and Greater Manchester meet, and also in the vicinities of Speke and Woodford. For the maps in this book, the 1974 boundaries have been used.

Amberswood Common (22 spp.), SD6003, 23.2.2019: former opencast coal mine

Wigan Flashes (22 spp.), SD5803, 23.2.2019: lakes from coal-mining subsidence

Gristlehurst Wood (25 spp.), SD8411, 28.2.2019: woodland in Roch valley

Prettywood (23 spp.), SD8310, 28.2.2019: former tip, river valley (Roch)

Seven Acres (23 spp.), SJ7309, 2.3.2019: country park in river valley (Bradshaw Brook)

Low Hall Park (22 spp.), SD6103, 4.3.2019: wetland/planted woodland; former coal mine

Bardsley (23 spp.), SD9202, 5.3.2019: former coal mine

Chadkirk (25 spp.), SJ9389/9489,9390/9490, 18.3.2019; country park/estate, meadow, woods

SOME GREATER MANCHESTER SITES WITH 20+ SPECIES RECORDED

Wilderswood (23 spp.), SD6412, 22.3.2019: woodland/grassland on hill

Dove Stone (22 spp.), SE0103, 26.3.2019: reservoir; moorland, woodland

Etherow Country Park (23 spp.), SJ9791, 27.3.2019: woodland/grassland by former mine & mill

Moston Brook (23 spp.), SD8901, 14.2.2014: small river valley

"Ash Hill", Flixton (24 spp.), SJ7393, 19.3.2019: former tip; habitat quality lessened by capping

Summit (21 spp.), SD9418, 21.3.2019: former quarry and brickworks

Alkrington Woods (25 spp.), SD8605, 16.6.2011: former hall estate

Birtle (Bircle) (23 spp.), SD8212, 3.9.2014: former quarry and surrounds

SOME GREATER MANCHESTER SITES WITH 20+ SPECIES RECORDED

Pretoria, SD6704/6804, 19.8.2015: woodland on former coal mine

Clifton tip, SD7901, 17.6.2014: species-rich grassland on former tip, active tip behind

Clifton Country Park, SD7704, 16.6.2012: lake from motorway construction, former colliery

Davyhulme Millennium reserve, SJ7496, 24.2.2014: formerly part of sewage works

Former school site, Derby Road, Salford, SJ8098, 16.6.2014

Nan Nook Wood, Wythenshawe Park, SJ8090, 3.6.2015: remnant of ancient woodland/moss

Park Wood, Wythenshawe, SJ8387, 29.4.2014: one of several remnant woods amidst housing

Disused Acregate/William Wroe golf course, SJ7594, 28.7.2017: potential, probably transient

OTHER GREATER MANCHESTER SITES WORTH TRYING FOR BUTTERFLIES

Dunham Park, SJ7386/7, 7486/7, 22.4.2011: deer park, many oaks, good *F. quercus* habitat

Haigh Hall gardens, SD5908/6008, 6.10.2015: autumn nectar; country park with woodland

Reserve by Timperley Brook, SJ7789, 16.7.2018: management has benefited horseradish and Pierids

Carrington Moss, SJ7491, 8.1.2019: former orchard on long-since-drained mossland

Little Woolden Moss, SJ6995, 16.10.2019: attempt to restore some of the peat bog as wetland

Painswick Park, SJ8186, 16.6.1991: attempt by Manchester Wildlife to transplant wild meadow

Highfield Country Park, SJ8893, 26.2.2014: former clay pit/brick works

Botany Bay Wood, SJ7297/8, 7398/9, 15.10.2019: largest woodland in Greater Manchester

SOME OTHER SITES OF INTEREST IN GREATER MANCHESTER

Philips Park (Prestwich), SD7903/4, 8004, 10.10.2019: hilly woodlands, steep brook valley

Fletcher Moss Park/Stenner Woods, SJ8489/8490, 4.8.2009: woodland & rough grassland nr.Mersey

Abney Hall Park, SJ8589/8689, 6.8.2009: former hall estate; grassland, woodland

Pennington Flash Country Park, SJ6398/9, 6498/9, 28.10.2019: lake and spoil heaps from mining

Buile Hill Park, SJ7999/8099, 29.10.2019: many trees in mown grass; some good woodland

Trafford Ecology Park, SJ7997, 29.10.2019: remnant lake/woodland amidst industry

Woodbank Park, SJ9190, 30.10.2019: former hall estate, woodlands mainly near river bank

Blackleach Country Park, SD7303/4, 7403/4, 31.10.2019: wood on former industry, reservoir

SOME OTHER SITES OF INTEREST IN GREATER MANCHESTER

Ainsdale nature reserve (26 spp.), SD2810/2910/ 2911, 27.7.2019: extensive dunes, woodland

Thurstaston Common (26 spp.), SJ2485, 30.3.2019: heather-covered sandstone hill, wood

Seaforth (24 spp.), SJ3197, 22.8.2018: nature reserve in docks, nearby dune & lake edge (Crosby)

Bidston Hill (25 spp.), SJ2989, 30.3.2019: heathland and woodland

New Ferry Butterfly Park (26 spp.), SJ3385, 1.6.2019: former railway sidings

Thurstaston/Caldy cliffs (24 spp.), SJ2383, 29.3.2019: coastal vegetation on slope

Wirral Way/Wirral Country Park (27 spp.), SJ2383/ 4. 2482/3, 2582, 29.3.2019: former railway line

Dibbinsdale (25 spp.), SJ3381/2, 3481/2, 14.12.2019: woodlands in and around brook valley

SOME MERSEYSIDE SITES WITH 20+ SPECIES RECORDED

Crosby Coastal Park, SJ3197, 22.8.2018: artificial marine lake, associated dunes and wetland

Lunt Meadows, SD3600/3601, 28.8.2018: planted woodland, grassland, brook valley

Mucky Mountains, SJ5794, 17.11.2018: mounds of vitriol waste from former soda works

Stockton Wood, Speke, SJ4282, 16.2.2019: woodland in hall estate

Garston Shore, SJ4082/4182, 16.2.2019: estuarine grassland

Royden Park, SJ2485/2486, 30.3.2019: country park north of and adjoining Thurstaston Common

Bidston Moss, SJ2990/2991, 27.8.2018: former tip on site of moss drained in 19th century

Knowsley Park, SJ4393/4, 4493-6, 4593-6, 4693-6, 23.7.2019: vast country/safari park, limited access

OTHER MERSEYSIDE SITES WORTH TRYING FOR BUTTERFLIES

Halewood Park Triangle, SJ4485, 2.11.2019: park developed from former railway sidings

Rice Lane City Farm, SJ3595, 21.10.2019: farm/ woodland developed from cemetery

"Wild trail" by Mizzy Lake, SJ4593, 23.7.2019: woodland in Knowsley Park

Stadt Moers Park, SJ4590/1, 4690/1, 16.11.2019: former brickworks/tip amidst industry, motorways

Rimrose Valley Country Park, SJ3298, 3398/9, 23.11.2019: reclaimed tip, grassland in brook valley

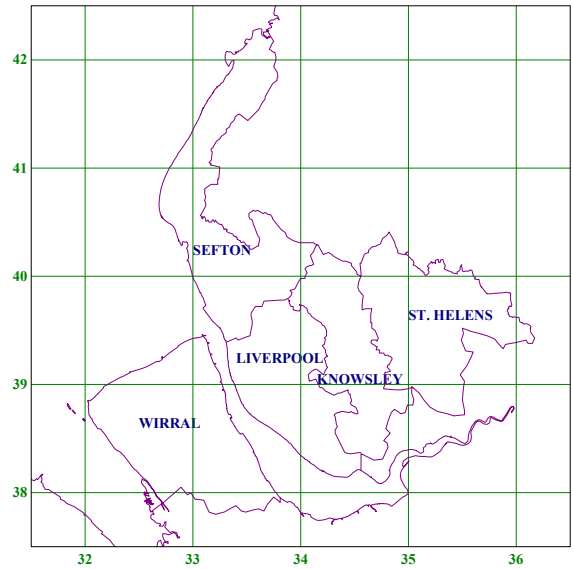
Hightown Dunes, SD2902, 23.11.2019: species-rich dune grassland

Clock Face Country Park, SJ5391, 30.11.2019: former coal mine

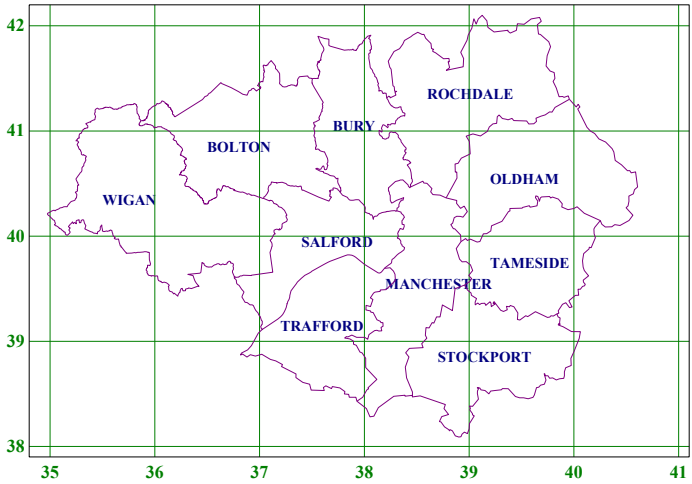
Red Rocks Marsh, SJ2087/8, 14.12.2019: coastal grassland, marsh, reedbeds

SOME OTHER SITES OF INTEREST IN MERSEYSIDE

MERSEYSIDE DISTRICTS



GREATER MANCHESTER DISTRICTS



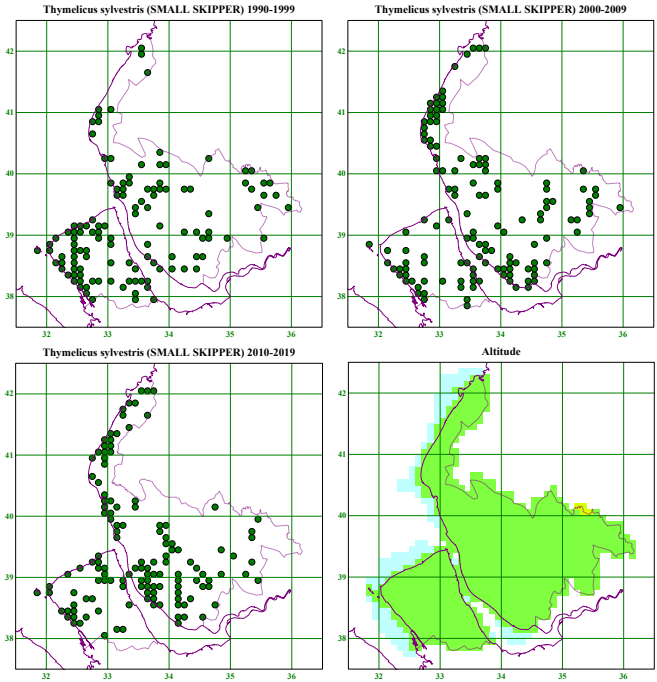
Thirty-two butterfly species have been recorded in the Manchester area since 1990. Twenty-four may be regarded as residents or annual migrants, though one of these, the Ringlet *Aphantopus hyperantus*, only colonised the area during period 2. Of the remaining eight, the Clouded Yellow *Colias croceus* has been recorded in just over half the years covered in this work, the Swallowtail *Papilio machaon,* the Long-tailed Blue *Lampides boeticus*, the Camberwell Beauty *Nymphalis antiopa* and the Milkweed *Danaus plexippus* are rare migrants which are never likely to become true elements of the Manchester fauna; the Dingy Skipper *Erynnis tages*, the Brown Argus *Aricia agestis* and the Silver-washed Fritillary *Argynnis paphia* are resident

British species but can only be regarded as occasional vagrants (or possibly unauthorised releases?) in the Manchester area; and the occasional occurrences of the Dark Green Fritillary *Argynnis aglaja* imply that it is also most likely a wanderer, although there is a slight possibility that it could be resident in the extreme east of the area, in the Pennine valleys.

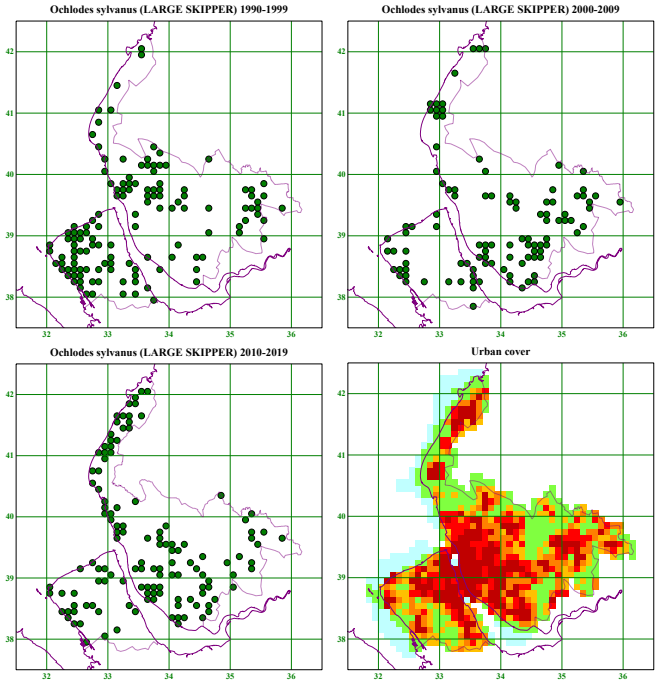
The total number of species recorded in Merseyside since 1990 is thirty, of which twenty-seven are residents or annual migrants. These comprise all the twenty-four such from Greater Manchester, plus the Dingy Skipper *Erynnis tages*, the Dark Green Fritillary *Argynnis aglaja* and the Grayling *Hipparchia semele*. The status of the Clouded Yellow *Colias croceus* and the Camberwell Beauty *Nymphalis antiopa* is the same as in Greater Manchester; the Silver-studded Blue *Plebejus argus* occurred on one site in the Wirral during period 1 and part of period 2 as the result of an introduction but died out.

The changes in distributions which show most clearly from the maps are the Satyrines: the increase in *P. aegeria, P. tithonus* and *A. hyperantus* and the decrease in *L. megera.* Some species appear to show a decrease from period 1 to period 2 and then an increase in period 3 (the Large Skipper *Ochlodes sylvanus* is a case in point), but it needs to be remembered that in period 1 butterfly recording and mapping with computer-programmes was a novelty and many recorders were very keen, especially with the anticipation of the "Millennium Atlas" (Asher et al, 2001), and also during the latter years of that period B.T. Shaw, in anticipation of his forthcoming atlas of the butterflies of Cheshire (Shaw, 1998) personally made a supreme effort to ensure that the whole of (post-1974) "Cheshire" (plus the Wirral, and the VC59 parts of "Halton" and "Warrington") was covered but, the atlases once published, some recorders flagged off rather in period 2 and coverage was less thorough. In Lancashire, the incentive in period 1 was not as great and this shows on the maps; those species showing an almost continuous distribution throughout Cheshire in that period would have been similarly distributed throughout Lancashire but because of the less comprehensive recording coverage in the latter they appear to have been less numerous. In period 3, the public were stimulated into a new wave of enthusiasm by such ventures as the "big butterfly count", which boosted the record for the showy species most apparent in July and August in that period.

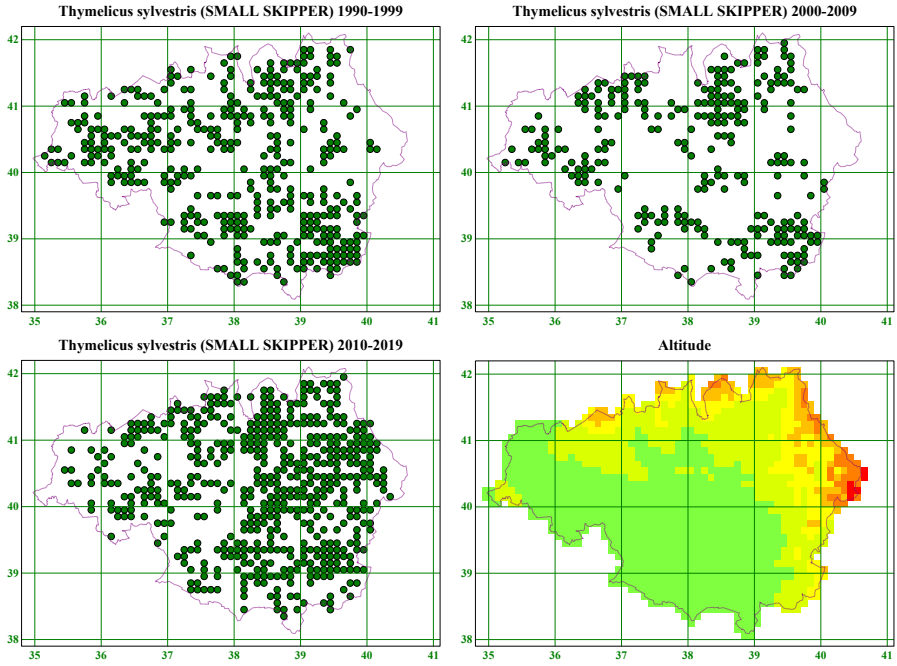
On the altitude maps, the green (lightest) represents land up to 99 metres in altitude, the light yellow is from 100 to 299 metres and then shades of orange/red for higher ground. The pale blue round the coastline of the Merseyside maps denotes 1 km grid squares nominally within the vice-county but below high-water mark, consisting of sand or mud. The urban cover maps were plotted on a five-point scale of colours in which the lightest (green) denotes that a 1 km square has no urban cover (or virtually none), yellow denotes that approximately a quarter of the square has urban cover, orange half, bright red three-quarters and dark red the whole square. (The distinctions between these colours may not be very obvious on maps this small, but they should give a fair idea of the extent of the urban cover.)



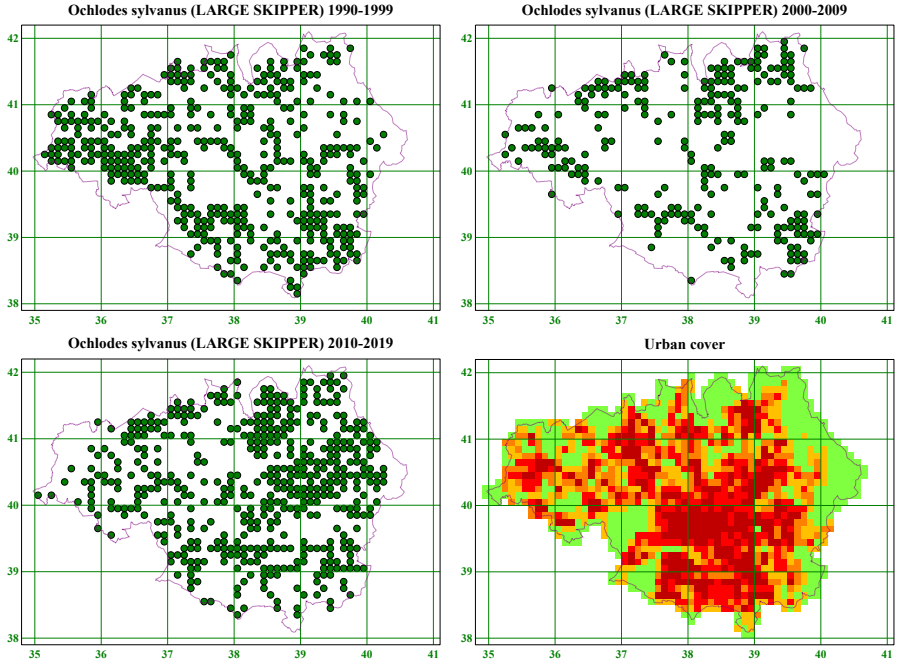
SMALL SKIPPER, *Thymelicus sylvestris*



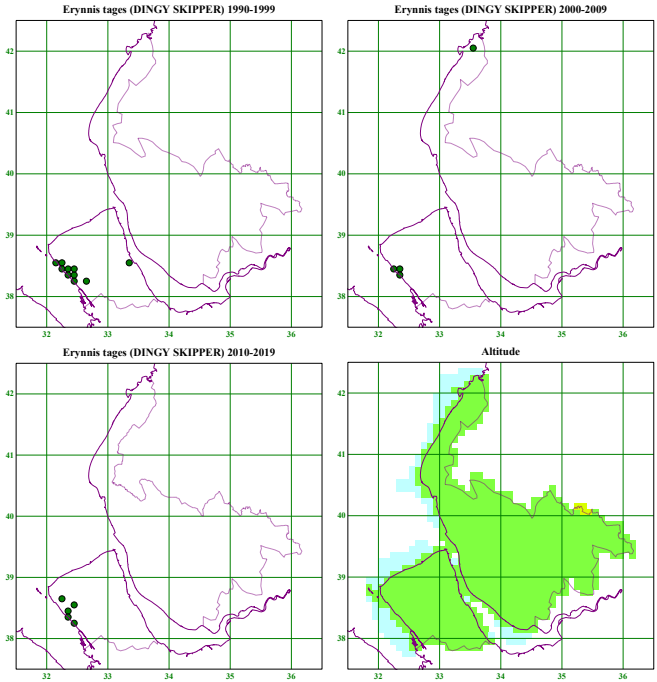
LARGE SKIPPER, *Ochlodes sylvanus*



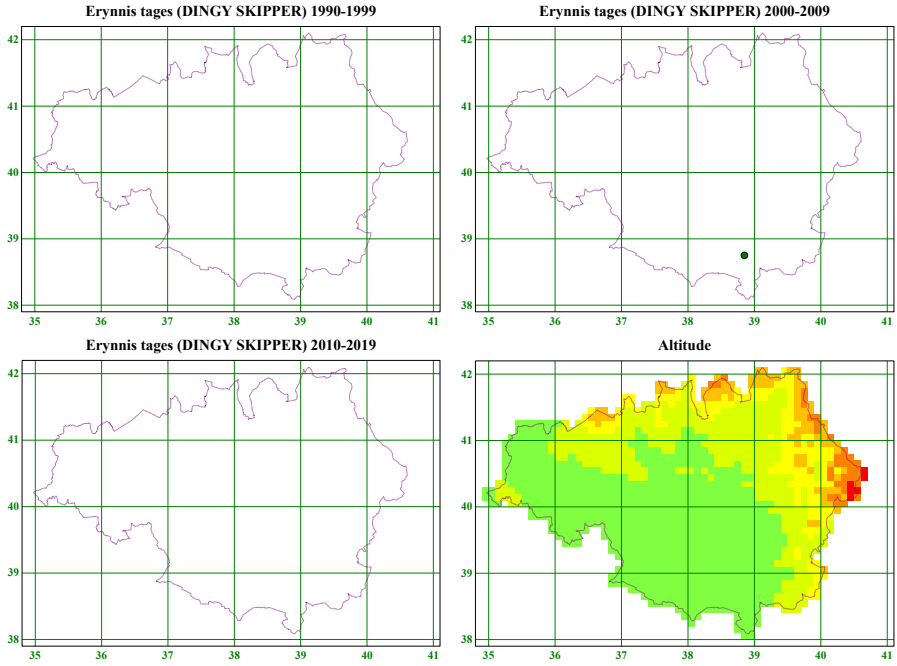
SMALL SKIPPER, *Thymelicus sylvestris*



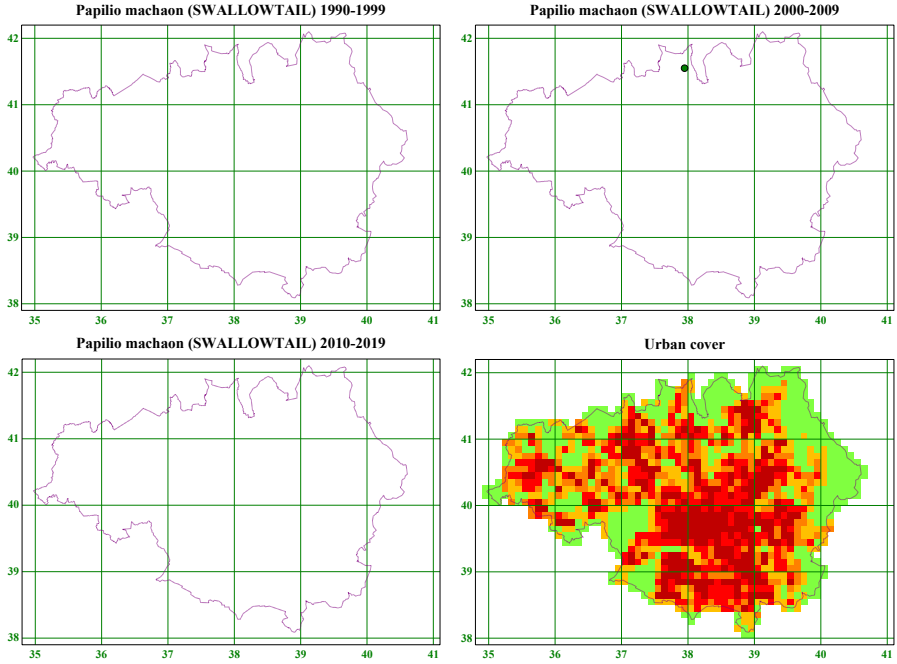
LARGE SKIPPER, *Ochlodes sylvanus*



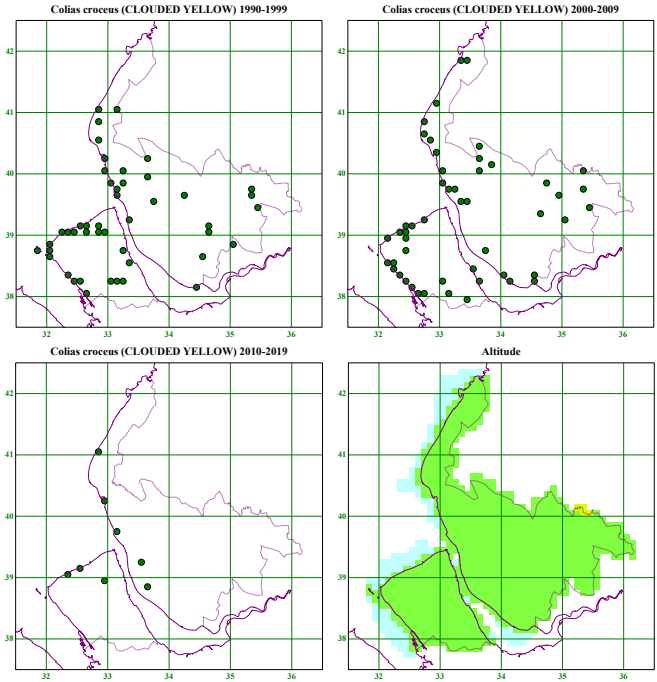
DINGY SKIPPER, *Erynnis tages*



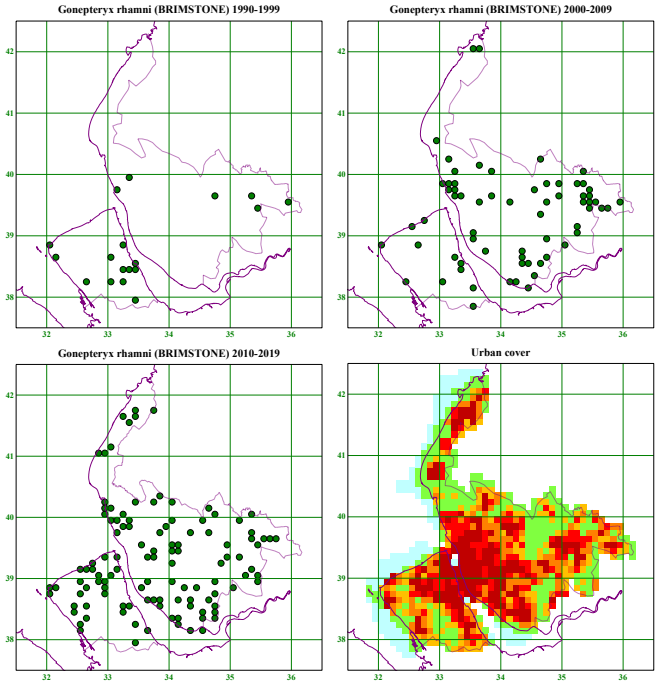
DINGY SKIPPER, *Erynnis tages*



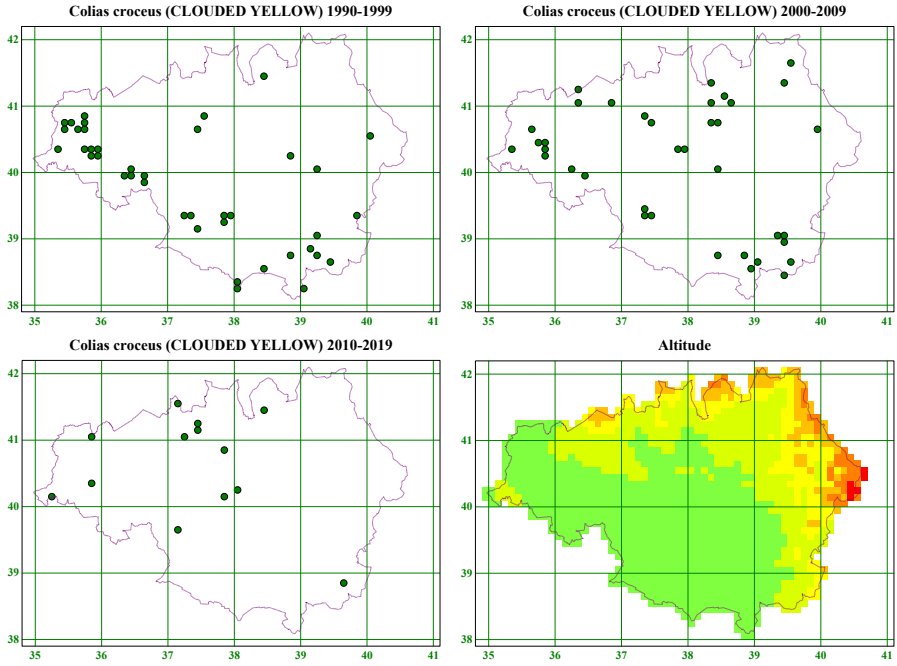
SWALLOWTAIL, *Papilio machaon*



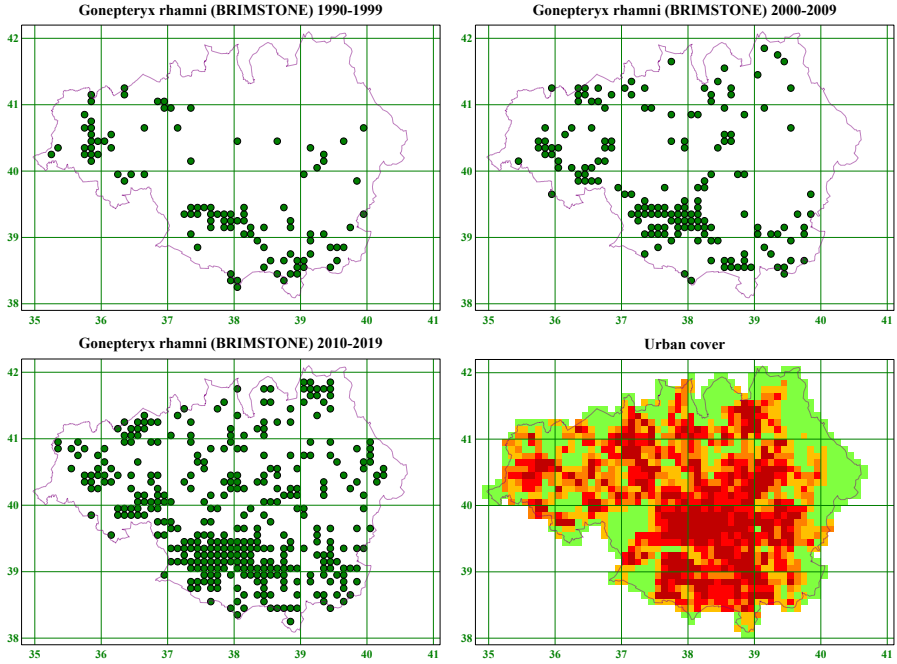
CLOUDED YELLOW, *Colias croceus*



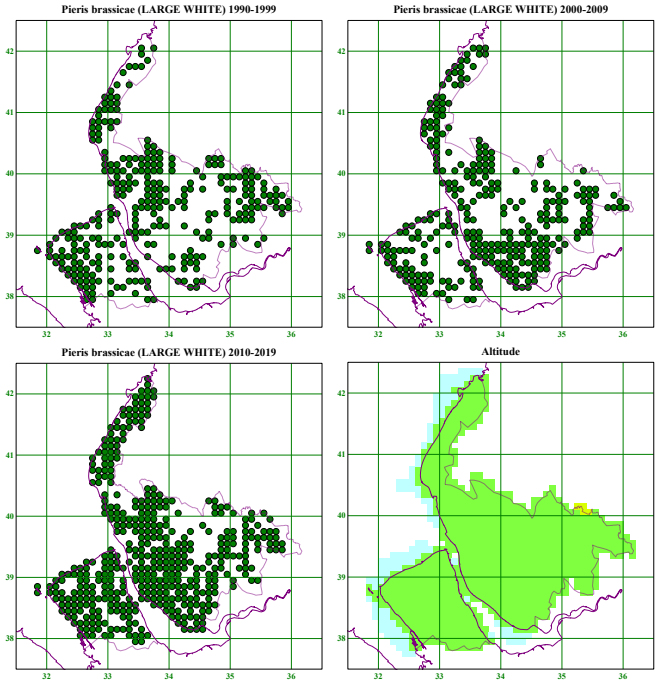
BRIMSTONE, *Gonepteryx rhamni*



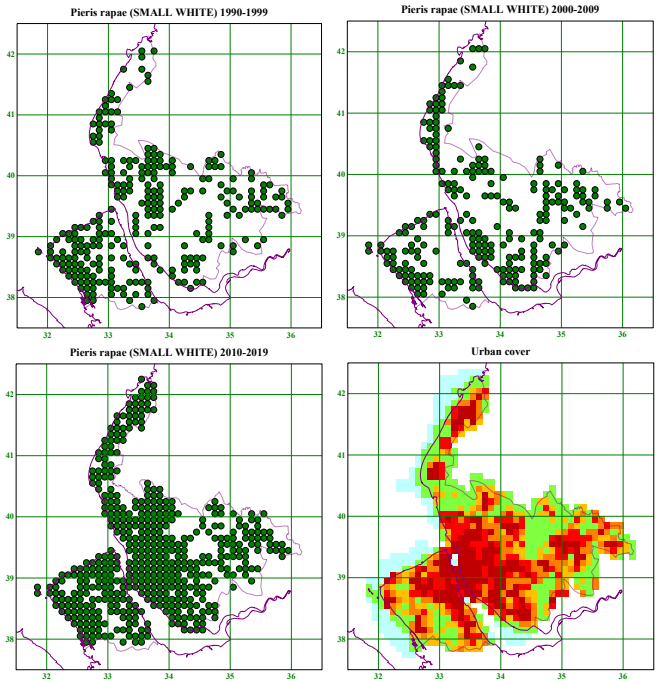
CLOUDED YELLOW, *Colias croceus*



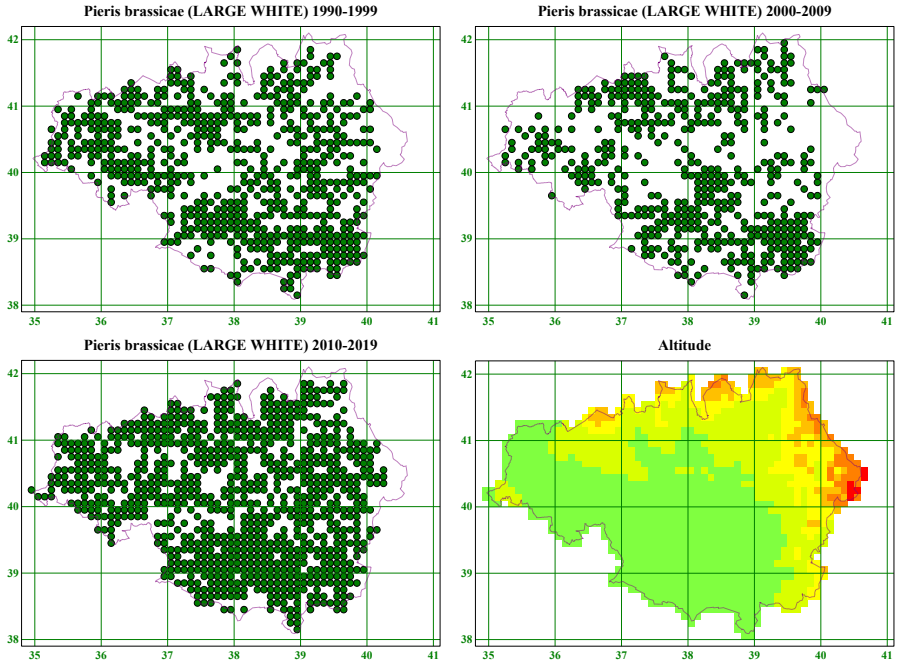
BRIMSTONE, *Gonepteryx rhamni*



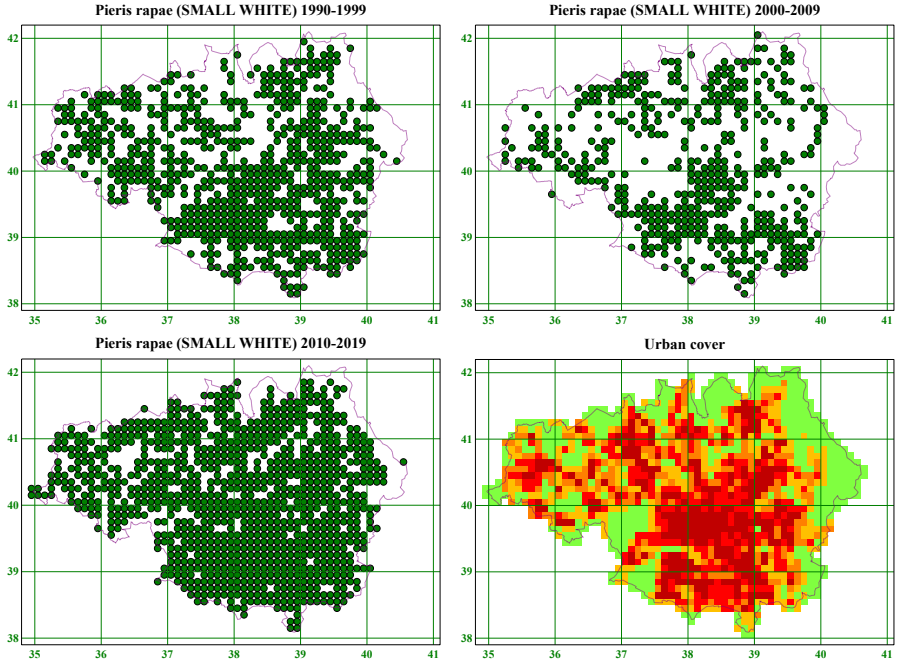
LARGE WHITE, *Pieris brassicae*



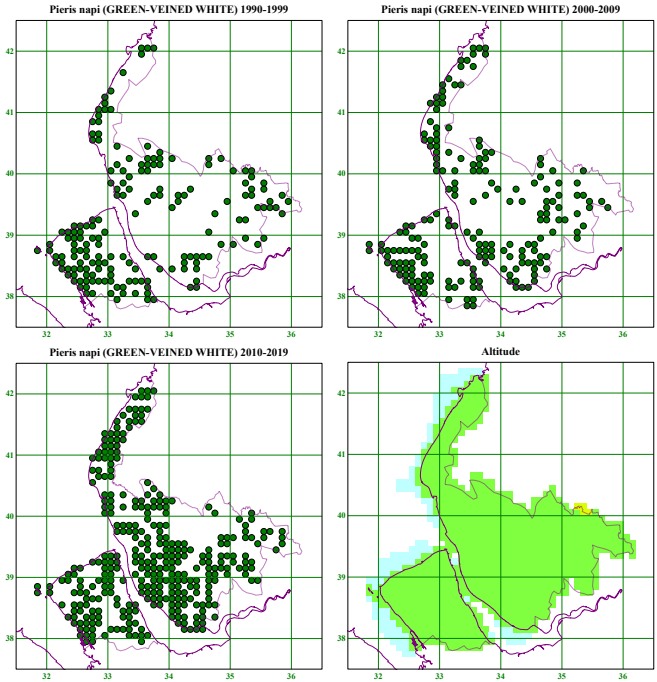
SMALL WHITE, *Pieris rapae*



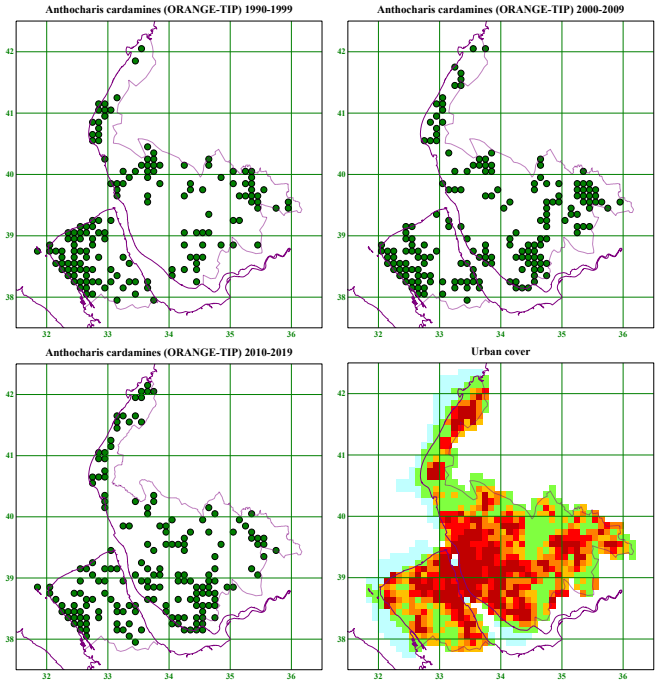
LARGE WHITE, *Pieris brassicae*



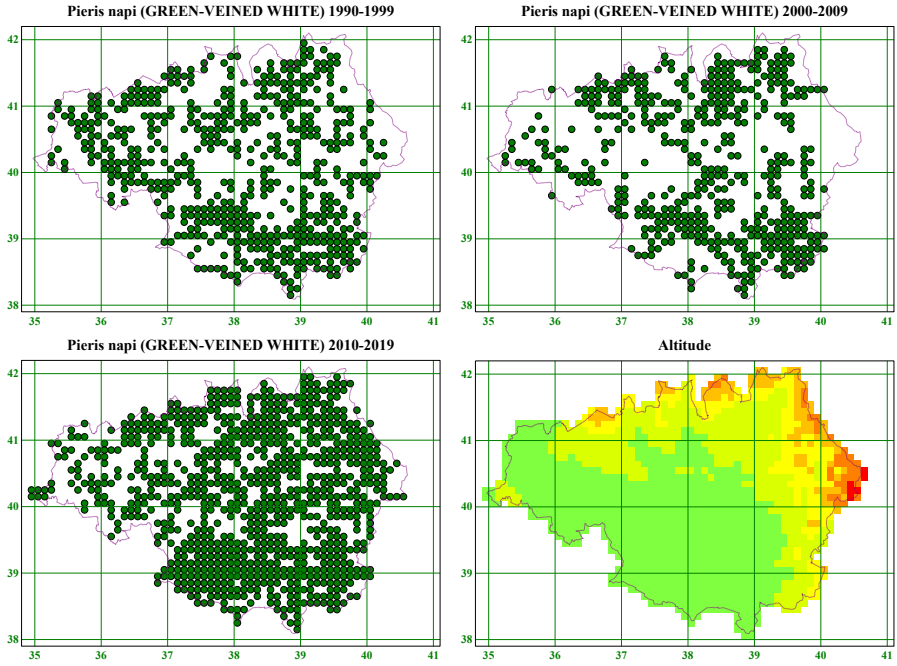
SMALL WHITE, *Pieris rapae*



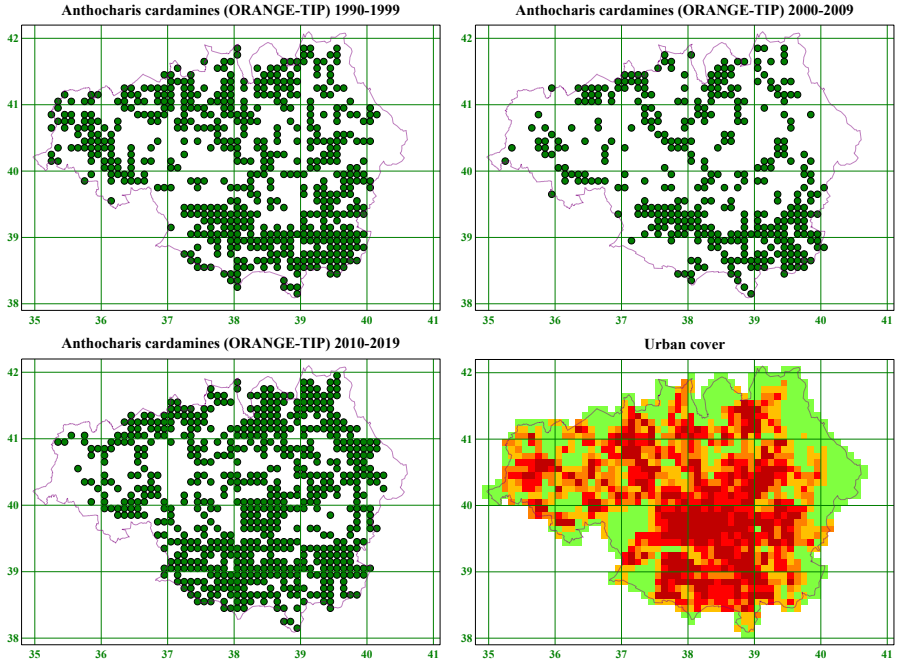
GREEN-VEINED WHITE, *Pieris napi*



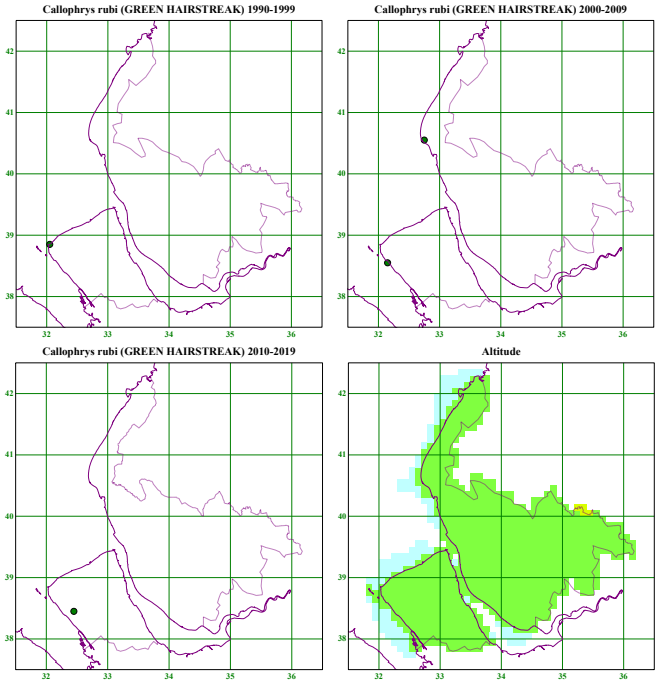
ORANGE-TIP, *Anthocharis cardamines*



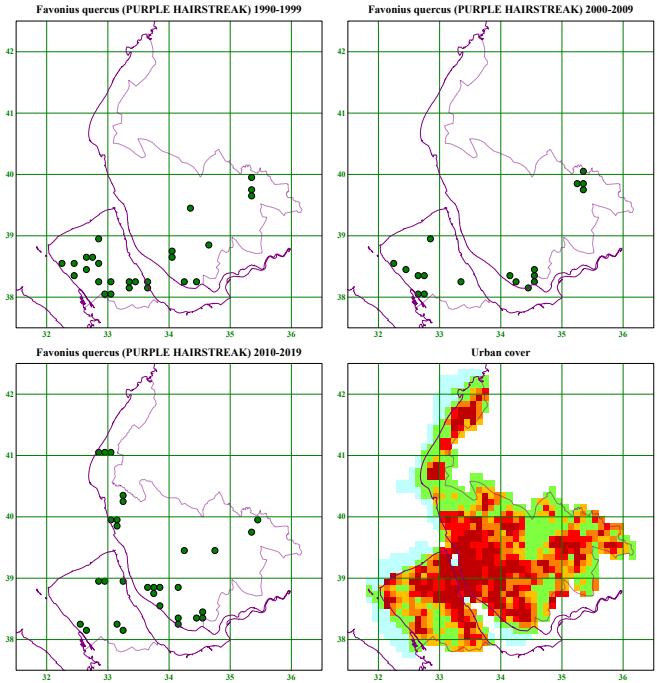
GREEN-VEINED WHITE, *Pieris napi*



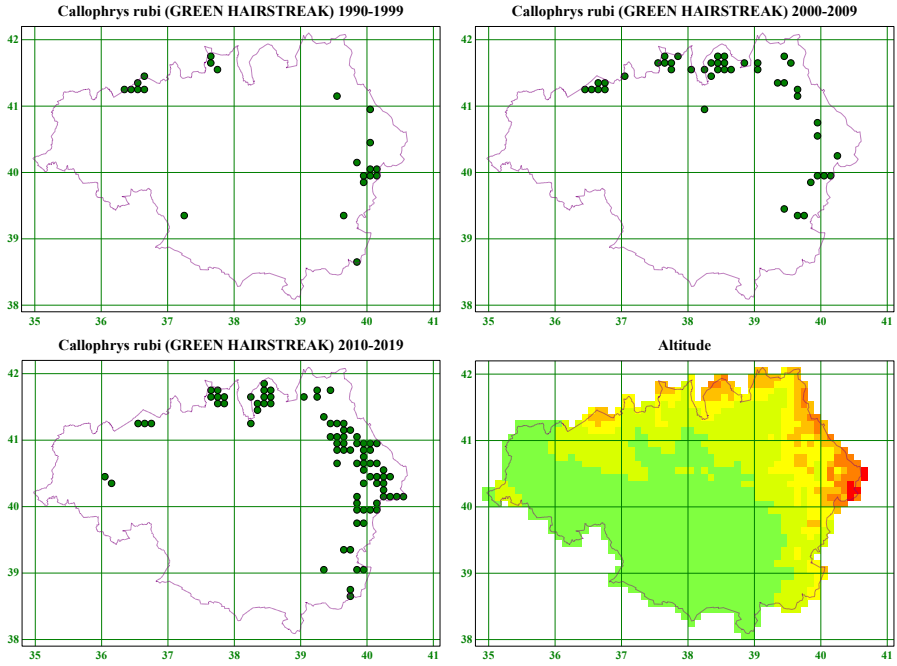
ORANGE-TIP, *Anthocharis cardamines*



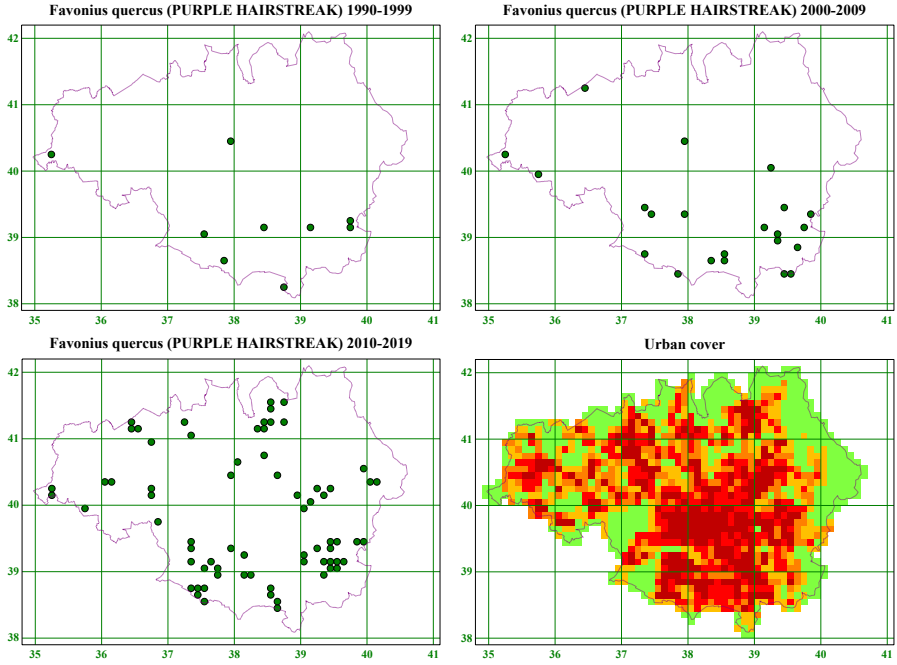
GREEN HAIRSTREAK, *Callophrys rubi*



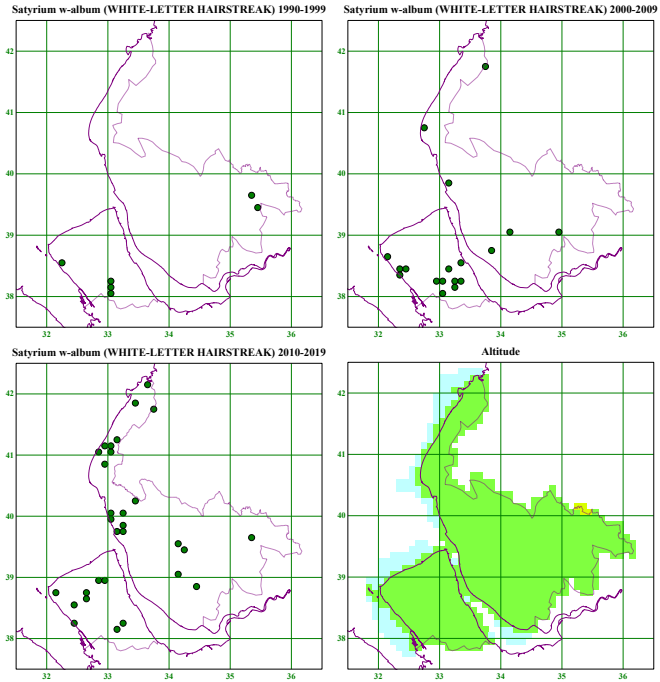
PURPLE HAIRSTREAK, *Favonius quercus*



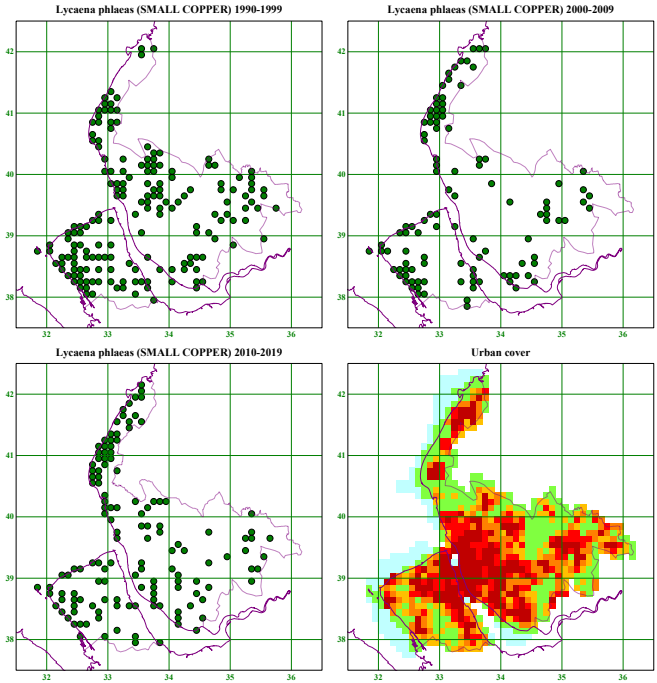
GREEN HAIRSTREAK, *Callophrys rubi*



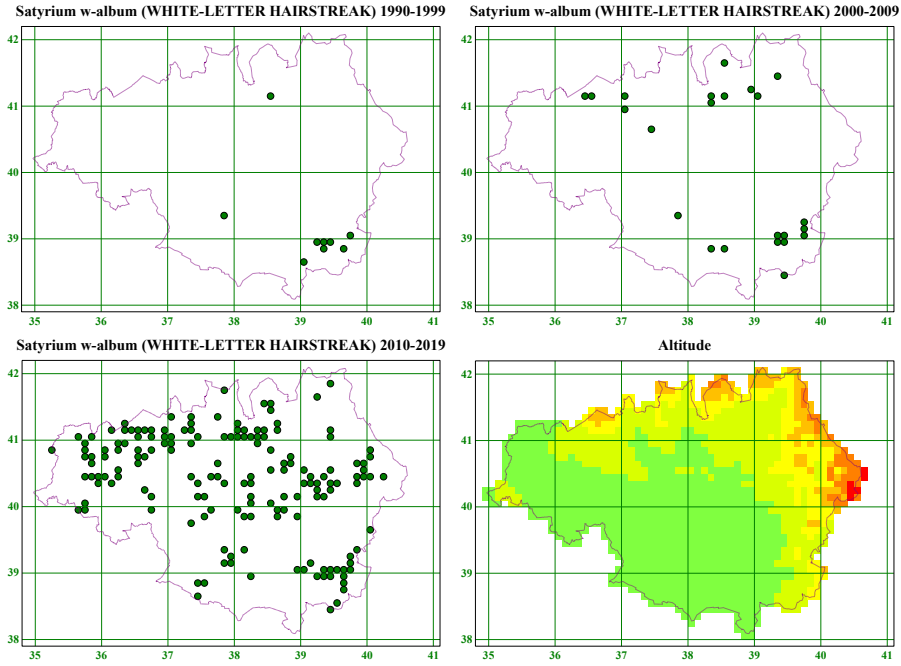
PURPLE HAIRSTREAK, *Favonius quercus*



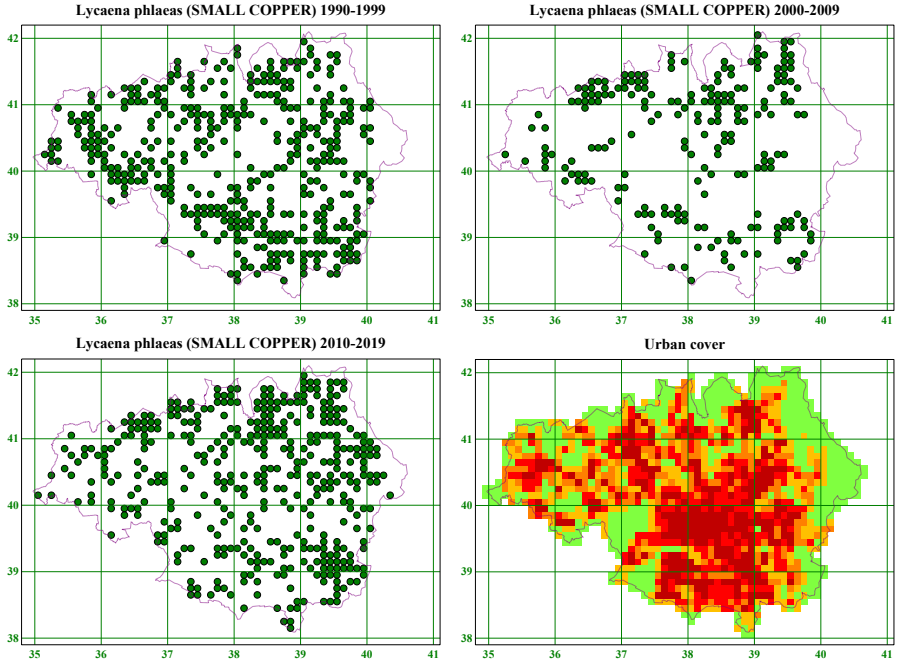
WHITE-LETTER HAIRSTREAK, *Satyrium w-album*



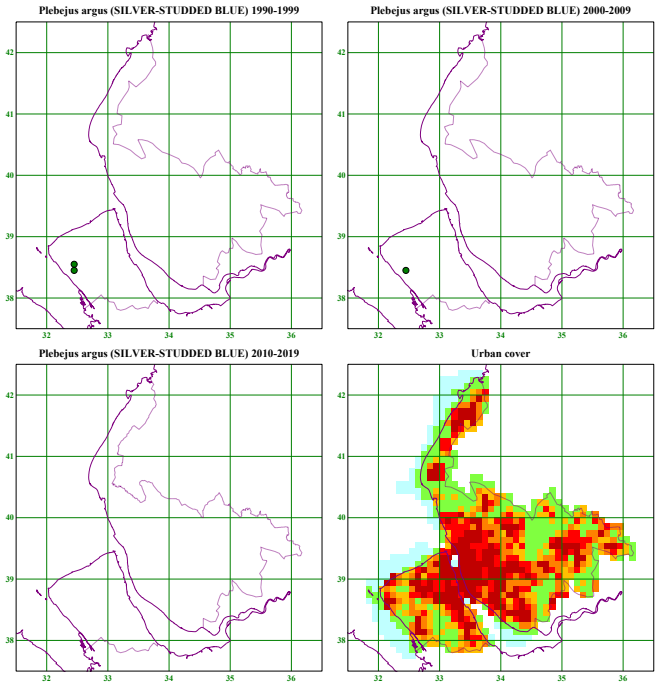
SMALL COPPER, *Lycaena phlaeas*



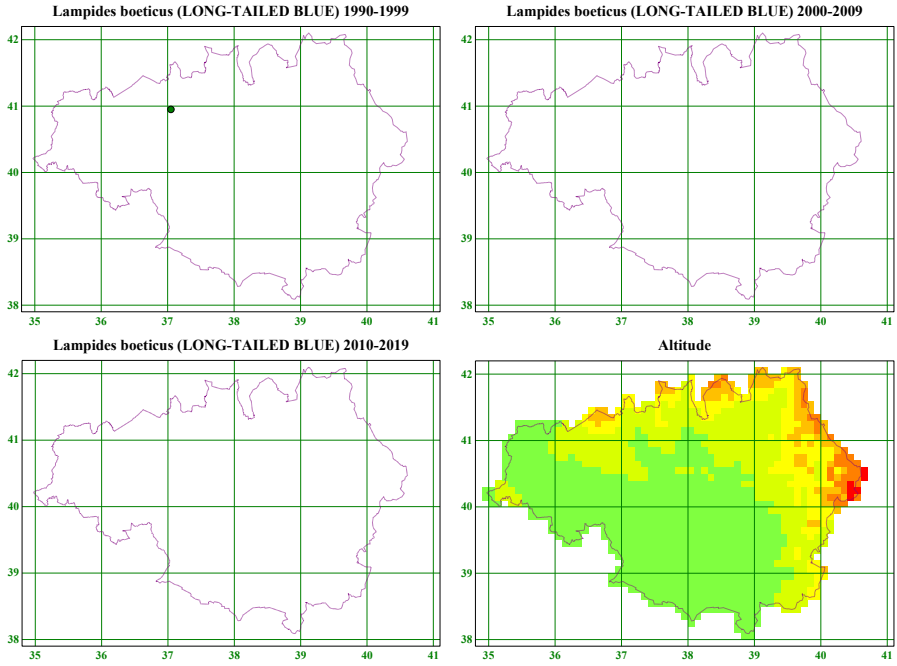
WHITE-LETTER HAIRSTREAK, *Satyrium w-album*



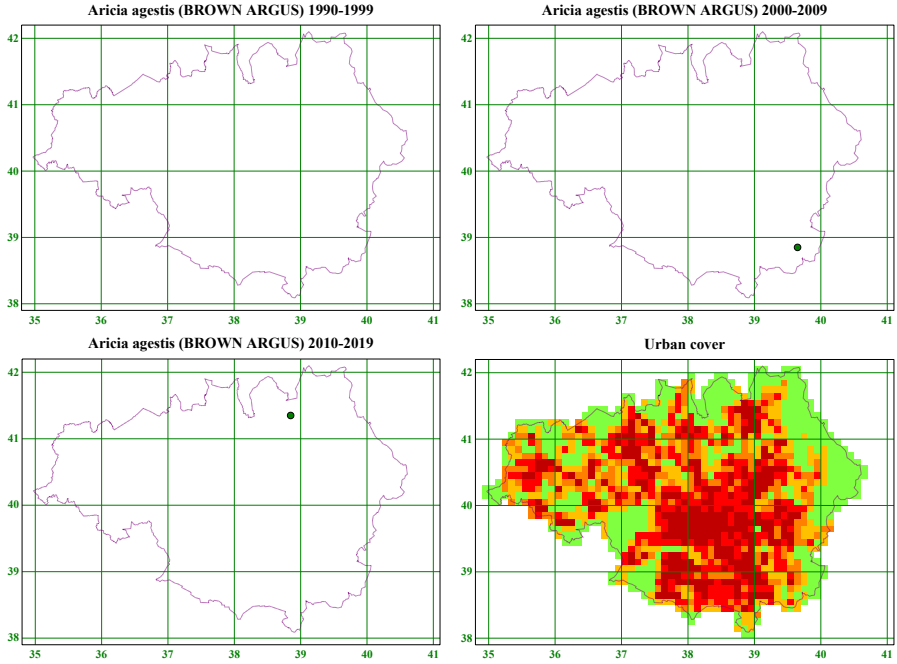
SMALL COPPER, *Lycaena phlaeas*



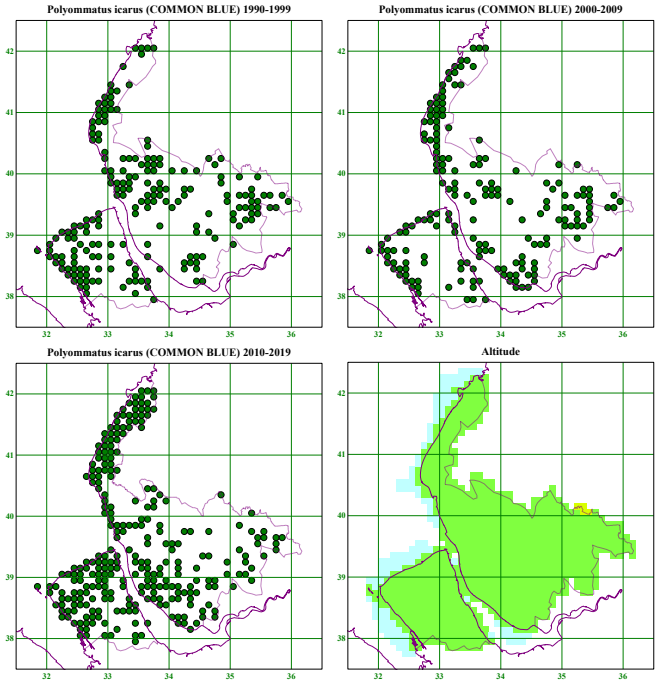
SILVER-STUDDED BLUE, *Plebejus argus*



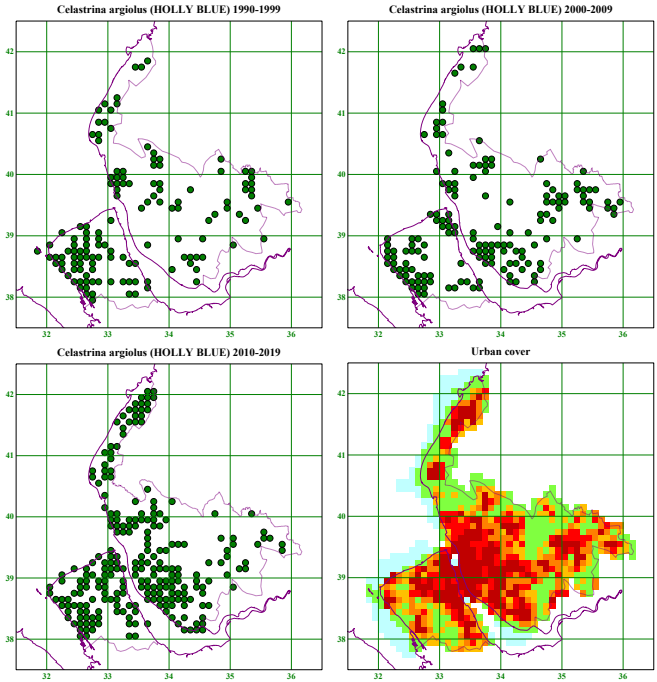
LONG-TAILED BLUE, *Lampides boeticus*



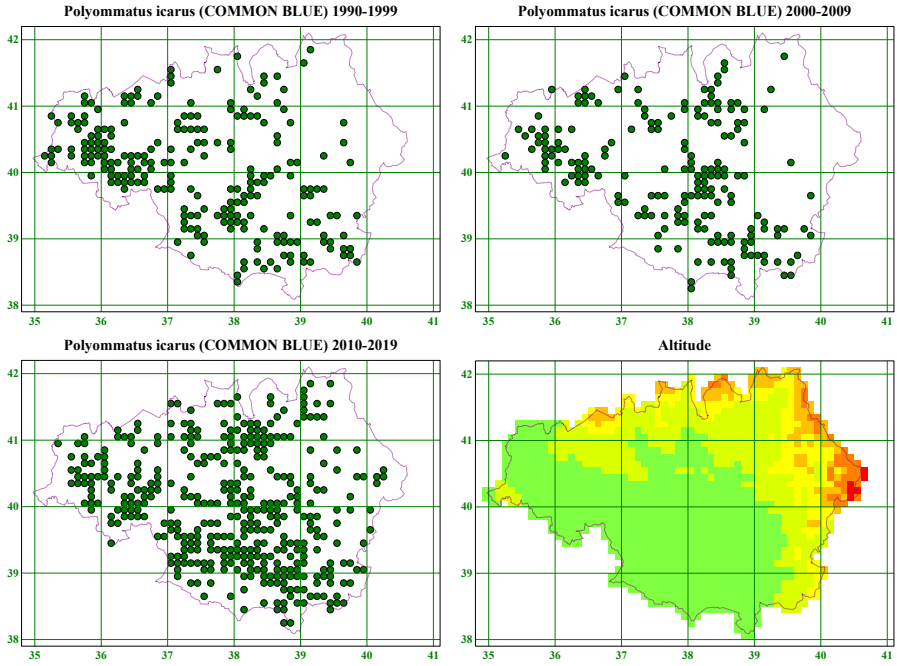
BROWN ARGUS, *Aricia agestis*



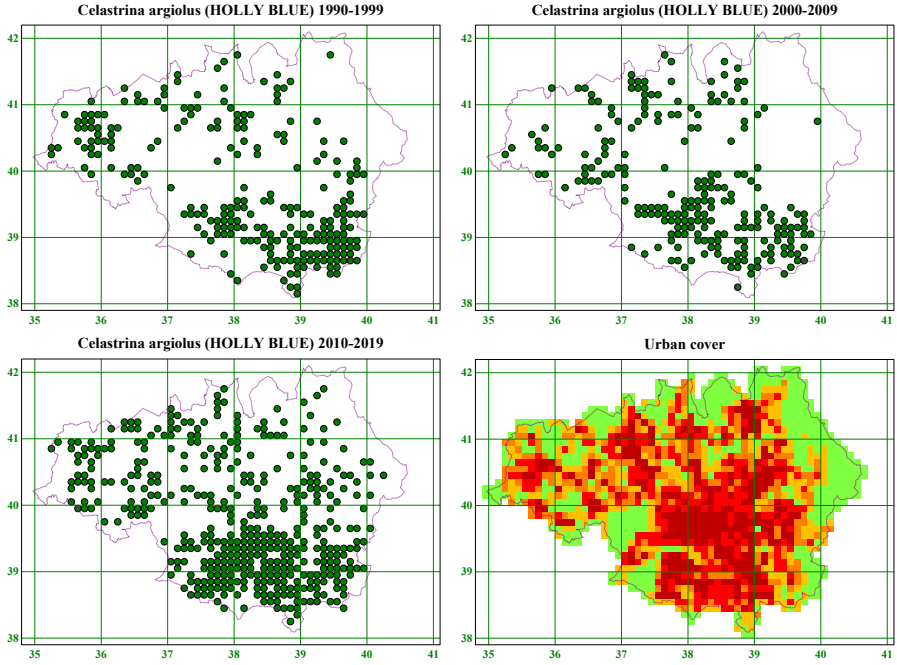
COMMON BLUE, *Polyommatus icarus*



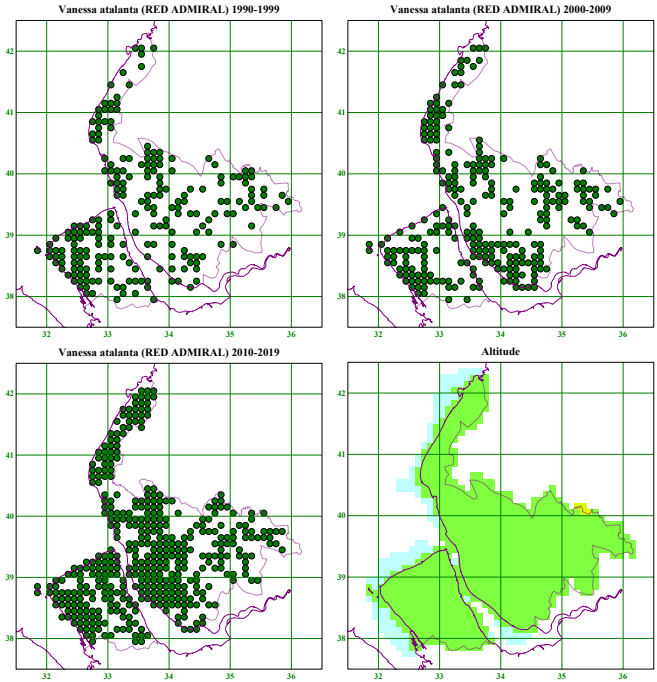
HOLLY BLUE, *Celastrina argiolus*



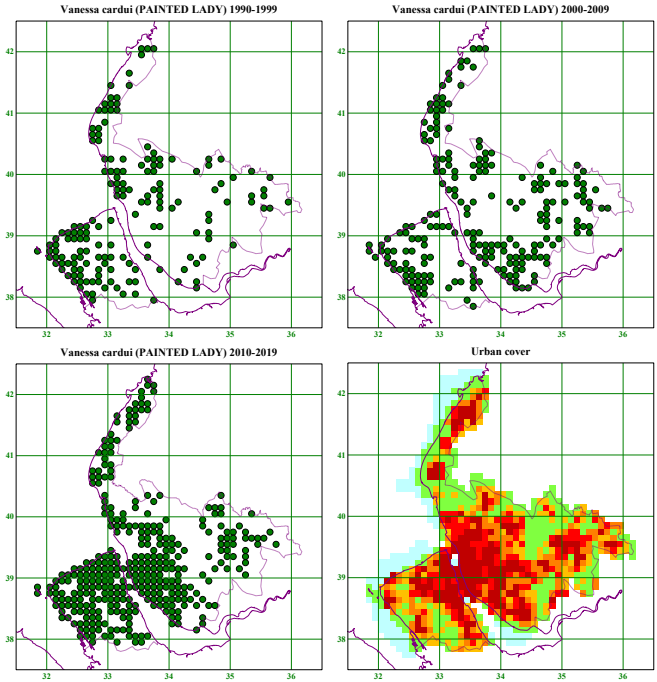
COMMON BLUE, *Polyommatus icarus*



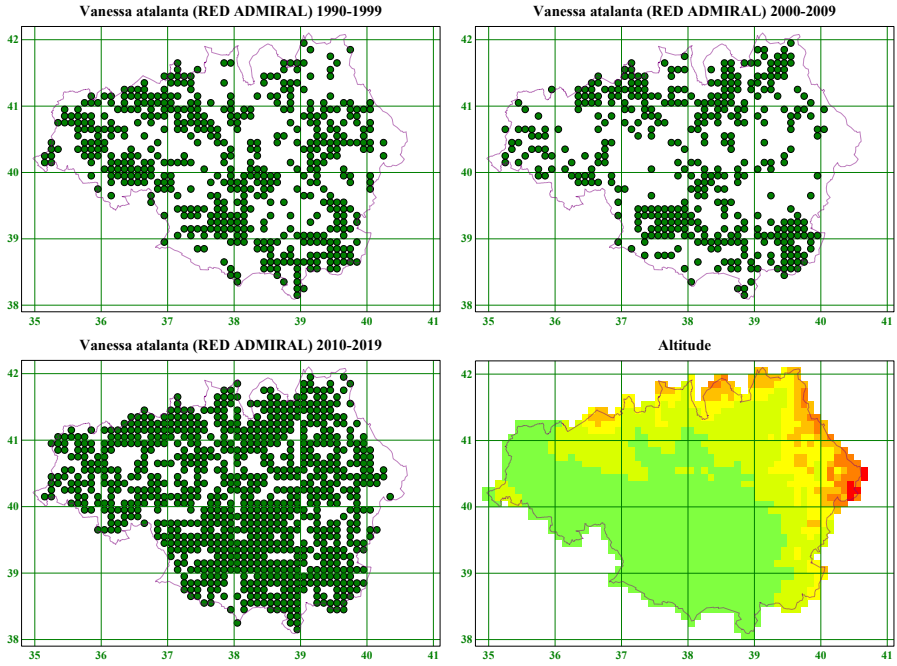
HOLLY BLUE, *Celastrina argiolus*



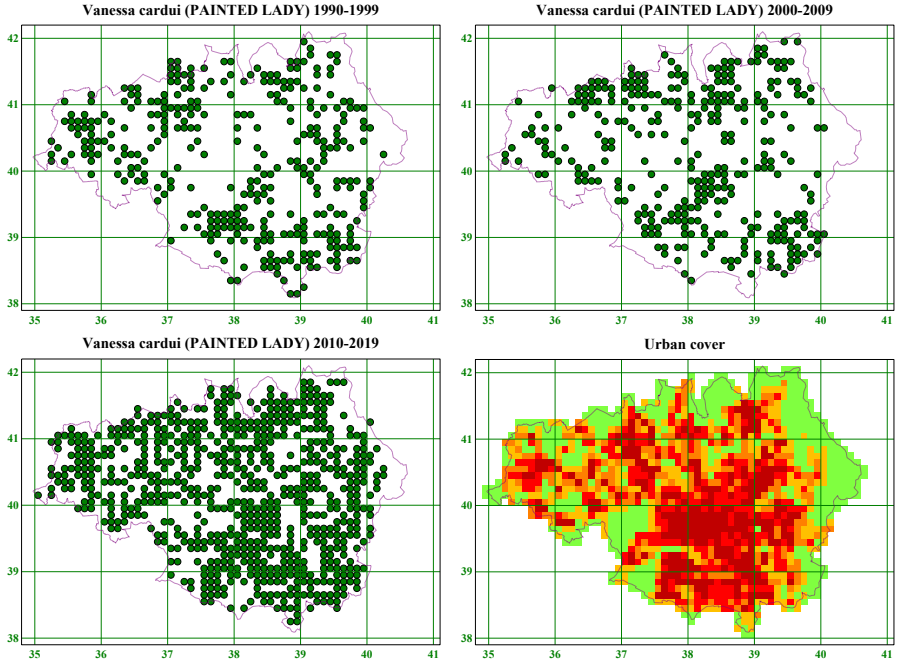
RED ADMIRAL, *Vanessa atalanta*



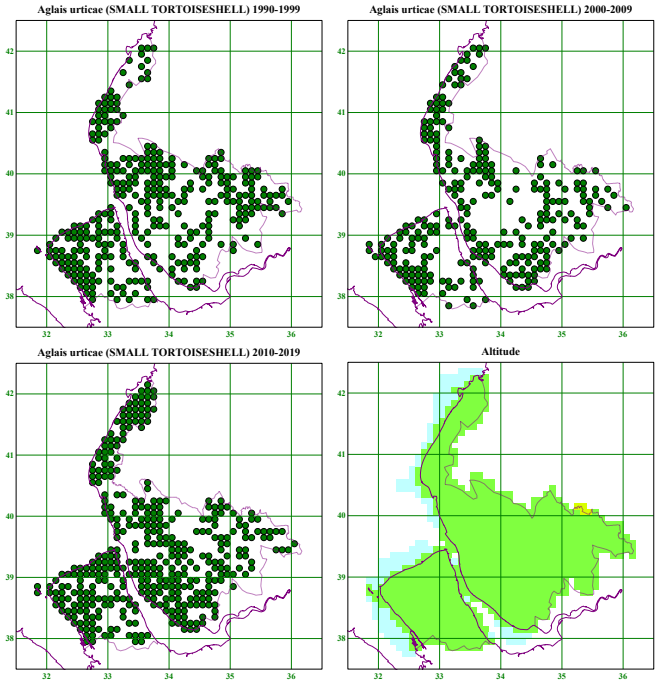
PAINTED LADY, *Vanessa cardui*



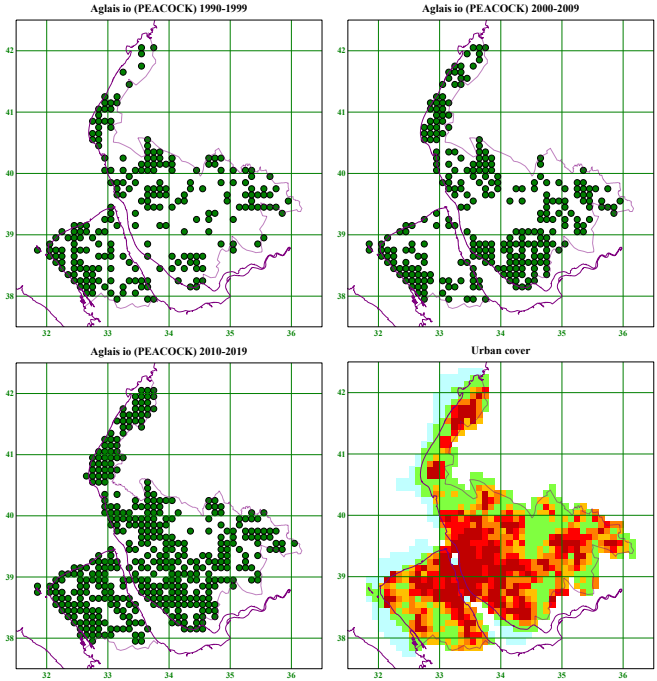
RED ADMIRAL, *Vanessa atalanta*



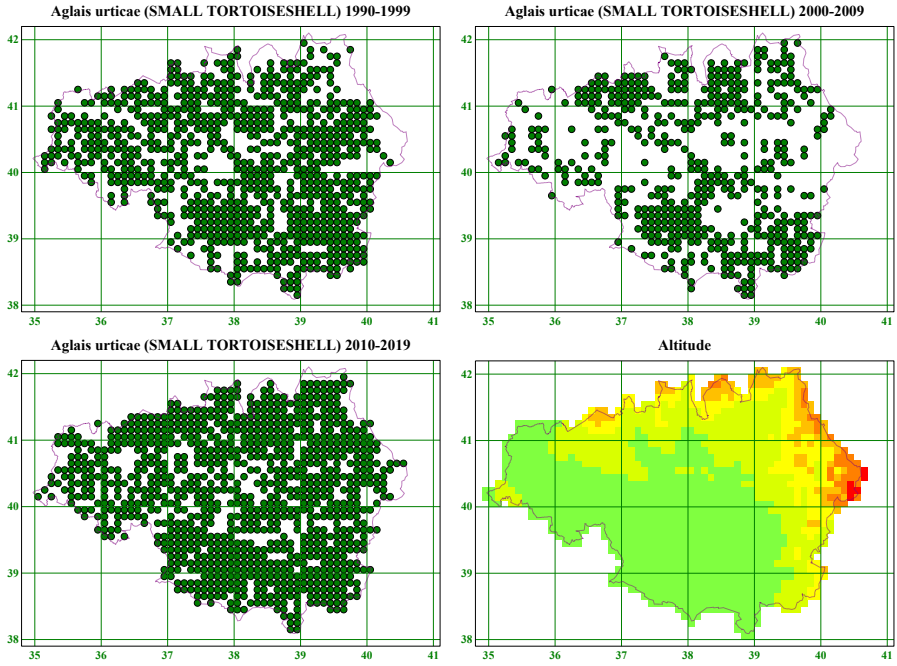
PAINTED LADY, *Vanessa cardui*



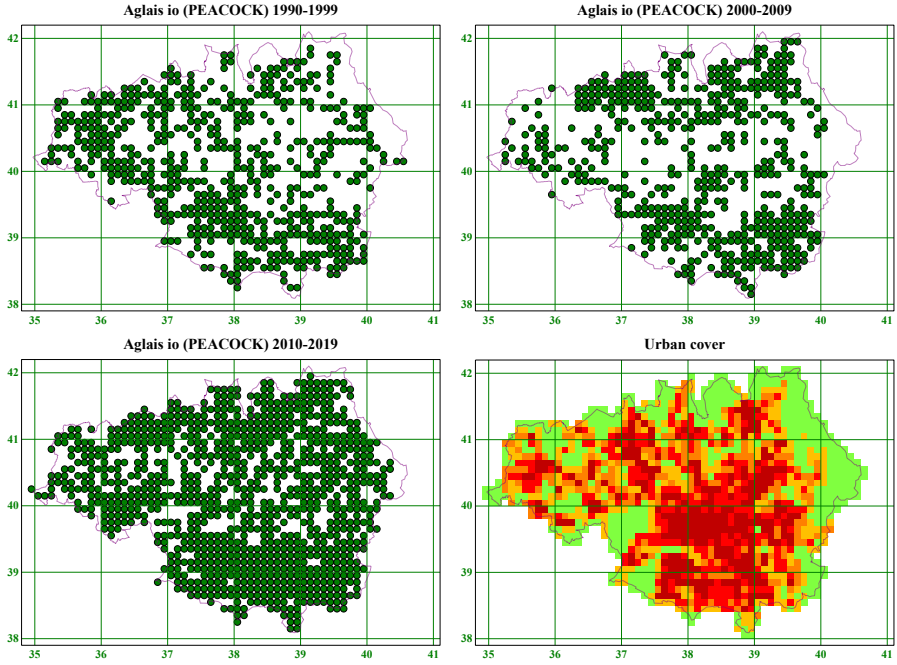
SMALL TORTOISESHELL, *Aglais urticae*



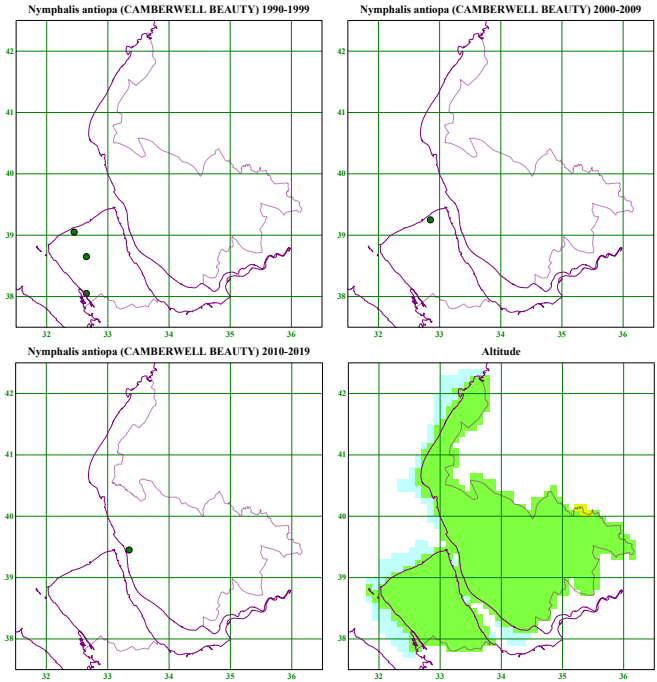
PEACOCK, *Aglais io*



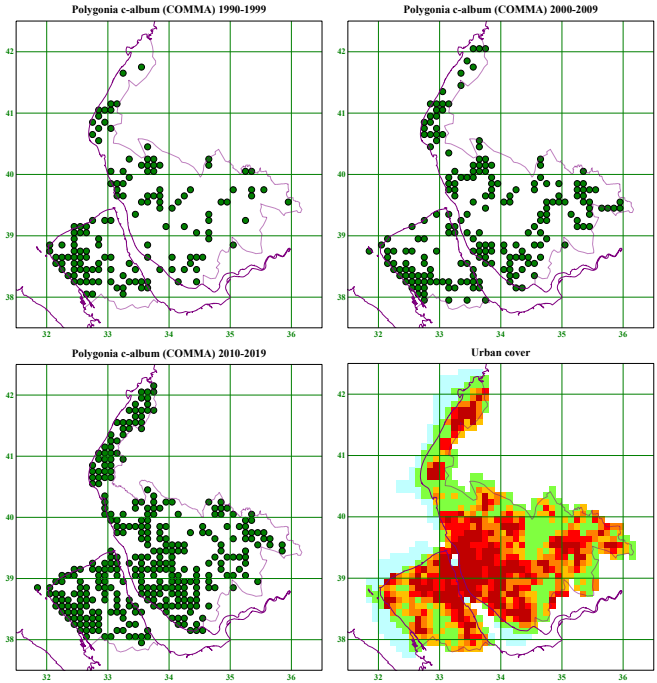
SMALL TORTOISESHELL, *Aglais urticae*



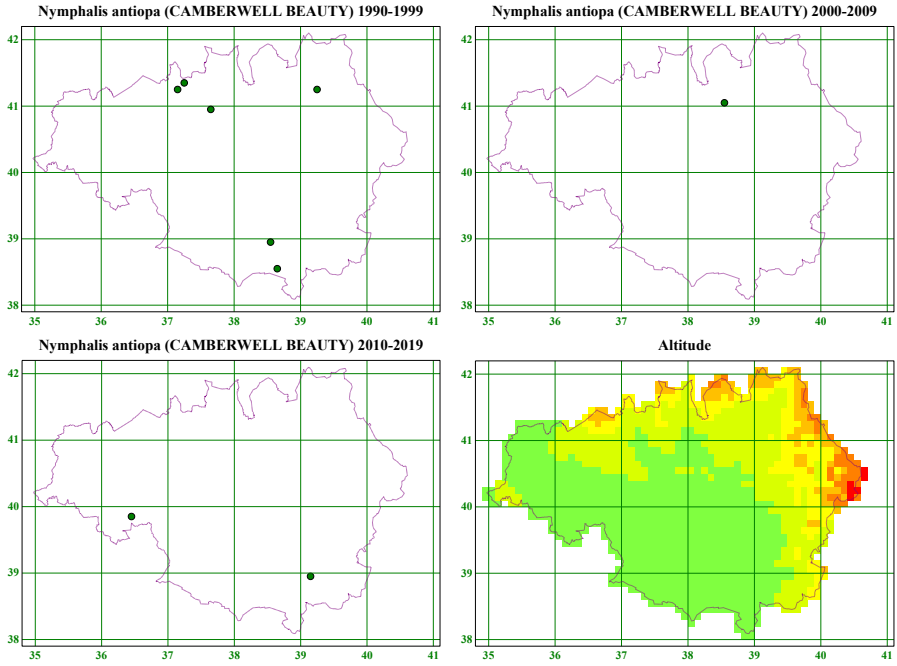
PEACOCK, *Aglais io*



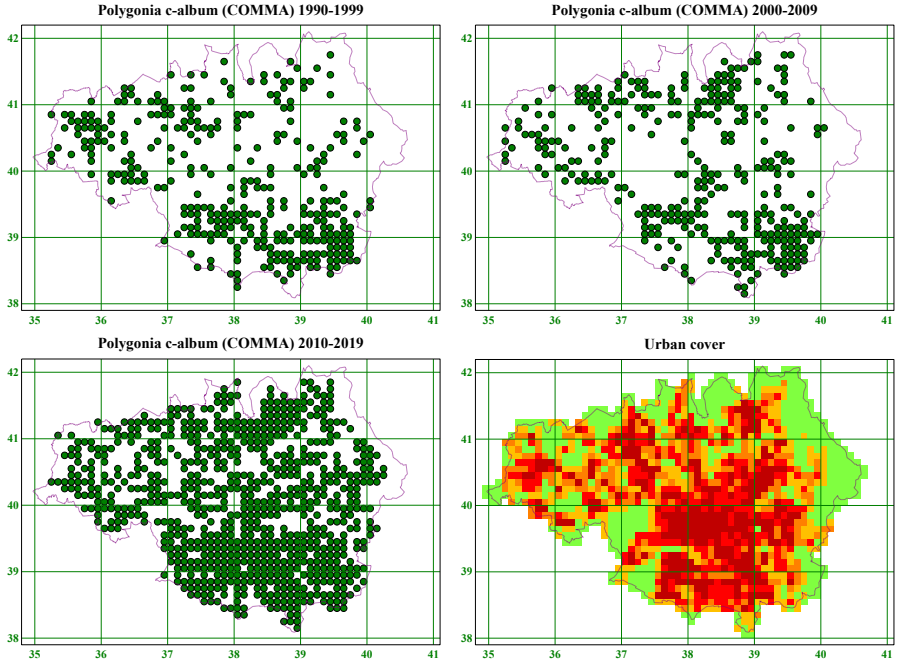
CAMBERWELL BEAUTY, *Nymphalis antiopa*



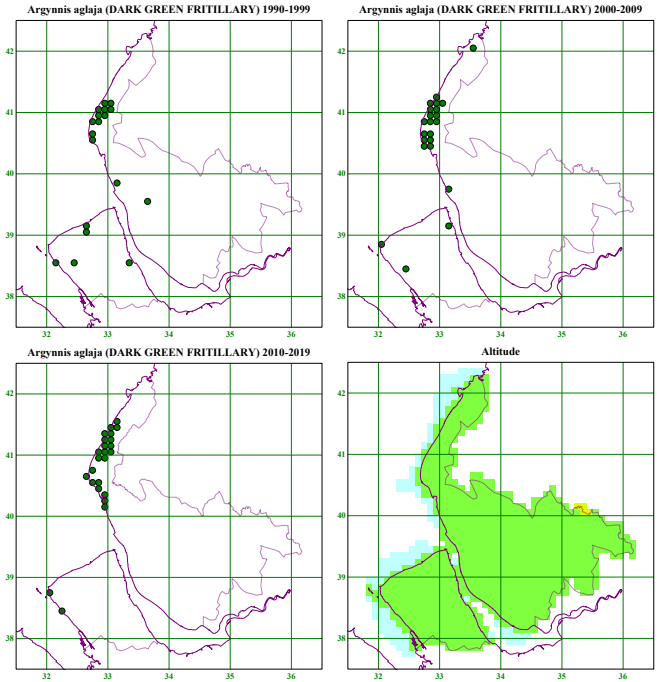
COMMA, *Polygonia c-album*



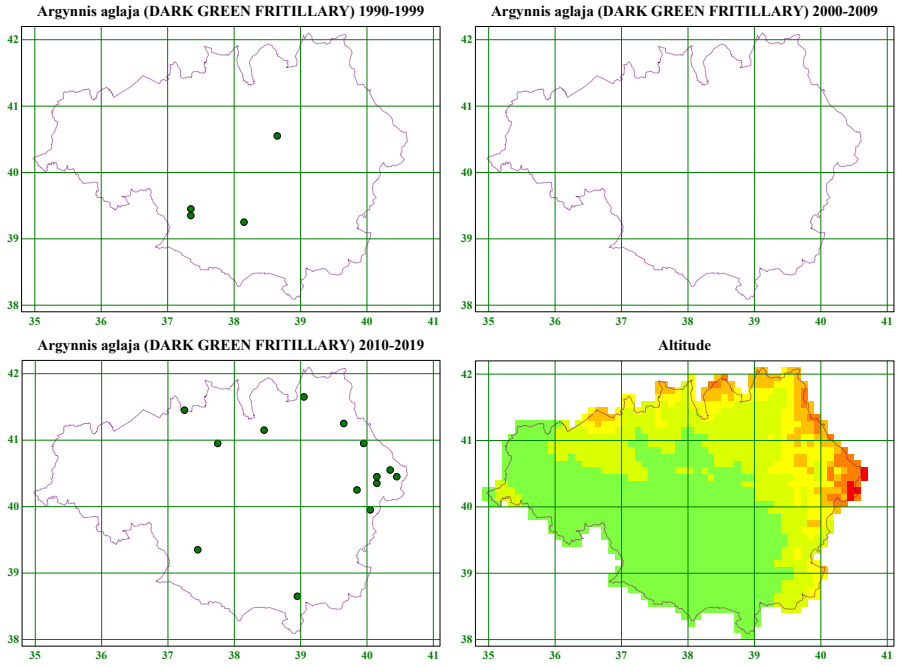
CAMBERWELL BEAUTY, *Nymphalis antiopa*



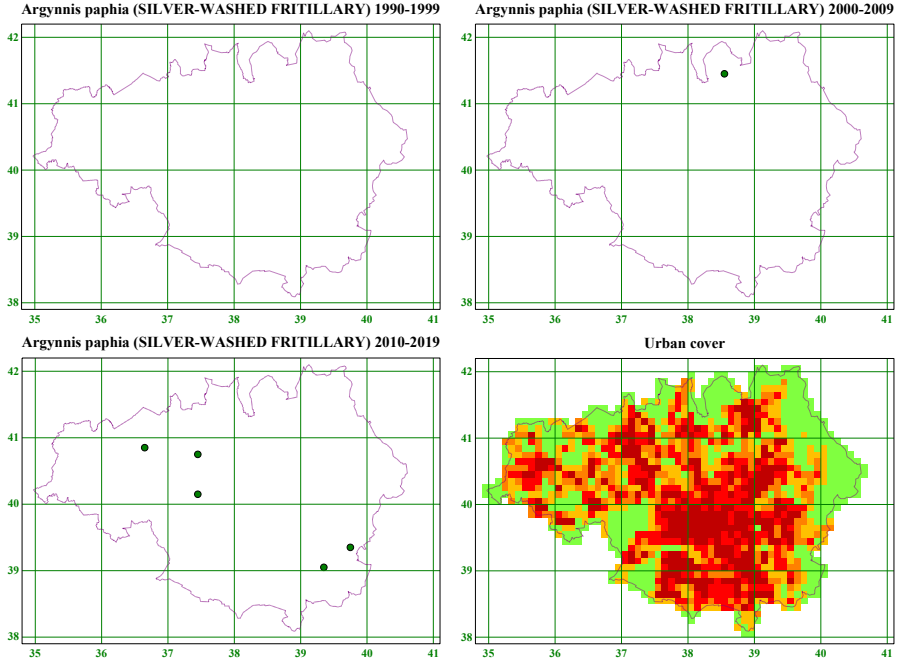
COMMA, *Polygonia c-album*



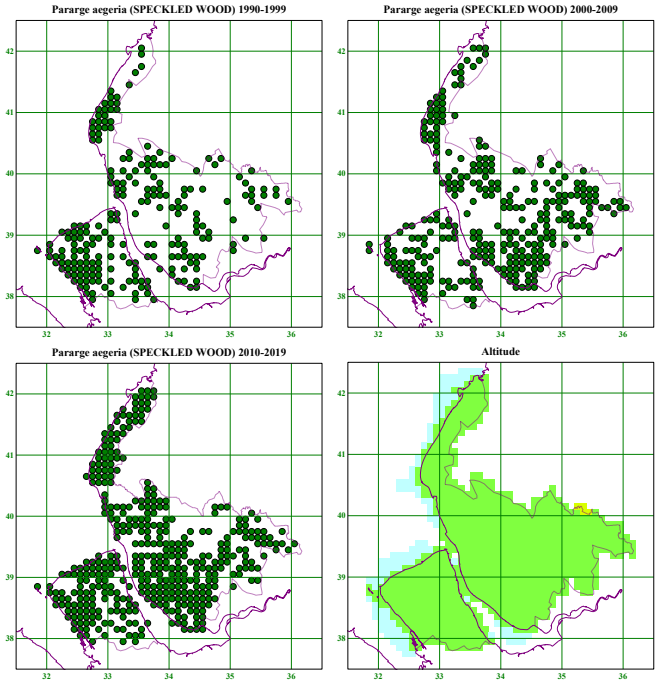
DARK GREEN FRITILLARY, *Argynnis aglaja*



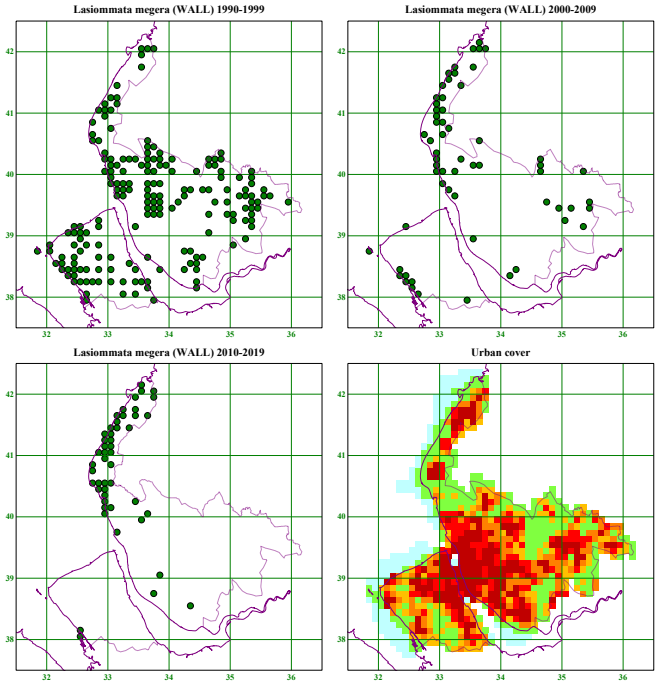
DARK GREEN FRITILLARY, *Argynnis aglaja*



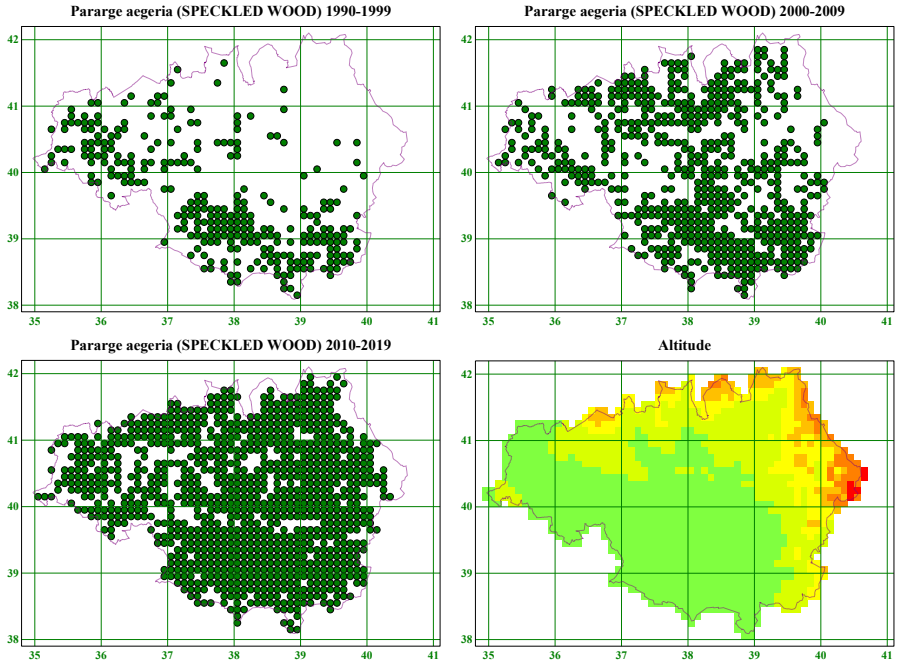
SILVER-WASHED FRITILARY, *Argynnis paphia*



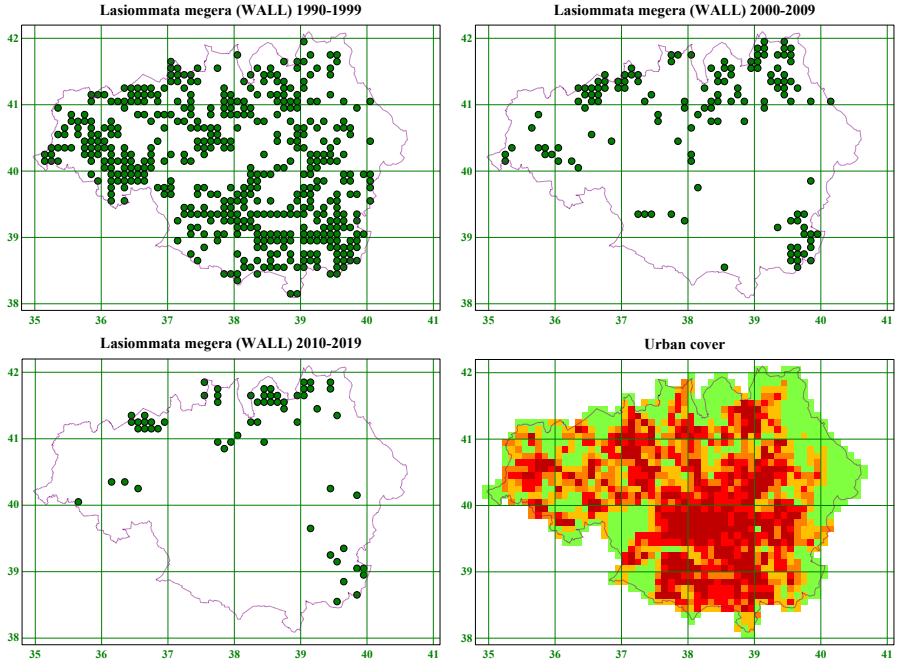
SPECKLED WOOD, *Pararge aegeria*



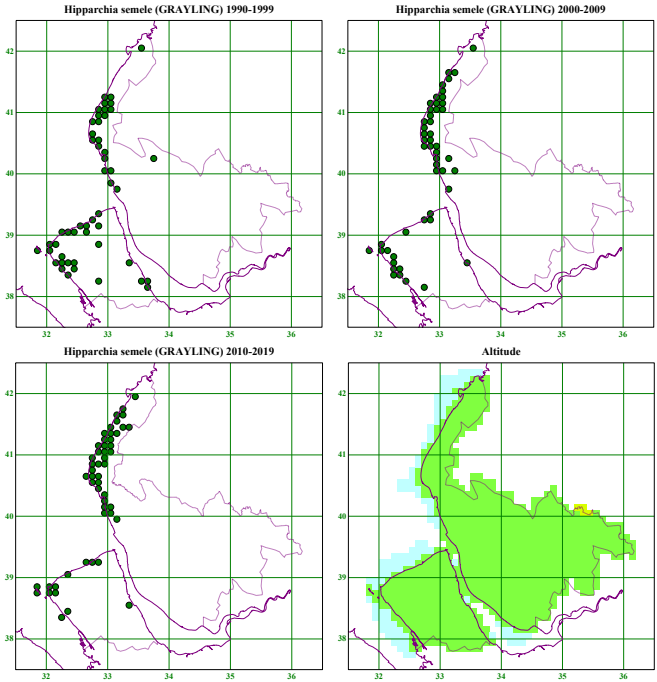
WALL, *Lasiommata megera*



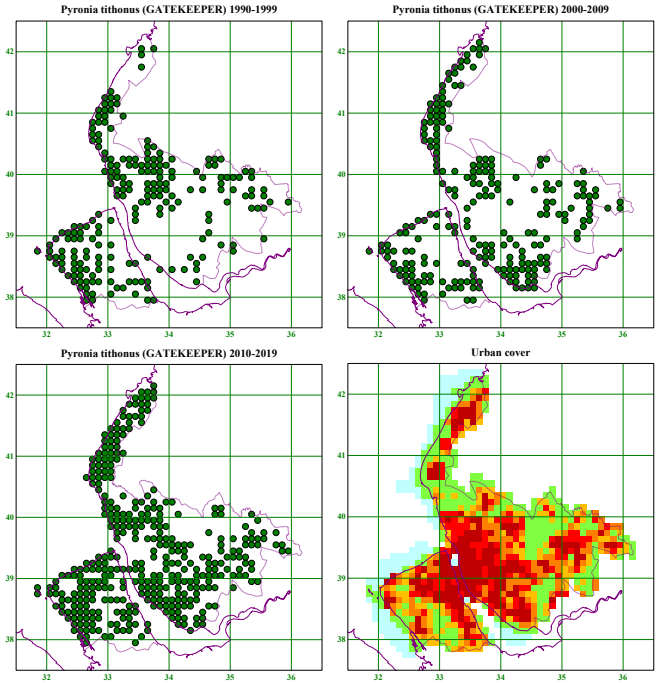
SPECKLED WOOD, *Pararge aegeria*



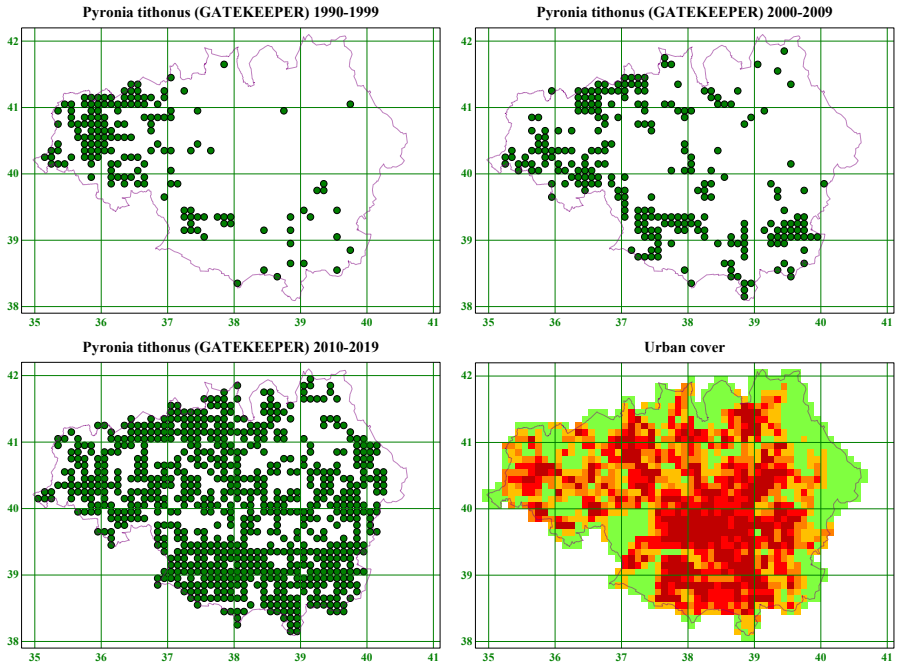
WALL, *Lasiommata megera*



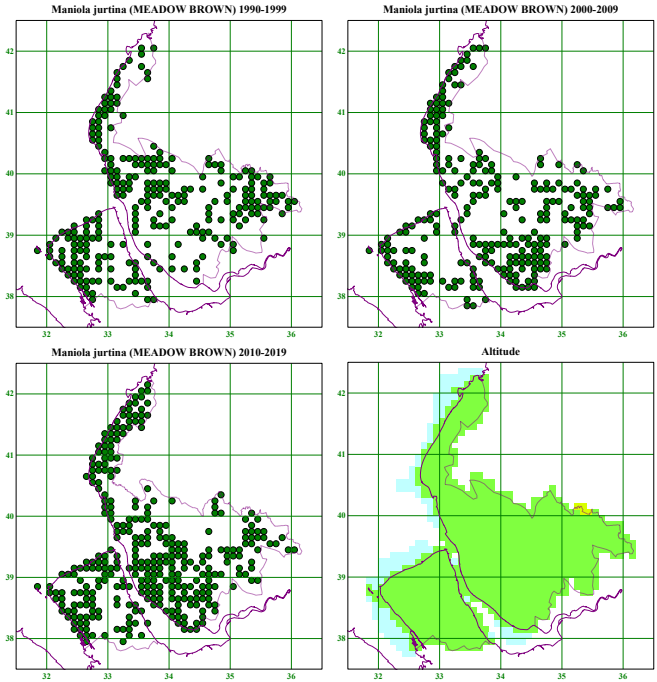
GRAYLING, *Hipparchia semele*



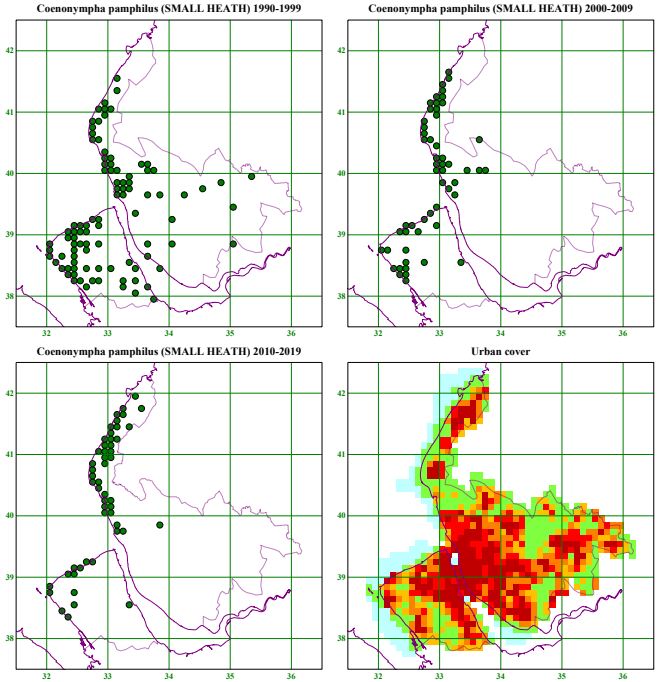
GATEKEEPER, *Pyronia tithonus*



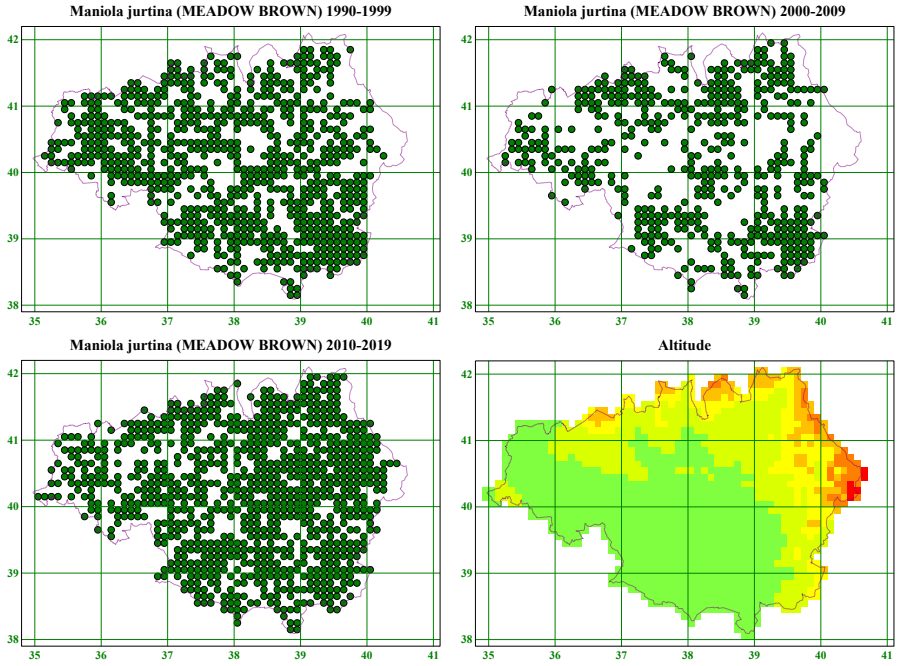
GATEKEEPER, *Pyronia tithonus*



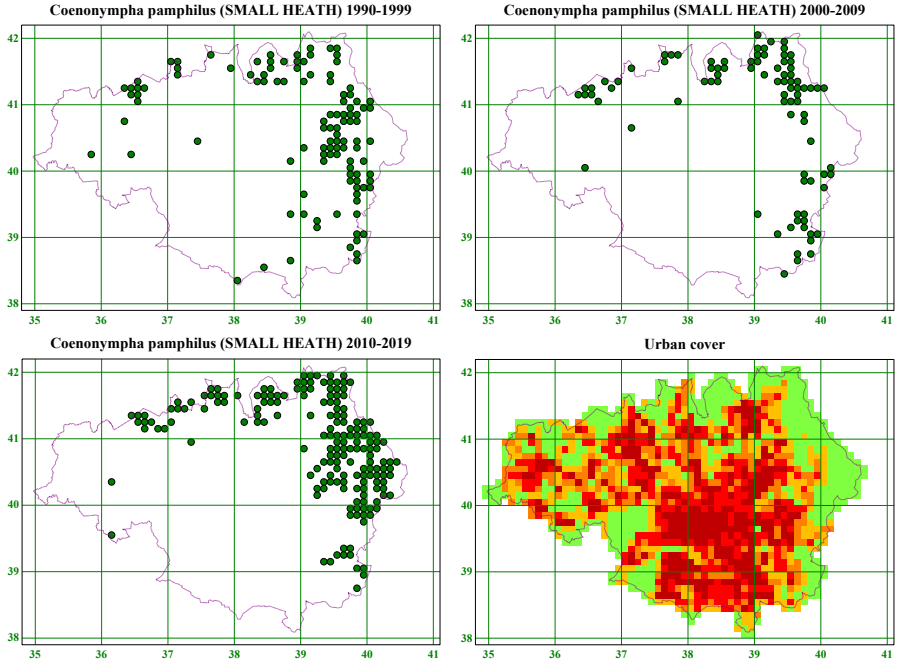
MEADOW BROWN, *Maniola jurtina*



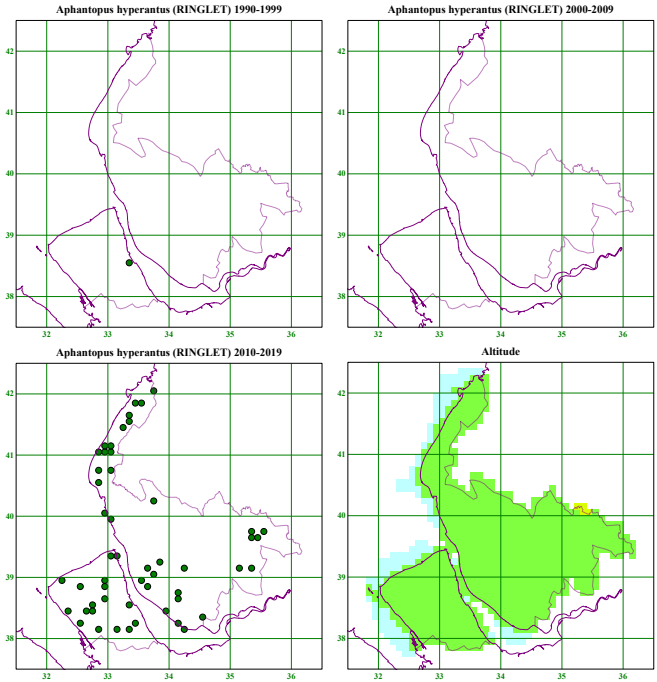
SMALL HEATH, *Coenonympha pamphilus*



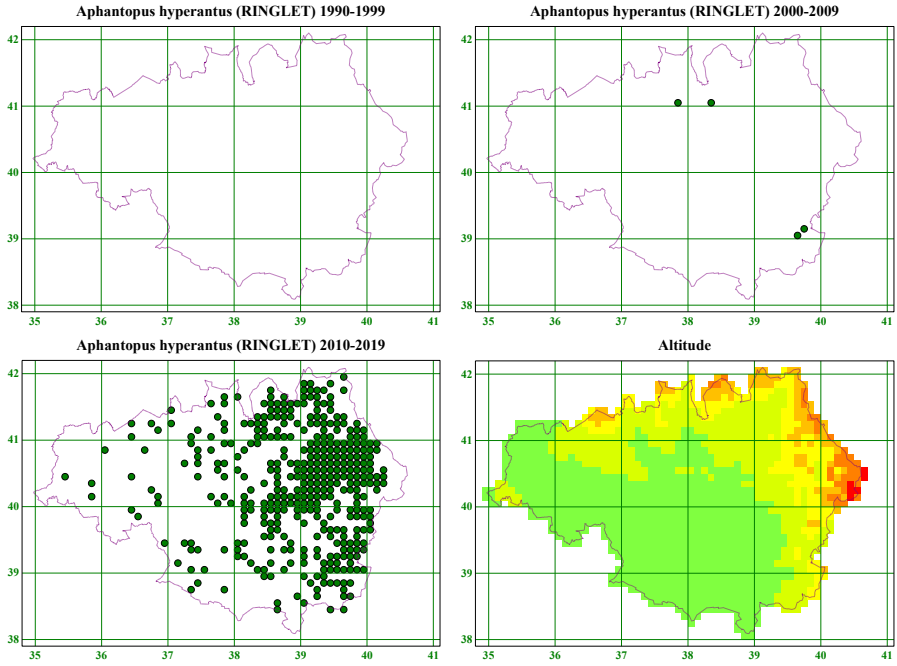
MEADOW BROWN, *Maniola jurtina*



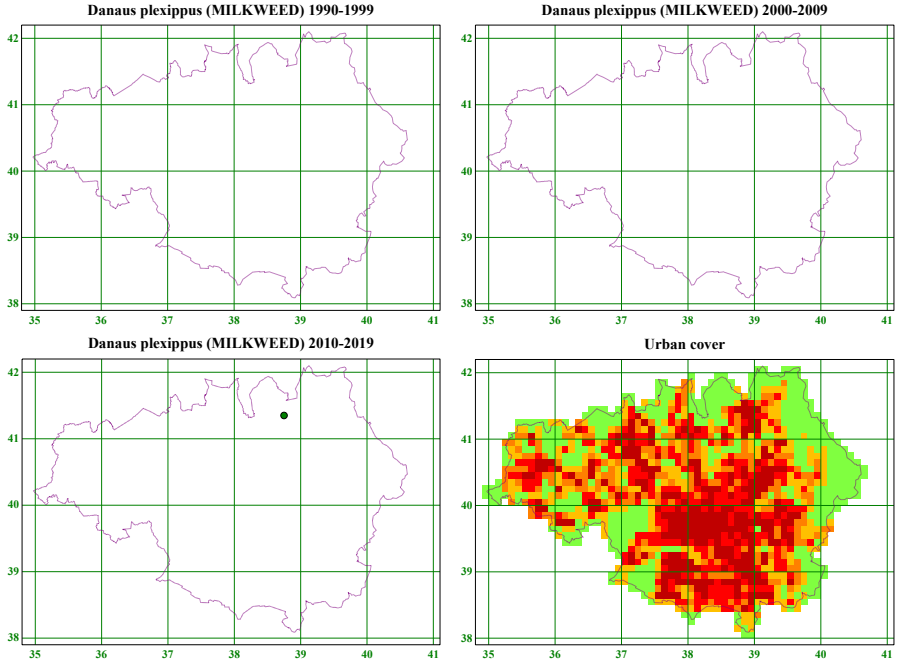
SMALL HEATH, *Coenonympha pamphilus*



RINGLET, *Aphantopus hyperantus*



RINGLET, *Aphantopus hyperantus*



MILKWEED, *Danaus plexippus*

THE MERSEY VALLEY AND ITS WARDEN SERVICE

In the 1998 book *Butterflies of Greater Manchester*, prominence was given to a section in the middle of the Mersey Valley: the 7 X 5 km zone from SJ7690 in the south-west to SJ8294 in the north-east. Butterflies therein were mapped at a 1 km resolution, and it was attempted to map hostplant-habitats at a 100 m resolution. Within that zone, a 3 X 2 km section, from SJ780900 to SJ809924, was mapped in greater detail: the butterflies, hostplants, habitat types and main nectar sources all at 100 m resolution. That zone has been studied intensively, by the author, over the years, and it is felt appropriate here to describe it in detail, as it is a good example of a rural habitat on an urban fringe. Over the three periods, a total of 23 butterfly species have been recorded, though in any one of the periods the maximum was 21: *T. sylvestris* (1,2,3), *O. sylvanus* (1,2,3), *C. croceus* (1), *G. rhamni* (1,2,3), *P. brassicae* (1,2,3), *P. rapae* (1,2,3), *P. napi* (1,2,3), *A. cardamines* (1,2,3), *F. quercus* (2,3), *S. w-album* (1,2,3), *L. phlaeas* (1,2,3), *P. icarus* (1,2,3), *C. argiolus* (1,2,3), *V. atalanta* (1,2,3), *V. cardui* (1,2,3), *A. urticae* (1,2,3), *A. io* (1,2,3), *P. c-album* (1,2,3), *P. aegeria* (1,2,3), *L. megera* (1,2), *P. tithonus* (1,2,3), *M. jurtina* (1,2,3), *A. hyperantus* (3).

The river Mersey flows across the zone from east to west, and its valley contains a significant amount of "green belt", north and south of the river. Historically, this land was regarded as of poor quality for agriculture, with the result that as the towns to the north and south grew in size much of it was set aside for rubbish tips and sewage works. The land was also prone to flooding in heavy rain, but for over a century the banks from Stockport to the approximate location of the present "Millennium Bridge" (SJ772935) have been artificially built up in the form of levees to contain the water. From the latter point westwards, the river still follows its natural course, with many meanders and erosion resulting in changes of course over the years and formation of an oxbow near Urmston (SJ7693). The banks along here are not as accessible as the sections with built-up banking, and, ironically, the latter have tended to be the best butterfly habitats, especially in (and prior to) period 1, the right bank particularly so as it forms a south-facing slope with a warm microclimate.

The oxbow, and also the built-up banks, are illustrated in the previous section, *Along the Mersey*.

The following tributaries of the Mersey also flow through the zone (showing in brackets whether the confluence is on the left or right bank of the Mersey):
The **Chorlton Brook** (right): this rises east of Gorton (SJ8396) as the Gore Brook, flows westwards through Manchester's suburbs, passes through Birchfields Park and Platt Fields Park as the Platt Brook, takes the name of Chorlton Brook from its confluence with the Red Lion Brook at SJ830935, and discharges into the Mersey at SJ801934. For much of its length it has been canalised and reshaped, but its south-facing right bank, like that of the Mersey itself, provides good habitat, especially from Brookburn Road (Ivy Green) to the confluence with the Mersey.
The **Barrow Brook** (left): drains the Sale golf course; west of Rifle Road it formerly drained the Sale Ees but following the development of the Sale Water-park it was re-channelled to flow into the lake; its original confluence with the Mersey was at

SJ795932. (It should perhaps be added here that some maps, such as the Geographers' A-Z Map Company's 1993 *New Greater Manchester Street Atlas*, erroneously mark the name "Barrow Brook" on the inlet channel which leaves the river at SJ809927 and in times of flood carries water into the Sale lake at SJ804927; this channel, though wholly artificial, is also of some value as butterfly habitat especially for the spring Pierids, but the brook does not enter it, its realigned course being further to the south-west and entering the lake at SJ804926.)

The **Kickety Brook** (right): the main source is just west of Chester Road at SJ792936, but it soon joins water from an overflow river channel; most of the brook's water is diverted along this channel; some is diverted into the Mersey at SJ778934 although the original course of the brook (as shown on the map) continues westwards just north of the river, becoming the Ousel Brook and later the Old Eea Brook, and entering the Mersey at SJ757933, Urmston.

The **Stromford Brook** (left): rises in suburban Ashton-on-Mersey; its present-day source seems to be in a garden on Glebelands Road although old maps show it as traceable quite a distance further south; it drains the Ashton golf course, passes through the Sale sewage works, emerging considerably wider and in an artificial channel and entering the Mersey at SJ761929.

[The above brooks are all illustrated in the section *Along the Mersey*.]

The **Sinderland Brook** (left): this is formed by the union of the Baguley Brook and the Fairywell Brook at SJ781903 then the Timperley Brook at SJ765901; it passes through farmland south of Carrington Moss, becomes the **Red Brook** and enters the ship canal (which at this point carries the waters of the Mersey + Irwell) just west of Partington at SJ699908. As well as within the 7 X 5 km zone, there are a variety of biotopes along the three contributory streams (and also along the Mill Brook, a tributary of the Fairywell Brook) ranging from agricultural land to suburbia and including long-established as well as more recent woodland, parks and sports fields with woodland edges. The brooks have carved small but nevertheless noticeable valleys with sloping sides and are particularly good in the springtime, for Nymphalids newly out of hibernation and Pierids especially the Orange-tip *Anthocharis cardamines*. There are good woodland-edge biotopes: with a south-westerly aspect where the Baguley Brook passes through Wythenshawe Park (SJ8089/8189) and a westerly aspect where the Fairywell Brook passes through a large sports field in Timperley (SJ7989).

The Sinderland Brook/Red Brook and its tributaries are illustrated in this section; the other brooks mentioned above are illustrated in the section *Along the Mersey*.

Mill Brook, SJ8187, 23.4.2014: Wythenshawe wood; joins Fairywell Brook at SJ7988

Fairywell Brook, SJ7989, 31.12.2014: Timperley sports field; woodland edge; good in springtime

Baguley Brook, SJ7990, 18.4.2014: microclimate for spring butterflies in valley despite mown grass

Baguley Brook/Fairywell Brook confluence, SJ7890, 7.5.2013

Timperley Brook, SJ7789, 5.5.2014: canalised but adjacent to wetland nature reserve

Baguley Brook/Timperley Brook confluence, SJ7690, 13.5.2015: now Sinderland Brook; carr

Sinderland Brook, SJ7390, 10.3.2015: by Dark Lane nature reserve; becomes Red Brook

Red Brook, SJ7090, 10.3.2015: by Oak Road, Partington; wildlife trail (Redbrook Trail)

RED BROOK (TRIBUTARY OF MERSEY/SHIP CANAL) AND ITS TRIBUTARIES
showing the assortment of butterfly habitats along their course

The 7 X 5 km zone was selected for the 1998 book because (a) the author's home was within it and (b) it contained the headquarters of the Mersey Valley warden service, a partnership of the councils of Manchester, Trafford and Stockport, who from 1981 established a visitor centre in the Sale water-park and a maintenance base at the Chorlton water-park and administered the whole of the Mersey Valley from its start in Stockport to its discharge into the ship canal at Flixton, as well as some parts of Carrington Moss, and were instrumental in promoting public awareness of the Valley's immense value for wildlife. As well as managing numerous nature reserves and other developing wildlife sites throughout the Valley, they organised public wildlife-orientated events regularly throughout the year: guided walks, lectures, ornithological, botanical and entomological study activities, volunteers' days where members of the public could take part in conservation and maintenance activities – all free of charge. From 1985 to 1995, every year for a week (sometimes alternate days over two weeks) in the school summer holidays they held an immensely successful children's activity "Operation Countryside", aimed at passing the environmental and conservation messages on to the next generation, in which the author used to assist.

In 1996, "Operation Countryside" ceased. The Stockport local authority pulled out of the partnership, leaving just Manchester and Trafford. For some years, public events continued, though at reduced frequency as there were repeated cuts in funding. In 2014 the Mersey Valley warden service was disbanded, the visitor centre having closed the previous year. The care of the Valley sites was devolved to other bodies, some of whom have tried to spread the conservation message; the building which used to house the visitor-centre is now a "hub" for certain conservation organisations, but it is not the same.

The author cannot praise the Mersey Valley warden service too highly, or express too strongly his regret at their disbandment. He obtained great inspiration from them, and indeed they were instrumental in reviving his interest in the natural world in general and Lepidoptera in particular, after some years of drifting to other interests (transport-orientated: railways, aviation, classic motor cars). It is therefore felt appropriate that, although not going into anywhere near the detail of the 1998 book, the present work should include a brief mention of them and the sites which they covered.

Of those sites, the foremost were the Sale and Chorlton water-parks. The lakes from which these parks developed were flooded gravel pits, which had been dug out to obtain material for constructing the motorway built through this section of the Valley in the early 1970s; the Sale lake especially had been enlarged and made suitable for water sports as well as for wildlife. Thus, although during and immediately following its construction the motorway may have seemed to have a deleterious effect on the Valley, it led indirectly to immense advantages. Indeed, many of the Mersey Valley sites ironically arose from activities totally at variance with the natural world and the following paragraphs give other examples. Although water-based sport activities at the Sale water-park were soon hived-off to a more appropriate organisation, the warden service held responsibility for all the land around the lakes, and created within the Sale water-park the wetland known as

"Broad Ees Dole" with its bird-observation hide(s), as well as the "Earth-magic Field" close to the visitor-centre, which aimed to teach children (and adults) to use all their five senses to appreciate different aspects of Nature. They kept a board in the visitor-centre on which to record up-to-the-minute observations of wildlife – mainly birds, but also other forms including butterflies – to keep visitors informed as to what was about and likely to be seen, and the staff in the centre were always ready and willing to answer queries and exchange information.

Several sites were developed from former rubbish tips, in particular Stretford tip (SJ7893/7894), Kenworthy (SJ8191/8291), Chorlton tip (SJ8192; this was another gravel pit, but instead of being turned into a lake it was filled-in over a period of several years by tipping rubbish), the land on Sale Ees behind the "Priory" in Sale (SJ7992 – this is discussed more fully in the section *In still greater detail: the Speckled Wood* Pararge aegeria *in the Priory, Sale in 2008*, as is the former Bethell's private tip immediately to the north-west); indeed, the visitor-centre itself (SJ8092) was built on a former tip, which used to exist between Rifle Road and Cow Lane.

The Stretford tip, which latterly has been labelled as "Stretford Meadows" on a board by its entrance, is a prime example of a household rubbish tip which developed into good butterfly habitat. It is large (approximately 45 hectares). Tipping ceased in the early 1980s and the whole site was capped with topsoil; an open but undulating and quite species-rich grassland developed and butterflies colonised; belts of woodland along the north, west and east sides provided additional habitat. There was little in the way of "management", and very gradually natural succession took its course, so that by the end of period 3, although the character of most of the site was still grassland rather than scrub, young trees were becoming more and more prominent over much of it, and, if left alone, future decades could see the whole develop into closed-canopy mixed forest.

The largest nature reserve in the Valley, the Chorlton Ees (SJ8092/3), is a woodland created out of the former Withington sewage works. A newly-planted wood in the late 1970s, this has developed into a quite high closed-canopy woodland; it also contains some rough grassland, which latterly has been managed by a voluntary "Friends" group, along with the nearby Ivy Green (SJ8093), a mixture of grassland, scrub and some woodland; these two sites are separated by the Chorlton Brook.

Further west (SJ7893), the Stretford sewage farm is still active, but to the north of it there exists an expanse of unmanaged land, slowly regenerating from grassland through scrub to possibly an ash-dominated woodland. There were formerly quite a few elms here: most died in the 1980s, and indeed around the same time at the edge of the nearby track leading northwards from Bradley Lane a number of logs from felled dead mature elms were dumped and the track came to be nicknamed the "dead elms lane"; this was concurrent with the planting of a rather densely packed new woodland (native species but not elms) close by. During the 1990s, however, a number of seedling elms grew up quite rapidly, by the lane and close by, and a good colony of the White-letter Hairstreak *Satyrium w-album* established: this colony was first noticed in 2000 (by the author and P.M. Kinder), and it thrived until 2015, but then another outbreak of disease killed almost all the elms and the colony was lost.

Also, just east of the "dead elms lane", in the 1990s there was a small patch of rough grassland/scrub: here, the Small Skipper *Thymelicus sylvestris* first appeared in the Valley in 1990 and in 1996 the expanding-in-range Gatekeeper *Pyronia tithonus* established a hold; during period 2, however, the site became completely shaded-out by natural succession to climax woodland.

Another still active sewage farm is the Sale one at Ashton-on-Mersey (SJ7692/3) and here again there are some quite good butterfly habitats close by, including Banky Meadow, although the character of this is rapidly changing from a meadow to scrub.

Kenworthy (SJ8191/8291), on the opposite side of the river to the Chorlton Water-park and accessible from it by a bailey-bridge, is a large expanse of rough grassland and woodland, most of the latter quite recently planted. Again, this site was once partly a tip, and in the 1980s and 1990s, in common with many other revegetated tips around Manchester, a flora developed including vast patches of wild Michaelmas Daisies, which at that time were much favoured by Nymphalid butterflies as an autumn nectar source. They have latterly greatly reduced in number, and the site as a whole has been managed as a mixture of tall-herb communities and woodland.

Other sites in this zone worthy of note include Lower Hardy Farm (SJ8191), primarily scrub but also some grassland and including an orchard, and a site a little to the south-east of it (SJ8192), formerly favoured by motor-cyclists for "scrambling", which has developed through scrub to woodland.

In period 2, this section of the Valley underwent a major upheaval with the widening of the motorway. Numerous sites were destroyed or severely damaged, especially around the "Priory", and it has been a case of their settling down into their new configuration during period 3. In that period, further sites were disrupted, especially the "scrambling" site, by the construction of the "metro" railway.

As well as semi-natural sites, the green space in the Valley includes a number of sports fields, and some of these are not without interest to butterfly enthusiasts. In Crossford sports field (SJ7992/3), there used to be a shallow drain, aligned north to south, between two sections of the field, the east section being just slightly higher than the west one. It was here where in period 1 the author used almost every year to see the season's first butterflies; Small Tortoiseshells *Aglais urticae* newly awakened from hibernation (they had possibly hibernated in the quite dense woodland on the north side of the field), basking on the west-facing slope which the drain provided or flying around the nettles which grew in several places along the drain (Hardy, 1994). During periods 2 and 3, however, several superficially slight but in fact quite far-reaching changes occurred: whips planted along the eastern edge of the drain gradually grew into trees, the drain gradually became filled in and the nettles gradually disappeared. Whether the reduction in the size of the woodland because of the widening of the motorway immediately to the north was also a contributory factor is uncertain (by way of a corresponding reduction in overwintering sites?), but the net result was that no *A. urticae* have been seen in the field during period 3.

Sale Water-park, SJ8092, 24.6.2003: lake from motorway construction, developed for wildlife

Sale Water-park (Broad Ees Dole), SJ7993, 21.6.2007; wetland created by valley wardens

Chorlton Water-park, SJ8191/8291, 13.8.1993: lake from motorway construction; some woodland

Priory Gardens, Sale, SJ7992, 31.8.2008: glade in mixed-age woodland (no Priory)

Chorlton Ees, SJ8092/3, 6.4.2007: former sewage works; nature reserve, woodland/grassland

Chorlton Ees, SJ8093, 25.5.1997: woodland established in 1970s in former sewage works

Kenworthy, SJ8191/8291, 30.7.2011: mainly planted woodland on former tip; managed

Kenworthy, SJ8191/8291, 21.2.2019: grassland and scrub on former tip

MERSEY VALLEY SITES - ALL GOOD BUTTERFLY HABITAT

Crossford sports field, SJ7992/3, 9.4.1995: centre drain suitable for Nymphalids in early spring

Crossford sports field, 25.2.2019: centre drain filled-in, no nettles, trees grown, no Nymphalids

Stretford tip, SJ7893, 19.3.1997: tipping ceased 1980s, tip capped, species-rich grassland developed

Stretford tip, 5.10.2017: natural succession brings increased scrub, progression to climax woodland

Track from Bradley Lane, SJ7893, 9.4.1995: wood with elms, many died but some seeded/regenerated

Same track, further and to left, 9.6.2011: elms supported *S. w-album*, but have since died

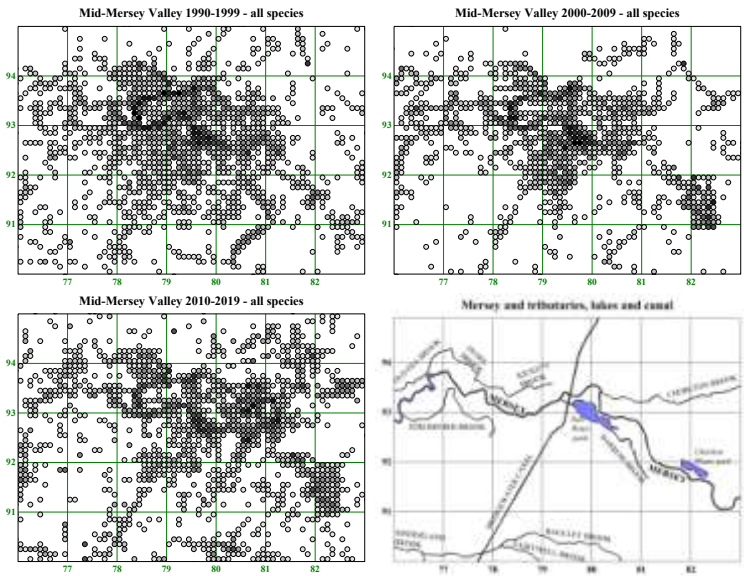
Grassland just E. of above site, SJ7893, 9.4.1995: *T. sylvestris, P. tithonus* colonised in 1990s; since completely shaded-out and climax woodland

Former Bethell's tip, Sale, SJ7992, 10.1999: good *P. icarus* habitat following disturbance 1994; scrub/brambles since smothered and colony lost

CHANGING SITES IN THE MERSEY VALLEY

This is only one instance of small insidious changes that happen to habitats, possibly unnoticed by us but having a significant effect on wildlife such as butterflies.

In the 1998 book, maps of each individual species were provided for this 7 X 5 km Mersey Valley zone. Such was not felt to be appropriate to the present work, and we therefore here just present three distribution maps giving an indication of the species-richness at a 100m scale during each period, the darkest circles denoting the highest number of species recorded during the ten-year period, together with a map showing the river and its tributaries. The author did not carry out recording in the sub-zone delimited by squares SJ7892 and SJ8093 nearly as intensively in period 3 as in periods 1 (especially) and 2; on the other hand more recording was done (largely by the warden service) in squares including SJ8191 and 8291, and more records were obtained from other contributors in the less well-recorded suburban squares. The complete absence of any records in square SJ8294 in period 2 is clearly because of lack of recording, not total absence of butterflies. Whilst potentially there could have been butterflies in every one of the 3,500 100m squares, and whilst any map is bound to show some recorder bias, nevertheless the maps do give a fair indication of whereabouts in the zone the best butterfly sites were and some of the changes over the periods; note for instance the south-west to north-east band of records in square SJ8090 in period 1, and a slight remnant in period 2: this site was a former tree-nursery which by period 3 had been totally destroyed by building a housing estate and subsequently a "metro" railway line.



Gains and losses within this zone, which were probably typical of much of the Manchester area, have included:
The Small Skipper *Thymelicus sylvestris* first appeared in the Valley in 1990, initially in the then grassland east of the "dead elms lane"; it soon spread throughout the Valley, but by period 3 had become much scarcer.

The Brimstone *Gonepteryx rhamni* was first seen by the author in the Valley in 1992 (although there had been just a few earlier reports notified to the Mersey Valley Wardens); it was initially very scarce and the few seen appeared to be on passage; by 1994 there were certainly breeding populations in the Sale water-park and at Kenworthy; there has however been no evidence of breeding at the former site since the motorway widening in period 2, and sightings in period 3 were not quite as numerous.

The White-letter Hairstreak *Satyrium w-album* was first noted on regenerating elms near the Stretford sewage farm in 1999, right at the end of period 1, though it had probably been present earlier but overlooked; the colony strengthened during period 2 but was lost during period 3 (the last record being in 2016 by M.J.C. Smith), as nearly all the elms died.

The Small Copper *Lycaena phlaeas* had been abundant on the river-bank in the late 1980s; it continued so in period 1, was much scarcer in period 2 although still present in some locations especially the section of the bank near the Stretford sewage farm, but almost or quite died out in period 3.

The Common Blue *Polyommatus icarus*, which had undergone a spectacular abundance in 1984, continued to occur rather sporadically on the river-bank and more regularly in other sites especially the former Bethell's tip during period 1 and some of period 2, but became much scarcer as natural succession led scrub to develop. Towards the end of period 3, the most regular sightings were in a small wild-flower-rich meadow close to a pylon near the Mersey Valley visitor-centre, and north of the river near the "metro" railway, but these colonies barely survived in 2019.

The Holly Blue *Celastrina argiolus* was first recorded in the Valley in 1992, as part of a general spread over south Manchester; it has fluctuated in abundance since then, and was rather scarce at the end of period 3. This species occurred more in the suburban squares than in the Valley itself.

The Speckled Wood *Pararge aegeria* first appeared in the Valley in August 1990, the first sighting being in the Priory and the second in the Chorlton Ees. The species then spread rapidly and was very numerous in period 2, reaching a peak in 2008 – see the section *In Still Greater Detail*. Although still widespread and fairly common in period 3, it was not nearly as abundant as in the earlier periods.

The Wall *Lasiommata megera* had been abundant, especially on the river-bank, in the late 1980s; it continued to be seen throughout period 1, though in decreasing numbers; there were two sightings in 2000 and then it died out completely.

The Gatekeeper *Pyronia tithonus* was first recorded in the Valley, on the river-bank, in 1992; sightings were sparse until 1996 when it colonised the (then) grassland east of the "dead elms lane"; since then it has been fairly stable.

The Ringlet *Aphantopus hyperantus* was first recorded in the Valley in 2015, a single sighting near the Stretford sewage farm; more sites were colonised during the remainder of period 3 but at the end of that period it was still rather scarce in the Valley compared with elsewhere around Manchester.

In 1992, the Clouded Yellow *Colias croceus* fortuitously found ideal breeding habitat on the river-bank, during its nationwide invasion that year, but has only once been recorded in the Valley since (1998).

THE INNER CITIES – MANCHESTER (+SALFORD) AND LIVERPOOL

As explained in the last section, in an earlier work (Hardy, 1998) maps were presented at three different scales: 2 km (tetrad) level for the main maps covering the whole of Greater Manchester, 1 km for a 7 X 5 km zone within the Mersey Valley, and 100 m for a 3 X 2 km zone within the 7 X 5 km zone. These zones were selected simply because the author lived in them and therefore had recorded in them more intensively. In retrospect, the 7 X 5 km zone mapped at 1 km scale was probably not of much value, as it showed at the most only up to thirty-five blobs per butterfly species. Following the publication of the 1998 book, the author did several years of recording in and near Manchester city centre, and published maps of the records in a 6 X 5 km zone in his web-site www.pbh-butterflies.yolasite.com. When planning the present work in 2018, it was felt that a survey of the inner-city zone would have more relevance in the eyes of most readers than a zone which happened to be near the author's home. It was further envisaged that mapping this zone over the three periods would bring home how catastrophically butterflies had declined and indeed been largely wiped out as a result of all the building and "development" that had occurred.

A reasonably comprehensive database was held for periods 1 and 2. In period 1, the author had a number of opportunities to survey in the city centre especially in 1994 and 1995; in period 2, during 2004 to 2006 he was working in the centre of Salford and thus was able to do quite intensive surveying around the Manchester and Salford city centres. During 2004 alone, eighteen species – only three less than the total recorded in a 25-year period in the 7 X 5 km rural zone in the mid-Mersey valley around Sale – were recorded in the zone covered by the city centre maps. The three species not recorded were the Wall *Lasiommata megera*, which has been recorded in previous years, the migrant Clouded Yellow *Colias croceus* which potentially could turn up anywhere during a favourable season and which was indeed recorded in the zone at Barney's Tip (Great Horrocks) (SD8400, a site which has since very regrettably been destroyed) in 2006, and the elusive White-letter Hairstreak *Satyrium w-album*, also since found to occur in the zone, in several places in Salford and also in Manchester in Collyhurst and Philips Park cemetery.

Up to 2018, however, not so much recording in the inner-city zone had been done in period 3. In order not to over-emphasise the presumed or actual decline by confusing lack of records with under-recording, in 2019 an effort was made to survey the 6 X 5 km zone as intensively as practicable to compensate for the paucity of records in this period so far; being now retired, the author was able to devote far more time during the week to recording, whereas in periods 1 and 2 his activities were confined to weekday lunchtimes. During the 2019 season, he achieved 71 recording days in this zone, the first on 28th March and the last on 8th October. The results were not quite as had been expected: although there certainly had been massive and ongoing habitat loss close to the city centre, slightly further out more scraps of habitat than had been expected were found to have persisted and indeed some new ones had developed following further demolition and regeneration, and instead of proving overall losses

the 2019 study revealed that over most of the zone much of the butterfly fauna was not only still managing to persist but indeed thriving.

The opportunity also became available to survey a similar-sized zone around the centre of Liverpool so that some comparison could be drawn between the two cities. In the case of Liverpool, however, it must be stressed that the greater numbers of dots in period 3 is not indicative of increases in distribution or numbers. There were sadly only a few records available for periods 1 and 2, which has proved to be due more to a shortage of recorders – city centres are not the places where one tends to go most readily when looking for butterflies – than to an actual dearth of butterflies throughout the zone. Most of the available records for periods 1 and 2 (and indeed for much of period 3) were the work of just two recorders, P. Slater and R. Murphy, and both of these only recorded grid references to four figures. As they gave the site names, it has been attempted to estimate the six-figure references and plot them accordingly on the maps, but many of them are centroids rather than exact locations. The author began to record in Liverpool in 2017; in 2019, as with Manchester, he carried out an intensive survey of all likely sites within the 6 X 5 km zone. Owing to family commitments, he surveyed Liverpool during school holidays and also weekly on Saturdays during term-time, and Manchester on weekdays during term-time, achieving a total of 48 recording days in Liverpool, the first on 18th April and the last on 12th October.

The area covered by the Manchester/Salford maps is from the White City in the south-west corner, the Littleton Road playing fields in the north-west, the "Central Park" in the north-east and the Longsight railway shed in the south-east; each corner-point is slightly over 2 miles distant from the city centre. The Liverpool maps cover from the Mersey estuary near Birkenhead docks in the south-west, Sandon docks in the north-west, near the crossing of Queen's Drive and Muirhead Avenue in the north-east and near Greenbank Park in the south-east. Selection of the Manchester zone was easy: it virtually corresponds to pages 78 and 79 of the Geographers' A-Z Map Company's Greater Manchester Street Atlas (1993), which has the city centre right in the middle. Liverpool was not so easy as the urban districts do not surround the city centre but extend more to the east: to select a rectangle with the city centre in the middle and including some of Birkenhead would have omitted much of the relevant eastern districts and included rather a large portion of the estuary, in which obviously there are no butterflies, whereas to cut the estuary out entirely would have meant omitting the docks and indeed much of the actual city centre – Melville (1849) described the extent and solidity of Liverpool docks as "like a chain of immense fortresses" and "equal to ... the old Pyramids of Egypt", and although they contain very little in the way of butterfly habitat it was felt that to omit such a significant feature from a survey purporting to cover central Liverpool would be inappropriate. As it is, the compromise selected still includes two 1 km squares, SJ3388 and SJ3389, of which 95% of their area is in the estuary, and therefore the land area of the 6 X 5 rectangle is less than the Manchester one.

The difference between the two cities is immediately apparent by the lack of river valleys in Liverpool and their associated public footpaths. In Manchester the Irwell, Irk and Medlock valleys converge close to the city centre and each has good

Chester Road/Warwick Road near White City, SJ810960, 12.6.2019

Littleton Road playing fields, with grassland/ woodland edge, SD810009, 13.6.2019

Land near "Central Park", SD869009, 12.6.2019

Longsight railway shed, SJ869960, 17.6.2019

CORNER POINTS OF THE MANCHESTER/SALFORD ZONE

Rosebrae Walkway, Birkenhead, SJ330887, the most south-westerly accessible point, 1.6.2019

Sandon Dock, SJ337929, the most north-westerly accessible point, 22.6.2019

Small park by junction of Muirhead Avenue and Queen's Drive, SJ387929, 8.6.2019

Briardale Road, east of Greenbank Park, extreme south-east point of zone, SJ389880, 28.6.2019

CORNER POINTS OF THE LIVERPOOL ZONE

riverside habitat. In addition there are canals: in Manchester, the Bridgewater, Ashton-under-Lyne and Rochdale Canals radiate respectively westwards, eastwards and north-eastwards from just south-east of the city centre; in Liverpool the Leeds & Liverpool Canal (slightly truncated at its southern end) starts at Eldonian Village, and heads northwards towards Bootle, with a short branch coming in from the west; from Stanley Dock; the towing paths of these canals are walkable: although they are certainly not as rich as river-valley paths they are worth trying for butterflies. Of other public footpaths, there are few in these zones: the OS "Pathfinder" map of Manchester shows some around Collyhurst (SJ8599, SJ8499 and SD8400), but these are inaccurately shown on the map; a path does exist leading westwards from Dalton Street at SJ850996 to Dantzic Street, where, opposite, the path continues westwards over a long footbridge spanning the former Newtown railway carriage sidings then north-westwards past the former Barney's tip to "Rayburn Way"; the other paths marked on the map here do not exist; the one marked as leading south-westwards to Collingham Street did once exist but was closed by stealth and blocked off during period 2. One other footpath marked on the map is in SJ8696 just east of the Longsight railway shed; this is signposted on Belle Vue Avenue but blocked by a fence a few yards along. In Liverpool centre, the Trans Pennine Trail passes through Sefton Park and Princes Park (and from there westwards is routed along streets not paths) and the Riverside Walk runs along the (completely built-up) right bank of the estuary; no other public footpaths are marked on the "Pathfinder" map, though there are short such paths just to the north of Sefton Park and eastwards from Newsham Park to New Road.

Some public open space in the inner-city regions is provided by established formal parks, which if not the most ideal habitats for butterflies are the green spaces most likely to endure, and for that reason are worth a closer look. In the Manchester zone are the whole of Ordsall Park, Peel Park and Albert Park (Salford), most of Queen's Park and the west end of Philips Park (Manchester), Hullard Park and part of Seymour Park (Old Trafford), St. George's Park and the newer Hulme Park; smaller ones include Ardwick Green Park, Swinton Grove Park, All Saints Park and the new Green Grosvenor Park; in the Liverpool zone are Everton Park, Newsham Park, Wavertree Botanic Park, Kensington Park, most of Wavertree Playground, Greenbank Park, the northern part of Sefton Park and most of Princes Park; whilst not up to the standard of country-parks or nature reserves all these parks do contain some sections of passable butterfly habitat. The overall impression gained during 2019, however, was that there is far less in the way of high-quality green space in the Liverpool zone than in the Manchester one. Far more of the densely built Victorian terraced housing survives in Liverpool than in Manchester, and in such housing there are few sizeable patches of suitable habitat. It is also a fairly recent feature of such housing areas, indeed in both Liverpool and Manchester, that alleys behind the houses, between the streets, which formerly could enable at least some of the garden space behind the houses to be viewed, in which several nectar plants, especially Buddleia and Ivy, are often established, are now usually gated and inaccessible.

Both city regions, however, were found to contain many patches of less obvious but immensely valuable habitat, if often transient, in the shape of so-called "waste" land – abandoned industrial land, demolition sites – as described above in the section

Along the Mersey. In the intensive recording of 2019, the best was done to locate and survey every bit of accessible potential butterfly habitat within the 6 x 5 km zone in each city; it should however be borne in mind that a zone of this size contains rather more such than at may at first sight appear, and some possible sites will have been overlooked or impracticable to reach. Examples of the latter include school grounds, allotments, back gardens and the above-mentioned gated alleys. In Liverpool, a higher proportion of the derelict land than in Manchester was found to have been fenced off, to prevent dumping of rubbish and entry by vagrants; however in many cases on closer investigation sites turned out not to be quite as impossible to enter after all, and in others they could at least partially be surveyed by looking closely through the fence.

In working these inner-city zones, it was aimed to ensure that the most productive sites were surveyed thoroughly and regularly, but to vary the routes each time and ensure that as far as possible the whole of the remainder was covered. Whilst the author can not claim to have walked along every single street in both these city zones, he did aim to pass at least within sight of all of them at some time or other. It also turned out to be more appropriate to concentrate on different biotopes at different times of the season: in the spring it was essential to give priority to locations where the Orange-tip *Anthocharis cardamines* might be found, either as adult butterflies or as eggs – as he was away for one-and-a-half weeks during the peak flight period and this is one species where one does not get a second chance in the butterfly season. Also at this time it was found worth keeping eyes open for nettle patches, as the caterpillars of the Small Tortoiseshell *Aglais urticae* were very numerous that spring – though oddly they were not followed by an abundance of the adult butterflies in the summer: quite the reverse as it turned out. Then from June it was more appropriate to look for areas of rough grassland frequented by Hesperiids and Satyrines, and especially those sites with a limestone element that might support the Common Blue *Polyommatus icarus*. In the late summer/early autumn, it became necessary to look for nectar sources which attracted the mobile Nymphalines; and Buddleias, both cultivated and growing wild as they do in great profusion around both city centres, were by far and away the most productive such source. The amazing abundance of the Painted Lady *Vanessa cardui* that year provided an incentive to search what earlier would have been regarded as the most unlikely of locations: even the densely-packed streets of Victorian terraced housing contained Buddleias, and the butterflies had smelt them out.

The photographs on the next seven pages show a selection of biotopes within each city, starting with what many members of the general public would probably regard as the most obvious – the city parks – and moving on to those less obvious, less known to the public, but yet all of which produced some butterfly records and several of which proved to be the most worthwhile.

Ordsall Park, SJ8197, 26.9.2019: nr. 100% mown, former good habitat to N. by church destroyed

Peel Park, SJ8299, 10.9.2019: formal gardens, some woodland to W, planted wild-flower areas

Albert Park, SD8200, 10.9.2019: very formal but elm trees; *S. w-album* recorded in 2019

Queen's Park, SD8500, 10.9.2019: contains sizeable patches of rough grassland and woodland

Philips Park (Manchester), SJ8699, 16.9.2019: some woodland and river valley (Medlock)

Hullard Park, SJ8296, 12.9.2019: includes substantial wild-flower meadow & woodland edge

St. George's Park, SJ8296, 12.9.2019: small woodland on W. edge

Hulme Park, SJ8396, 12.9.2019: mostly unsuitable but small strips of rough grassland

INNER-CITY PARKS, MANCHESTER & SALFORD

All Saints Park, SJ8497, 4.10.2019: formal, some potential nectar flowers

Green Grosvenor Park, SJ8299, 8.10.2019: new park on former good grassland, new woodland

Ardwick Green Park, SJ8597, 4.10.2019: attempt at a "butterfly garden" apparently abandoned

Swinton Grove Park, SJ8596, 4.10.2019: slightly more convincing "butterfly garden"

St. John's Gardens, SJ8397, 4.10.2019: formal, some tree cover; nectar

Seymour Park, SJ8196, 12.9.2019: mown grass, large buddleias along wall provide nectar source

Sackville Gardens, SJ8497, 8.10.2019: formal, city centre; some nectar (buddleias)

Cheetwood Park, SD8300, 8.10.2019: nearly all mown grass, a few trees

SMALLER INNER-CITY PARKS, MANCHESTER & SALFORD

Patience is needed to find butterflies in these parks, but there are records from all of them on the database.

Everton Park, SJ3591/2, 27.5.2019: grassland, woodland, wild-flower meadows

Wavertree Botanic Park, SJ3790, 29.5.2019: largely formal but with some suitable woodland

Newsham Park, SJ3791/2, 11.5.2019: planted woodland strip E. side; buddleias round buildings

Sefton Park, SJ3788, 11.5.2019: some woodland, little suitable grassland

Greenbank Park, SJ3888, 11.5.2019: lake, formal gardens, woodland at N. end

Wavertree Playground, SJ3888/9, 12.10.2019: mostly mown, ivy/nettles N.side; woodland edge

Princes Park, SJ3688, 12.10.2019: formal, lake, shrubberies, some woodland

Kensington Park, SJ3690, 12.10.2019: grassland but not very species-rich

INNER-CITY PARKS, LIVERPOOL

Newtown, SJ8499, 23.8.2019. A woodland developed from former railway sidings

The Meadow in the Irwell bend, SJ8298, 10.7.2019. Grassland, former sports field

Former Sherborne Street trading estate, SD8400, 20.6.2019. Pioneering wild flowers

Another view of Sherborne Street trading estate 17.7.2019. Evening Primrose, Mullein, etc.

Buddleia growing in a wall near Victoria, SJ8399, 15.9.2017. *V. atalanta* recorded

Educational mini-wetland, Birley, SJ8396, 7.5.2019. No substitute for former good grassland

Hulme garden centre, SJ8396, 5.7.2019. *P. rapae* and *P. aegeria* recorded

Demolition site, Gaythorn, SJ8397, 18.8.2019. Buddleias; transient Nymphalid habitat

Planted wild-flower meadow, Brunswick Road, SJ3591, 9.8.2017; transient, only *P. rapae* noted

Liverpool Cathedral and St. James's Gardens, SJ3589, 23.8.2018. Grassland on terraces

Sherwood Street, SJ3391, 22.6.2019. Good *P. rapae* habitat but liable to human disturbance

Edinburgh Park, SJ3792, 26.7.2019. Abandoned sports field, grassland (author unable to enter)

Planted meadow outside World Museum, SJ3490, 18.4.2019. Several species recorded by museum staff

Nr. Albert Dock, SJ3389, 29.7.2019. Almost the only green space in this square. *P. rapae* nearby

Falkner Square, SJ3689, 25.5.2019. Very formal mown grass/park, but 6 species have been recorded

Queen Square bus station 29.7.2019. No breeding habitat but 3 species recorded on buddleia

Chavasse Park, SJ3490, 12.10.2019: very formal, no hostplant-habitat; *P. brassicae, P. rapae* and *V. cardui* have been recorded

Toxteth Park Cemetery, SJ3788/9, 19.9.2019: large green space, but mostly too severely mown to provide hostplant-habitat

The extreme SE corner of Toxteth Park Cemetery, SJ3788, 19.9.2019: the only part of the cemetery with apparent breeding habitat; nettles, nectar

Liverpool "innovation park", SJ3790, 21.10.2019: the most productive grassland site in the 6 X 5 km zone in 2019, but will almost certainly be built over

Scrub/woodland with Buddleias, NW. of Everton Park, SJ3592, 21.10.2019: on 1.8.2019 over 200 *V. cardui* were recorded within 4 hectares here

Waste land by a small park on Whitefield Road, SJ3692, 26.7.2019: *P. rapae* was observed attempting to breed even here

INNER-CITY SITES, LIVERPOOL

Former Hampson Street trading estate, SJ8298 15.6.2015

Former Hampson Street trading estate, 16.5.2019

Pomona Docks, SJ8196/8296/8297, 9.3.2005

Pomona Docks, 28.6.2011; pioneering vegetation developing after periodical disturbance

Pomona Docks 13.8.2015, largely regenerated

Pomona Docks 20.5.2019, scrub developing but blocks of flats being built and site reduced in size

Former Manchester racecourse, SD8100/8200, 26.5.2011. Grassland and woodland edge.

The racecourse, 10.10.2019: converted for flood storage and named "Kersal Wetlands", but 100% mown grass and no habitat value

CHANGES/LOSSES TO SITES IN MANCHESTER & SALFORD

The photographs on the previous page show just a few of the changes which have taken place in the Manchester/Salford zone, from total loss of a once good habitat to extensive modification which may or may not eventually turn out to be beneficial.

The species most adapted to surviving in the inner cities was the amazingly versatile Small White *Pieris rapae*, and being highly mobile and very conspicuous this could often be relied on to provide records in even the most difficult grid squares. Females were seen seeking hostplants in the most unlikely places, as edges of pavements and industrial areas where tiny cruciferous plants were growing between cracks, as well as larger patches of waste ground where larger pioneering crucifers were often abundant. In 2019 (and 2018) *P. rapae* vastly outnumbered *P. napi*, which in other years has not always been the author's experience (though possibly *P. napi* was more numerous in more rural areas?). Also wonderfully versatile during their annually recurring but discontinuous cycle were the migrant Nymphalids – the Red Admiral *Vanessa atalanta* and the Painted Lady *V. cardui*, the intensive survey of the city centres in 2019 fortuitously coinciding with the superlative invasion of the latter species that year. The vegetation in some of the sites illustrated, and other locations where man had moved out, contained ideal resources by way of Nettles and Thistles as larval hostplants, and nectar flowers especially wild-growing Buddleias.

It was also very noticeable the extent to which some Nymphalids used man-made artefacts as thermoregulation substrates. Such artefacts abound around cities, especially away from formal parkland and in the less affluent areas; they may with justification be regarded as eyesores but nevertheless to some butterflies they can form part of a resource-based habitat. Hardy (2015b) commented on the use of such items as a white plastic bag by the Speckled Wood *Pararge aegeria* in Rochdale; numerous other instances of this species and several Nymphalines using similar and other man-made objects were observed during the 2019 inner-cities survey, and some of them are illustrated on the next four pages, along with a couple of instances from earlier years and two from outside the inner-city zone in Sale.

"An intriguing issue is: are the butterflies that succeed in future the ones that can put up with and make use of human debris? It certainly looks as if the debris forms a multitude of thermoregulation/rest/roost sites, but sadly little in the way of host plants. However, gardens may be conceived as human debris to a butterfly and they do have a number of useful components, not least adult food." [R.L.H. Dennis, pers. comm., 2019]


Anfield, Liverpool 15.8.2019


Irwell/Manchester Ship Canal, Salford 2.9.2019


Monsall, Manchester 30.8.2019


Wavertree Botanic Park, Liverpool 31.8.2019

RED ADMIRAL *Vanessa atalanta* – non-natural thermorgulation substrates


Strangeways, Manchester 18.9.2019


Hulme, Manchester 18.8.2019


Salford 20.8.2019


Salford 20.8.2019

PAINTED LADY *Vanessa cardui* – thermoregulation on non-natural substrates


SMALL TORTOISESHELL *Aglais urticae*, Bridgewater Canal, Sale 25.8.2019


PEACOCK *Aglais io*, Everton, Liverpool 21.8.2019


PEACOCK *Aglais io*, Everton, Liverpool 1.8.2019


RED ADMIRAL *Vanessa atalanta*, Strangeways, Manchester 17.9.2019

Thermorgulation substrates


SPECKLED WOOD *Pararge aegeria*, Clayton, Manchester 17.10.2017


SPECKLED WOOD *Pararge aegeria*, nr. 'Sport city', Manchester 17.10.2017

P. aegeria, Monsall, Manchester 30.8.2019

V. atalanta, Worthington Park, Sale 25.7.2011

V. cardui, Liverpool 1.8.2019

V. atalanta, Liverpool 21.8.2019

Thermoregulation substrates

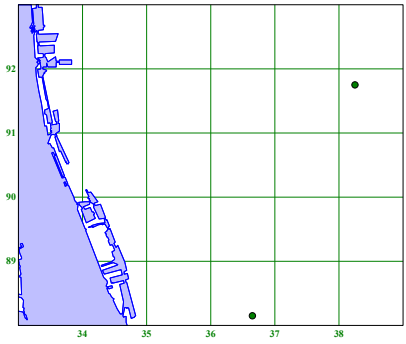
The species totals for the two cities are very similar: during the thirty years 23 species have been recorded in Liverpool and 22 in Manchester. Species recorded in Liverpool and not in Manchester are the Purple Hairstreak *Favonius quercus*, of which there are three records in period 3, all by D. Foy in 2011, two being in Sefton Park (which does contain mature trees including oaks) and the third from Nicander Road, Wavertee, a highly unlikely-looking location of densely built Victorian terraced housing, but backing on to a railway line with some trees; and the Small Heath *Coenonympha pamphilus* of which there is a record in period 1 (1997), again in Sefton Park, by S.J. White. The biotope in Sefton Park in 2019 did not look suitable for this species. The only species recorded in Manchester but not in Liverpool is the White-letter Hairstreak *Satyrium w-album*, the distribution of which has been discussed earlier in this section. K. Haydock and J. Mills are to be thanked for discovering the Salford colonies, and S.B. Smith for the others.

The impression gained from the maps is that most species show about the same level of abundance in each of the two cities (this incidentally is not the impression which the author gained when doing the survey in 2019: he felt that Manchester was winning "hands-down"!). The Brimstone *Gonepteryx rhamni* was very scarce in both cities, but slightly less so in Manchester; the Orange-tip *Anthocharis cardamines*, the Common Blue *Polyommatus icarus* and the Ringlet *Aphantopus hyperantus* were also distinctly more numerous in Manchester. The Small Copper *Lycaena phlaeas* had become much scarcer in Manchester than it had been in period 3 and in 2019 the author found just two examples, both near the disused Newtown railway sidings; the species was also scarce in Liverpool but gave the impression of faring a little better in that city. The Wall *Lasiommata megera*, lost to Manchester in period 2, still hung on at very low density in Liverpool, as evidenced by the author's finding one as mentioned in the main species account. The Holly Blue *Celastrina argiolus* was possibly more numerous in Liverpool than Manchester, although in 2019 the author obtained very few records of it in either city.

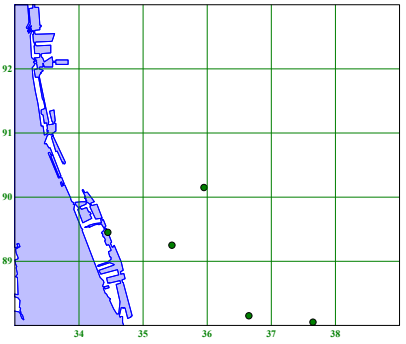
Species which appear on balance to have shown an increase in both cities (making allowances for the paucity of records from Liverpool in the first two periods) are: *P. rapae, P. napi, A. cardamines, P. icarus* (but followed by a decrease in period 3 in Manchester), *P. c-album, P. aegeria, P. tithonus* and *A. hyperantus*. Those which appear to have shown a decrease are *O. sylvanus, P. brassicae, L. phlaeas* and *C. argiolus* (possible increase in Liverpool but decrease in Manchester). The remaining resident species, i.e. *T. sylvestris, G. rhamni, A. urticae, A. io* and *M. jurtina*, give the impression of being fairly stable. The three migrant species appeared to favour the two cities more or less equally. The Pierid *C. croceus* was very scarce in both; the two Nymphalids *V. atalanta* and *V. cardui* showed their typically transient and seasonal adaptations in both; in its wave of abundance in 2019 *V. cardui* appeared more numerous in Liverpool but that may well have been because the author was recording more in that city than Manchester at the time of the peak summer emergence.

The urban cover maps (alternating, 1990 and 2019) show, for each 100m square, whether it is predominantly: dark green, woodland; light green, potentially suitable grassland; yellow, potentially unsuitable grassland; red, built-up.

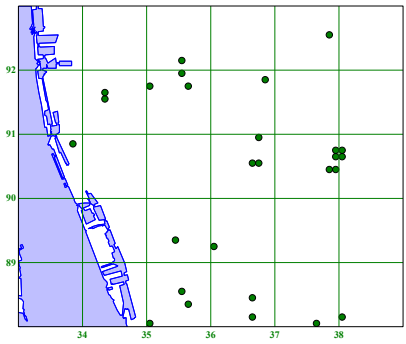
Thymelicus sylvestris (SMALL SKIPPER) 1990-1999



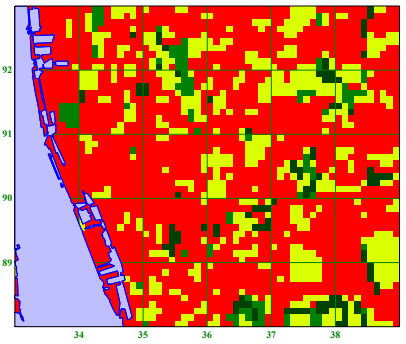
Thymelicus sylvestris (SMALL SKIPPER) 2000-2009



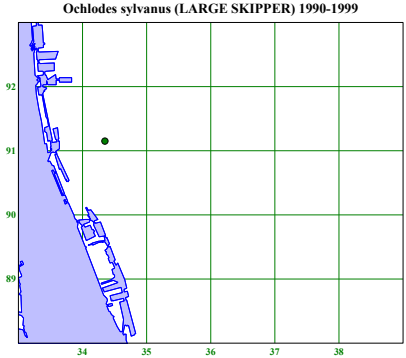
Thymelicus sylvestris (SMALL SKIPPER) 2010-2019



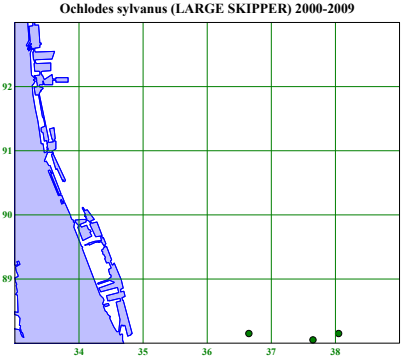
Liverpool Centre urban cover 1990



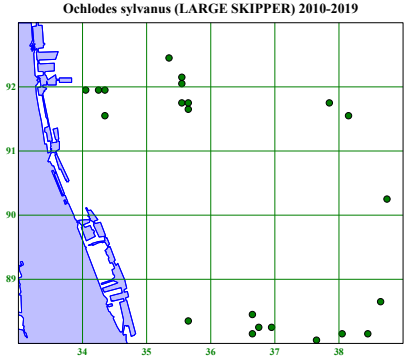
Ochlodes sylvanus (LARGE SKIPPER) 1990-1999



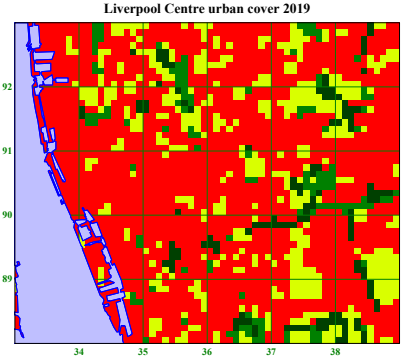
Ochlodes sylvanus (LARGE SKIPPER) 2000-2009



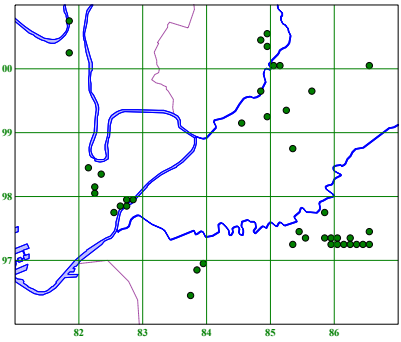
Ochlodes sylvanus (LARGE SKIPPER) 2010-2019



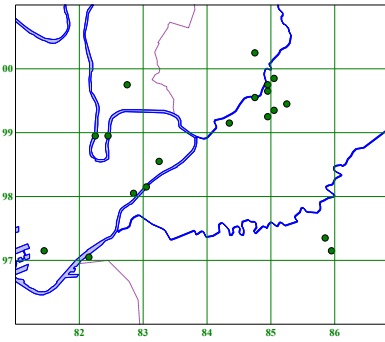
Liverpool Centre urban cover 2019



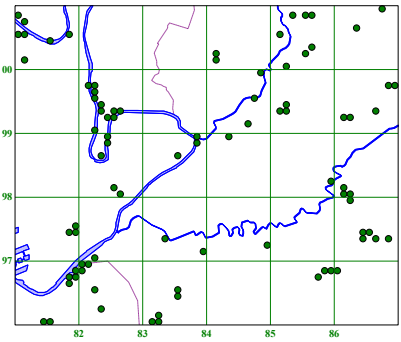
Thymelicus sylvestris (SMALL SKIPPER) 1990-1999



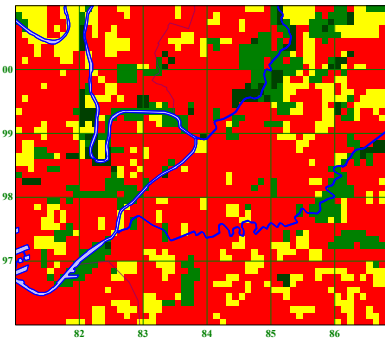
Thymelicus sylvestris (SMALL SKIPPER) 2000-2009



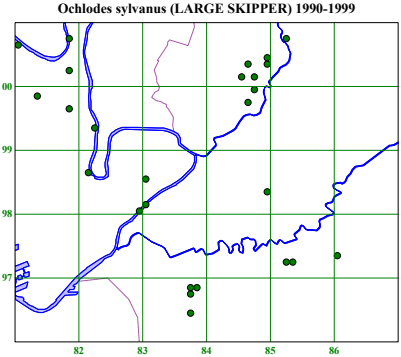
Thymelicus sylvestris (SMALL SKIPPER) 2010-2019



Manchester Centre urban cover 1990



Ochlodes sylvanus (LARGE SKIPPER) 1990-1999



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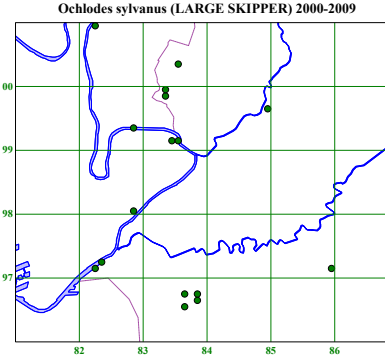
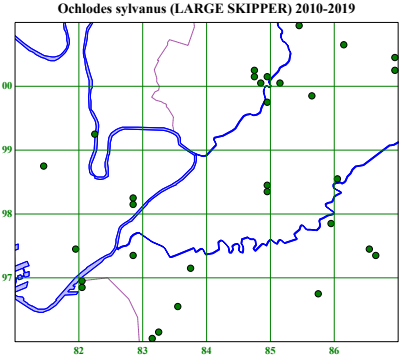
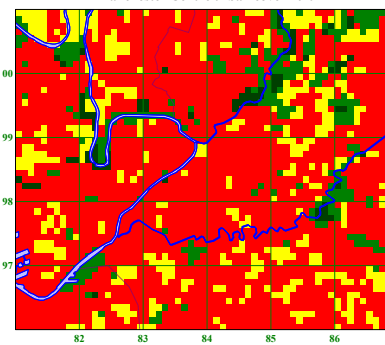


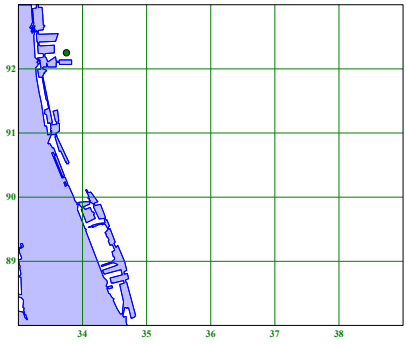
Ochlodes sylvanus (LARGE SKIPPER) 2010-2019



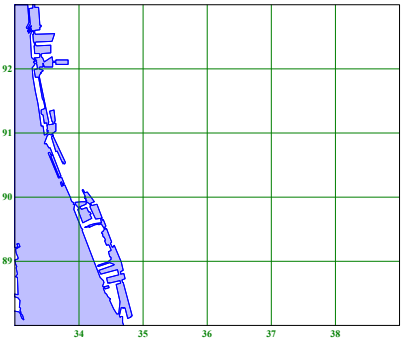
Manchester Centre urban cover 2019



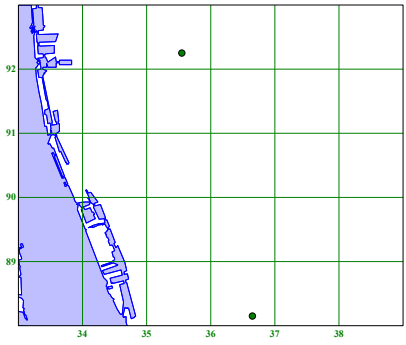
Colias croceus (CLOUDED YELLOW) 1990-1999



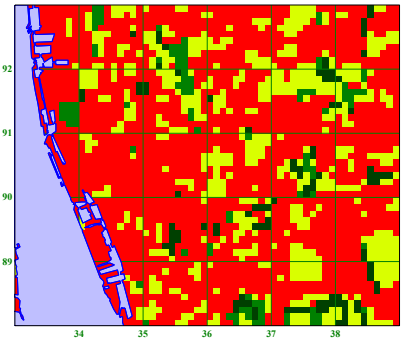
Colias croceus (CLOUDED YELLOW) 2000-2009



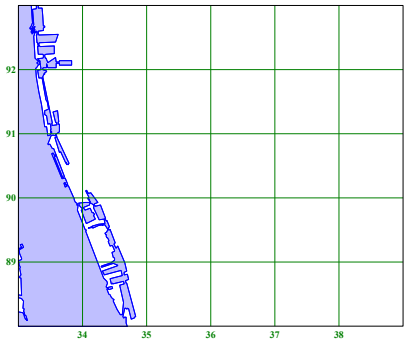
Colias croceus (CLOUDED YELLOW) 2010-2019



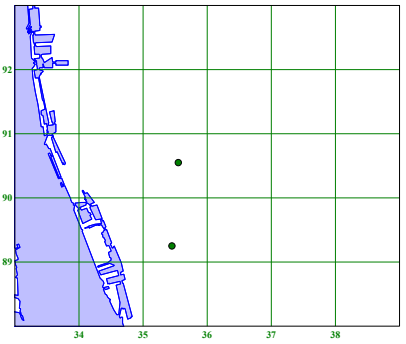
Liverpool Centre urban cover 1990



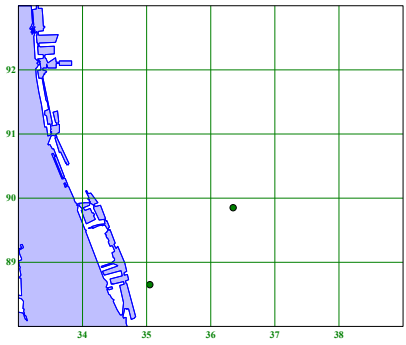
Gonepteryx rhamni (BRIMSTONE) 1990-1999



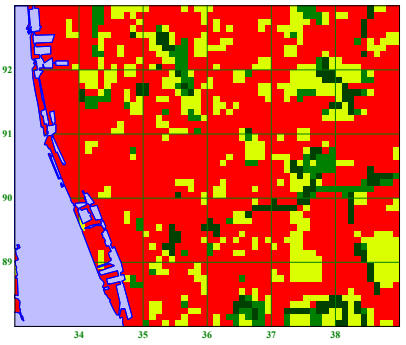
Gonepteryx rhamni (BRIMSTONE) 2000-2009



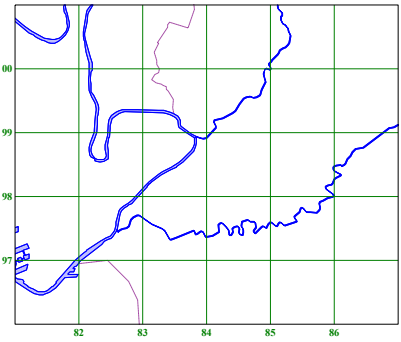
Gonepteryx rhamni (BRIMSTONE) 2010-2019



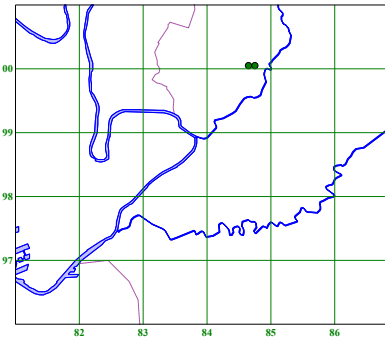
Liverpool Centre urban cover 2019



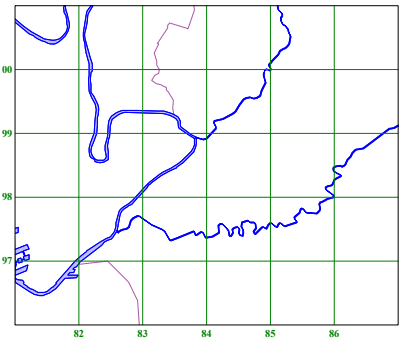
Colias croceus (CLOUDED YELLOW) 1990-1999



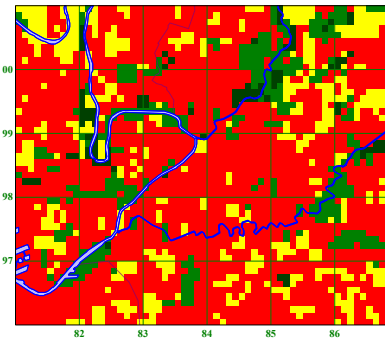
Colias croceus (CLOUDED YELLOW) 2000-2009



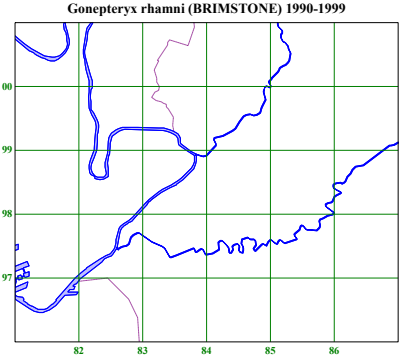
Colias croceus (CLOUDED YELLOW) 2010-2019



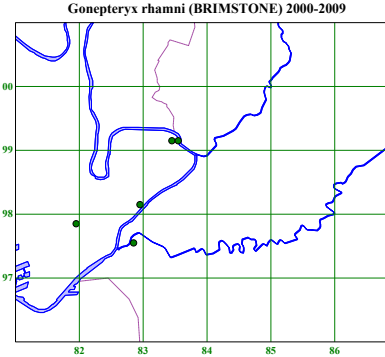
Manchester Centre urban cover 1990



Gonepteryx rhamni (BRIMSTONE) 1990-1999



Gonepteryx rhamni (BRIMSTONE) 2000-2009



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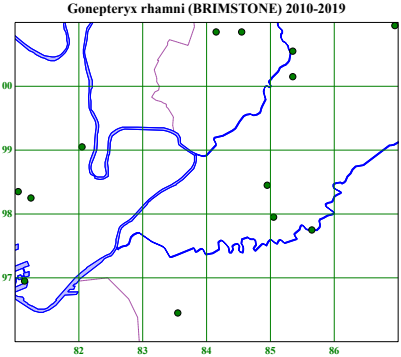
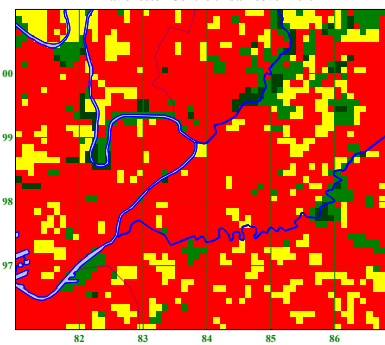
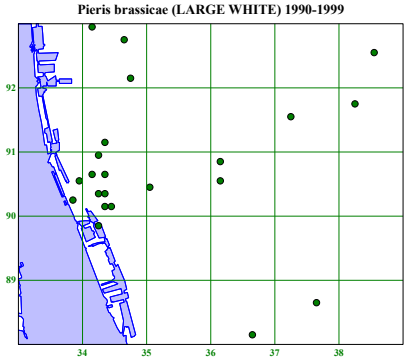


Manchester Centre urban cover 2019




Pieris brassicae (LARGE WHITE) 1990-1999
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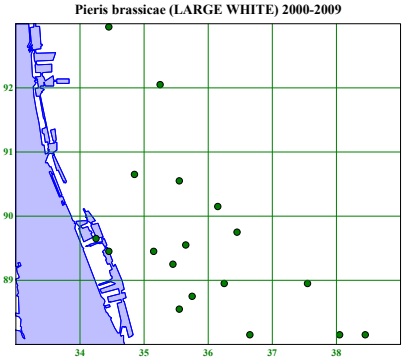
Pieris brassicae (LARGE WHITE) 2000-2009
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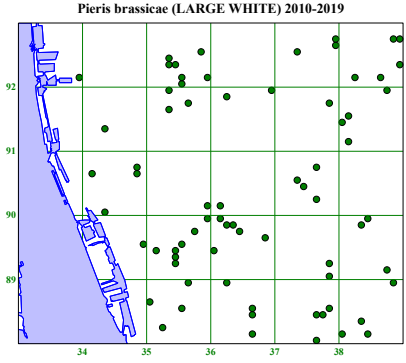
Pieris brassicae (LARGE WHITE) 2010-2019
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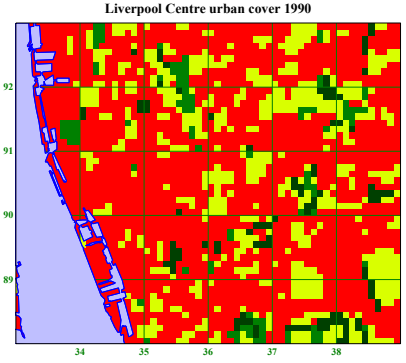
Liverpool Centre urban cover 1990
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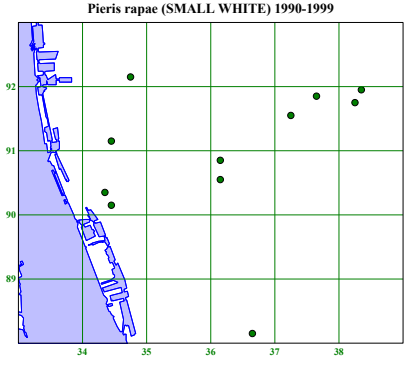
Pieris rapae (SMALL WHITE) 1990-1999
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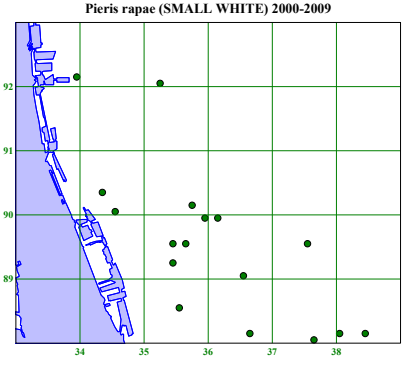
Pieris rapae (SMALL WHITE) 2000-2009
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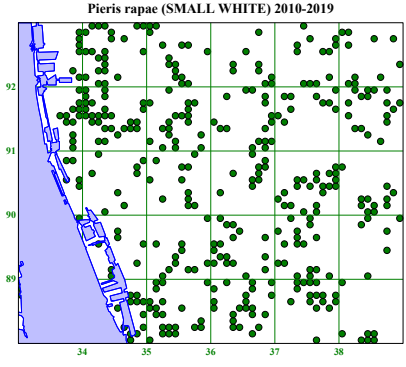
Pieris rapae (SMALL WHITE) 2010-2019
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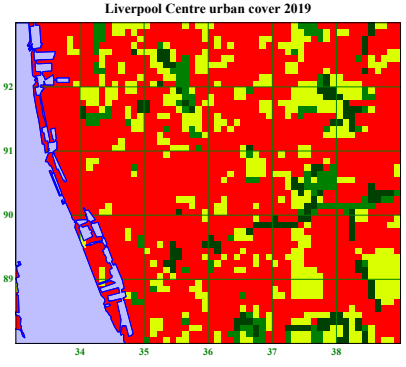
Liverpool Centre urban cover 2019
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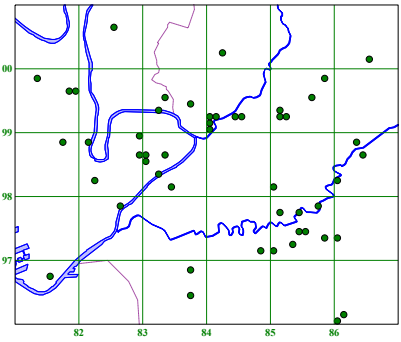
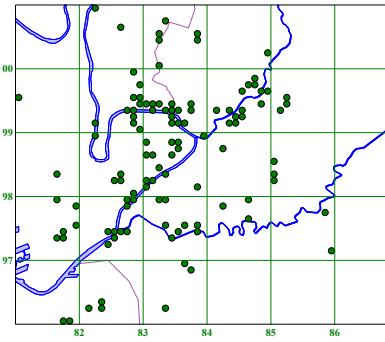
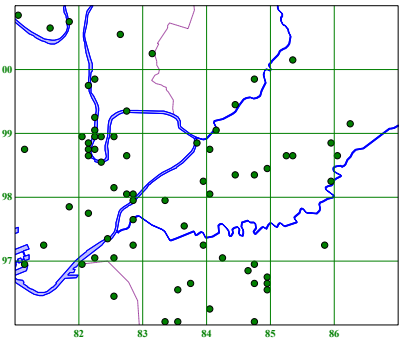
Pieris brassicae (LARGE WHITE) 1990-1999



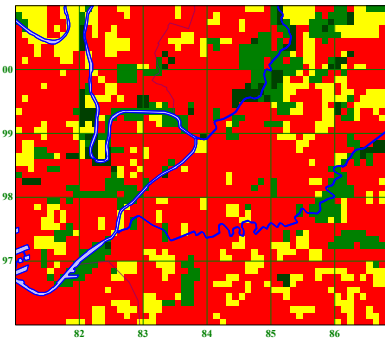
Pieris brassicae (LARGE WHITE) 2000-2009



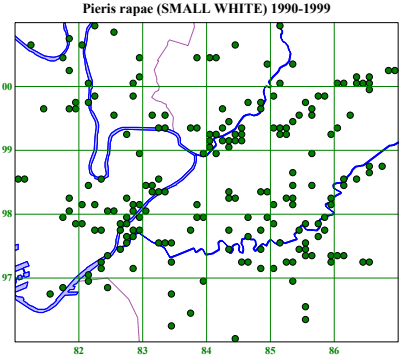
Pieris brassicae (LARGE WHITE) 2010-2019



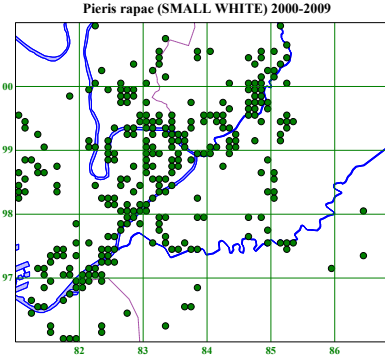
Manchester Centre urban cover 1990



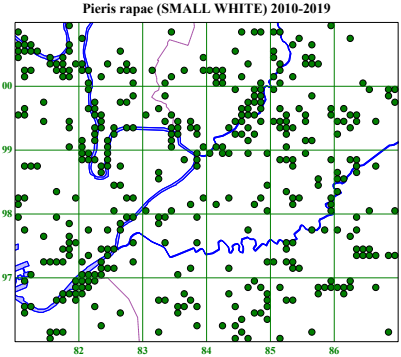
Pieris rapae (SMALL WHITE) 1990-1999



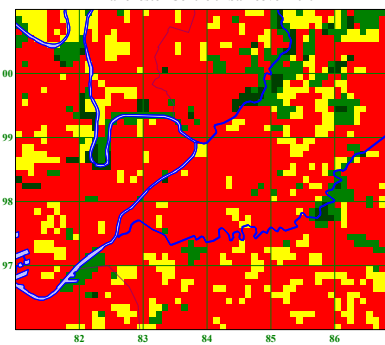
Pieris rapae (SMALL WHITE) 2000-2009



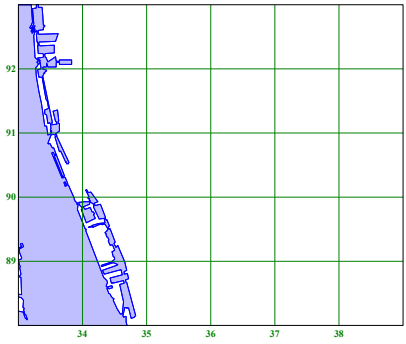
Pieris rapae (SMALL WHITE) 2010-2019



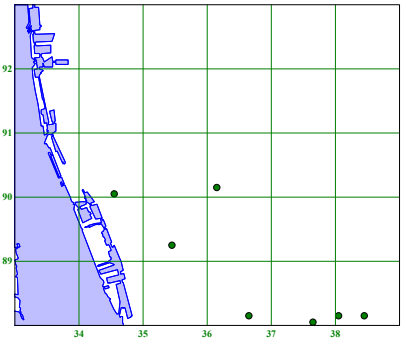
Manchester Centre urban cover 2019



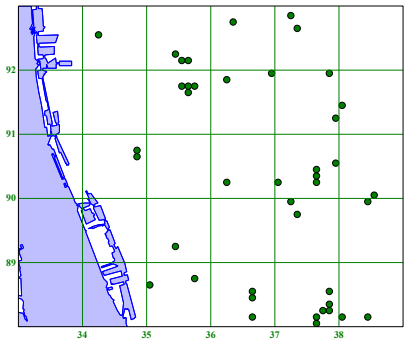
Pieris napi (GREEN-VEINED WHITE) 1990-1999



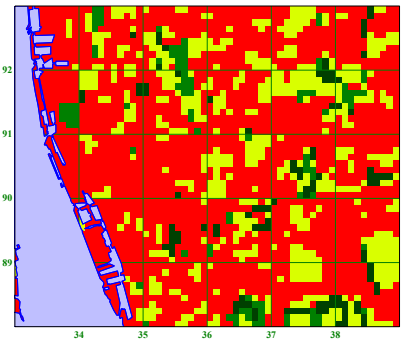
Pieris napi (GREEN-VEINED WHITE) 2000-2009



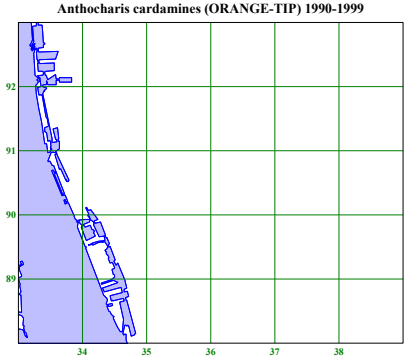
Pieris napi (GREEN-VEINED WHITE) 2010-2019



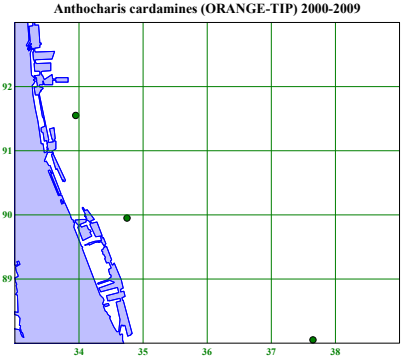
Liverpool Centre urban cover 1990



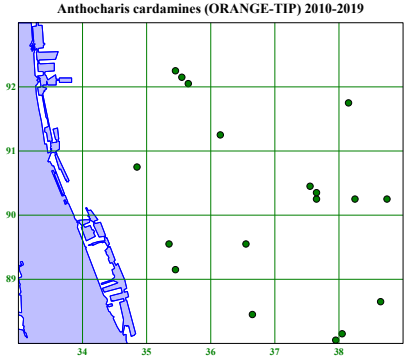
Anthocharis cardamines (ORANGE-TIP) 1990-1999



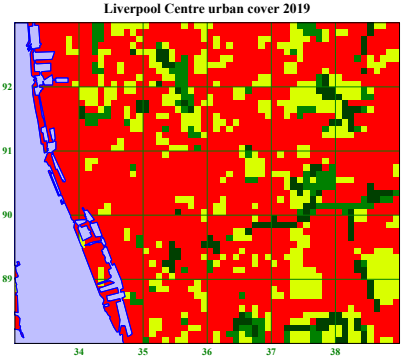
Anthocharis cardamines (ORANGE-TIP) 2000-2009



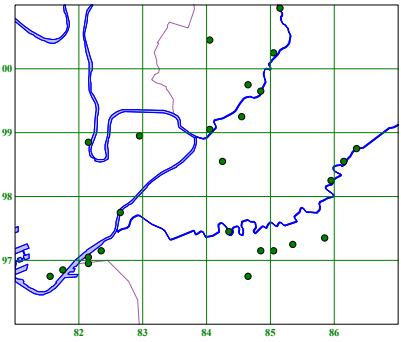
Anthocharis cardamines (ORANGE-TIP) 2010-2019



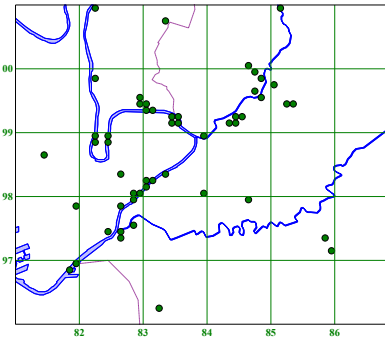
Liverpool Centre urban cover 2019



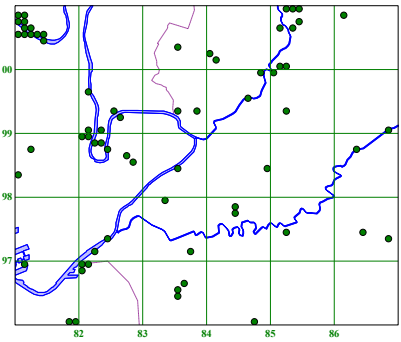
Pieris napi (GREEN-VEINED WHITE) 1990-1999



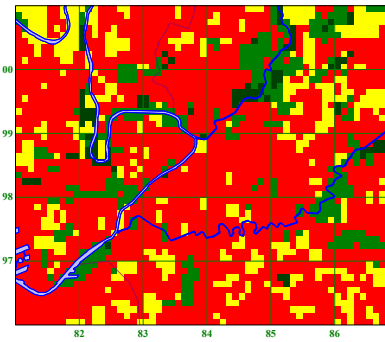
Pieris napi (GREEN-VEINED WHITE) 2000-2009



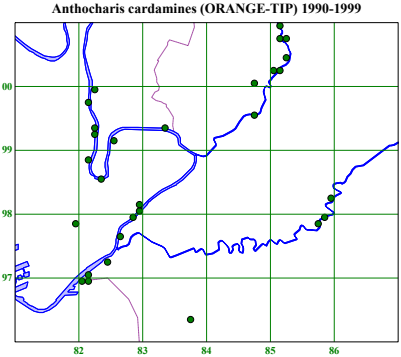
Pieris napi (GREEN-VEINED WHITE) 2010-2019



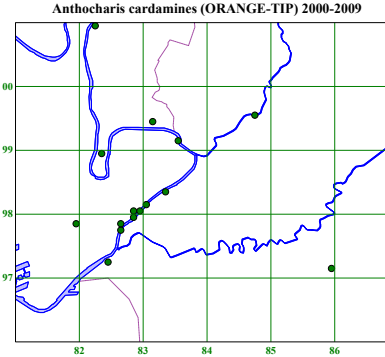
Manchester Centre urban cover 1990



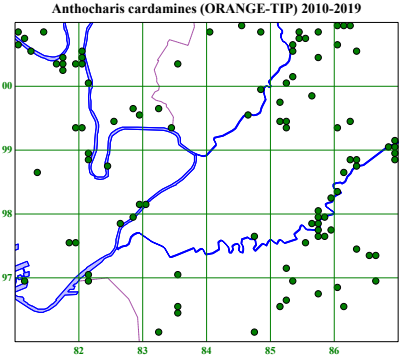
Anthocharis cardamines (ORANGE-TIP) 1990-1999



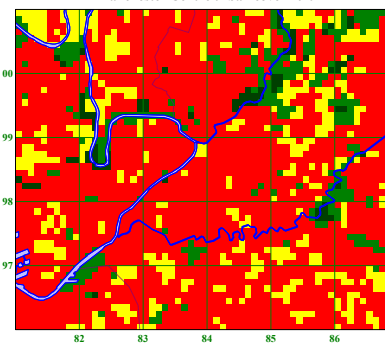
Anthocharis cardamines (ORANGE-TIP) 2000-2009



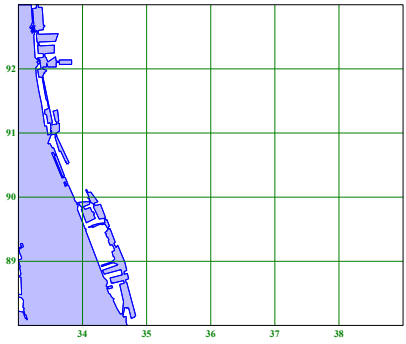
Anthocharis cardamines (ORANGE-TIP) 2010-2019



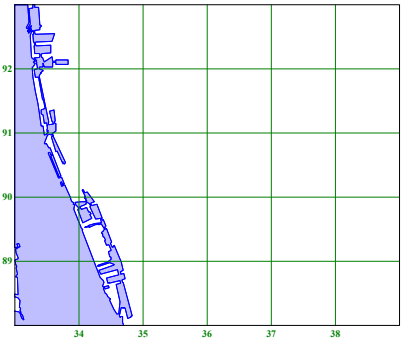
Manchester Centre urban cover 2019



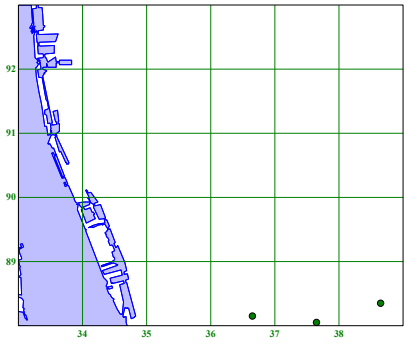
Favonius quercus (PURPLE HAIRSTREAK) 1990-1999



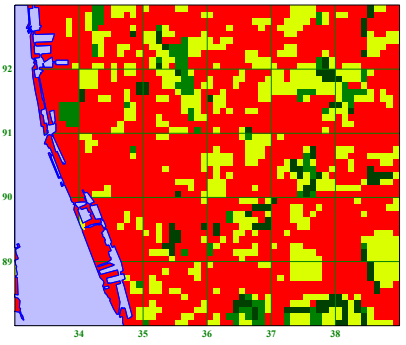
Favonius quercus (PURPLE HAIRSTREAK) 2000-2009



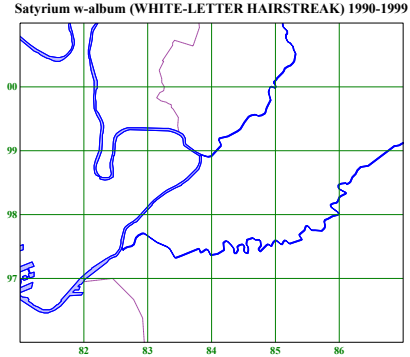
Favonius quercus (PURPLE HAIRSTREAK) 2010-2019



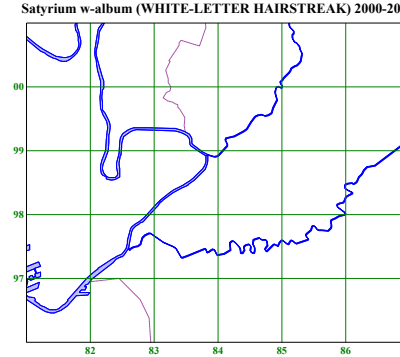
Liverpool Centre urban cover 1990



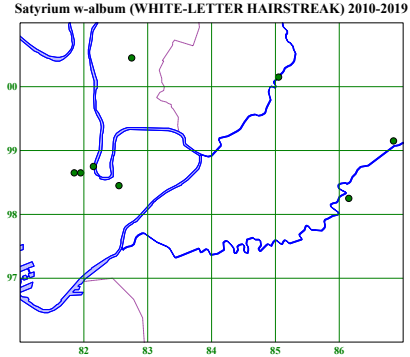
Satyrium w-album (WHITE-LETTER HAIRSTREAK) 1990-1999



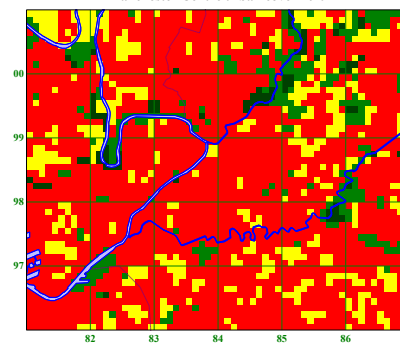
Satyrium w-album (WHITE-LETTER HAIRSTREAK) 2000-2009



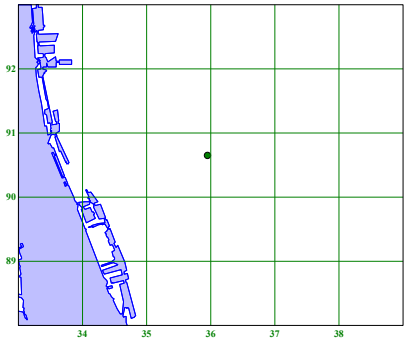
Satyrium w-album (WHITE-LETTER HAIRSTREAK) 2010-2019



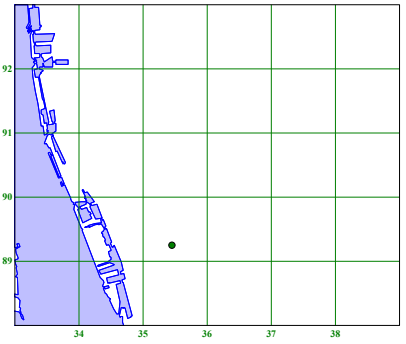
Manchester Centre urban cover 2019



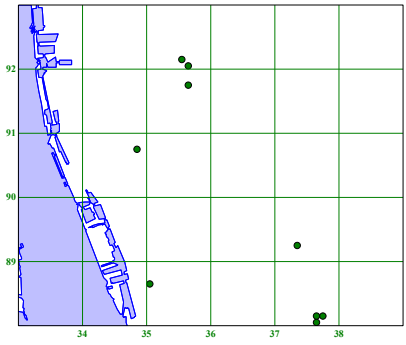
Lycaena phlaeas (SMALL COPPER) 1990-1999



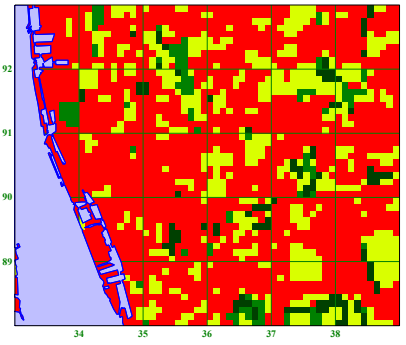
Lycaena phlaeas (SMALL COPPER) 2000-2009



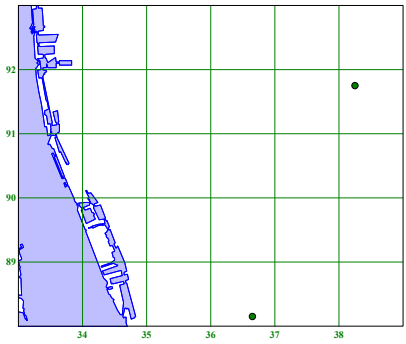
Lycaena phlaeas (SMALL COPPER) 2010-2019



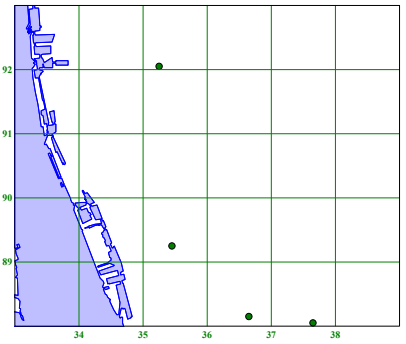
Liverpool Centre urban cover 1990



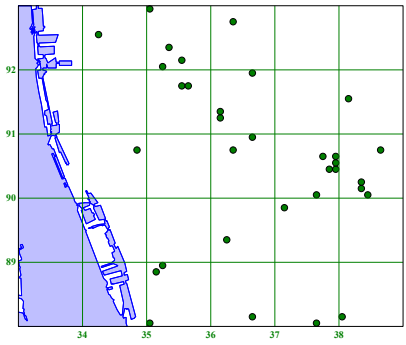
Polyommatus icarus (COMMON BLUE) 1990-1999



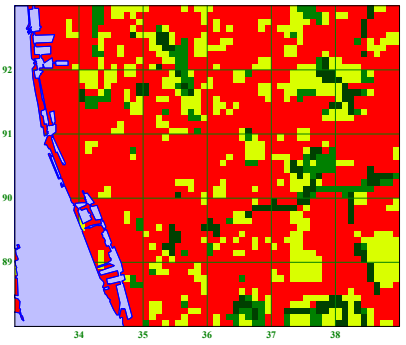
Polyommatus icarus (COMMON BLUE) 2000-2009



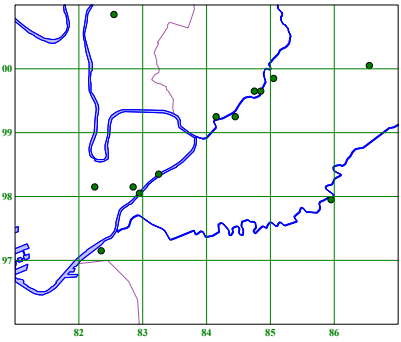
Polyommatus icarus (COMMON BLUE) 2010-2019



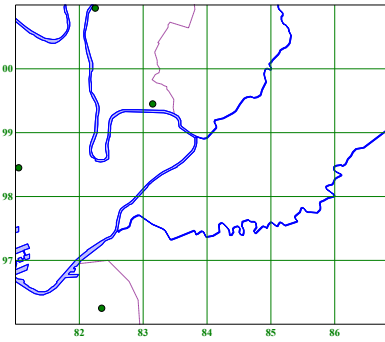
Liverpool Centre urban cover 2019



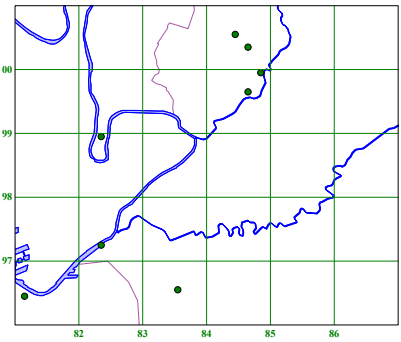
Lycaena phlaeas (SMALL COPPER) 1990-1999



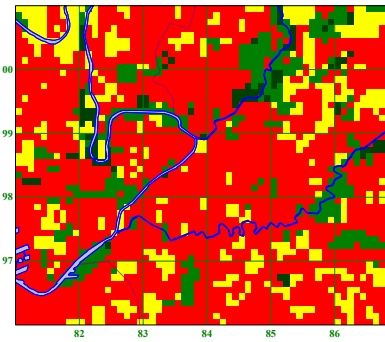
Lycaena phlaeas (SMALL COPPER) 2000-2009



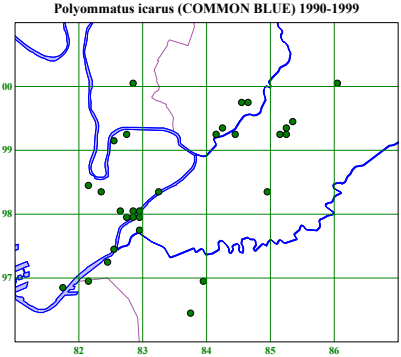
Lycaena phlaeas (SMALL COPPER) 2010-2019



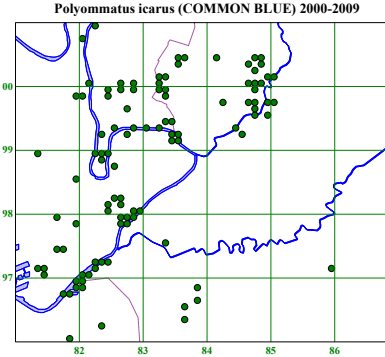
Manchester Centre urban cover 1990



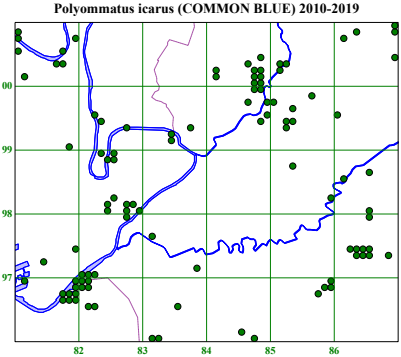
Polyommatus icarus (COMMON BLUE) 1990-1999



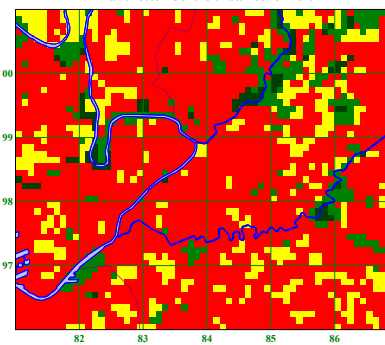
Polyommatus icarus (COMMON BLUE) 2000-2009

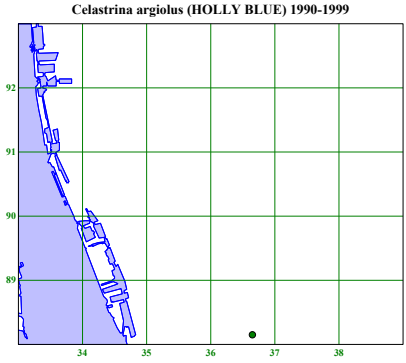


Polyommatus icarus (COMMON BLUE) 2010-2019



Manchester Centre urban cover 2019




Celastrina argiolus (HOLLY BLUE) 1990-1999
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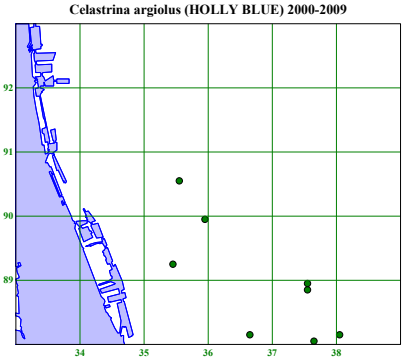
Celastrina argiolus (HOLLY BLUE) 2000-2009
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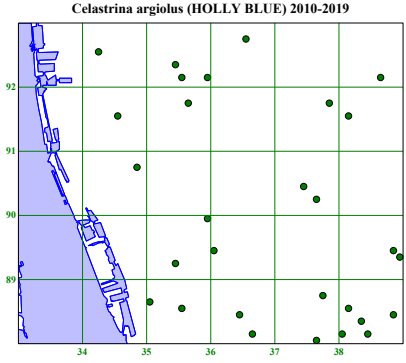
Celastrina argiolus (HOLLY BLUE) 2010-2019
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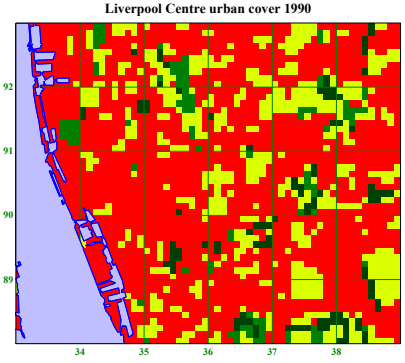
Liverpool Centre urban cover 1990
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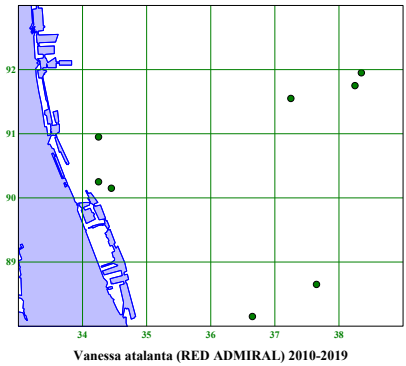
Vanessa atalanta (RED ADMIRAL) 1990-1999
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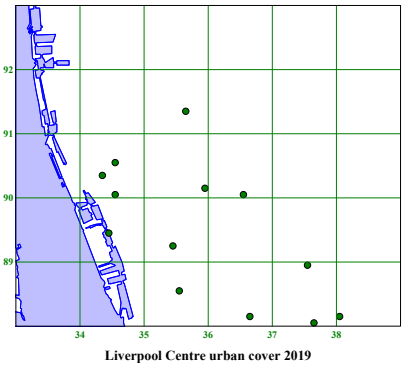
Vanessa atalanta (RED ADMIRAL) 2000-2009
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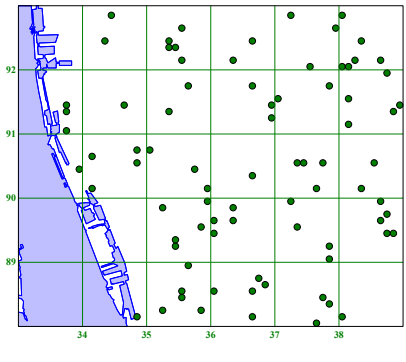
Vanessa atalanta (RED ADMIRAL) 2010-2019
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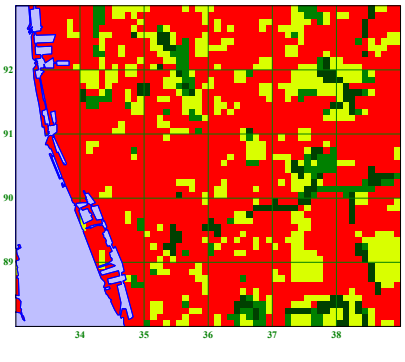
Liverpool Centre urban cover 2019
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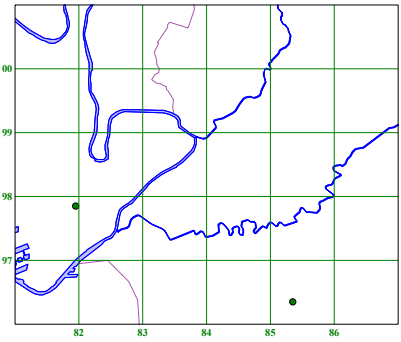
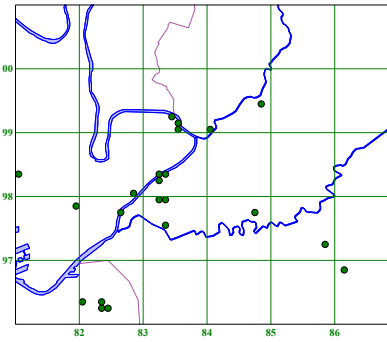
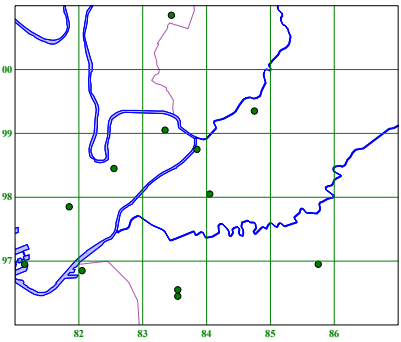
Celastrina argiolus (HOLLY BLUE) 1990-1999



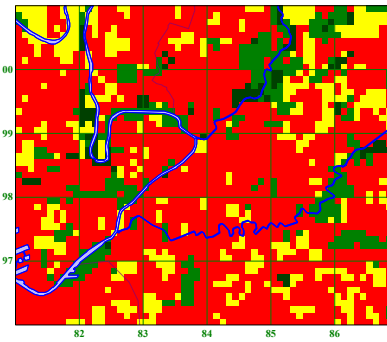
Celastrina argiolus (HOLLY BLUE) 2000-2009



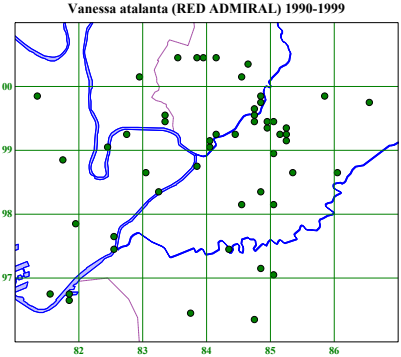
Celastrina argiolus (HOLLY BLUE) 2010-2019



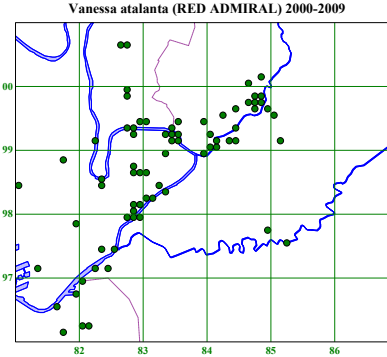
Manchester Centre urban cover 1990



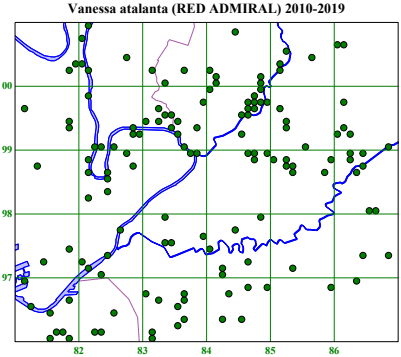
Vanessa atalanta (RED ADMIRAL) 1990-1999



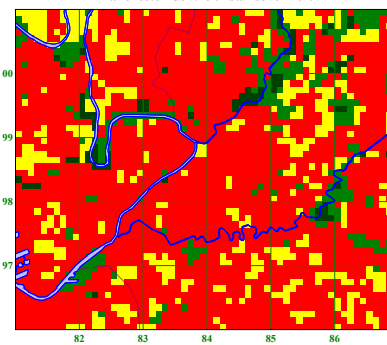
Vanessa atalanta (RED ADMIRAL) 2000-2009

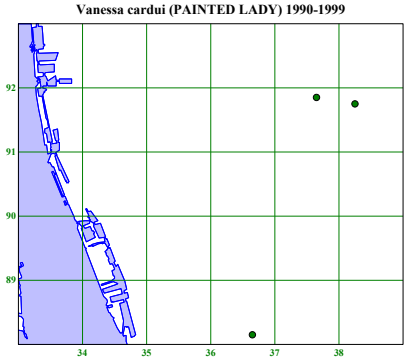


Vanessa atalanta (RED ADMIRAL) 2010-2019



Manchester Centre urban cover 2019




Vanessa cardui (PAINTED LADY) 1990-1999
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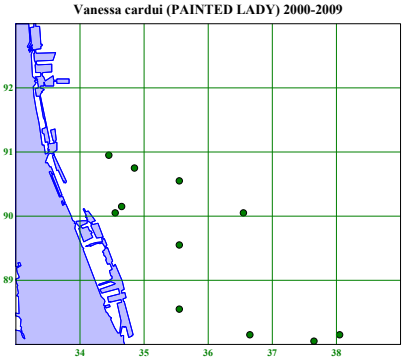
Vanessa cardui (PAINTED LADY) 2000-2009
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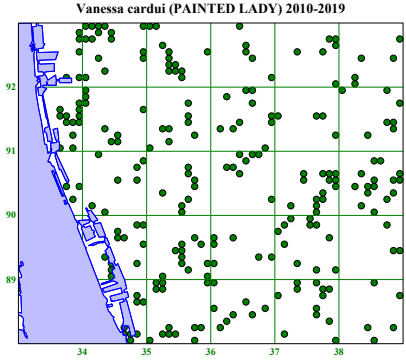
Vanessa cardui (PAINTED LADY) 2010-2019
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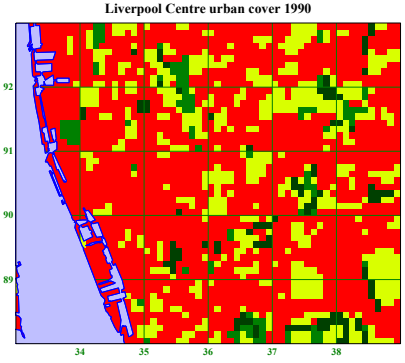
Liverpool Centre urban cover 1990
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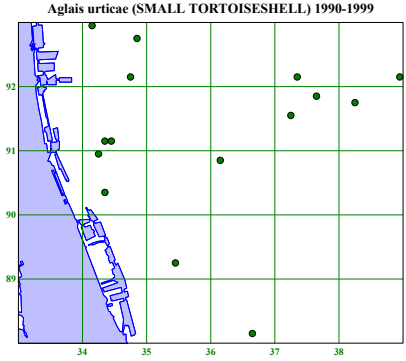
Aglais urticae (SMALL TORTOISESHELL) 1990-1999
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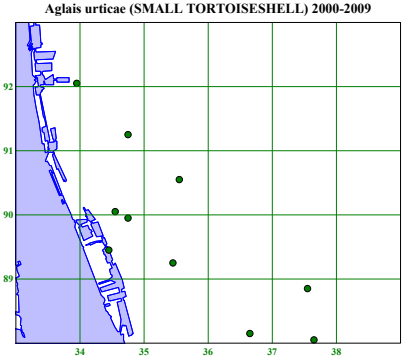
Aglais urticae (SMALL TORTOISESHELL) 2000-2009
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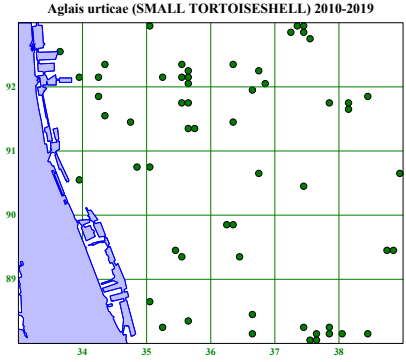
Aglais urticae (SMALL TORTOISESHELL) 2010-2019
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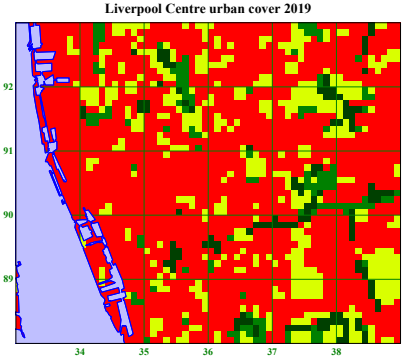
Liverpool Centre urban cover 2019
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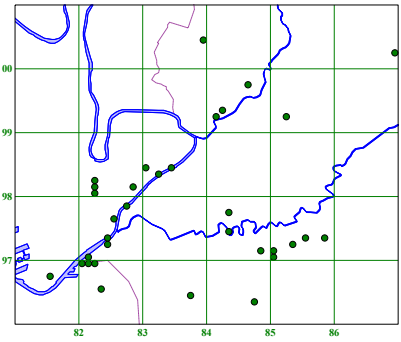
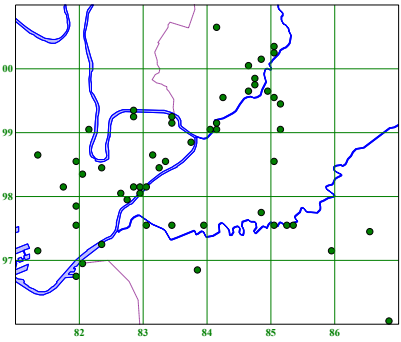
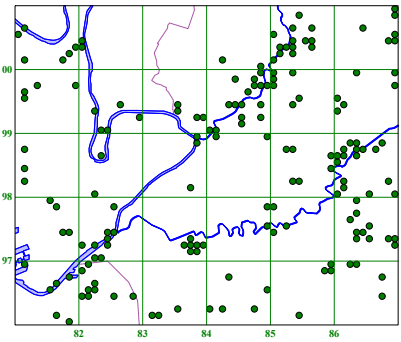
Vanessa cardui (PAINTED LADY) 1990-1999



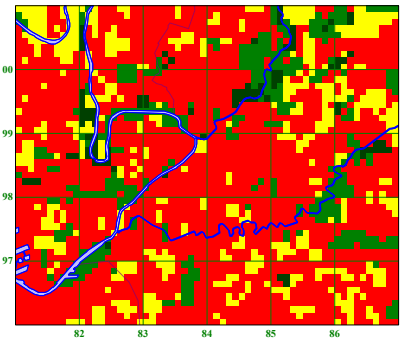
Vanessa cardui (PAINTED LADY) 2000-2009



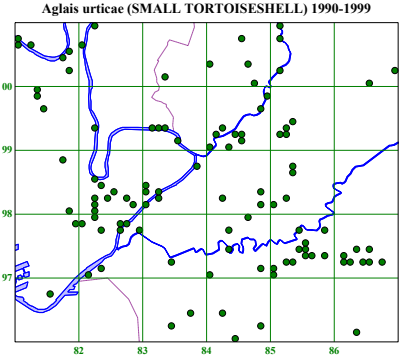
Vanessa cardui (PAINTED LADY) 2010-2019



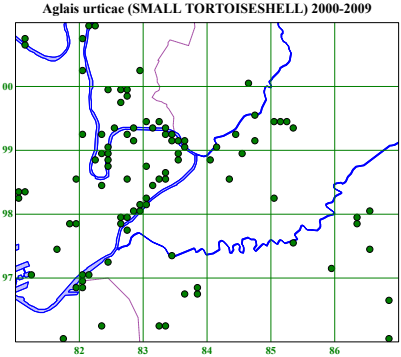
Manchester Centre urban cover 1990



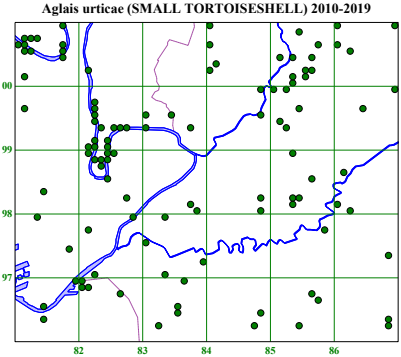
Aglais urticae (SMALL TORTOISESHELL) 1990-1999



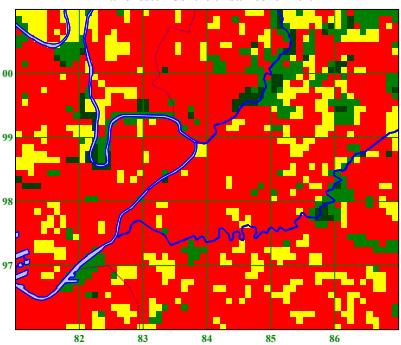
Aglais urticae (SMALL TORTOISESHELL) 2000-2009

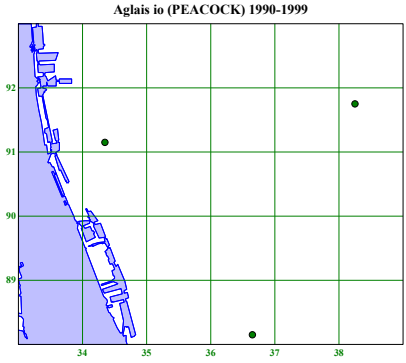


Aglais urticae (SMALL TORTOISESHELL) 2010-2019



Manchester Centre urban cover 2019




Aglais io (PEACOCK) 1990-1999
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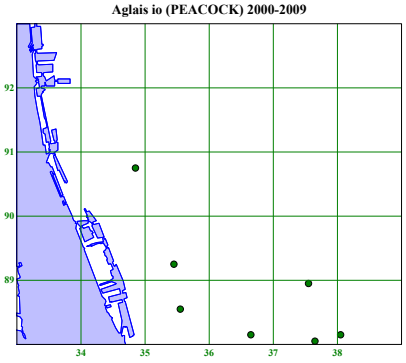
Aglais io (PEACOCK) 2000-2009
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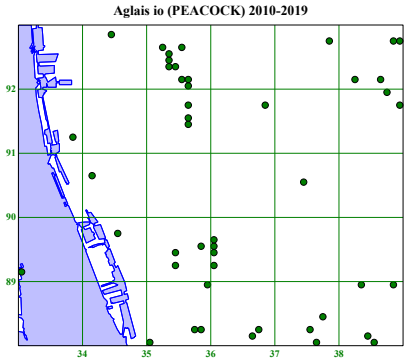
Aglais io (PEACOCK) 2010-2019
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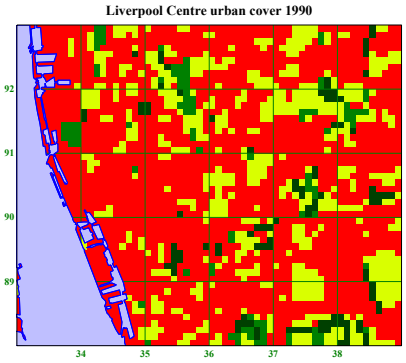
Liverpool Centre urban cover 1990
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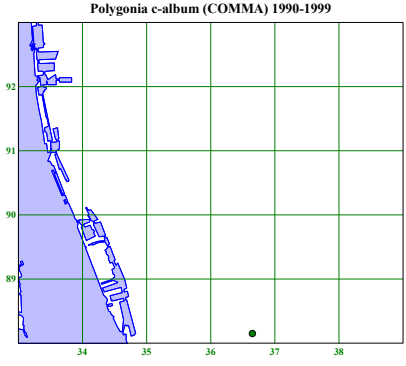
Polygonia c-album (COMMA) 1990-1999
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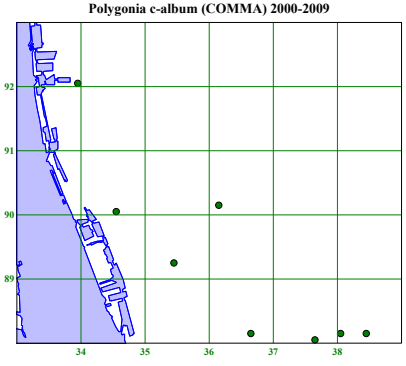
Polygonia c-album (COMMA) 2000-2009
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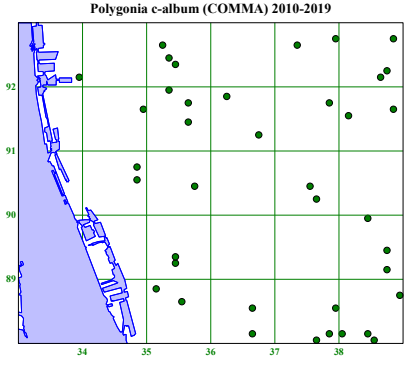
Polygonia c-album (COMMA) 2010-2019
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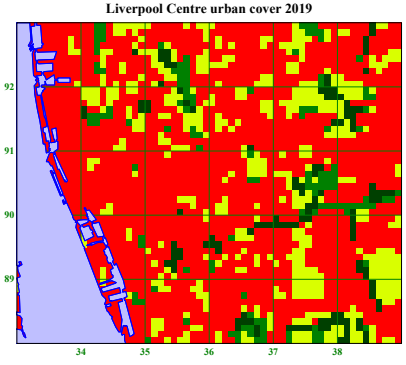
Liverpool Centre urban cover 2019
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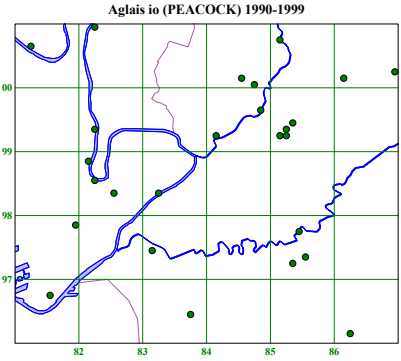
Aglais io (PEACOCK) 1990-1999
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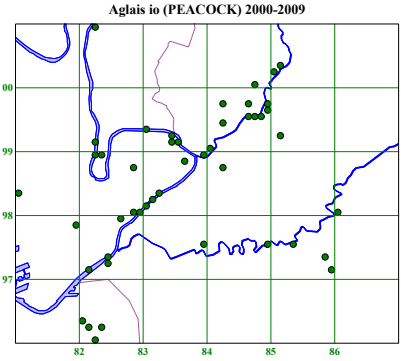
Aglais io (PEACOCK) 2000-2009
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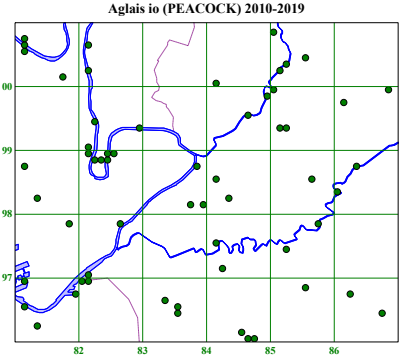
Aglais io (PEACOCK) 2010-2019
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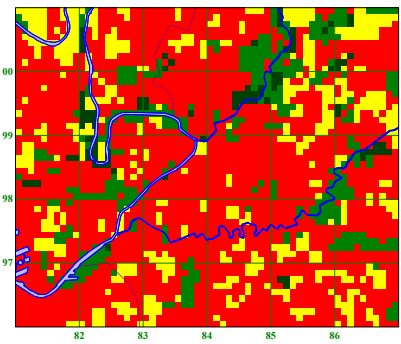
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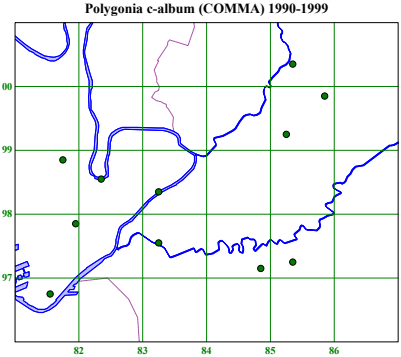
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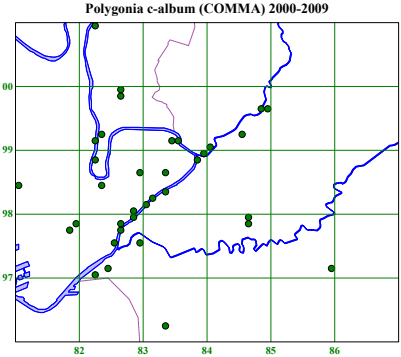
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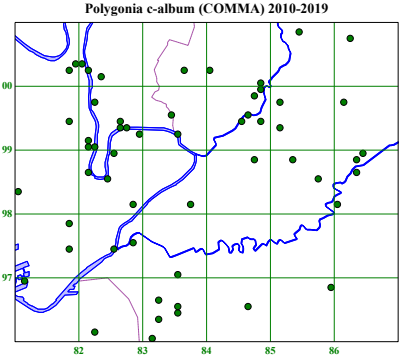
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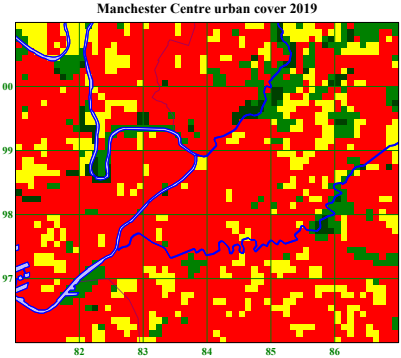
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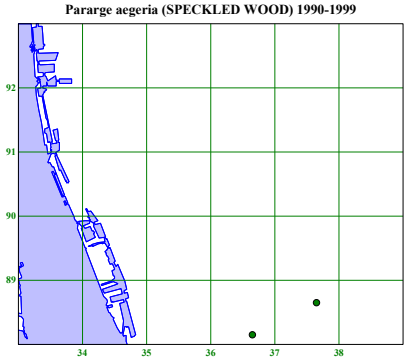
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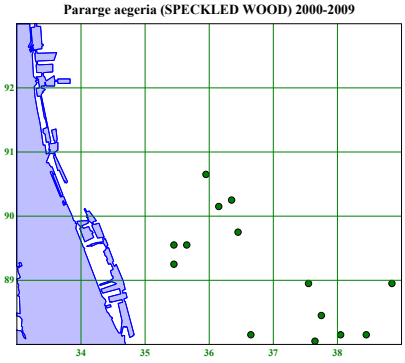
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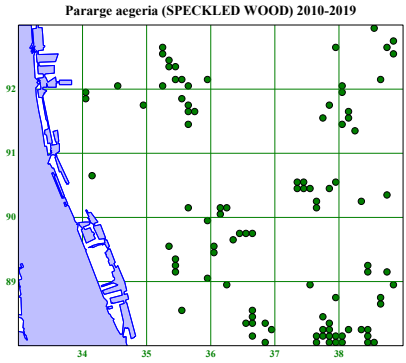
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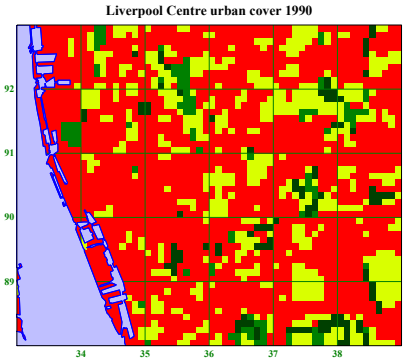
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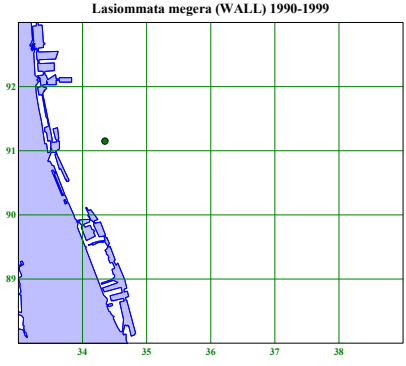
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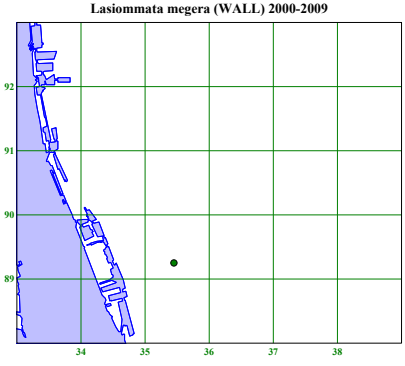
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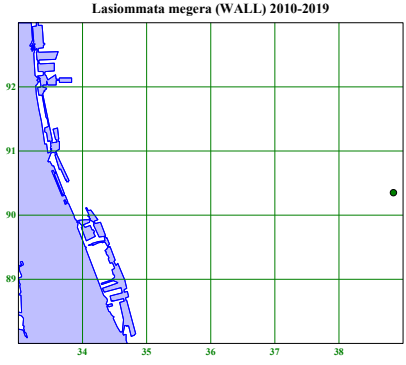
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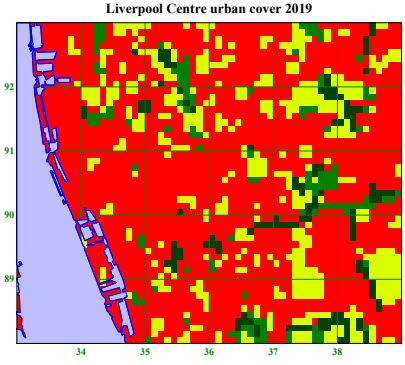
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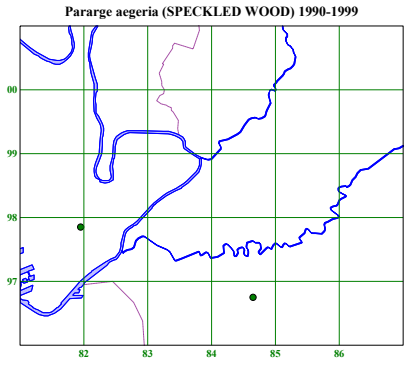
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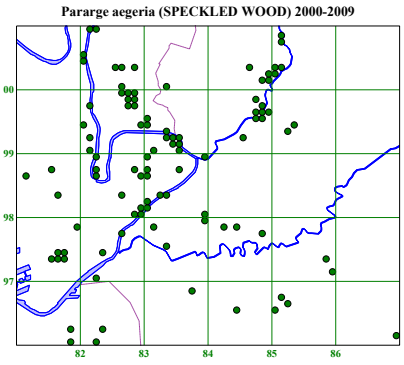
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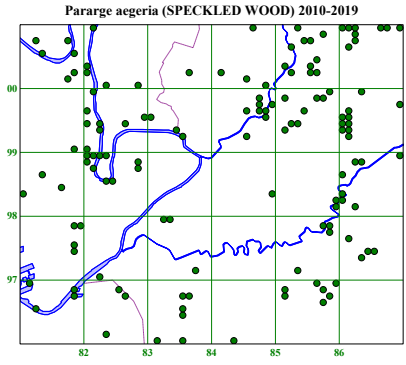
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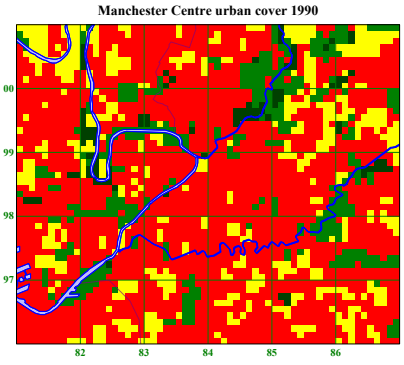
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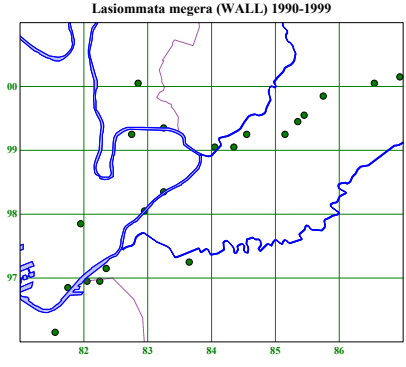
Lasiommata megera (WALL) 1990-1999
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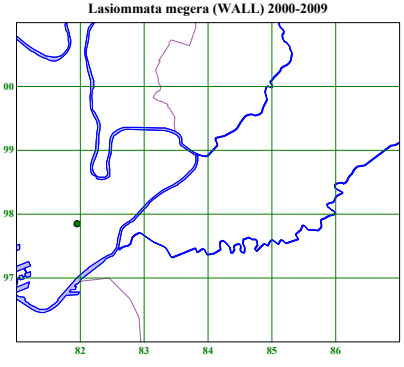
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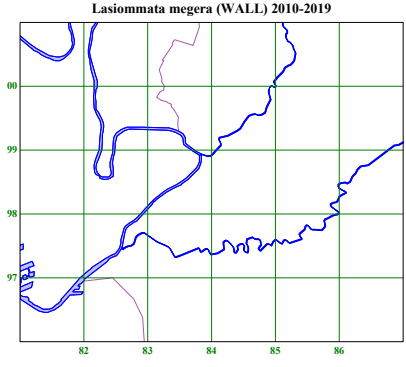
Lasiommata megera (WALL) 2010-2019
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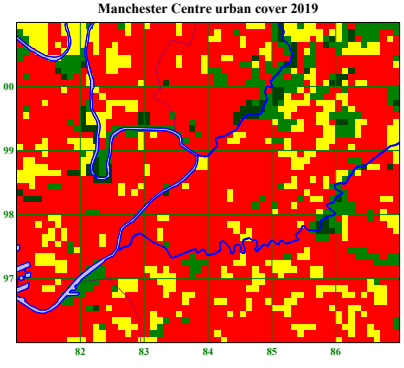
Manchester Centre urban cover 2019
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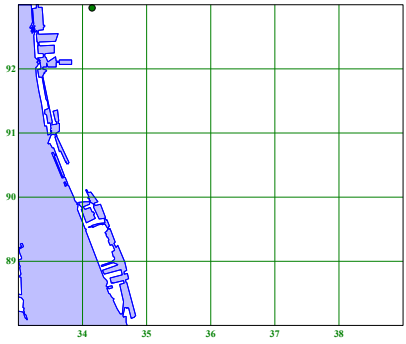
Pyronia tithonus (GATEKEEPER) 1990-1999



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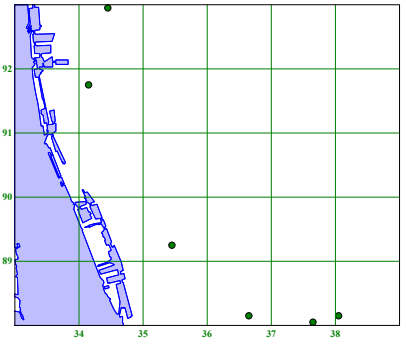

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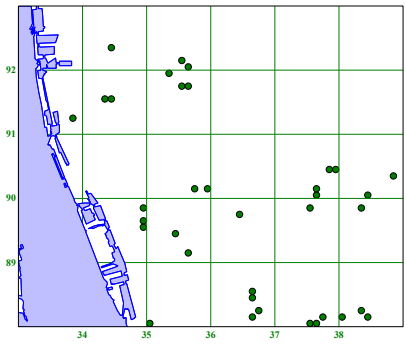
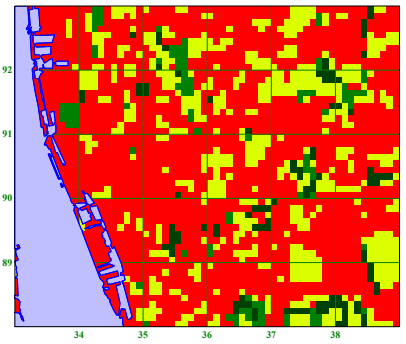
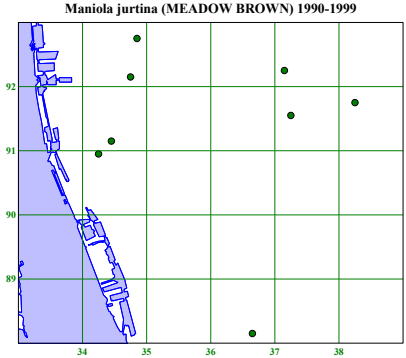


Liverpool Centre urban cover 1990



Maniola jurtina (MEADOW BROWN) 1990-1999



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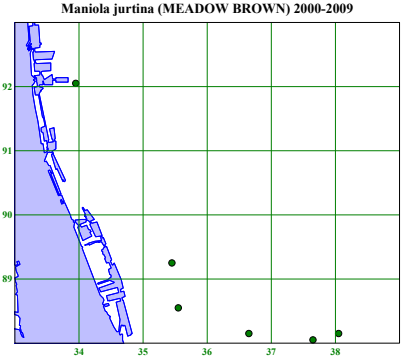

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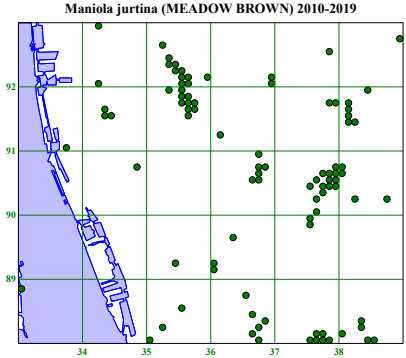
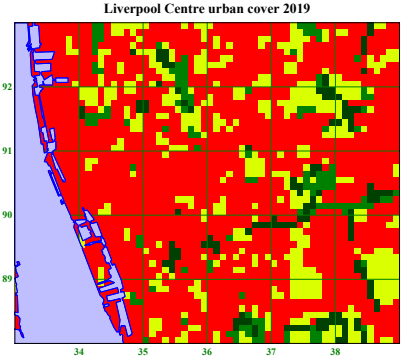


Liverpool Centre urban cover 2019



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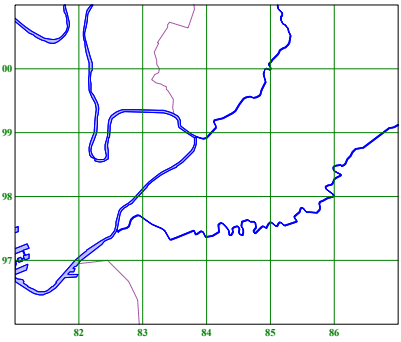

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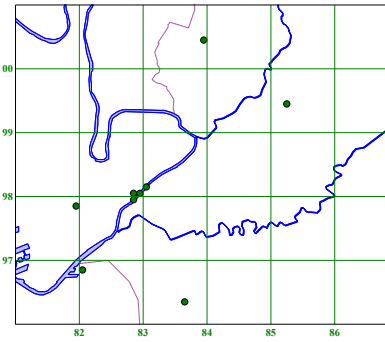
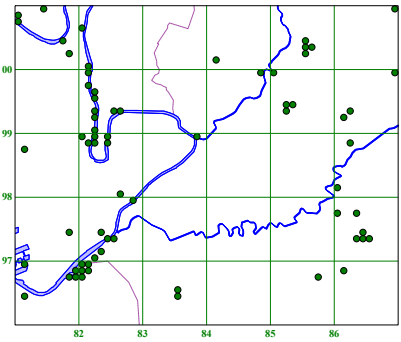
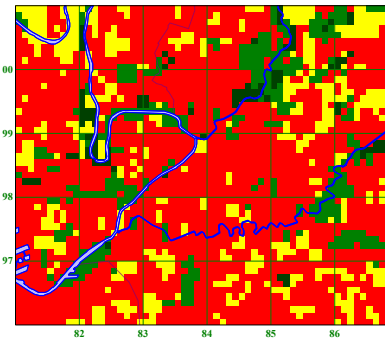


Pyronia tithonus (GATEKEEPER) 2010-2019



Manchester Centre urban cover 1990



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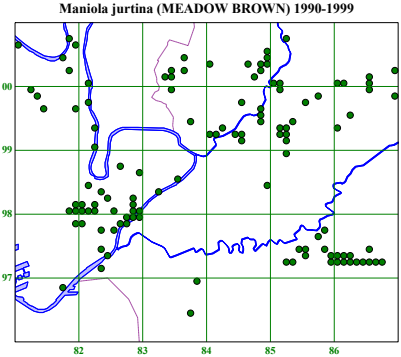

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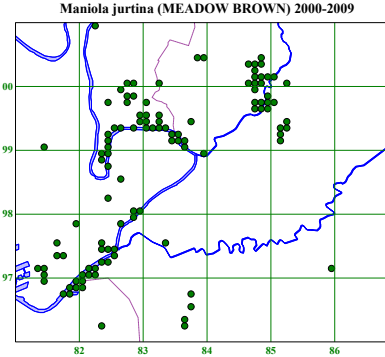
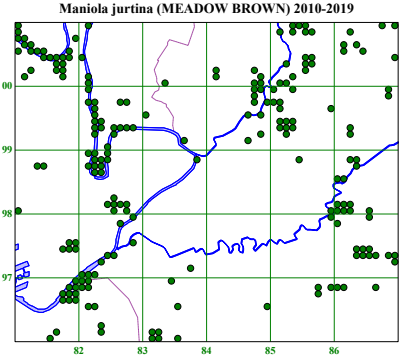
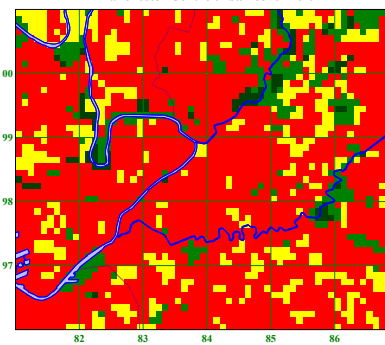


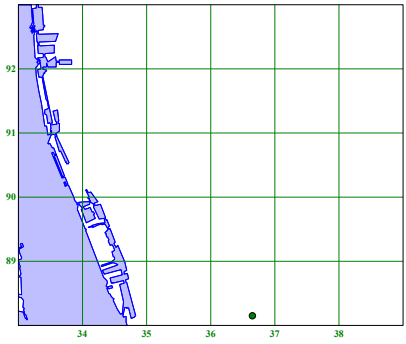
Maniola jurtina (MEADOW BROWN) 2010-2019



Manchester Centre urban cover 2019



Coenonympha pamphilus (SMALL HEATH) 1990-1999



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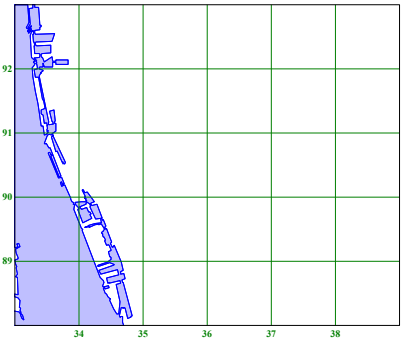
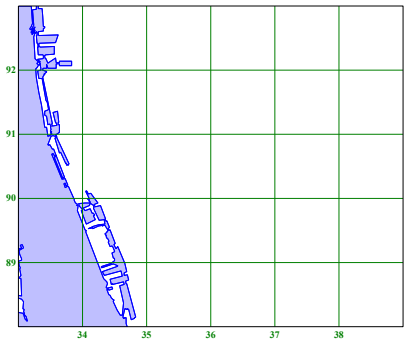
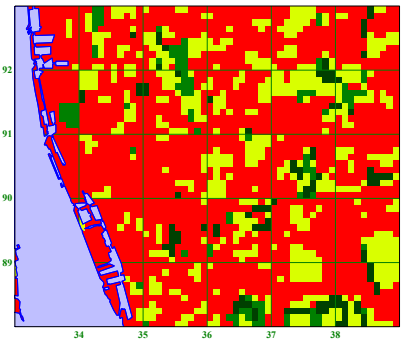


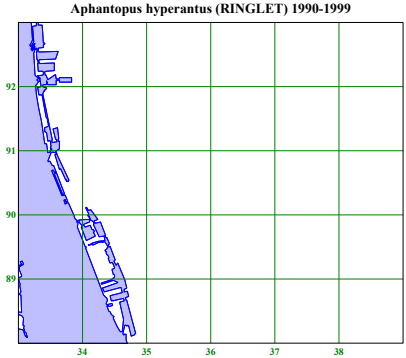
Coenonympha pamphilus (SMALL HEATH) 2010-2019



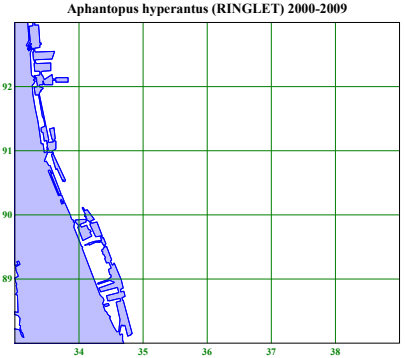
Liverpool Centre urban cover 1990



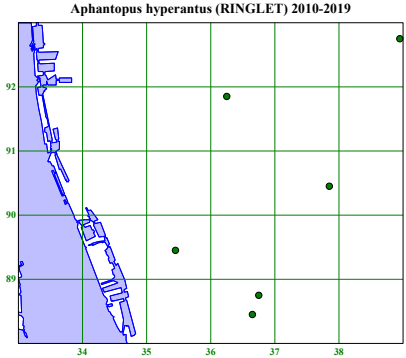
Aphantopus hyperantus (RINGLET) 1990-1999



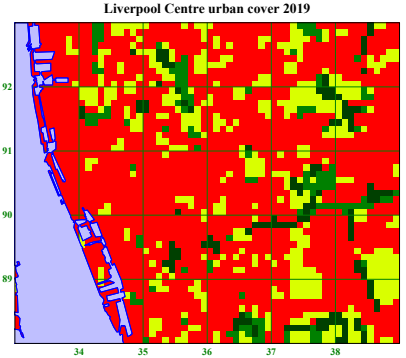
Aphantopus hyperantus (RINGLET) 2000-2009

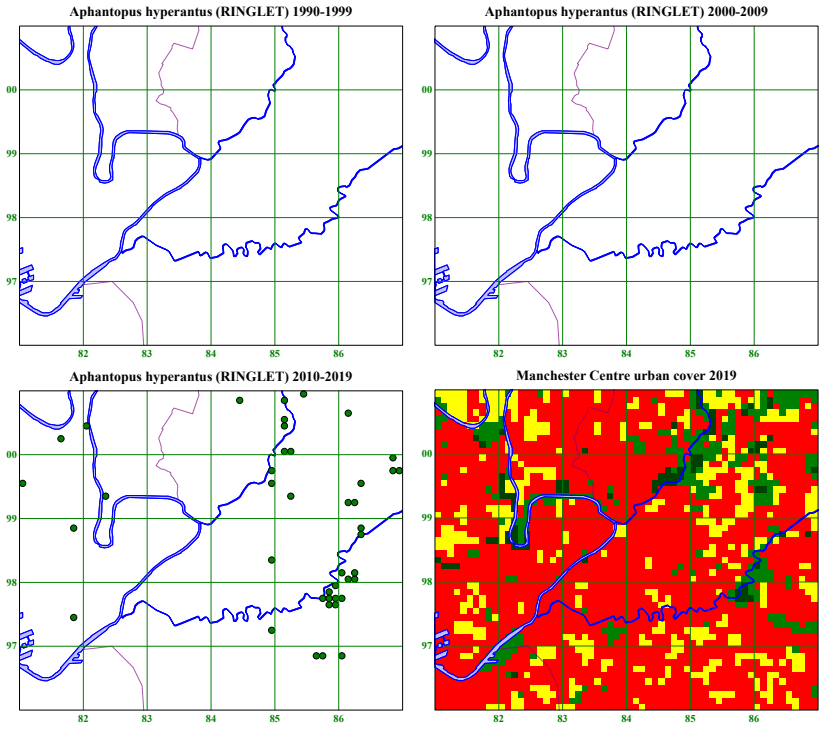


Aphantopus hyperantus (RINGLET) 2010-2019



Liverpool Centre urban cover 2019




Aphantopus hyperantus (RINGLET) 1990-1999
Aphantopus hyperantus (RINGLET) 2000-2009
Aphantopus hyperantus (RINGLET) 2010-2019
Manchester Centre urban cover 2019
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ADULT FEEDING – NECTAR AND OTHER SOURCES

Whilst the most important resource for any butterfly species is unquestionably the larval hostplant, this is far from being the only resource which constitutes a butterfly's habitat. The adult insects require nutrition to provide them with energy, fat reserves, and sperm and egg production: this nutrition is mostly from flower nectar, though some species also utilise other sources, such as over-ripe fruit, aphid honey-dew, carrion, dung or minerals from damp ground or road surfaces, these last usually referred to as "mud-puddling". The locations where adult butterflies feed may be close to where they fed as caterpillars – for example, Common Blues *Polyommatus icarus* very frequently are seen taking nectar from the flowers of their larval hostplant Bird's-foot Trefoil – or may be a considerable distance away and in a very different-seeming environment, especially in the case of the mobile Nymphalids and Pierids, for which there are numerous records in built-up areas well away from any likely breeding habitat.

The author's records of the plants from which butterflies were seen taking nectar date mostly from 1996 onwards, though there are a few from the earlier years of period 1. Latterly, some other recorders have noted nectar sources, and further records have been obtained from publications including B.T. Shaw's annual reports on the butterflies of Cheshire and L. Sivell's on the butterflies of Lancashire.

Much has been written about "garden butterflies" and "gardening for butterflies"; indeed a lepidopterist resident in the Midlands, M. Vickery, has over the years amassed a considerable database of cultivated flowering plants on which her contributors have seen butterflies feeding. Over the years, therefore, her work gave the impression that the planting of suitable flowering garden plants could provide a haven for butterflies and a very significant resource for them. Her survey however took no account of the many plants from which butterflies obtain nectar in the wild. In the present work, an attempt is made to address this imbalance by tabulating all observed sources of nectar, whether cultivated or wild, and other adult nutrition including feeding from ripe fruit, carrion, dung or mud/damp mineral-rich surfaces, in Lancashire and Cheshire during the three periods covered. The results seem to indicate that wild nectar sources are vastly more important than garden ones; and for any butterflies at all to appear in gardens it is essential that there must be breeding habitat, if not immediately adjacent, at least within reach.

"Wild" vegetation here can include both native plants and alien ones that have run wild – self-seeded or "garden escapes". The dividing lines between "decorative garden plants", "wild flowers" and "invasive weeds" are not always all that obvious, and in different places the same plant species may be viewed in more than one of these categories. The foremost example is the "Butterfly Bush" *Buddleja davidii*, which has long been popular in gardens and parks, but which also grows wild in great profusion in towns and cities especially in run-down districts around industry and demolition sites. This plant is non-indigenous, hailing originally from Sichuan and Hubei provinces in central China, and therefore has no natural enemies in Britain; it seeds very readily and the seedlings will often germinate in such places as gaps in concrete, cracks between slabs in pavements or mortar between bricks in

walls. In densely-packed housing districts, such as close to the centres of Liverpool and Manchester, where gardens are small or non-existent and the human population does not include many keen gardeners, buddleia bushes are able to establish themselves and frequently provide a nectar source for butterflies even in the tiniest of front gardens and alleys and backyards. Michaelmas Daisies have also spread: in the 1990s there were huge swathes of them especially on former tips around Manchester, though latterly their numbers have become rather less; they are mostly the hybrid *Aster x salignus*, whereas those grown in gardens are more likely *A. amellus* or *A. novi-belgii*. Our initial nectar survey, in 1996/7, showed these two plants as among the six most frequently used by butterflies, with Buddleia appearing a clear first, which as regards the number of individual butterflies using it (as distinct from the number of butterfly species) it quite clearly still is. It should however be borne in mind that it is primarily the five Nymphalines (the Red Admiral *Vanessa atalanta*, the Painted Lady *V. cardui*, the Small Tortoiseshell *Aglais urticae*, the Peacock *A. io* and the Comma *Polygonia c-album*) and the most mobile of the Pierids (the Large White *Pieris brassicae* and the Small White *P. rapae*) which regularly use it; other species were only recorded on seven occasions during the initial two years. It is possible to over-estimate the usefulness of the plant as a nectar source by omitting to take account of three factors: (a) the vagility of the Nymphalines and Pierids, (b) the extent to which they move away from breeding habitats in search of nectar, including into gardens which contain no breeding habitat, and (c) the general apparency and popular appeal of these "showy" butterflies to the general public.

As will be seen from the following tabulation of the nutrition sources which attracted ten or more butterfly species, some native plants such as Bramble, Creeping Thistle, Knapweed and Ragwort scored higher than Buddleia in number of species, the overall highest being Ragwort with 25 in period 3. The nomenclature follows Stace (1997).

Period 1
Rubus fruticosus agg. (BRAMBLE, native) 18, *Cirsium arvense* (CREEPING THISTLE, native) 18, *Centaurea nigra* (BLACK/COMMON KNAPWEED, native) 14, *Aster x salignus* (COMMON MICHAELMAS-DAISY, introduced) 16, *Buddleja davidii* (BUDDLEIA/BUTTERFLY-BUSH, introduced) 16, *Senecio jacobaea* (COMMON RAGWORT, native) 16, *Buddleja davidii* (BUDDLEIA/BUTTERFLY-BUSH, introduced) 16, *Trifolium pratense* (RED CLOVER, native) 14, *Ranunculus acris* (MEADOW BUTTERCUP, native) 12, *Taraxacum* sp. (DANDELION, native) 11.

Period 2
Cirsium arvense (CREEPING THISTLE, native) 21, *Buddleja davidii* (BUDDLEIA/BUTTERFLY-BUSH, introduced) 18, *Rubus fruticosus* agg. (BRAMBLE, native) 17, *Senecio jacobaea* (COMMON RAGWORT) 16, *Centaurea nigra* (BLACK/COMMON KNAPWEED, native) 15, *Aster x salignus* (COMMON MICHAELMAS-DAISY, introduced) 14, *Taraxacum* sp. (DANDELION, native) 13, *Ranunculus acris* (MEADOW BUTTERCUP, native) 13, *Calluna vulgaris* (HEATHER, native) 13, *Trifolium pratense* (RED CLOVER, native) 10.

Period 3
Senecio jacobaea (COMMON RAGWORT, native) 25, *Cirsium arvense* (CREEPING THISTLE, native) 23, *Rubus fruticosus* agg. (BRAMBLE, native) 21, *Buddleja davidii* (BUDDLEIA/BUTTERFLY-BUSH, introduced) 20, *Cirsium palustre* (MARSH THISTLE, native) 19, *Centaurea nigra* (BLACK/COMMON KNAPWEED, native) 16, *Eupatorium cannabinum* (HEMP AGRIMONY, native) 15, *Taraxacum* sp. (DANDELION, native) 15, *Cirsium vulgare* (SPEAR THISTLE, native) 14, *Lotus corniculatus* (COMMON BIRD'S-FOOT TREFOIL, native) 14, *Trifolium pratense* (RED CLOVER, native) 14, *Calluna vulgaris* (HEATHER, native) 13, *Pulicaria dysenterica* (COMMON FLEABANE, native) 13,

Ranunculus acris (MEADOW BUTTERCUP, native) 13, *Ligustrum ovalifolium* (GARDEN PRIVET, introduced) 13, (Mud-puddling) 12, *Aster x salignus* (COMMON MICHAELMAS-DAISY, introduced) 12, *Knautia arvensis* (FIELD SCABIOUS, native) 12, *Origanum vulgare* (WILD MARJORAM, native) 12, *Trifolium repens* (WHITE CLOVER, native) 11.

The following shows the number of individual butterflies recorded for the nutrition sources which attracted 100 or more individuals, during each of the three periods. Buddleia is way in the lead in each period, and Creeping Thistle second, also in each period.

Period 1
Buddleja davidii (BUDDLEIA/BUTTERFLY-BUSH, introduced) 922, *Cirsium arvense* (CREEPING THISTLE, native) 552, *Taraxacum* sp. (DANDELION, native) 256, *Senecio jacobaea* (COMMON RAGWORT, native) 216, *Rubus fruticosus* agg. (BRAMBLE, native) 163, *Aster x salignus* (COMMON MICHAELMAS-DAISY, introduced) 154, *Sedum spectabile* (BUTTERFLY STONECROP/ICE-PLANT, introduced) 102.

Period 2
Buddleja davidii (BUDDLEIA/BUTTERFLY-BUSH, introduced) 2419, *Cirsium arvense* (CREEPING THISTLE, native) 1434, *Aster x salignus* (COMMON MICHAELMAS-DAISY, introduced) 462, *Sedum spectabile* (BUTTERFLY STONECROP/ICE-PLANT, introduced) 332, *Centaurea nigra* (BLACK/COMMON KNAPWEED, native) 297, *Senecio jacobaea* (COMMON RAGWORT, native) 287, *Taraxacum* sp. (DANDELION, native) 266, *Rubus fruticosus* agg. (BRAMBLE, native) 248, *Pulicaria dysenterica* (COMMON FLEABANE, native) 190, *Hedera helix* (IVY, native) 175, *Aster tripolium* (SEA ASTER, native) 170, *Lotus corniculatus* (COMMON BIRD'S-FOOT TREFOIL, native) 152.

Period 3
Buddleja davidii (BUDDLEIA/BUTTERFLY-BUSH) 4461, *Cirsium arvense* (CREEPING THISTLE, native) 1764, *Senecio jacobaea* (COMMON RAGWORT, native) 1263, *Hedera helix* (IVY, native) 933, *Rubus fruticosus* agg. (BRAMBLE, native) 700, *Taraxacum* sp. (DANDELION, native) 457, *Centaurea nigra* (BLACK/COMMON KNAPWEED, native) 390, *Buddleja x weyeriana* (YELLOW BUDDLEIA/WEYER'S BUTTERFLY-BUSH) 245, *Sedum spectabile* (BUTTERFLY STONECROP/ICE-PLANT) 245, *Aster x salignus* (COMMON MICHAELMAS-DAISY) 228, *Trifolium pratense* (RED CLOVER, native) 214, *Cirsium palustre* (MARSH THISTLE, native) 171, *Lotus corniculatus* (COMMON BIRD'S-FOOT TREFOIL, native) 170, *Verbena bonariensis* (ARGENTINIAN VERVAIN) 170, *Calluna vulgaris* (HEATHER, native) 151, *Epilobium hirsutum* (GREAT WILLOWHERB, native) 147, *Cardamine pratensis* (CUCKOO FLOWER, native) 139.

The figure for *Aster tripolium* in period 2 is 70 *Pieris rapae* mentioned by Shaw (2005) as having been reported from Hale Shore on 17.8.2004 plus an estimated 100 *Aglais urticae* mentioned by Jones (2005) in a paper primarily about bird predation of butterflies as having been noted at Morecambe Bay on 23.8.2003, and is included here with reservations.

Brimstone *Gonepteryx rhamni*, on Dandelion, Sale water-park 12.5.2016

Small Skipper *Thymelicus sylvestris*, on a variety of Knapweed, Littleton Road playing fields 11.7.2019

Small White *Pieris rapae*, on Ice-plant (Butterfly Stonecrop), Wythenshawe Park 11.9.2016

Red Admiral *Vanessa atalanta*, on wild Michaelmas-daisy, Stretford tip 5.10.2017

Small Tortoiseshell *Aglais urticae*, on Sallow (Grey Willow), Carrington Moss 18.4.2018

Large White *Pieris brassicae*, on unidentified Thistle, Ainsdale 7.7.2018

Green-veined White *Pieris napi*, Gatekeeper *Pyronia tithonus* and Ringlet *Aphantopus hyperantus* on Ragwort, Broadbottom 19.7.2018

Painted Lady *Vanessa cardui*, on Sea Holly, Seaforth 23.7.2018

Adult nutrition

Peacock *Aglais io*, on Sea Holly, Seaforth 23.7.2018

Wall *Lasiommata megera*, on Fleabane, Formby 4.8.2018

Small White *Pieris rapae*, on Ragwort, Fazakerley 25.8.2018

Speckled Wood *Pararge aegeria*, on wild Buddleia, Falkner Street, Liverpool 20.7.2019

Grayling *Hipparchia semele*, on Creeping Thistle, Formby 7.7.2018

Painted Ladies *Vanessa cardui*, feeding and basking on wild Buddleia, Everton, Liverpool 1.8.2019

Holly Blue *Celastrina argiolus*, on Bramble, Everton Park, Liverpool 21.8.2019

Small White *Pieris rapae*, on cultivated Michaelmas-daisy, formal garden near Manchester University 20.9.2019

Adult nutrition

Small Skipper *Thymelicus sylvestris*, "mud-puddling" on damp ground by brook, Hyde 9.7.2014

Red Admiral *Vanessa atalanta*, "mud-puddling" on damp ground, Stretford Ees 10.7.2015

Speckled Wood *Pararge aegeria*, "mud-puddling" on road surface, Mills Brow 30.9.2014

Holly Blue *Celastrina argiolus*, "mud-puddling" on wet splashes on grass stem, Timperley 23.5.2016

Holly Blue *Celastrina argiolus*, "mud-puddling" on P.B.H.'s shoe, Wigan Flashes 21.8.2016

Green-veined White *Pieris napi* (and flies) feeding on decayed farm waste, Carrington Moss 28.8.2015

Small Copper *Lycaena phlaeas* and Meadow Brown *Maniola jurtina*, on Creeping Thistle, Rakewood 8.8.2010

Two Commas *Polygonia c-album*, feeding on over-ripe pears, Hillam Farm, Urmston 21.9.2011

Adult nutrition

The following is a full list of the plants and other nutritional sources noted during the three periods, and the butterflies noted as using them, including the number of individuals, in each of the periods. The intention has been only to make a nectar record when a butterfly has actually been seen to be feeding, even though there have also been very many instances, especially with *Vanessa atalanta* and *V. cardui*, where butterflies have been seen, or disturbed, when thermoregulating on leaves or on the adjacent ground around a nectar source, such as a Buddleia bush, from which they obviously had been feeding not long previously. It is possible that sometimes mistakes will have been made and a butterfly noted as feeding when it was actually just sitting on, or inspecting, a flower. There is also a possibility that some of the plants may have been misidentified, as the author is not quite as knowledgeable about botany as about entomology, and this may well apply to some of the other recorders also.

***Abelia* sp.** (ABELIA (UNSPECIFIED))
(Period 2) *Vanessa atalanta* (1).
(Period 3) *Vanessa atalanta* (1).

Abelia x grandiflora (ABELIA)
(Period 2) *Pieris brassicae* (1), *Vanessa atalanta* (1).

***Acanthus* sp.** (BEAR'S-BREECHES)
(Period 3) *Pieris rapae* (1).

Achillea millefolium (YARROW)
(Period 1) *Thymelicus sylvestris* (1), *Lycaena phlaeas* (3), *Polyommatus icarus* (1), *Pyronia tithonus* (1).
(Period 2) *Ochlodes sylvanus* (1), *Pieris rapae* (1), *Pieris napi* (1), *Vanessa cardui* (1), *Maniola jurtina* (1).
(Period 3) *Thymelicus sylvestris* (1), *Pieris napi* (2), *Lycaena phlaeas* (2), *Vanessa atalanta* (1), *Pararge aegeria* (1), *Pyronia tithonus* (1), *Maniola jurtina* (1).

Achillea ptarmica (SNEEZEWORT)
(Period 3) *Thymelicus sylvestris* (2), *Pieris napi* (1), *Lycaena phlaeas* (1), *Pyronia tithonus* (1).

Actaea simplex (BANEBERRY)
(Period 3) *Vanessa atalanta* (1).

Aegopodium podagraria (GROUND-ELDER)
(Period 2) *Ochlodes sylvanus* (1).

Aesculus carnea (RED HORSE-CHESTNUT)
(Period 2) *Pieris brassicae* (1).

Aesculus hippocastanum (HORSE-CHESTNUT)
(Period 3) *Pieris napi* (3).

Ajuga reptans (BUGLE)
(Period 1) *Hamearis lucina* (1), *Boloria euprhrosye* (2).
(Period 2) *Boloria euprhrosye* (1).
(Period 3) *Erynnis tages* (1), *Pieris napi* (1), *Boloria euprhrosye* (1).

Alliaria petiolata (GARLIC MUSTARD)
(Period 1) *Pieris rapae* (1), *Pieris napi* (2), *Anthocharis cardamines* (6), *Lycaena phlaeas* (1).
(Period 2) *Gonepteryx rhamni* (1), *Pieris rapae* (2), *Pieris napi* (4), *Anthocharis cardamines* (6), *Aglais io* (1).
(Period 3) *Pieris rapae* (6), *Pieris napi* (9), *Anthocharis cardamines* (17).

Allium schoenoprasum (CHIVES)
(Period 3) *Vanessa cardui* (1).

***Allium* sp**. (ONION (UNSPECIFIED))
(Period 2) *Aglais urticae* (1).

Allium ursinum (RAMSONS)
(Period 2) *Pieris napi* (1).
(Period 3) *Anthocharis cardamines* (1), *Aglais urticae* (1).

Amberboa moschata (SWEET SULTAN)
(Period 1) *Aglais urticae* (3).

Anemone nemorosa (WOOD ANEMONE)
(Period 3) *Aglais io* (1).

Anemone x hybrida (JAPANESE ANEMONE)
(Period 1) *Vanessa atalanta* (1).

Angelica sylvestris (WILD ANGELICA)
(Period 2) *Polygonia c-album* (1).

Anthemis arvensis (CORN CHAMOMILE)
(Period 1) *Pieris rapae* (1), *Lycaena phlaeas* (1), *Polyommatus icarus* (1), *Vanessa cardui* (1).
(Period 2) *Vanessa cardui* (1), *Aglais urticae* (2), *Maniola jurtina* (1).
(Period 3) *Pieris napi* (1), *Polyommatus icarus* (1), *Aglais urticae* (1).

Anthriscus sylvestris (COW PARSLEY)
(Period 1) *Pieris brassicae* (1), *Pieris napi* (3), *Anthocharis cardamines* (2), *Aglais urticae* (1), *Aglais io* (1), *Polygonia c-album* (1), *Pararge aegeria* (2).
(Period 2) *Pieris napi* (5), *Anthocharis cardamines* (2).
(Period 3) *Pieris napi* (2), *Vanessa cardui* (10).

Anthyllis vulneraria (KIDNEY VETCH)
(Period 3) *Cupido minimus* (1).

Antirrhinum majus (SNAPDRAGON)
(Period 1) *Pieris rapae* (1).
(Period 3) *Pieris rapae* (1).

Aquilegia vulgaris (COLUMBINE)
(Period 3) *Anthocharis cardamines* (1).

Arbutus unedo (STRAWBERRY-TREE)
(Period 3) *Vanessa atalanta* (17).

Arctium lappa (GREATER BURDOCK)
(Period 2) *Gonepteryx rhamni* (7), *Vanessa atalanta* (1), *Aglais io* (1), *Argynnis paphia* (1), *Maniola jurtina* (1).
(Period 3) *Pieris rapae* (2), *Pieris napi* (3).

Argyranthemum frutescens (MARGUERITE)
(Period 1) *Pieris rapae* (1), *Lycaena phlaeas* (1), *Maniola jurtina* (1).
(Period 2) *Pieris brassicae* (1).
(Period 3) *Pieris rapae* (1).

Armoracia rusticana (HORSE-RADISH)
(Period 1) *Pieris rapae* (1).

Artemisia vulgaris (MUGWORT)
(Period 2) *Pieris rapae* (1).

Aster amellus (EUROPEAN MICHAELMAS-DAISY)
(Period 3) *Pieris rapae* (1).

Aster novae-angliae (HAIRY MICHAELMAS-DAISY)
(Period 3) *Vanessa atalanta* (1).

Aster novi-belgii (CONFUSED MICHAELMAS-DAISY)
(Period 2) *Pieris rapae* (1), *Vanessa atalanta* (7), *Polygonia c-album* (5).
(Period 3) *Pieris brassicae* (4), *Pieris rapae* (1), *Vanessa atalanta* (69), *Aglais urticae* (2), *Polygonia c-album* (9).

***Aster* sp.** (MICHAELMAS-DAISY (UNSPECIFIED))
(Period 3) *Vanessa atalanta* (12), *Pararge aegeria* (1).

Aster tripolium (SEA ASTER)
(Period 2) *Pieris rapae* (70), *Aglais urticae* (100).
(Period 3) *Pieris rapae* (2).

Aster x salignus (COMMON MICHAELMAS-DAISY)
(Period 1) *Colias croceus* (1), *Gonepteryx rhamni* (1), *Pieris brassicae* (3), *Pieris rapae* (19), *Pieris napi* (10), *Lycaena phlaeas* (6), *Polyommatus icarus* (3), *Celastrina argiolus* (1), *Vanessa atalanta* (22), *Vanessa cardui* (9), *Aglais urticae* (38), *Aglais io* (8), *Polygonia c-album* (24), *Pararge aegeria* (5), *Lasiommata megera* (2), *Maniola jurtina* (2).
(Period 2) *Colias croceus* (2), *Gonepteryx rhamni* (4), *Pieris brassicae* (6), *Pieris rapae* (36), *Pieris napi* (14), *Lycaena phlaeas* (20), *Polyommatus icarus* (3), *Vanessa atalanta* (102), *Vanessa cardui* (19), *Aglais urticae* (75), *Aglais io* (10), *Polygonia c-album* (87), *Pararge aegeria* (77).
(Period 3) *Gonepteryx rhamni* (4), *Pieris rapae* (19), *Pieris napi* (4), *Lycaena phlaeas* (7), *Polyommatus icarus* (4), *Vanessa atalanta* (76), *Vanessa cardui* (5), *Aglais urticae* (40), *Aglais io* (5), *Polygonia c-album* (47), *Pararge aegeria* (16), *Pyronia tithonus* (1).

Aubrieta deltoidea (AUBRETIA)
(Period 1) *Pieris rapae* (4), *Pieris napi* (1), *Anthocharis cardamines* (5).
(Period 2) *Pieris napi* (1).
(Period 3) *Pieris brassicae* (1), *Pieris rapae* (1), *Anthocharis cardamines* (1).

Ballota nigra (BLACK HOREHOUND)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (1), *Pieris napi* (2).

Bellis perennis (DAISY)
(Period 1) *Pieris rapae* (3), *Pieris napi* (3), *Lycaena phlaeas* (1), *Vanessa cardui* (1).
(Period 2) *Pieris rapae* (1), *Pieris napi* (1), *Anthocharis cardamines* (1).
(Period 3) *Gonepteryx rhamni* (1), *Pieris rapae* (2), *Pieris napi* (2), *Anthocharis cardamines* (1), *Polyommatus icarus* (1), *Aglais io* (1), *Pararge aegeria* (1), *Lasiommata megera* (1).

Bergenia crassifolia (ELEPHANT-EARS)
(Period 3) *Anthocharis cardamines* (1), *Aglais urticae* (1).

Brachyglottis* 'Sunshine'** (B. compacta x laxifolia***) (SHRUB RAGWORT)
(Period 3) *Pieris rapae* (2).

Brassica napus (RAPE)
(Period 3) *Pieris rapae* (1), *Pieris napi* (2), *Lycaena phlaeas* (1).

Brassica oleracea (CABBAGE (WILD))
(Period 1) *Pieris brassicae* (2), *Pieris rapae* (11), *Pieris napi* (10), *Polyommatus icarus* (1), *Aglais urticae* (3).
(Period 2) *Pieris rapae* (3), *Pieris napi* (5), *Anthocharis cardamines* (4), *Aglais urticae* (1), *Pyronia tithonus* (1).
(Period 3) *Pieris rapae* (10), *Pieris napi* (1).

Brassica rapa (TURNIP)
(Period 2) *Pieris rapae* (4).
(Period 3) *Pieris brassicae* (3), *Pieris rapae* (22), *Pieris napi* (7), *Polyommatus icarus* (1).

Bryonia dioica (WHITE BRYONY)
(Period 3) *Celastrina argiolus* (1).

Buddleja davidii (BUDDLEIA/BUTTERFLY-BUSH)
(Period 1) *Thymelicus sylvestris* (4), *Gonepteryx rhamni* (3), *Pieris brassicae* (133), *Pieris rapae* (61), *Pieris napi* (5), *Favonius quercus* (1), *Celastrina argiolus* (2), *Vanessa atalanta* (138), *Vanessa cardui* (38), *Aglais urticae* (322), *Aglais io* (169), *Polygonia c-album* (39), *Argynnis adippe* (1), *Pararge aegeria* (1), *Pyronia tithonus* (1), *Maniola jurtina* (4).
(Period 2) *Thymelicus sylvestris* (2), *Colias croceus* (1), *Gonepteryx rhamni* (4), *Pieris brassicae* (462), *Pieris rapae* (154), *Pieris napi* (18), *Favonius quercus* (1), *Lycaena phlaeas* (1), *Celastrina argiolus* (4), *Vanessa atalanta* (540), *Vanessa cardui* (221), *Aglais urticae* (471), *Aglais io* (412), *Argynnis paphia* (1), *Pararge aegeria* (21), *Lasiommata megera* (1), *Maniola jurtina* (21).
(Period 3) *Thymelicus sylvestris* (14), *Gonepteryx rhamni* (4), *Pieris brassicae* (215), *Pieris rapae* (317), *Pieris napi* (38), *Favonius quercus* (2), *Lycaena phlaeas* (11), *Celastrina argiolus* (3), *Vanessa atalanta* (1102), *Vanessa cardui* (1309), *Aglais urticae* (523), *Aglais io* (708), *Polygonia c-album* (151), *Argynnis paphia* (1), *Pararge aegeria* (8), *Lasiommata megera* (1), *Hipparchia semele* (1), *Pyronia tithonus* (4), *Maniola jurtina* (48), *Danaus plexippus* (1).

Buddleja fallowiana (CHINESE BUTTERFLY-BUSH)
(Period 1) *Polygonia c-album* (1).

Buddleja globosa (ORANGE-BALL-TREE)
(Period 1) *Vanessa atalanta* (1), *Vanessa cardui* (1).
(Period 2) *Aglais urticae* (1).

Buddleja x weyeriana (YELLOW BUDDLEIA/WEYER'S BUTTERFLY-BUSH)
(Period 1) *Vanessa atalanta* (28), *Polygonia c-album* (3).
(Period 2) *Pieris rapae* (1), *Vanessa atalanta* (18), *Vanessa cardui* (1), *Aglais urticae* (2), *Aglais io* (2), *Polygonia c-album* (10), *Pararge aegeria* (1).
(Period 3) *Pieris brassicae* (9), *Pieris rapae* (3), *Pieris napi* (1), *Vanessa atalanta* (78), *Vanessa cardui* (7), *Aglais urticae* (71), *Aglais io* (61), *Polygonia c-album* (8), *Pararge aegeria* (7).

Calendula officinalis (POT MARIGOLD)
(Period 1) *Pieris rapae* (1).
(Period 2) *Pieris rapae* (1).

Callistephus chinensis (CHINA ASTER)
(Period 1) *Pieris brassicae* (4), *Aglais urticae* (6).
(Period 2) *Vanessa cardui* (1).

***Calluna* sp.** (HEATHER (UNSPECIFIED))
(Period 3) *Aglais urticae* (2).

Calluna vulgaris (HEATHER)
(Period 1) *Thymelicus sylvestris* (1), *Anthocharis cardamines* (1), *Lycaena phlaeas* (3), *Polyommatus icarus* (1), *Celastrina argiolus* (1), *Vanessa cardui* (1), *Aglais urticae* (1), *Lasiommata megera* (1), *Pyronia tithonus* (1).
(Period 2) *Pieris brassicae* (1), *Pieris rapae* (1), *Pieris napi* (4), *Callophrys rubi* (1), *Lycaena phlaeas* (9), *Celastrina argiolus* (3), *Vanessa atalanta* (2), *Vanessa cardui* (5), *Aglais urticae* (5), *Aglais io* (2), *Polygonia c-album* (14), *Pararge aegeria* (3), *Maniola jurtina* (1).
(Period 3) *Pieris rapae* (2), *Pieris napi* (5), *Lycaena phlaeas* (66), *Polyommatus icarus* (5), *Celastrina argiolus* (1), *Vanessa atalanta* (5), *Aglais urticae* (20), *Aglais io* (26), *Polygonia c-album* (2), *Pararge aegeria* (1), *Pyronia tithonus* (11), *Maniola jurtina* (6), *Coenonympha pamphilus* (1).

Caltha palustris (MARSH-MARIGOLD)
(Period 3) *Pieris brassicae* (2), *Pieris napi* (1), *Aglais urticae* (1).

Calystegia sepium (HEDGE BINDWEED)
(Period 1) *Ochlodes sylvanus* (1).
(Period 3) *Ochlodes sylvanus* (1).

Calystegia silvatica (LARGE BINDWEED)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (3), *Pieris napi* (2).
(Period 2) *Pieris brassicae* (3), *Pieris rapae* (1), *Pieris napi* (1), *Vanessa atalanta* (1).
(Period 3) *Thymelicus sylvestris* (1), *Ochlodes sylvanus* (1), *Gonepteryx rhamni* (5), *Pieris brassicae* (2), *Pieris rapae* (1), *Pieris napi* (1).

Capsella bursa-pastoris (SHEPHERD'S-PURSE)
(Period 1) *Pieris napi* (1).
(Period 3) *Pieris napi* (1), *Anthocharis cardamines* (2).

Cardamine hirsuta (HAIRY BITTER-CRESS)
(Period 3) *Anthocharis cardamines* (1).

Cardamine pratensis (CUCKOO FLOWER)
(Period 1) *Pieris rapae* (5), *Pieris napi* (11), *Anthocharis cardamines* (25), *Aglais urticae* (1).
(Period 2) *Pieris brassicae* (1), *Pieris rapae* (3), *Pieris napi* (41), *Anthocharis cardamines* (25), *Aglais urticae* (2), *Polygonia c-album* (3), *Coenonympha pamphilus* (1).
(Period 3) *Pieris rapae* (3), *Pieris napi* (70), *Anthocharis cardamines* (63), *Lycaena phlaeas* (1), *Aglais urticae* (1), *Aglais io* (1).

Caryopteris x clandonensis (BLUEBEARD)
(Period 3) *Pararge aegeria* (1).

Ceanothus x delileanus (CALIFORNIAN LILAC)
(Period 1) *Celastrina argiolus* (1).
(Period 2) *Lycaena phlaeas* (2), *Celastrina argiolus* (5), *Aglais urticae* (1).

Centaurea cyanus (CORNFLOWER)
(Period 2) *Pieris rapae* (1).

Centaurea nigra (BLACK/COMMON KNAPWEED)
(Period 1) *Thymelicus sylvestris* (25), *Ochlodes sylvanus* (1), *Colias croceus* (1), *Pieris brassicae* (2), *Pieris rapae* (4), *Pieris napi* (4), *Lycaena phlaeas* (2), *Polyommatus icarus* (3), *Vanessa cardui* (8), *Aglais urticae* (8), *Aglais io* (7), *Lasiommata megera* (1), *Maniola jurtina* (8), *Coenonympha pamphilus* (1).
(Period 2) *Thymelicus sylvestris* (127), *Colias croceus* (1), *Gonepteryx rhamni* (5), *Pieris brassicae* (9), *Pieris rapae* (12), *Pieris napi* (17), *Lycaena phlaeas* (1), *Polyommatus icarus* (2), *Vanessa atalanta* (1), *Vanessa cardui* (16), *Aglais urticae* (41), *Aglais io* (33), *Argynnis adippe* (1), *Argynnis paphia* (3), *Maniola jurtina* (31).
(Period 3) *Thymelicus sylvestris* (45), *Ochlodes sylvanus* (1), *Gonepteryx rhamni* (8), *Pieris brassicae* (11), *Pieris rapae* (25), *Pieris napi* (29), *Lycaena phlaeas* (6), *Vanessa cardui* (168), *Aglais urticae* (7), *Aglais io* (25), *Argynnis aglaja* (1), *Argynnis paphia* (1), *Pararge aegeria* (1), *Pyronia tithonus* (6), *Maniola jurtina* (55), *Aphantopus hyperantus* (1).

Centaurea scabiosa (GREATER KNAPWEED)
(Period 1) *Thymelicus sylvestris* (1).
(Period 3) *Ochlodes sylvanus* (1), *Polyommatus icarus* (1), *Maniola jurtina* (3).

***Centaurea* sp.** (KNAPWEED (UNSPECIFIED))
(Period 1) *Argynnis adippe* (1).
(Period 2) *Aglais io* (61).

Centaurium littorale (SEASIDE CENTAURY)
(Period 3) *Maniola jurtina* (1).

Centranthus ruber (RED VALERIAN)
(Period 1) *Pieris rapae* (2), *Aglais urticae* (4).
(Period 2) *Pieris rapae* (4), *Aglais urticae* (1).

(Period 3) *Vanessa atalanta* (2), *Vanessa cardui* (23).

***Cerastium* sp**. (MOUSE-EAR)
(Period 3) *Pieris napi* (1).

Chamerion angustifolium (ROSEBAY WILLOWHERB)
(Period 1) *Thymelicus sylvestris* (8), *Pieris brassicae* (4), *Pieris rapae* (12), *Pieris napi* (10), *Polyommatus icarus* (6), *Celastrina argiolus* (1), *Maniola jurtina* (1).
(Period 2) *Thymelicus sylvestris* (1), *Pieris brassicae* (6), *Pieris rapae* (10), *Pieris napi* (8), *Aglais io* (2), *Polygonia c-album* (5), *Pararge aegeria* (1).
(Period 3) *Thymelicus sylvestris* (1), *Ochlodes sylvanus* (2), *Pieris brassicae* (2), *Pieris rapae* (7), *Pieris napi* (14), *Satyrium w-album* (7), *Celastrina argiolus* (9), *Aglais io* (2), *Maniola jurtina* (2), *Aphantopus hyperantus* (2).

Choisya ternata (MEXICAN ORANGE)
(Period 2) *Pieris napi* (1).

Chrysanthemum segetum (CORN MARIGOLD)
(Period 2) *Pieris rapae* (1).
(Period 3) *Pieris napi* (1), *Maniola jurtina* (1).

Cichorium intybus (CHICORY)
(Period 2) *Pieris rapae* (1).

Cirsium arvense (CREEPING THISTLE)
(Period 1) *Thymelicus sylvestris* (58), *Ochlodes sylvanus* (16), *Gonepteryx rhamni* (4), *Pieris brassicae* (16), *Pieris rapae* (44), *Pieris napi* (43), *Lycaena phlaeas* (8), *Polyommatus icarus* (6), *Celastrina argiolus* (1), *Vanessa atalanta* (6), *Vanessa cardui* (15), *Aglais urticae* (155), *Aglais io* (93), *Polygonia c-album* (9), *Pararge aegeria* (1), *Lasiommata megera* (3), *Pyronia tithonus* (7), *Maniola jurtina* (67).
(Period 2) *Thymelicus sylvestris* (54), *Ochlodes sylvanus* (6), *Gonepteryx rhamni* (1), *Pieris brassicae* (6), *Pieris rapae* (42), *Pieris napi* (44), *Satyrium w-album* (2), *Lycaena phlaeas* (31), *Polyommatus icarus* (1), *Celastrina argiolus* (1), *Vanessa atalanta* (1), *Vanessa cardui* (15), *Aglais urticae* (997), *Aglais io* (97), *Polygonia c-album* (29), *Argynnis aglaja* (1), *Pararge aegeria* (4), *Lasiommata megera* (13), *Pyronia tithonus* (26), *Maniola jurtina* (62), *Coenonympha pamphilus* (1).
(Period 3) *Thymelicus sylvestris* (298), *Ochlodes sylvanus* (65), *Gonepteryx rhamni* (8), *Pieris brassicae* (20), *Pieris rapae* (214), *Pieris napi* (147), *Satyrium w-album* (28), *Lycaena phlaeas* (40), *Polyommatus icarus* (4), *Celastrina argiolus* (4), *Vanessa atalanta* (8), *Vanessa cardui* (42), *Aglais urticae* (261), *Aglais io* (67), *Polygonia c-album* (26), *Argynnis aglaja* (1), *Pararge aegeria* (5), *Lasiommata megera* (18), *Hipparchia semele* (3), *Pyronia tithonus* (97), *Maniola jurtina* (383), *Coenonympha pamphilus* (20), *Aphantopus hyperantus* (5).

Cirsium palustre (MARSH THISTLE)
(Period 1) *Pieris napi* (2), *Aglais urticae* (1).
(Period 2) *Ochlodes sylvanus* (6), *Gonepteryx rhamni* (1), *Vanessa cardui* (1), *Aglais io* (3), *Argynnis paphia* (1), *Maniola jurtina* (2), *Coenonympha pamphilus* (1), *Aphantopus hyperantus* (2).

***Cirsium* sp. (**THISTLE (UNSPECIFIED))
(Period 3) *Pieris napi* (10), *Argynnis aglaja* (3), *Pararge aegeria* (1).

Cirsium vulgare (SPEAR THISTLE)
(Period 1) *Thymelicus sylvestris* (11), *Ochlodes sylvanus* (2), *Pieris brassicae* (5), *Pieris rapae* (3).
(Period 2) *Thymelicus sylvestris* (6), *Gonepteryx rhamni* (2), *Pieris brassicae* (6), *Pieris rapae* (9), *Pieris napi* (1), *Maniola jurtina* (1).
(Period 3) *Thymelicus sylvestris* (7), *Ochlodes sylvanus* (3), *Colias croceus* (1), *Gonepteryx rhamni* (2), *Pieris brassicae* (3), *Pieris rapae* (14), *Pieris napi* (7), *Vanessa atalanta* (1), *Vanessa cardui* (1), *Aglais urticae* (1), *Argynnis aglaja* (2), *Pyronia tithonus* (2), *Maniola jurtina* (15), *Coenonympha pamphilus* (1).

Claytonia sibirica (PINK PURSLANE)
(Period 3) *Lasiommata megera* (1).

Clinopodium ascendens (COMMON CALAMINT)
(Period 3) *Maniola jurtina* (1).

Cosmos bipinnatus (MEXICAN ASTER)
(Period 3) *Pieris rapae* (1), *Vanessa cardui* (1).

Cornus sanguinea (DOGWOOD)
(Period 2) *Aglais io* (1).

***Cotoneaster* sp.** (COTONEASTER)
(Period 1) *Vanessa atalanta* (1).
(Period 3) *Celastrina argiolus* (1), *Vanessa cardui* (1).

Crataegus monogyna (HAWTHORN)
(Period 1) *Pieris rapae* (2), *Pieris napi* (3), *Aglais io* (1), *Pararge aegeria* (1).
(Period 2) *Pieris brassicae* (1), *Pieris napi* (3), *Pararge aegeria* (1).
(Period 3) *Pieris rapae* (1), *Pieris napi* (3), *Anthocharis cardamines* (11), *Celastrina argiolus* (1), *Vanessa atalanta* (1), *Vanessa cardui* (1), *Aglais urticae* (1), *Aglais io* (1), *Pararge aegeria* (1).

Crepis capillaris (SMOOTH HAWK'S-BEARD)
(Period 2) *Pieris rapae* (1).
(Period 3) *Pieris rapae* (1).

***Crepis* sp.** (HAWK'S-BEARD (UNSPECIFIED))
(Period 3) *Polyommatus icarus* (2), *Maniola jurtina* (2).

***Crocus* sp.** (CROCUS)
(Period 2) *Aglais io* (2).
(Period 3) *Gonepteryx rhamni* (1), *Aglais urticae* (1), *Polygonia c-album* (2).

Dactylorhiza fuchsii (COMMON SPOTTED-ORCHID)
(Period 1) *Pieris napi* (1).

Dactylorhiza purpurella (NORTHERN MARSH-ORCHID)
(Period 2) *Maniola jurtina* (2).

***Dactylorhiza* sp.** (ORCHID (UNSPECIFIED))
(Period 3) *Maniola jurtina* (2).

Dahlia pinnata (DAHLIA)
(Period 1) *Aglais urticae* (1).

Daucus carota (CARROT)
(Period 3) *Pieris napi* (2).

***Dendranthema* sp.** (CHRYSANTHEMUM)
Aglais io (4).

Dianthus barbatus (SWEET-WILLIAM)
(Period 3) *Colias croceus* (1), *Vanessa atalanta* (1), *Maniola jurtina* (1).

Dianthus plumarius (PINK)
(Period 1) *Pieris rapae* (1).

Digitalis purpurea (FOXGLOVE)
(Period 3) *Ochlodes sylvanus* (1), *Pieris napi* (2).

***Diplotaxis* sp.** (WALL-ROCKET)
(Period 3) *Pieris rapae* (3).

Dipsacus fullonum (TEASEL)
(Period 1) *Vanessa cardui* (1), *Aglais io* (1).
(Period 2) *Pieris napi* (1).
(Period 3) *Gonepteryx rhamni* (1), *Vanessa atalanta* (2), *Vanessa cardui* (3), *Aglais urticae* (1), *Aglais io* (4).

Echinacea purpurea (PURPLE CONEFLOWER)
(Period 1) *Aglais urticae* (1).
(Period 2) *Vanessa cardui* (1).
(Period 3) *Pyronia tithonus* (1).

Echinops **sp.** (GLOBE-THISTLE)
(Period 2) *Lycaena phlaeas* (1).
(Period 3) *Satyrium w-album* (1), *Celastrina argiolus* (1).

Epilobium hirsutum (GREAT WILLOWHERB)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (5), *Pieris napi* (18), *Polyommatus icarus* (1), *Pararge aegeria* (1).
(Period 2) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (1), *Pieris brassicae* (2), *Pieris rapae* (20), *Pieris napi* (45), *Polygonia c-album* (1).
(Period 3) *Thymelicus sylvestris* (5), *Pieris brassicae* (10), *Pieris rapae* (54), *Pieris napi* (77), *Pyronia tithonus* (1).

Epilobium montanum (BROAD-LEAVED WILLOWHERB)
(Period 1) *Vanessa cardui* (1).
(Period 2) *Pieris brassicae* (1), *Pieris rapae* (10), *Pieris napi* (8).
(Period 3) *Pieris rapae* (8), *Pieris napi* (22).

Epilobium **sp.** (WILLOWHERB (UNSPECIFIED))
(Period 2) *Vanessa cardui* (1).
(Period 3) *Pieris napi* (10), *Lycaena phlaeas* (1), *Aglais urticae* (2).

Erica cinerea (BELL HEATHER)
(Period 1) *Maniola jurtina* (2), *Coenonympha tullia* (1).

Eryngium maritimum (SEA-HOLLY)
(Period 3) *Lycaena phlaeas* (3), *Polyommatus icarus* (2), *Vanessa cardui* (2), *Aglais urticae* (1), *Aglais io* (7), *Hipparchia semele* (7), *Coenonympha pamphilus* (1).

Erysimum **'Bowles's Mauve'** (PERENNIAL WALLFLOWER)
(Period 3) *Pieris rapae* (1), *Vanessa atalanta* (14), *Vanessa cardui* (1), *Polygonia c-album* (4).

Erysimum cheiri (WALLFLOWER)
(Period 1) *Lasiommata megera* (2).
(Period 2) *Pieris brassicae* (1), *Vanessa atalanta* (5), *Vanessa cardui* (2), *Aglais io* (1), *Polygonia c-album* (1), *Pararge aegeria* (1).

Erysimum **sp.** (WALLFLOWER (UNSPECIFIED))
(Period 3) *Aglais urticae* (1).

Escallonia x langleyensis (ESCALLONIA)
(Period 2) *Pieris rapae* (1), *Vanessa cardui* (1).

Eupatorium cannabinum (HEMP AGRIMONY)
(Period 1) *Vanessa atalanta* (1), *Aglais urticae* (2), *Aglais io* (2), *Polygonia c-album* (1), *Argynnis adippe* (1), *Pararge aegeria* (1).
(Period 2) *Aglais io* (1), *Polygonia c-album* (1).
(Period 3) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (3), *Pieris rapae* (1), *Pieris napi* (10), *Satyrium w-album* (2), *Lycaena phlaeas* (2), *Vanessa atalanta* (6), *Vanessa cardui* (3), *Aglais urticae* (1), *Aglais io* (18), *Polygonia c-album* (4), *Pararge aegeria* (5), *Pyronia tithonus* (2), *Maniola jurtina* (13), *Aphantopus hyperantus* (2).

Eupatorium purpureum (SWEET JOE-PYE-WEED)
(Period 3) *Pieris rapae* (2), *Vanessa atalanta* (8), *Aglais io* (6).

***Eupatorium* sp.** (JOE-PYE-WEED (UNSPECIFIED))
(Period 3) *Celastrina argiolus* (2).

***Euphrasia* sp.** (EYEBRIGHT (UNSPECIFIED))
(Period 3) *Pieris napi* (1).

Fallopia baldschuanica (RUSSIAN VINE)
(Period 1) *Vanessa atalanta* (2), *Aglais io* (1).
(Period 2) *Pieris rapae* (1).
(Period 3) *Pieris rapae* (1).

Fallopia japonica (JAPANESE KNOTWEED)
(Period 2) *Vanessa atalanta* (2).
(Period 3) *Vanessa atalanta* (3).

Filipendula ulmaria (MEADOWSWEET)
(Period 2) *Argynnis paphia* (1)

Fragaria vesca (WILD STRAWBERRY)
(Period 2) *Hamearis lucina* (1).
(Period 3) *Pieris napi* (1).

Fragaria x ananassa (GARDEN STRAWBERRY)
(Period 2) *Pieris napi* (1).
(Period 3) *Pieris rapae* (1).

Fragaria x ananassa (GARDEN STRAWBERRY) **(FRUIT)**
(Period 3) *Polygonia c-album* (1).

Fraxinus excelsior (ASH)
(Period 3) *Satyrium w-album* (1), *Polygonia c-album* (1).

Galeopsis segetum (DOWNY HEMP-NETTLE)
(Period 3) *Pieris napi* (1).

Galeopsis tetrahit (COMMON HEMP-NETTLE)
(Period 1) *Pieris rapae* (1), *Pieris napi* (1).

Galium saxatile (HEATH BEDSTRAW)
(Period 3) *Coenonympha pamphilus* (1).

Geranium dissectum (CUT-LEAVED CRANE'S-BILL)
(Period 1) *Polyommatus icarus* (1).
(Period 2) *Pieris rapae* (1), *Pieris napi* (1), *Polyommatus icarus* (1).
(Period 3) *Pieris rapae* (1), *Polyommatus icarus* (1).

Geranium endressii (FRENCH CRANE'S-BILL)
(Period 3) *Pieris brassicae* (1), *Pieris rapae* (3), *Pieris napi* (1), *Pararge aegeria* (1).

Geranium molle (DOVE'S-FOOT CRANE'S-BILL)
(Period 3) *Pieris rapae* (1).

Geranium pratense (MEADOW CRANE'S-BILL)
(Period 3) *Pieris rapae* (2), *Pieris napi* (1).

Geranium robertianum (HERB-ROBERT)
(Period 1) *Gonepteryx rhamni* (1), *Pieris rapae* (1), *Pieris napi* (1).
(Period 2) *Thymelicus sylvestris* (1), *Pieris rapae* (5), *Pieris napi* (3).

(Period 3) *Ochlodes sylvanus* (2), *Pieris brassicae* (1), *Pieris rapae* (5), *Pieris napi* (19), *Anthocharis cardamines* (9), *Lasiommata megera* (1).

***Geranium* sp.** (CRANE'S-BILL (UNSPECIFIED))
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (1).
(Period 2) *Pararge aegeria* (1).
(Period 3) *Pieris brassicae* (1), *Pieris rapae* (3), *Pieris napi* (3), *Pyronia tithonus* (1).

***Hebe* sp.** (HEDGE VERONICA (UNSPECIFIED))
(Period 3) *Pieris rapae* (2), *Pieris napi* (2), *Celastrina argiolus* (6), *Aglais io* (4), *Pararge aegeria* (1), *Pyronia tithonus* (1).

Hebe x franciscana (HEDGE VERONICA)
(Period 1) *Pieris rapae* (3), *Aglais urticae* (1).
(Period 2) *Pieris rapae* (1), *Celastrina argiolus* (2), *Aglais io* (1).
(Period 3) *Pieris rapae* (1).

Hedera helix (IVY)
(Period 1) *Pieris brassicae* (1), *Vanessa atalanta* (1), *Polygonia c-album* (1).
(Period 2) *Pieris rapae* (2), *Vanessa atalanta* (164), *Vanessa cardui* (2), *Aglais io* (1), *Polygonia c-album* (3), *Pararge aegeria* (3).
(Period 3) *Pieris brassicae* (2), *Pieris rapae* (3), *Lycaena phlaeas* (1), *Celastrina argiolus* (3), *Vanessa atalanta* (826), *Vanessa cardui* (5), *Aglais urticae* (8), *Polygonia c-album* (73), *Pararge aegeria* (12).

Helianthus annuus (SUNFLOWER)
(Period 3) *Vanessa atalanta* (2).

Helichrysum bracteatum (EVERLASTING-FLOWER)
(Period 1) *Pieris brassicae* (2), *Aglais urticae* (2).

Heracleum sphondylium (HOGWEED)
(Period 1) *Pieris brassicae* (1), *Pieris napi* (2), *Vanessa cardui* (2), *Aglais urticae* (2), *Aglais io* (1), *Maniola jurtina* (1).
(Period 2) *Lycaena phlaeas* (1), *Polyommatus icarus* (1), *Aglais io* (1), *Pararge aegeria* (2), *Maniola jurtina* (15).
(Period 3) *Thymelicus sylvestris* (1), *Pieris brassicae* (1), *Pieris napi* (2), *Celastrina argiolus* (1), *Vanessa atalanta* (1), *Aglais io* (1), *Pararge aegeria* (1), *Maniola jurtina* (1).

Hesperis matronalis (DAME'S VIOLET/SWEET ROCKET)
(Period 1) *Pieris brassicae* (4), *Pieris rapae* (7), *Pieris napi* (14), *Anthocharis cardamines* (7), *Vanessa cardui* (1), *Aglais urticae* (4), *Aglais io* (1).
(Period 2) *Ochlodes sylvanus* (1), *Pieris brassicae* (3), *Pieris rapae* (1), *Pieris napi* (3), *Anthocharis cardamines* (3).
(Period 3) *Pieris brassicae* (3), *Pieris napi* (5), *Anthocharis cardamines* (7).

***Hieracium* sp.** (HAWKWEED)
(Period 1) *Thymelicus sylvestris* (3), *Pieris brassicae* (3), *Pieris rapae* (7), *Pieris napi* (4), *Lycaena phlaeas* (5), *Polyommatus icarus* (2), *Vanessa cardui* (2), *Aglais urticae* (8), *Aglais io* (1), *Maniola jurtina* (2).
(Period 2) *Thymelicus sylvestris* (4), *Ochlodes sylvanus* (4), *Pieris brassicae* (2), *Pieris rapae* (5), *Pieris napi* (4), *Lycaena phlaeas* (10), *Vanessa cardui* (1), *Aglais io* (1), *Lasiommata megera* (3).
(Period 3) *Thymelicus sylvestris* (1), *Pieris rapae* (1), *Pieris napi* (1), *Anthocharis cardamines* (1), *Lycaena phlaeas* (6), *Polyommatus icarus* (2), *Aglais urticae* (1), *Lasiommata megera* (9).

Hyacinthoides hispanica (SPANISH BLUEBELL)
(Period 1) *Pieris brassicae* (3), *Pieris napi* (1), *Anthocharis cardamines* (3).
(Period 2) *Pieris brassicae* (1), *Pieris napi* (1), *Anthocharis cardamines* (4), *Vanessa cardui* (1), *Aglais io* (1).
(Period 3) *Gonepteryx rhamni* (1), *Pieris brassicae* (1), *Pieris rapae* (2), *Pieris napi* (13), *Anthocharis cardamines* (8), *Lycaena phlaeas* (1), *Aglais urticae* (4), *Aglais io* (4).

Hyacinthoides non-scripta (BLUEBELL)
(Period 2) *Aglais io* (2).
(Period 3) *Gonepteryx rhamni* (1), *Pieris brassicae* (3), *Pieris rapae* (1), *Pieris napi* (4), *Anthocharis cardamines* (3), *Celastrina argiolus* (2), *Aglais urticae* (1), *Aglais io* (2), *Lasiommata megera* (1).

Hydrangea aspera (ROUGH-LEAVED HYDRANGEA)
(Period 2) *Pieris napi* (2), *Pararge aegeria* (2).

Hydrangea macrophylla (HYDRANGEA)
(Period 1) *Thymelicus sylvestris* (1), *Pieris napi* (1), *Aglais urticae* (1).
(Period 2) *Gonepteryx rhamni* (1), *Pieris brassicae* (5), *Pieris rapae* (3), *Pieris napi* (1), *Aglais io* (4), *Pararge aegeria* (2).

Hypericum perforatum (PERFORATE ST. JOHN'S-WORT)
(Period 2) *Pieris rapae* (1).

***Hypericum* sp.** (ST. JOHN'S-WORT (UNSPECIFIED))
(Period 3) *Pieris rapae* (1).

Hypochaeris radicata (CAT'S-EAR)
(Period 1) *Pieris napi* (1), *Lasiommata megera* (1).
(Period 2) *Pieris brassicae* (1).
(Period 3) *Thymelicus sylvestris* (9), *Pieris napi* (3), *Aglais urticae* (1), *Maniola jurtina* (1), *Coenonympha pamphilus* (1).

Iberis umbellata (CANDYTUFT)
(Period 1) *Pieris napi* (1), *Celastrina argiolus* (1), *Aglais urticae* (5).
(Period 3) *Aglais urticae* (1).

Ilex aquifolium (HOLLY)
(Period 2) *Pieris napi* (1), *Callophrys rubi* (1), *Celastrina argiolus* (2), *Aglais io* (1).
(Period 3) *Celastrina argiolus* (3), *Aglais io* (1), *Pararge aegeria* (1).

Impatiens glandulifera (HIMALAYAN BALSAM)
(Period 1) *Pieris brassicae* (3), *Pieris rapae* (3), *Pieris napi* (3), *Vanessa atalanta* (1), *Pararge aegeria* (1).
(Period 2) *Pieris napi* (1), *Vanessa atalanta* (1).
(Period 3) *Pieris rapae* (5), *Pieris napi* (3), *Lycaena phlaeas* (1), *Vanessa atalanta* (1), *Pararge aegeria* (2).

Impatiens walleriana (BUSY LIZZIE)
(Period 2) *Pieris napi* (1), *Polygonia c-album* (1).

Inula helenium (ELECAMPANE)
(Period 2) *Pieris brassicae* (1).

Jasminum nudiflorum (WINTER JASMINE)
(Period 2) *Vanessa atalanta* (1).

***Jasminum* sp.** (JASMINE (UNSPECIFIED))
(Period 3) *Aglais urticae* (1).

Knautia arvensis (FIELD SCABIOUS)
(Period 2) *Pieris rapae* (1), *Celastrina argiolus* (1).
(Period 3) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (6), *Pieris brassicae* (2), *Pieris rapae* (12), *Lycaena phlaeas* (1), *Vanessa atalanta* (1), *Vanessa cardui* (5), *Aglais urticae* (12), *Aglais io* (6), *Polygonia c-album* (4), *Pararge aegeria* (1), *Maniola jurtina* (5).

Lamium purpureum (RED DEAD-NETTLE)
(Period 2) *Pieris rapae* (1), *Pieris napi* (1), *Maniola jurtina* (1).

Lapsana communis (NIPPLEWORT)
(Period 1) *Pieris napi* (1).
(Period 3) *Pieris rapae* (1), *Pieris napi* (1).

Lathyrus nissolia (GRASS VETCHLING)
(Period 3) *Polyommatus icarus* (1).

Lathyrus odoratus (SWEET PEA)
(Period 1) *Pieris rapae* (1).
(Period 3) *Gonepteryx rhamni* (1).

Lathyrus pratensis (MEADOW VETCHLING)
(Period 1) *Thymelicus sylvestris* (8), *Ochlodes sylvanus* (1), *Maniola jurtina* (1).
(Period 2) *Thymelicus sylvestris* (3), *Ochlodes sylvanus* (18), *Polyommatus icarus* (2), *Maniola jurtina* (3), *Aphantopus hyperantus* (1).
(Period 3) *Thymelicus sylvestris* (19), *Ochlodes sylvanus* (24), *Polyommatus icarus* (7), *Aglais urticae* (1), *Maniola jurtina* (2), *Aphantopus hyperantus* (1).

Lathyrus **sp.** (PEA (UNSPECIFIED))
(Period 1) *Aglais urticae* (1).

Lavandula x intermedia (GARDEN LAVENDER)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (21), *Pieris napi* (1), *Aglais urticae* (5).
(Period 2) *Thymelicus sylvestris* (1), *Pieris brassicae* (5), *Pieris rapae* (20), *Pieris napi* (2), *Lycaena phlaeas* (1), *Vanessa cardui* (1), *Pyronia tithonus* (1).
(Period 3) *Thymelicus sylvestris* (4), *Pieris rapae* (55), *Pieris napi* (2), *Vanessa cardui* (29), *Aglais urticae* (3), *Aglais io* (2).

Lavatera **sp.** (MALLOW (UNSPECIFIED))
(Period 3) *Celastrina argiolus* (1).

Leontodon autumnalis (AUTUMN HAWKBIT)
(Period 2) *Pieris rapae* (2), *Lycaena phlaeas* (1).
(Period 3) *Lycaena phlaeas* (1), *Lasiommata megera* (1).

Leontodon hispidus (ROUGH HAWKBIT)
(Period 2) *Ochlodes sylvanus* (1), *Pieris rapae* (4), *Pieris napi* (2), *Lycaena phlaeas* (5), *Pararge aegeria* (1).
(Period 3) *Thymelicus sylvestris* (1), *Pieris rapae* (1), *Pieris napi* (3), *Lycaena phlaeas* (1), *Polyommatus icarus* (1), *Aglais urticae* (1), *Lasiommata megera* (3), *Maniola jurtina* (2), *Aphantopus hyperantus* (1).

Leontodon saxatilis (LESSER HAWKBIT)
(Period 1) *Polyommatus icarus* (2), *Maniola jurtina* (1).
(Period 2) *Pieris rapae* (2), *Maniola jurtina* (1).
(Period 3) *Thymelicus sylvestris* (4), *Ochlodes sylvanus* (2), *Pieris rapae* (3), *Pieris napi* (7), *Lycaena phlaeas* (2), *Lasiommata megera* (5), *Maniola jurtina* (3).

Leontodon **sp.** (HAWKBIT (UNSPECIFIED))
(Period 3) *Thymelicus sylvestris* (1), *Pieris brassicae* (1), *Pieris rapae* (8), *Polyommatus icarus* (3), *Maniola jurtina* (2).

Leucanthemum vulgare (OXEYE DAISY)
(Period 1) *Thymelicus sylvestris* (1), *Pieris rapae* (1), *Pieris napi* (1), *Lycaena phlaeas* (1), *Vanessa cardui* (1), *Lasiommata megera* (1), *Pyronia tithonus* (1).
(Period 2) *Pieris rapae* (1), *Polyommatus icarus* (2), *Pararge aegeria* (1), *Coenonympha pamphilus* (1).
(Period 3) *Ochlodes sylvanus* (1), *Pieris rapae* (2), *Pieris napi* (1), *Polyommatus icarus* (3), *Argynnis aglaja* (1), *Maniola jurtina* (1).

Ligularia **x 'The Rocket'** (LEOPARD-PLANT)
(Period 2) *Pieris napi* (2).

Ligustrum ovalifolium (GARDEN PRIVET)
(Period 1) *Pieris brassicae* (2), *Pieris rapae* (2), *Pieris napi* (1), *Celastrina argiolus* (2), *Vanessa atalanta* (2), *Vanessa cardui* (2), *Aglais urticae* (12), *Aglais io* (4), *Polygonia c-album* (1), *Maniola jurtina* (1).
(Period 2) *Pieris rapae* (2), *Pieris napi* (1), *Vanessa atalanta* (3), *Polygonia c-album* (3).
(Period 3) *Pieris rapae* (1), *Pieris napi* (1), *Celastrina argiolus* (1), *Vanessa atalanta* (2), *Vanessa cardui* (4), *Aglais urticae* (12), *Aglais io* (4), *Polygonia c-album* (7), *Argynnis paphia* (1), *Pararge aegeria* (1).

***Lilium* sp.** (LILY (UNSPECIFIED))
(Period 2) *Favonius quercus* (1).

Linaria vulgaris (COMMON TOADFLAX)
(Period 3) *Pieris rapae* (1).

Lobelia erinus (GARDEN LOBELIA)
(Period 1) *Pieris rapae* (1).

***Lobelia* sp.** (LOBELIA (UNSPECIFIED))
(Period 3) *Pieris rapae* (11), *Pieris napi* (2), *Aglais io* (2), *Maniola jurtina* (2).

Lotus corniculatus (COMMON BIRD'S-FOOT TREFOIL)
(Period 1) *Thymelicus sylvestris* (14), *Ochlodes sylvanus* (1), *Pieris rapae* (1), *Pieris napi* (1), *Polyommatus icarus* (9), *Maniola jurtina* (3).
(Period 2) *Thymelicus sylvestris* (101), *Ochlodes sylvanus* (7), *Polyommatus icarus* (44).
(Period 3) *Thymelicus sylvestris* (26), *Ochlodes sylvanus* (17), *Erynnis tages* (13), *Pieris rapae* (2), *Pieris napi* (5), *Lycaena phlaeas* (1), *Cupido minimus* (6), *Aricia agestis* (1), *Polyommatus icarus* (92), *Boloria selene* (1), *Boloria euprhrosye* (1), *Lasiommata megera* (2), *Pyronia tithonus* (1), *Maniola jurtina* (2).

Lotus pedunculatus (GREATER BIRD'S-FOOT TREFOIL)
(Period 3) *Thymelicus sylvestris* (2), *Pieris napi* (1), *Lasiommata megera* (2).

Lunaria annua (HONESTY)
(Period 1) *Pieris brassicae* (2), *Pieris rapae* (1), *Pieris napi* (2), *Anthocharis cardamines* (2).
(Period 2) *Pieris rapae* (1), *Pieris napi* (1), *Anthocharis cardamines* (1), *Aglais io* (1)
(Period 3) *Anthocharis cardamines* (2).

Lychnis flos-cuculi (RAGGED-ROBIN)
(Period 1) *Ochlodes sylvanus* (1).
(Period 3) *Ochlodes sylvanus* (1), *Pieris napi* (1), *Polyommatus icarus* (4).

Lysimachia punctata (DOTTED LOOSESTRIFE)
(Period 3) *Thymelicus sylvestris* (1), *Maniola jurtina* (1).

Lythrum salicaria (PURPLE-LOOSESTRIFE)
(Period 2) *Colias croceus* (1), *Pieris brassicae* (1), *Pieris rapae* (1), *Pieris napi* (1), *Polyommatus icarus* (1), *Celastrina argiolus* (1), *Vanessa atalanta* (1), *Lasiommata megera* (1), *Maniola jurtina* (1).
(Period 3) *Thymelicus sylvestris* (3), *Pieris brassicae* (3), *Pieris rapae* (8), *Pieris napi* (12), *Vanessa atalanta* (17), *Pararge aegeria* (2), *Pyronia tithonus* (1), *Maniola jurtina* (3).

Mahonia aquifolium (OREGON-GRAPE)
(Period 3) *Vanessa atalanta* (2).

Mahonia x media (OREGON-GRAPE)
(Period 2) *Vanessa atalanta* (1).

Malus domestica (APPLE)
(Period 2) *Celastrina argiolus* (1).
(Period 3) *Pieris napi* (1).

Malus domestica (APPLE) **(FRUIT)**
(Period 1) *Nymphalis antiopa* (1).
(Period 2) *Vanessa atalanta* (3), *Pararge aegeria* (2).

(Period 3) *Vanessa atalanta* (4), *Polygonia c-album* (1), *Pararge aegeria* (1).

Matricaria discoidea (PINEAPPLE-WEED)
(Period 2) *Pieris rapae* (1).

Matthiola incana (HOARY STOCK)
(Period 2) *Pieris brassicae* (2), *Pieris rapae* (2).
(Period 3) *Pieris rapae* (6), *Aglais urticae* (3), *Aglais io* (5).

***Matthiola* sp.** (STOCK (UNSPECIFIED))
(Period 2) *Pieris rapae* (1).

Medicago sativa (LUCERNE)
(Period 1) *Pieris rapae* (1), *Pieris napi* (1), *Aglais urticae* (10), *Aglais io* (1).

Melilotus albus (WHITE MELILOT)
(Period 2) *Pieris rapae* (1), *Polyommatus icarus* (1).

Melilotus officinalis (RIBBED MELILOT)
(Period 3) *Thymelicus sylvestris* (1).

Mentha aquatica (WATER MINT)
(Period 1) *Lycaena phlaeas* (1), *Polygonia c-album* (1).
(Period 2) *Vanessa atalanta* (7), *Vanessa cardui* (1), *Aglais io* (3), *Polygonia c-album* (7), *Pararge aegeria* (1), *Pyronia tithonus* (1).
(Period 3) *Pieris napi* (3), *Lycaena phlaeas* (2), *Vanessa atalanta* (2), *Aglais urticae* (2), *Aglais io* (2), *Polygonia c-album* (1), *Pararge aegeria* (1), *Pyronia tithonus* (4), *Maniola jurtina* (2).

***Mentha* sp.** (MINT (UNSPECIFIED))
(Period 2) *Pyronia tithonus* (1).
(Period 3) *Pieris rapae* (1).

Mentha spicata (SPEAR MINT)
(Period 2) *Lycaena phlaeas* (3), *Lasiommata megera* (1).

Montia fontana (BLINKS)
(Period 3) *Pieris napi* (7).

***Muscari* sp.** (GRAPE-HYACINTH)
(Period 3) *Aglais urticae* (3), *Polygonia c-album* (1).

Myosotis arvensis (FIELD FORGET-ME-NOT)
(Period 1) *Pieris napi* (1).
(Period 2) *Anthocharis cardamines* (1).
(Period 3) *Gonepteryx rhamni* (1), *Pieris rapae* (2), *Pieris napi* (9), *Anthocharis cardamines* (1), *Celastrina argiolus* (1).

Myosotis scorpioides (WATER FORGET-ME-NOT)
(Period 3) *Gonepteryx rhamni* (1), *Pieris napi* (1), *Anthocharis cardamines* (1).

***Myosotis* sp.** (FORGET-ME-NOT (UNSPECIFIED))
(Period 3) *Pieris rapae* (1), *Pieris napi* (2), *Anthocharis cardamines* (4), *Callophrys rubi* (1), *Polyommatus icarus* (2), *Aglais urticae* (1).

Myrica gale (BOG-MYRTLE)
(Period 2) *Gonepteryx rhamni* (5).

Narcissus pseudonarcissus (DAFFODIL)
(Period 3) *Gonepteryx rhamni* (3), *Pieris rapae* (1), *Aglais urticae* (2), *Aglais io* (2), *Polygonia c-album* (2).

Nepeta x faassenii (GARDEN CATMINT)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (1), *Vanessa atalanta* (1).
(Period 3) *Pieris rapae* (1).

Odontites vernus (RED BARTSIA)
(Period 3) *Pararge aegeria* (1).

Oenanthe crocata (HEMLOCK WATER-DROPWORT)
(Period 3) *Vanessa cardui* (1).

Origanum vulgare (WILD MARJORAM)
(Period 1) *Pieris brassicae* (1), *Maniola jurtina* (1).
(Period 2) *Pieris rapae* (1), *Pieris napi* (1).
(Period 3) *Thymelicus sylvestris* (2), *Pieris rapae* (7), *Pieris napi* (7), *Celastrina argiolus* (4), *Vanessa cardui* (1), *Aglais urticae* (1), *Aglais io* (2), *Polygonia c-album* (1), *Pararge aegeria* (6), *Pyronia tithonus* (27), *Maniola jurtina* (16), *Aphantopus hyperantus* (5).

Paeonia officinalis (GARDEN PEONY)
(Period 2) *Favonius quercus* (1).

Pastinaca sativa (WILD PARSNIP)
(Period 3) *Pieris napi* (2).

Pelargonium x hybridum (SCARLET GERANIUM)
(Period 1) *Pieris brassicae* (1).
(Period 3) *Celastrina argiolus* (1).

Pentaglottis sempervirens (GREEN ALKANET)
(Period 1) *Pieris rapae* (2).
(Period 2) *Pieris rapae* (1).

Persicaria bistorta (COMMON BISTORT)
(Period 1) *Pieris brassicae* (1).
(Period 2) *Pieris napi* (1), *Coenonympha pamphilus* (1).
(Period 3) *Pieris napi* (1), *Lycaena phlaeas* (1).

Persicaria maculosa (REDSHANK)
(Period 1) *Pieris napi* (3).
(Period 3) *Celastrina argiolus* (1).

Petasites hybridus (BUTTERBUR)
(Period 1) *Pieris rapae* (1), *Pieris napi* (1), *Aglais urticae* (1).
(Period 3) *Aglais urticae* (2).

Petunia x hybrida (PETUNIA)
(Period 1) *Pieris brassicae* (1), *Aglais io* (1).
(Period 2) *Pieris brassicae* (1).

Phlox drummondii (ANNUAL PHLOX)
(Period 1) *Pieris brassicae* (1), *Aglais urticae* (1).
(Period 2) *Gonepteryx rhamni* (1).
(Period 3) *Gonepteryx rhamni* (1), *Polyommatus icarus* (1).

Phlox paniculata (PHLOX)
(Period 2) *Aglais io* (1), *Polygonia c-album* (1).

Pieris japonica (JAPANESE ANDROMEDA)
(Period 2) *Aglais io* (1).

Plantago lanceolata (RIBWORT PLANTAIN)
(Period 1) *Polyommatus icarus* (1).

(Period 2) *Anthocharis cardamines* (1), *Polyommatus icarus* (1).
(Period 3) *Anthocharis cardamines* (1).

Pontederia cordata (PICKERELL-WEED)
(Period 2) *Celastrina argiolus* (1).

Potentilla anserina (SILVERWEED)
(Period 3) *Pieris napi* (1).

Potentilla erecta (TORMENTIL)
(Period 2) *Coenonympha pamphilus* (1).
(Period 3) *Lasiommata megera* (1), *Coenonympha pamphilus* (2).

Potentilla fruticosa (SHRUBBY CINQUEFOIL)
(Period 3) *Pieris rapae* (1), *Maniola jurtina* (1).

***Potentilla* sp.** (CINQUEFOIL (UNSPECIFIED))
(Period 2) *Pieris napi* (1).

***Primula* sp.** (PRIMROSE (UNSPECIFIED))
(Period 3) *Polygonia c-album* (1).

Prunella vulgaris (SELFHEAL)
(Period 1) *Polyommatus icarus* (1).
(Period 3) *Thymelicus sylvestris* (4), *Pieris rapae* (1), *Pieris napi* (2), *Maniola jurtina* (1).

Prunus avium (WILD CHERRY)
(Period 2) *Pieris brassicae* (1).

Prunus domestica (PLUM)
(Period 3) *Polygonia c-album* (1).

Prunus domestica (PLUM/GREENGAGE) **(FRUIT)**
(Period 3) *Polygonia c-album* (3).

Prunus laurocerasus (CHERRY LAUREL)
(Period 2) *Aglais io* (2).
(Period 3) *Celastrina argiolus* (2).

Prunus padus (BIRD CHERRY)
(Period 2) *Polygonia c-album* (1).

***Prunus* sp.** (CHERRY (UNSPECIFIED))
(Period 2) *Aglais io* (6).

Prunus spinosa (BLACKTHORN)
(Period 1) *Celastrina argiolus* (1), *Aglais urticae* (1).
(Period 2) *Aglais io* (2).
(Period 3) *Aglais urticae* (4), *Aglais io* (9), *Polygonia c-album* (1).

Pulicaria dysenterica (COMMON FLEABANE)
(Period 1) *Polyommatus icarus* (1), *Vanessa atalanta* (1).
(Period 2) *Aglais io* (190).
(Period 3) *Gonepteryx rhamni* (2), *Pieris rapae* (12), *Pieris napi* (3), *Lycaena phlaeas* (8), *Polyommatus icarus* (2), *Vanessa cardui* (1), *Aglais urticae* (1), *Aglais io* (2), *Polygonia c-album* (1), *Pararge aegeria* (4), *Lasiommata megera* (1), *Pyronia tithonus* (1), *Maniola jurtina* (26).

Pyracantha coccinea (FIRETHORN)
(Period 3) *Vanessa cardui* (1).

Pyrus communis (PEAR) **(FRUIT)**
(Period 1) *Nymphalis antiopa* (1).
(Period 3) *Vanessa atalanta* (4), *Pararge aegeria* (1).

Ranunculus acris (MEADOW BUTTERCUP)
(Period 1) *Ochlodes sylvanus* (1), *Pieris rapae* (3), *Pieris napi* (8), *Anthocharis cardamines* (1), *Lycaena phlaeas* (3), *Polyommatus icarus* (3), *Vanessa cardui* (2), *Aglais urticae* (5), *Aglais io* (1), *Lasiommata megera* (3), *Maniola jurtina* (5).
(Period 2) *Ochlodes sylvanus* (3), *Pieris brassicae* (3), *Pieris rapae* (8), *Pieris napi* (13), *Anthocharis cardamines* (3), *Lycaena phlaeas* (3), *Polyommatus icarus* (5), *Aglais io* (1), *Pararge aegeria* (3), *Lasiommata megera* (1), *Maniola jurtina* (1), *Coenonympha pamphilus* (2), *Aphantopus hyperantus* (1).
(Period 3) *Thymelicus sylvestris* (8), *Ochlodes sylvanus* (3), *Pieris brassicae* (2), *Pieris rapae* (6), *Pieris napi* (13), *Lycaena phlaeas* (18), *Polyommatus icarus* (2), *Aglais urticae* (5), *Aglais io* (1), *Lasiommata megera* (7), *Maniola jurtina* (14), *Coenonympha pamphilus* (2), *Aphantopus hyperantus* (7).

Ranunculus ficaria (LESSER CELANDINE)
(Period 1) *Aglais io* (2).
(Period 2) *Polygonia c-album* (1).
(Period 3) *Pieris napi* (3), *Anthocharis cardamines* (1), *Aglais urticae* (15), *Aglais io* (1), *Polygonia c-album* (2).

Raphanus raphanistrum (WILD RADISH)
(Period 1) *Pieris rapae* (2).
(Period 2) *Pieris brassicae* (1), *Pieris rapae* (2).

Raphanus sativus (GARDEN RADISH)
(Period 1) *Pieris rapae* (1).
(Period 2) *Pieris rapae* (6).
(Period 3) *Pieris rapae* (1).

Reseda luteola (WELD)
(Period 3) *Pieris rapae* (1).

Rhododendron ponticum (RHODODENDRON)
(Period 1) *Pieris napi* (2).
(Period 3) *Ochlodes sylvanus* (5), *Gonepteryx rhamni* (1), *Pieris brassicae* (2), *Pieris napi* (4), *Lycaena phlaeas* (2), *Pararge aegeria* (1).

Ribes sanguineum (FLOWERING CURRRANT)
(Period 2) *Aglais io* (1), *Polygonia c-album* (1).

Rorippa nasturtium-aquaticum (WATER-CRESS)
(Period 2) *Pieris rapae* (1), *Pieris napi* (5), *Anthocharis cardamines* (1).
(Period 3) *Pieris napi* (4), *Anthocharis cardamines* (1).

Rosa **sp.** (ROSE)
(Period 1) *Pieris rapae* (1).

Rubus caesius (DEWBERRY)
(Period 3) *Pieris rapae* (1), *Pieris napi* (1).

Rubus fruticosus **agg.** (BRAMBLE)
(Period 1) *Thymelicus sylvestris* (10), *Ochlodes sylvanus* (5), *Pieris brassicae* (10), *Pieris rapae* (38), *Pieris napi* (38), *Polyommatus icarus* (1), *Celastrina argiolus* (4), *Vanessa atalanta* (2), *Vanessa cardui* (5), *Aglais urticae* (4), *Aglais io* (4), *Polygonia c-album* (7), *Pararge aegeria* (11), *Pyronia tithonus* (2), *Maniola jurtina* (22).
(Period 2) *Thymelicus sylvestris* (8), *Ochlodes sylvanus* (51), *Pieris brassicae* (6), *Pieris rapae* (35), *Pieris napi* (45), *Satyrium w-album* (2), *Lycaena phlaeas* (2), *Polyommatus icarus* (3), *Celastrina argiolus* (2), *Vanessa atalanta* (3), *Vanessa cardui* (14), *Aglais io* (6), *Polygonia c-album* (16), *Argynnis paphia* (8), *Pyronia tithonus* (6), *Maniola jurtina* (44), *Coenonympha pamphilus* (11).

(Period 3) *Thymelicus sylvestris* (36), *Ochlodes sylvanus* (74), *Gonepteryx rhamni* (4), *Pieris brassicae* (9), *Pieris rapae* (72), *Pieris napi* (174), *Anthocharis cardamines* (2), *Satyrium w-album* (13), *Lycaena phlaeas* (4), *Celastrina argiolus* (6), *Vanessa atalanta* (23), *Vanessa cardui* (10), *Aglais urticae* (18), *Aglais io* (5), *Polygonia c-album* (31), *Argynnis aglaja* (3), *Pararge aegeria* (15), *Pyronia tithonus* (30), *Maniola jurtina* (148), *Coenonympha pamphilus* (1), *Aphantopus hyperantus* (22).

***Rubus fruticosus* agg.** (BRAMBLE (BLACKBERRY)) **(FRUIT)**
(Period 1) *Polygonia c-album* (3), *Pararge aegeria* (1).
(Period 2) *Vanessa atalanta* (1), *Aglais io* (1), *Polygonia c-album* (7), *Pararge aegeria* (34).
(Period 3) *Vanessa atalanta* (3), *Aglais urticae* (1), *Polygonia c-album* (47), *Pararge aegeria* (36).

Rudbeckia fulgida (ORANGE CONEFLOWER)
(Period 3) *Pararge aegeria* (2).

***Rudbeckia* sp.** (CONEFLOWER (UNSPECIFIED))
(Period 3) *Vanessa atalanta* (7), *Polygonia c-album* (1).

Salix caprea (GOAT WILLOW)
(Period 3) *Gonepteryx rhamni* (2), *Aglais urticae* (13), *Aglais io* (21), *Polygonia c-album* (6).

Salix cinerea (GREY WILLOW/SALLOW)
(Period 1) *Aglais urticae* (4), *Aglais io* (2), *Polygonia c-album* (1).
(Period 2) *Aglais io* (4), *Polygonia c-album* (3).
(Period 3) *Gonepteryx rhamni* (1), *Pieris napi* (2), *Vanessa atalanta* (1), *Aglais urticae* (2), *Aglais io* (26), *Polygonia c-album* (2).

***Salix* sp.** (WILLOW (UNSPECIFIED))
(Period 3) *Gonepteryx rhamni* (6), *Pieris napi* (1), *Aglais urticae* (25), *Aglais io* (32), *Polygonia c-album* (4).

Salvia involucrata (ROSELEAF SAGE) (?)
(Period 3) *Pararge aegeria* (2).

Salvia splendens (SCARLET SAGE)
(Period 1) *Pieris rapae* (1).

Sambucus nigra (ELDER (BERRY)) **(FRUIT)**
(Period 2) *Pararge aegeria* (1).
(Period 3) *Vanessa atalanta* (1).
(Period 3) *Vanessa atalanta* (2), *Polygonia c-album* (2).

Sanguisorba officinalis (GREAT BURNET)
(Period 3) *Satyrium w-album* (1).

Scabiosa columbaria (SMALL SCABIOUS)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (1), *Pieris napi* (1), *Vanessa atalanta* (6), *Aglais urticae* (3), *Aglais io* (1), *Polygonia c-album* (5), *Lasiommata megera* (1).
(Period 2) *Thymelicus sylvestris* (1), *Pieris rapae* (1).

***Sedum* sp.** (STONECROP (UNSPECIFIED))
(Period 1) *Thymelicus sylvestris* (1).
(Period 3) *Lycaena phlaeas* (1), *Vanessa atalanta* (16), *Aglais urticae* (1), *Polygonia c-album* (5).

Sedum spectabile (BUTTERFLY STONECROP/ICE-PLANT)
(Period 1) *Pieris brassicae* (1), *Pieris rapae* (2), *Celastrina argiolus* (2), *Vanessa atalanta* (14), *Vanessa cardui* (9), *Aglais urticae* (66), *Aglais io* (1), *Polygonia c-album* (8), *Pararge aegeria* (6).
(Period 2) *Pieris brassicae* (25), *Pieris rapae* (18), *Pieris napi* (1), *Lycaena phlaeas* (2), *Vanessa atalanta* (176), *Vanessa cardui* (22), *Aglais io* (31), *Polygonia c-album* (46), *Pararge aegeria* (11).
(Period 3) *Gonepteryx rhamni* (4), *Pieris rapae* (1), *Vanessa atalanta* (129), *Vanessa cardui* (15), *Aglais urticae* (43), *Aglais io* (12), *Polygonia c-album* (29), *Pararge aegeria* (11), *Maniola jurtina* (1).

Senecio aquaticus (MARSH RAGWORT)
(Period 2) *Vanessa cardui* (47).
(Period 3) *Lycaena phlaeas* (1), *Pararge aegeria* (1), *Pyronia tithonus* (1), *Maniola jurtina* (1), *Aphantopus hyperantus* (1).

Senecio inaequidens (NARRROW-LEAVED RAGWORT)
(Period 3) *Lycaena phlaeas* (2).

Senecio jacobaea (COMMON RAGWORT)
(Period 1) *Thymelicus sylvestris* (18), *Pieris brassicae* (7), *Pieris rapae* (16), *Pieris napi* (14), *Lycaena phlaeas* (35), *Polyommatus icarus* (9), *Celastrina argiolus* (1), *Vanessa atalanta* (4), *Aglais urticae* (38), *Aglais io* (16), *Polygonia c-album* (3), *Pararge aegeria* (8), *Lasiommata megera* (3), *Pyronia tithonus* (5), *Maniola jurtina* (36).
(Period 2) *Thymelicus sylvestris* (13), *Gonepteryx rhamni* (1), *Pieris brassicae* (1), *Pieris rapae* (21), *Pieris napi* (14), *Satyrium w-album* (1), *Lycaena phlaeas* (70), *Celastrina argiolus* (1), *Vanessa atalanta* (1), *Vanessa cardui* (2), *Aglais io* (16), *Polygonia c-album* (2), *Pararge aegeria* (23), *Pyronia tithonus* (71), *Maniola jurtina* (44).
(Period 3) *Thymelicus sylvestris* (302), *Ochlodes sylvanus* (2), *Gonepteryx rhamni* (2), *Pieris brassicae* (4), *Pieris rapae* (46), *Pieris napi* (35), *Anthocharis cardamines* (2), *Favonius quercus* (1), *Satyrium w-album* (5), *Lycaena phlaeas* (181), *Polyommatus icarus* (18), *Celastrina argiolus* (6), *Vanessa atalanta* (5), *Vanessa cardui* (6), *Aglais urticae* (77), *Aglais io* (38), *Polygonia c-album* (9), *Argynnis aglaja* (1), *Pararge aegeria* (22), *Lasiommata megera* (1), *Hipparchia semele* (11), *Pyronia tithonus* (251), *Maniola jurtina* (229), *Coenonympha pamphilus* (2), *Aphantopus hyperantus* (7).

***Senecio* sp.** (RAGWORT (UNSPECIFIED))
(Period 2) *Pieris rapae* (1), *Pieris napi* (1).

Senecio squalidus (OXFORD RAGWORT)
(Period 1) *Pieris rapae* (3), *Lycaena phlaeas* (1), *Vanessa cardui* (3), *Aglais urticae* (1), *Lasiommata megera* (2).
(Period 2) *Pieris rapae* (4), *Pieris napi* (1), *Celastrina argiolus* (1).
(Period 3) *Aglais io* (1).

Senecio vulgaris (GROUNDSEL)
(Period 1) *Pieris rapae* (1).

Silene dioica (RED CAMPION)
(Period 1) *Pieris rapae* (1), *Pieris napi* (1).
(Period 2) *Pieris brassicae* (1), *Pieris rapae* (1), *Anthocharis cardamines* (3).
(Period 3) *Gonepteryx rhamni* (4), *Pieris brassicae* (4), *Pieris rapae* (2), *Pieris napi* (4), *Anthocharis cardamines* (3).

Sisymbrium officinale (HEDGE MUSTARD)
(Period 1) *Pieris rapae* (2).

Skimmia japonica (JAPANESE SKIMMIA)
(Period 2) *Aglais io* (1).

Solanum tuberosum (POTATO)
(Period 1) *Pieris rapae* (1).

Solidago canadensis (CANADIAN GOLDEN-ROD)
(Period 1) *Polyommatus icarus* (1), *Aglais io* (2).
(Period 2) *Vanessa cardui* (1).
(Period 3) *Favonius quercus* (1), *Vanessa cardui* (3), *Aglais urticae* (4), *Aglais io* (3), *Pyronia tithonus* (3), *Maniola jurtina* (5).

Solidago virgaurea (GOLDEN-ROD)
(Period 3) *Satyrium w-album* (1).

Sonchus arvensis (PERENNIAL SOW-THISTLE)
(Period 1) *Pieris rapae* (7), *Aglais urticae* (1).
(Period 2) *Pieris rapae* (1).
(Period 3) *Pieris rapae* (1), *Vanessa atalanta* (2).

Sonchus asper (SPINY SOW-THISTLE)
(Period 2) *Pieris napi* (1).

Sonchus oleraceus (SMOOTH SOW-THISTLE)
(Period 2) *Pieris rapae* (5).

Sorbus aucuparia (ROWAN)
(Period 2) *Celastrina argiolus* (2).

Sorbus aucuparia (ROWAN) **(FRUIT)**
(Period 3) *Pararge aegeria* (2).

Spiraea **sp.** (BRIDEWORT (UNSPECIFIED))
(Period 1) *Aglais urticae* (1).

Spiraea x billardii (BILLARD'S BRIDEWORT)
(Period 2) *Polygonia c-album* (1).

Stachys officinalis (BETONY)
(Period 2) *Gonepteryx rhamni* (4).
(Period 3) *Thymelicus sylvestris* (3), *Gonepteryx rhamni* (8), *Pieris rapae* (1), *Vanessa cardui* (5), *Argynnis aglaja* (1), *Maniola jurtina* (1).

Stellaria holostea (GREATER STITCHWORT)
(Period 1) *Pieris napi* (3).
(Period 2) *Pieris napi* (2).
(Period 3) *Pieris rapae* (1), *Pieris napi* (2), *Polyommatus icarus* (2).

Stellaria media (COMMON CHICKWEED)
(Period 1) *Pieris rapae* (1).
(Period 2) *Polyommatus icarus* (1).
(Period 3) *Pieris napi* (2), *Coenonympha pamphilus* (1).

Succisa pratensis (DEVIL'S-BIT SCABIOUS)
(Period 1) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (1), *Pieris rapae* (3), *Pieris napi* (3), *Lycaena phlaeas* (6), *Polyommatus icarus* (1), *Vanessa atalanta* (1), *Aglais io* (1), *Lasiommata megera* (1).
(Period 2) *Pieris rapae* (1), *Vanessa cardui* (2), *Aglais urticae* (1), *Aglais io* (1).
(Period 3) *Thymelicus sylvestris* (2), *Pieris brassicae* (1), *Pieris rapae* (1), *Pieris napi* (3), *Lycaena phlaeas* (2), *Celastrina argiolus* (1), *Aglais urticae* (4), *Aglais io* (70), *Pyronia tithonus* (2), *Maniola jurtina* (4).

Symphoricarpos albus (SNOWBERRY)
(Period 2) *Celastrina argiolus* (5), *Pararge aegeria* (1).
(Period 3) *Celastrina argiolus* (1).

Symphytum officinale (COMMON COMFREY)
(Period 1) *Pieris rapae* (1), *Pieris napi* (2), *Vanessa cardui* (1), *Aglais urticae* (1).
(Period 2) *Gonepteryx rhamni* (3), *Pieris rapae* (2), *Pieris napi* (1), *Anthocharis cardamines* (1), *Vanessa cardui* (1).
(Period 3) *Ochlodes sylvanus* (1), *Pieris brassicae* (1), *Anthocharis cardamines* (1).

Syringa vulgaris (LILAC)
(Period 1) *Pieris brassicae* (1).
(Period 2) *Pieris brassicae* (1).
(Period 3) *Pieris brassicae* (1), *Aglais urticae* (1).

Tagetes erecta (AFRICAN MARIGOLD)
(Period 1) *Pieris napi* (2), *Aglais urticae* (7), *Aglais io* (1).
(Period 2) *Pieris rapae* (2), *Vanessa atalanta* (1), *Aglais urticae* (4), *Polygonia c-album* (1).
(Period 3) *Pieris rapae* (1).

Tagetes patula (FRENCH MARIGOLD)
(Period 1) *Pieris brassicae* (4), *Pieris rapae* (2), *Vanessa atalanta* (1), *Vanessa cardui* (1), *Aglais urticae* (11).
(Period 2) *Aglais urticae* (1).
(Period 3) *Aglais urticae* (4), *Aglais io* (1).

Tanacetum vulgare (TANSY)
(Period 2) *Celastrina argiolus* (1).
(Period 3) *Pieris napi* (1), *Lycaena phlaeas* (1), *Aglais urticae* (1).

***Taraxacum* sp.** (DANDELION)
(Period 1) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (1), *Pieris brassicae* (10), *Pieris rapae* (29), *Pieris napi* (25), *Anthocharis cardamines* (13), *Vanessa cardui* (1), *Aglais urticae* (97), *Aglais io* (75), *Polygonia c-album* (2), *Lasiommata megera* (2).
(Period 2) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (5), *Pieris brassicae* (10), *Pieris rapae* (15), *Pieris napi* (36), *Anthocharis cardamines* (10), *Lycaena phlaeas* (3), *Polyommatus icarus* (2), *Aglais urticae* (105), *Aglais io* (69), *Polygonia c-album* (5), *Pararge aegeria* (4), *Maniola jurtina* (1).
(Period 3) *Thymelicus sylvestris* (1), *Gonepteryx rhamni* (14), *Pieris brassicae* (3), *Pieris rapae* (37), *Pieris napi* (78), *Anthocharis cardamines* (33), *Callophrys rubi* (2), *Lycaena phlaeas* (6), *Aglais urticae* (160), *Aglais io* (115), *Polygonia c-album* (1), *Pararge aegeria* (1), *Lasiommata megera* (3), *Maniola jurtina* (2), *Aphantopus hyperantus* (1).

Trachystemon orientalis (ABRAHAM-ISAAC-JACOB)
(Period 3) *Aglais urticae* (1).

Trifolium dubium (LESSER TREFOIL)
(Period 1) *Thymelicus sylvestris* (1), *Polyommatus icarus* (9).
(Period 2) *Polyommatus icarus* (18).
(Period 3) *Cupido minimus* (1), *Polyommatus icarus* (18).

Trifolium hybridum (ALSIKE CLOVER)
(Period 1) *Polyommatus icarus* (1).
(Period 2) *Thymelicus sylvestris* (2), *Pieris napi* (1).
(Period 3) *Maniola jurtina* (1).

Trifolium pratense (RED CLOVER)
(Period 1) *Thymelicus sylvestris* (47), *Ochlodes sylvanus* (12), *Colias croceus* (1), *Gonepteryx rhamni* (1), *Pieris brassicae* (3), *Pieris rapae* (3), *Pieris napi* (1), *Lycaena phlaeas* (2), *Polyommatus icarus* (3), *Vanessa cardui* (4), *Aglais urticae* (1), *Aglais io* (3), *Pararge aegeria* (1), *Maniola jurtina* (4).
(Period 2) *Thymelicus sylvestris* (19), *Ochlodes sylvanus* (19), *Gonepteryx rhamni* (1), *Pieris rapae* (4), *Pieris napi* (3), *Lycaena phlaeas* (2), *Polyommatus icarus* (4), *Aglais urticae* (4), *Aglais io* (4), *Maniola jurtina* (9).
(Period 3) *Thymelicus sylvestris* (41), *Ochlodes sylvanus* (23), *Pieris brassicae* (3), *Pieris rapae* (1), *Pieris napi* (1), *Lycaena phlaeas* (1), *Vanessa atalanta* (3), *Vanessa cardui* (9), *Aglais urticae* (5), *Aglais io* (100), *Argynnis aglaja* (9), *Pyronia tithonus* (2), *Maniola jurtina* (15), *Coenonympha pamphilus* (1).

Trifolium repens (WHITE CLOVER)
(Period 1) *Thymelicus sylvestris* (9), *Pieris rapae* (1), *Pieris napi* (5), *Anthocharis cardamines* (1), *Polyommatus icarus* (8), *Vanessa cardui* (2), *Aglais urticae* (1), *Maniola jurtina* (4).
(Period 2) *Thymelicus sylvestris* (3), *Ochlodes sylvanus* (1), *Pieris rapae* (4), *Pieris napi* (3), *Polyommatus icarus* (17), *Maniola jurtina* (4), *Coenonympha pamphilus* (1).
(Period 3) *Thymelicus sylvestris* (5), *Ochlodes sylvanus* (4), *Pieris rapae* (1), *Pieris napi* (3), *Lycaena phlaeas* (2), *Polyommatus icarus* (4), *Argynnis aglaja* (1), *Pyronia tithonus* (2), *Maniola jurtina* (12), *Coenonympha pamphilus* (1), *Aphantopus hyperantus* (1).

***Trifolium* sp.** (CLOVER (UNSPECIFIED))
(Period 3) *Ochlodes sylvanus* (2), *Lycaena phlaeas* (1), *Polyommatus icarus* (1), *Vanessa cardui* (3).

Tropaeolum majus (NASTURTIUM)
(Period 3) *Pieris rapae* (7).

Tripleurospermum inodorum (SCENTLESS MAYWEED)
(Period 1) *Pieris rapae* (1), *Lycaena phlaeas* (1).
(Period 2) *Colias croceus* (1), *Pieris rapae* (3), *Polyommatus icarus* (5).

Tussilago farfara (COLT'S-FOOT)
(Period 1) *Pieris rapae* (1), *Aglais urticae* (6), *Aglais io* (1), *Polygonia c-album* (1).
(Period 2) *Aglais urticae* (5).
(Period 3) *Gonepteryx rhamni* (2), *Anthocharis cardamines* (2), *Vanessa cardui* (1), *Aglais urticae* (12), *Aglais io* (1), *Polygonia c-album* (1).

Ulex europaeus (GORSE)
(Period 1) *Callophrys rubi* (1), *Aglais io* (1).
(Period 3) *Callophrys rubi* (5).

Vaccinium myrtillus (BILBERRY)
(Period 2) *Pieris napi* (1), *Callophrys rubi* (5).
(Period 3) *Anthocharis cardamines* (1), *Callophrys rubi* (6), *Pararge aegeria* (1).

Valeriana officinalis (COMMON VALERIAN)
(Period 3) *Aglais urticae* (1).

Verbena bonariensis (ARGENTINIAN VERVAIN)
(Period 2) *Pieris brassicae* (11), *Pieris rapae* (13), *Vanessa atalanta* (6), *Vanessa cardui* (1), *Aglais urticae* (9), *Nymphalis polychloros* (1), *Polygonia c-album* (2).
(Period 3) *Pieris brassicae* (12), *Pieris rapae* (30), *Pieris napi* (3), *Lycaena phlaeas* (1), *Vanessa atalanta* (52), *Vanessa cardui* (40), *Aglais urticae* (4), *Polygonia c-album* (27), *Maniola jurtina* (1).

Veronica chamaedrys (GERMANDER SPEEDWELL)
(Period 3) *Pieris rapae* (1), *Pieris napi* (1).

***Veronica* sp.** (SPEEDWELL (UNSPECIFIED))
(Period 1) *Vanessa atalanta* (1), *Polygonia c-album* (1).

Viburnum lantana (WAYFARING-TREE)
(Period 1) *Vanessa cardui* (2).

Viburnum opulus (GUELDER-ROSE)
(Period 1) *Argynnis adippe* (1).
(Period 3) *Aglais io* (1), *Boloria euprhrosye* (1).

***Viburnum* sp.** (VIBURNUM (UNSPECIFIED))
(Period 2) *Aglais urticae* (1).
(Period 3) *Polygonia c-album* (1).

Vicia cracca (TUFTED VETCH)
(Period 1) *Thymelicus sylvestris* (60), *Ochlodes sylvanus* (7), *Pieris napi* (12), *Polyommatus icarus* (4), *Maniola jurtina* (14).
(Period 2) *Thymelicus sylvestris* (19), *Ochlodes sylvanus* (11), *Pieris rapae* (1), *Pieris napi* (2), *Polyommatus icarus* (1), *Aglais urticae* (1), *Pararge aegeria* (1), *Maniola jurtina* (5).
(Period 3) *Thymelicus sylvestris* (27), *Ochlodes sylvanus* (22), *Pieris brassicae* (1), *Pieris rapae* (11), *Polyommatus icarus* (3), *Vanessa cardui* (1), *Aglais urticae* (2), *Pyronia tithonus* (1), *Maniola jurtina* (8).

Vicia hirsuta (HAIRY TARE)
(Period 3) *Thymelicus sylvestris* (1), *Polyommatus icarus* (2).

Vicia sativa (COMMON VETCH)
(Period 1) *Pieris rapae* (1), *Vanessa cardui* (2).
(Period 2) *Ochlodes sylvanus* (1), *Pieris rapae* (2), *Pieris napi* (1), *Polyommatus icarus* (2), *Aglais urticae* (1).
(Period 3) *Ochlodes sylvanus* (5), *Anthocharis cardamines* (3), *Polyommatus icarus* (1), *Lasiommata megera* (4).

Vicia sepium (BUSH VETCH)
(Period 1) *Anthocharis cardamines* (2).
(Period 3) *Ochlodes sylvanus* (6), *Gonepteryx rhamni* (1), *Pieris napi* (2), *Anthocharis cardamines* (2), *Polyommatus icarus* (2).

***Vinca* sp.** (PERIWINKLE (UNSPECIFIED))
(Period 2) *Gonepteryx rhamni* (1).

Viola arvensis (FIELD PANSY)
(Period 3) *Pieris rapae* (1), *Pieris napi* (1).

***Viola* sp.** (VIOLET (UNSPECIFIED))
(Period 3) *Pieris napi* (2), *Anthocharis cardamines* (2).

Viola tricolor (WILD PANSY)
(Period 2) *Pieris rapae* (1).

Viola x wittrockiana (GARDEN PANSY)
(Period 1) *Pieris rapae* (1).
(Period 2) *Celastrina argiolus* (1).
(Period 3) *Pieris rapae* (1).

(Cuckoo-spit)
(Period 2) *Pararge aegeria* (1).

(Dung)
(Period 1) *Lycaena phlaeas* (1), *Maniola jurtina* (1).
(Period 2) *Polygonia c-album* (1).
(Period 3) *Pieris napi* (1), *Vanessa atalanta* (2), *Polygonia c-album* (2).

(Honey-dew)
(Period 2) *Vanessa atalanta* (1), *Polygonia c-album* (2).
(Period 3) *Favonius quercus* (7), *Satyrium w-album* (9), *Polygonia c-album* (2), *Pararge aegeria* (7).

(Mud-puddling)
(Period 1) *Celastrina argiolus* (1), *Pararge aegeria* (2).
(Period 2) *Pieris rapae* (2), *Pieris napi* (7), *Celastrina argiolus* (3), *Vanessa atalanta* (1), *Aglais urticae* (3), *Aglais io* (2), *Polygonia c-album* (3), *Pararge aegeria* (7).
(Period 3) *Thymelicus sylvestris* (4), *Pieris rapae* (6), *Pieris napi* (15), *Favonius quercus* (1), *Celastrina argiolus* (10), *Vanessa atalanta* (2), *Vanessa cardui* (1), *Aglais urticae* (3), *Polygonia c-album* (3), *Pararge aegeria* (6), *Coenonympha pamphilus* (3).

(Rotten flesh)
(Period 3) *Vanessa atalanta* (1).

(Semi-dry cut/chewed grass)
(Period 3) *Pieris napi* (1).

The following is a list of the nectar plants and other nutritional sources noted as used by each butterfly species, with the number of individual butterflies noted using it, in each of the three periods:

Thymelicus sylvestris (SMALL SKIPPER)
(Period 1) *Vicia cracca* (60), *Cirsium arvense* (58), *Trifolium pratense* (47), *Centaurea nigra* (25), *Senecio jacobaea* (18), *Lotus corniculatus* (14), *Cirsium vulgare* (11), *Rubus fruticosus* agg. (10), *Trifolium repens* (9), *Chamerion angustifolium* (8), *Lathyrus pratensis* (8), *Buddleja davidii* (4), *Hieracium* sp. (3), *Achillea millefolium* (1), *Calluna vulgaris* (1), *Centaurea scabiosa* (1), *Hydrangea macrophylla* (1), *Leucanthemum vulgare* (1), *Sedum* sp. (1), *Succisa pratensis* (1), *Taraxacum* sp. (1), *Trifolium dubium* (1).
(Period 2) *Centaurea nigra* (127), *Lotus corniculatus* (101), *Cirsium arvense* (54), *Trifolium pratense* (19), *Vicia cracca* (19), *Senecio jacobaea* (13), *Rubus fruticosus* agg. (8), *Cirsium vulgare* (6), *Hieracium* sp. (4), *Lathyrus pratensis* (3), *Trifolium repens* (3), *Buddleja davidii* (2), *Trifolium hybridum* (2), *Chamerion angustifolium* (1), *Epilobium hirsutum* (1), *Geranium robertianum* (1), *Lavandula x intermedia* (1), *Scabiosa columbaria* (1), *Taraxacum* sp. (1).
(Period 3) *Senecio jacobaea* (302), *Cirsium arvense* (298), *Centaurea nigra* (45), *Trifolium pratense* (41), *Rubus fruticosus* agg. (36), *Vicia cracca* (27), *Lotus corniculatus* (26), *Cirsium palustre* (25), *Lathyrus pratensis* (19), *Buddleja davidii* (14), *Hypochaeris radicata* (9), *Ranunculus acris* (8), *Cirsium vulgare* (7), *Epilobium hirsutum* (5), *Trifolium repens* (5), (Mud-puddling) (4), *Lavandula x intermedia* (4), *Leontodon saxatilis* (4), *Prunella vulgaris* (4), *Lythrum salicaria* (3), *Stachys officinalis* (3), *Achillea ptarmica* (2), *Lotus pedunculatus* (2), *Origanum vulgare* (2), *Succisa pratensis* (2), *Achillea millefolium* (1), *Calystegia silvatica* (1), *Chamerion angustifolium* (1), *Eupatorium cannabinum* (1), *Heracleum sphondylium* (1), *Hieracium* sp. (1), *Knautia arvensis* (1), *Leontodon hispidus* (1), *Leontodon* sp. (1), *Lysimachia punctata* (1), *Melilotus officinalis* (1), *Taraxacum* sp. (1), *Vicia hirsuta* (1).

Ochlodes sylvanus (LARGE SKIPPER)
(Period 1) *Cirsium arvense* (16), *Trifolium pratense* (12), *Vicia cracca* (7), *Rubus fruticosus* agg. (5), *Cirsium vulgare* (2), *Calystegia sepium* (1), *Centaurea nigra* (1), *Lathyrus pratensis* (1), *Lotus corniculatus* (1), *Lychnis flos-cuculi* (1), *Ranunculus acris* (1).
(Period 2) *Rubus fruticosus* agg. (51), *Trifolium pratense* (19), *Lathyrus pratensis* (18), *Vicia cracca* (11), *Lotus corniculatus* (7), *Cirsium arvense* (6), *Cirsium palustre* (6), *Hieracium* sp. (4), *Ranunculus acris* (3), *Achillea millefolium* (1), *Aegopodium podagraria* (1), *Hesperis matronalis* (1), *Leontodon hispidus* (1), *Trifolium repens* (1), *Vicia sativa* (1).
(Period 3) *Rubus fruticosus* agg. (74), *Cirsium arvense* (65), *Lathyrus pratensis* (24), *Trifolium pratense* (23), *Vicia cracca* (22), *Lotus corniculatus* (17), *Cirsium palustre* (12), *Vicia sepium* (6), *Rhododendron ponticum* (5), *Vicia sativa* (5), *Trifolium repens* (4), *Cirsium vulgare* (3), *Ranunculus acris* (3), *Chamerion angustifolium* (2), *Geranium robertianum* (2), *Leontodon saxatilis* (2), *Senecio jacobaea* (2), *Trifolium* sp. (2), *Calystegia sepium* (1), *Calystegia silvatica* (1), *Centaurea nigra* (1), *Centaurea scabiosa* (1), *Digitalis purpurea* (1), *Leucanthemum vulgare* (1), *Lychnis flos-cuculi* (1), *Symphytum officinale* (1).

Erynnis tages (DINGY SKIPPER)
(Period 3) *Lotus corniculatus* (13), *Ajuga reptans* (1).

Colias croceus (CLOUDED YELLOW)
(Period 1) *Aster x salignus* (1), *Centaurea nigra* (1), *Trifolium pratense* (1).
(Period 2) *Aster x salignus* (2), *Buddleja davidii* (1), *Centaurea nigra* (1), *Lythrum salicaria* (1), *Tripleurospermum inodorum* (1).
(Period 3) *Cirsium vulgare* (1), *Dianthus barbatus* (1).

Gonepteryx rhamni (BRIMSTONE)
(Period 1) *Cirsium arvense* (4), *Buddleja davidii* (3), *Aster x salignus* (1), *Geranium robertianum* (1), *Succisa pratensis* (1), *Taraxacum* sp. (1), *Trifolium pratense* (1).
(Period 2) *Arctium lappa* (7), *Centaurea nigra* (5), *Myrica gale* (5), *Rubus fruticosus* agg. (5), *Taraxacum* sp. (5), *Aster x salignus* (4), *Buddleja davidii* (4), *Stachys officinalis* (4), *Symphytum officinale* (3), *Cirsium vulgare* (2), *Alliaria petiolata* (1), *Cirsium arvense* (1), *Cirsium palustre* (1), *Epilobium hirsutum*

(1), *Hydrangea macrophylla* (1), *Phlox drummondii* (1), *Senecio jacobaea* (1), *Trifolium pratense* (1), *Vinca* sp. (1).
(Period 3) *Taraxacum* sp. (14), *Centaurea nigra* (8), *Cirsium arvense* (8), *Stachys officinalis* (8), *Knautia arvensis* (6), *Salix* sp. (6), *Calystegia silvatica* (5), *Aster x salignus* (4), *Buddleja davidii* (4), *Rubus fruticosus* agg. (4), *Sedum spectabile* (4), *Silene dioica* (4), *Eupatorium cannabinum* (3), *Narcissus pseudonarcissus* (3), *Cirsium vulgare* (2), *Pulicaria dysenterica* (2), *Salix caprea* (2), *Senecio jacobaea* (2), *Tussilago farfara* (2), *Bellis perennis* (1), *Crocus* sp. (1), *Dipsacus fullonum* (1), *Hyacinthoides hispanica* (1), *Hyacinthoides non-scripta* (1), *Lathyrus odoratus* (1), *Myosotis arvensis* (1), *Myosotis scorpioides* (1), *Phlox drummondii* (1), *Rhododendron ponticum* (1), *Salix cinerea* (1), *Vicia sepium* (1).

Pieris brassicae (LARGE WHITE)
(Period 1) *Buddleja davidii* (133), *Cirsium arvense* (16), *Rubus fruticosus* agg. (10), *Taraxacum* sp. (10), *Senecio jacobaea* (7), *Cirsium vulgare* (5), *Callistephus chinensis* (4), *Chamerion angustifolium* (4), *Hesperis matronalis* (4), *Tagetes patula* (4), *Aster x salignus* (3), *Hieracium* sp. (3), *Hyacinthoides hispanica* (3), *Impatiens glandulifera* (3), *Trifolium pratense* (3), *Brassica oleracea* (2), *Centaurea nigra* (2), *Helichrysum bracteatum* (2), *Ligustrum ovalifolium* (2), *Lunaria annua* (2), *Anthriscus sylvestris* (1), *Ballota nigra* (1), *Calystegia silvatica* (1), *Epilobium hirsutum* (1), *Geranium* sp. (1), *Hedera helix* (1), *Heracleum sphondylium* (1), *Lavandula x intermedia* (1), *Nepeta x faassenii* (1), *Origanum vulgare* (1), *Pelargonium x hybridum* (1), *Persicaria bistorta* (1), *Petunia x hybrida* (1), *Phlox drummondii* (1), *Scabiosa columbaria* (1), *Sedum spectabile* (1), *Syringa vulgaris* (1).
(Period 2) *Buddleja davidii* (462), *Sedum spectabile* (25), *Verbena bonariensis* (11), *Taraxacum* sp. (10), *Centaurea nigra* (9), *Aster x salignus* (6), *Chamerion angustifolium* (6), *Cirsium arvense* (6), *Cirsium vulgare* (6), *Rubus fruticosus* agg. (6), *Hydrangea macrophylla* (5), *Lavandula x intermedia* (5), *Calystegia silvatica* (3), *Hesperis matronalis* (3), *Ranunculus acris* (3), *Epilobium hirsutum* (2), *Hieracium* sp. (2), *Matthiola incana* (2), (*unknown purple spike*) (1), *[yellow-flowered garden shrub]* (1), *Abelia x grandiflora* (1), *Aesculus carnea* (1), *Argyranthemum frutescens* (1), *Calluna vulgaris* (1), *Cardamine pratensis* (1), *Crataegus monogyna* (1), *Epilobium montanum* (1), *Erysimum cheiri* (1), *Hyacinthoides hispanica* (1), *Hypochaeris radicata* (1), *Inula helenium* (1), *Lythrum salicaria* (1), *Petunia x hybrida* (1), *Prunus avium* (1), *Raphanus raphanistrum* (1), *Senecio jacobaea* (1), *Silene dioica* (1), *Syringa vulgaris* (1).
(Period 3) *Buddleja davidii* (215), *Cirsium arvense* (20), *Verbena bonariensis* (12), *Centaurea nigra* (11), *Epilobium hirsutum* (10), *Buddleja x weyeriana* (9), *Rubus fruticosus* agg. (9), *Cirsium palustre* (5), *Aster novi-belgii* (4), *Senecio jacobaea* (4), *Silene dioica* (4), *Brassica rapa* (3), *Cirsium vulgare* (3), *Hesperis matronalis* (3), *Hyacinthoides non-scripta* (3), *Lythrum salicaria* (3), *Taraxacum* sp. (3), *Trifolium pratense* (3), *Caltha palustris* (2), *Calystegia silvatica* (2), *Chamerion angustifolium* (2), *Hedera helix* (2), *Knautia arvensis* (2), *Ranunculus acris* (2), *Rhododendron ponticum* (2), *Aubrieta deltoidea* (1), *Geranium endressii* (1), *Geranium robertianum* (1), *Geranium* sp. (1), *Heracleum sphondylium* (1), *Hyacinthoides hispanica* (1), *Leontodon* sp. (1), *Succisa pratensis* (1), *Symphytum officinale* (1), *Syringa vulgaris* (1), *Vicia cracca* (1).

Pieris rapae (SMALL WHITE)
(Period 1) *Buddleja davidii* (61), *Cirsium arvense* (44), *Rubus fruticosus* agg. (38), *Taraxacum* sp. (29), *Lavandula x intermedia* (21), *Aster x salignus* (19), *Senecio jacobaea* (16), *Chamerion angustifolium* (12), *Brassica oleracea* (11), *Hesperis matronalis* (7), *Hieracium* sp. (7), *Sonchus arvensis* (7), *Cardamine pratensis* (5), *Epilobium hirsutum* (5), *Aubrieta deltoidea* (4), *Centaurea nigra* (4), *Bellis perennis* (3), *Calystegia silvatica* (3), *Cirsium vulgare* (3), *Hebe x franciscana* (3), *Impatiens glandulifera* (3), *Ranunculus acris* (3), *Senecio squalidus* (3), *Succisa pratensis* (3), *Trifolium pratense* (3), *Centranthus ruber* (2), *Crataegus monogyna* (2), *Ligustrum ovalifolium* (2), *Pentaglottis sempervirens* (2), *Raphanus raphanistrum* (2), *Sedum spectabile* (2), *Sisymbrium officinale* (2), *Tagetes patula* (2), *Alliaria petiolata* (1), *Anthemis arvensis* (1), *Antirrhinum majus* (1), *Argyranthemum frutescens* (1), *Armoracia rusticana* (1), *Ballota nigra* (1), *Calendula officinalis* (1), *Dianthus plumarius* (1), *Galeopsis tetrahit* (1), *Geranium robertianum* (1), *Geranium* sp. (1), *Lathyrus odoratus* (1), *Leucanthemum vulgare* (1), *Lobelia erinus* (1), *Lotus corniculatus* (1), *Lunaria annua* (1), *Medicago sativa* (1), *Nepeta x faassenii* (1), *Petasites hybridus* (1), *Raphanus sativus* (1), *Rosa* sp. (1), *Salvia splendens* (1), *Scabiosa columbaria* (1), *Senecio vulgaris* (1), *Silene dioica* (1), *Solanum tuberosum* (1), *Stellaria media* (1), *Symphytum officinale* (1), *Trifolium repens* (1), *Tripleurospermum inodorum* (1), *Tussilago farfara* (1), *Vicia sativa* (1), *Viola x wittrockiana* (1).
(Period 2) *Buddleja davidii* (154), *Aster tripolium* (70), *Cirsium arvense* (42), *Aster x salignus* (36), *Rubus fruticosus* agg. (35), *Senecio jacobaea* (21), *Epilobium hirsutum* (20), *Lavandula x intermedia* (20), *Sedum spectabile* (18), *Taraxacum* sp. (15), *Verbena bonariensis* (13), *Centaurea nigra* (12), *Chamerion angustifolium* (10), *Epilobium montanum* (10), *Cirsium vulgare* (9), *Ranunculus acris* (8), *Raphanus*

sativus (6), *Geranium robertianum* (5), *Hieracium* sp. (5), *Sonchus oleraceus* (5), *Brassica rapa* (4), *Centranthus ruber* (4), *Leontodon hispidus* (4), *Senecio squalidus* (4), *Trifolium pratense* (4), *Trifolium repens* (4), *Brassica oleracea* (3), *Cardamine pratensis* (3), *Hydrangea macrophylla* (3), *Tripleurospermum inodorum* (3), (Mud-puddling) (2), *Alliaria petiolata* (2), *Hedera helix* (2), *Leontodon autumnalis* (2), *Leontodon saxatilis* (2), *Ligustrum ovalifolium* (2), *Matthiola incana* (2), *Raphanus raphanistrum* (2), *Symphytum officinale* (2), *Tagetes erecta* (2), *Vicia sativa* (2), *Achillea millefolium* (1), *Artemisia vulgaris* (1), *Aster novi-belgii* (1), *Bellis perennis* (1), *Buddleja x weyeriana* (1), *Calendula officinalis* (1), *Calluna vulgaris* (1), *Calystegia silvatica* (1), *Centaurea cyanus* (1), *Chrysanthemum segetum* (1), *Cichorium intybus* (1), *Crepis capillaris* (1), *Escallonia x langleyensis* (1), *Fallopia baldschuanica* (1), *Geranium dissectum* (1), *Hebe x franciscana* (1), *Hesperis matronalis* (1), *Hypericum perforatum* (1), *Knautia arvensis* (1), *Lamium purpureum* (1), *Leucanthemum vulgare* (1), *Lunaria annua* (1), *Lythrum salicaria* (1), *Matricaria discoidea* (1), *Matthiola* sp. (1), *Melilotus albus* (1), *Origanum vulgare* (1), *Pentaglottis sempervirens* (1), *Rorippa nasturtium-aquaticum* (1), *Scabiosa columbaria* (1), *Senecio* sp. (1), *Silene dioica* (1), *Sonchus arvensis* (1), *Succisa pratensis* (1), *Vicia cracca* (1), *Viola tricolor* (1).

(Period 3) *Buddleja davidii* (317), *Cirsium arvense* (214), *Rubus fruticosus* agg. (72), *Lavandula x intermedia* (55), *Epilobium hirsutum* (54), *Senecio jacobaea* (46), *Taraxacum* sp. (37), *Verbena bonariensis* (30), *Centaurea nigra* (25), *Brassica rapa* (22), *Aster x salignus* (19), *Cirsium vulgare* (14), *Knautia arvensis* (12), *Pulicaria dysenterica* (12), *Lobelia* sp. (11), *Vicia cracca* (11), *Brassica oleracea* (10), *Epilobium montanum* (8), *Leontodon* sp. (8), *Lythrum salicaria* (8), *Chamerion angustifolium* (7), *Origanum vulgare* (7), *Tropaeolum majus* (7), (Mud-puddling) (6), *Alliaria petiolata* (6), *Cirsium palustre* (6), *Matthiola incana* (6), *Ranunculus acris* (6), *Raphanus raphanistrum* (6), *Geranium robertianum* (5), *Impatiens glandulifera* (5), *Buddleja x weyeriana* (3), *Cardamine pratensis* (3), *Diplotaxis* sp. (3), *Geranium endressii* (3), *Geranium* sp. (3), *Hedera helix* (3), *Leontodon saxatilis* (3), *Arctium lappa* (2), *Aster tripolium* (2), *Bellis perennis* (2), *Brachyglottis* 'Sunshine' (*B. compacta x laxifolia*) (2), *Calluna vulgaris* (2), *Eupatorium purpureum* (2), *Geranium pratense* (2), *Hebe* sp. (2), *Hyacinthoides hispanica* (2), *Leucanthemum vulgare* (2), *Lotus corniculatus* (2), *Myosotis arvensis* (2), *Silene dioica* (2), *Acanthus* sp. (1), *Antirrhinum majus* (1), *Argyranthemum frutescens* (1), *Aster amellus* (1), *Aster novi-belgii* (1), *Aubrieta deltoidea* (1), *Brassica napus* (1), *Calystegia silvatica* (1), *Cosmos bipinnatus* (1), *Crataegus monogyna* (1), *Crepis capillaris* (1), *Erysimum* 'Bowles's Mauve' (1), *Eupatorium cannabinum* (1), *Fallopia baldschuanica* (1), *Fragaria x ananassa* (1), *Geranium dissectum* (1), *Geranium molle* (1), *Hebe x franciscana* (1), *Hieracium* sp. (1), *Hyacinthoides non-scripta* (1), *Hypericum* sp. (1), *Lapsana communis* (1), *Leontodon hispidus* (1), *Ligustrum ovalifolium* (1), *Linaria vulgaris* (1), *Mentha* sp. (1), *Myosotis* sp. (1), *Narcissus pseudonarcissus* (1), *Nepeta x faassenii* (1), *Potentilla fruticosa* (1), *Prunella vulgaris* (1), *Raphanus sativus* (1), *Reseda luteola* (1), *Rubus caesius* (1), *Sedum spectabile* (1), *Sonchus arvensis* (1), *Stachys officinalis* (1), *Stellaria holostea* (1), *Succisa pratensis* (1), *Tagetes erecta* (1), *Trifolium pratense* (1), *Trifolium repens* (1), *Veronica chamaedrys* (1), *Viola arvensis* (1), *Viola x wittrockiana* (1).

Pieris napi (GREEN-VEINED WHITE)

(Period 1) *Cirsium arvense* (43), *Rubus fruticosus* agg. (38), *Taraxacum* sp. (25), *Epilobium hirsutum* (18), *Hesperis matronalis* (14), *Senecio jacobaea* (14), *Vicia cracca* (12), *Cardamine pratensis* (11), *Aster x salignus* (10), *Brassica oleracea* (10), *Chamerion angustifolium* (10), *Ranunculus acris* (8), *Buddleja davidii* (5), *Trifolium repens* (5), *Centaurea nigra* (4), *Hieracium* sp. (4), *Anthriscus sylvestris* (3), *Bellis perennis* (3), *Crataegus monogyna* (3), *Impatiens glandulifera* (3), *Persicaria maculosa* (3), *Stellaria holostea* (3), *Succisa pratensis* (3), *Alliaria petiolata* (2), *Ballota nigra* (2), *Calystegia silvatica* (2), *Cirsium palustre* (2), *Heracleum sphondylium* (2), *Lunaria annua* (2), *Rhododendron ponticum* (2), *Symphytum officinale* (2), *Tagetes erecta* (2), *Aubrieta deltoidea* (1), *Capsella bursa-pastoris* (1), *Dactylorhiza fuchsii* (1), *Galeopsis tetrahit* (1), *Geranium robertianum* (1), *Hyacinthoides hispanica* (1), *Hydrangea macrophylla* (1), *Hypochaeris radicata* (1), *Iberis umbellata* (1), *Lapsana communis* (1), *Lavandula x intermedia* (1), *Leucanthemum vulgare* (1), *Ligustrum ovalifolium* (1), *Lotus corniculatus* (1), *Medicago sativa* (1), *Myosotis arvensis* (1), *Petasites hybridus* (1), *Scabiosa columbaria* (1), *Silene dioica* (1), *Trifolium pratense* (1).

(Period 2) *Epilobium hirsutum* (45), *Rubus fruticosus* agg. (45), *Cirsium arvense* (44), *Cardamine pratensis* (41), *Taraxacum* sp. (36), *Buddleja davidii* (18), *Centaurea nigra* (17), *Aster x salignus* (14), *Senecio jacobaea* (14), *Ranunculus acris* (13), *Chamerion angustifolium* (8), *Epilobium montanum* (8), (Mud-puddling) (7), *Anthriscus sylvestris* (5), *Brassica oleracea* (5), *Rorippa nasturtium-aquaticum* (5), *Alliaria petiolata* (4), *Calluna vulgaris* (4), *Hieracium* sp. (4), *Crataegus monogyna* (3), *Geranium robertianum* (3), *Hesperis matronalis* (3), *Trifolium pratense* (3), *Trifolium repens* (3), *Hydrangea aspera* (2), *Lavandula x intermedia* (2), *Leontodon hispidus* (2), *Ligularia* x 'The Rocket' (2), *Stellaria holostea* (2), *Vicia cracca* (2), *Achillea millefolium* (1), *Allium ursinum* (1), *Aubrieta deltoidea* (1), *Bellis perennis*

(1), *Calystegia silvatica* (1), *Choisya ternata* (1), *Cirsium vulgare* (1), *Dipsacus fullonum* (1), *Fragaria x ananassa* (1), *Geranium dissectum* (1), *Hyacinthoides hispanica* (1), *Hydrangea macrophylla* (1), *Ilex aquifolium* (1), *Impatiens glandulifera* (1), *Impatiens walleriana* (1), *Lamium purpureum* (1), *Ligustrum ovalifolium* (1), *Lunaria annua* (1), *Lythrum salicaria* (1), *Origanum vulgare* (1), *Persicaria bistorta* (1), *Potentilla* sp. (1), *Sedum spectabile* (1), *Senecio* sp. (1), *Senecio squalidus* (1), *Sonchus asper* (1), *Symphytum officinale* (1), *Trifolium hybridum* (1), *Vaccinium myrtillus* (1), *Vicia sativa* (1).
(Period 3) *Rubus fruticosus* agg. (174), *Cirsium arvense* (147), *Taraxacum* sp. (78), *Epilobium hirsutum* (77), *Cardamine pratensis* (70), *Buddleja davidii* (38), *Cirsium palustre* (35), *Senecio jacobaea* (35), *Centaurea nigra* (29), *Epilobium montanum* (22), *Geranium robertianum* (19), (Mud-puddling) (15), *Chamerion angustifolium* (14), *Hyacinthoides hispanica* (13), *Ranunculus acris* (13), *Lythrum salicaria* (12), *Cirsium* sp. (10), *Epilobium* sp. (10), *Eupatorium cannabinum* (10), *Alliaria petiolata* (9), *Myosotis arvensis* (9), *Brassica rapa* (7), *Cirsium vulgare* (7), *Leontodon saxatilis* (7), *Montia fontana* (7), *Origanum vulgare* (7), *Calluna vulgaris* (5), *Hesperis matronalis* (5), *Lotus corniculatus* (5), *Aster x salignus* (4), *Hyacinthoides non-scripta* (4), *Rhododendron ponticum* (4), *Rorippa nasturtium-aquaticum* (4), *Silene dioica* (4), *Aesculus hippocastanum* (3), *Arctium lappa* (3), *Crataegus monogyna* (3), *Geranium* sp. (3), *Hypochaeris radicata* (3), *Impatiens glandulifera* (3), *Leontodon hispidus* (3), *Mentha aquatica* (3), *Pulicaria dysenterica* (3), *Ranunculus ficaria* (3), *Succisa pratensis* (3), *Trifolium repens* (3), *Verbena bonariensis* (3), *Achillea millefolium* (2), *Anthriscus sylvestris* (2), *Bellis perennis* (2), *Brassica napus* (2), *Daucus carota* (2), *Digitalis purpurea* (2), *Hebe* sp. (2), *Heracleum sphondylium* (2), *Lavandula x intermedia* (2), *Lobelia* sp. (2), *Myosotis* sp. (2), *Pastinaca sativa* (2), *Prunella vulgaris* (2), *Salix cinerea* (2), *Stellaria holostea* (2), *Stellaria media* (2), *Vicia sepium* (2), *Viola* sp. (2), (dung) (1), (semi-dry cut/chewed grass) (1), *Achillea ptarmica* (1), *Ajuga reptans* (1), *Anthemis arvensis* (1), *Brassica oleracea* (1), *Buddleja x weyeriana* (1), *Caltha palustris* (1), *Calystegia silvatica* (1), *Capsella bursa-pastoris* (1), *Cerastium* sp. (1), *Chrysanthemum segetum* (1), *Euphrasia* sp. (1), *Fragaria vesca* (1), *Galeopsis segetum* (1), *Geranium endressii* (1), *Geranium pratense* (1), *Hieracium* sp. (1), *Lapsana communis* (1), *Leucanthemum vulgare* (1), *Ligustrum ovalifolium* (1), *Lotus pedunculatus* (1), *Lychnis flos-cuculi* (1), *Malus domestica* (1), *Myosotis scorpioides* (1), *Persicaria bistorta* (1), *Potentilla anserina* (1), *Rubus caesius* (1), *Salix* sp. (1), *Tanacetum vulgare* (1), *Trifolium pratense* (1), *Veronica chamaedrys* (1), *Viola arvensis* (1).

Anthocharis cardamines (ORANGE-TIP)
(Period 1) *Cardamine pratensis* (25), *Taraxacum* sp. (13), *Hesperis matronalis* (7), *Alliaria petiolata* (6), *Aubrieta deltoidea* (5), *Hyacinthoides hispanica* (3), *Anthriscus sylvestris* (2), *Lunaria annua* (2), *Vicia sepium* (2), *Calluna vulgaris* (1), *Ranunculus acris* (1), *Trifolium repens* (1).
(Period 2) *Cardamine pratensis* (25), *Taraxacum* sp. (10), *Alliaria petiolata* (6), *Brassica oleracea* (4), *Hyacinthoides hispanica* (4), *Hesperis matronalis* (3), *Ranunculus acris* (3), *Silene dioica* (3), *Anthriscus sylvestris* (2), *Bellis perennis* (1), *Lunaria annua* (1), *Myosotis arvensis* (1), *Plantago lanceolata* (1), *Rorippa nasturtium-aquaticum* (1), *Symphytum officinale* (1).
(Period 3) *Cardamine pratensis* (63), *Taraxacum* sp. (33), *Alliaria petiolata* (17), *Crataegus monogyna* (11), *Geranium robertianum* (9), *Hyacinthoides hispanica* (8), *Hesperis matronalis* (7), *Myosotis* sp. (4), *Hyacinthoides non-scripta* (3), *Silene dioica* (3), *Vicia sativa* (3), *Capsella bursa-pastoris* (2), *Lunaria annua* (2), *Rubus fruticosus* agg. (2), *Senecio jacobaea* (2), *Tussilago farfara* (2), *Vicia sepium* (2), *Viola* sp. (2), *Allium ursinum* (1), *Aquilegia vulgaris* (1), *Aubrieta deltoidea* (1), *Bellis perennis* (1), *Bergenia crassifolia* (1), *Cardamine hirsuta* (1), *Cirsium palustre* (1), *Hieracium* sp. (1), *Myosotis arvensis* (1), *Myosotis scorpioides* (1), *Plantago lanceolata* (1), *Ranunculus ficaria* (1), *Rorippa nasturtium-aquaticum* (1), *Symphytum officinale* (1), *Vaccinium myrtillus* (1).

Callophrys rubi (GREEN HAIRSTREAK)
(Period 1) *Ulex europaeus* (1).
(Period 2) *Vaccinium myrtillus* (5), *Calluna vulgaris* (1), *Ilex aquifolium* (1).
(Period 3) *Vaccinium myrtillus* (6), *Ulex europaeus* (5), *Taraxacum* sp. (2), *Myosotis* sp. (1).

Favonius quercus (PURPLE HAIRSTREAK)
(Period 1) *Buddleja davidii* (1).
(Period 2) *Buddleja davidii* (1), *Lilium* sp. (1), *Paeonia officinalis* (1).
(Period 3) (Honey-dew) (7), *Buddleja davidii* (2), (Mud-puddling) (1), *Senecio jacobaea* (1), *Solidago canadensis* (1).

Satyrium w-album (WHITE-LETTER HAIRSTREAK)
(Period 2) *Cirsium arvense* (2), *Rubus fruticosus* agg. (2), *Senecio jacobaea* (1).

(Period 3) *Cirsium arvense* (28), *Rubus fruticosus* agg. (13), (Honey-dew) (9), *Chamerion angustifolium* (7), *Cirsium palustre* (7), *Senecio jacobaea* (5), *Eupatorium cannabinum* (2), *Echinops* sp. (1), *Fraxinus excelsior* (1), *Sanguisorba officinalis* (1), *Solidago virgaurea* (1).

Lycaena phlaeas (SMALL COPPER)
(Period 1) *Senecio jacobaea* (35), *Cirsium arvense* (8), *Aster x salignus* (6), *Succisa pratensis* (6), *Hieracium* sp. (5), *Achillea millefolium* (3), *Calluna vulgaris* (3), *Ranunculus acris* (3), *Centaurea nigra* (2), *Trifolium pratense* (2), (dung) (1), *Alliaria petiolata* (1), *Anthemis arvensis* (1), *Argyranthemum frutescens* (1), *Bellis perennis* (1), *Leucanthemum vulgare* (1), *Mentha aquatica* (1), *Senecio squalidus* (1), *Tripleurospermum inodorum* (1).
(Period 2) *Senecio jacobaea* (70), *Cirsium arvense* (31), *Aster x salignus* (20), *Hieracium* sp. (10), *Calluna vulgaris* (9), *Leontodon hispidus* (5), *Mentha spicata* (3), *Ranunculus acris* (3), *Taraxacum* sp. (3), *Ceanothus x delileanus* (2), *Rubus fruticosus* agg. (2), *Sedum spectabile* (2), *Trifolium pratense* (2), *Buddleja davidii* (1), *Centaurea nigra* (1), *Echinops* sp. (1), *Heracleum sphondylium* (1), *Lavandula x intermedia* (1), *Leontodon autumnalis* (1).
(Period 3) *Senecio jacobaea* (181), *Calluna vulgaris* (66), *Cirsium arvense* (40), *Ranunculus acris* (18), *Buddleja davidii* (11), *Pulicaria dysenterica* (8), *Aster x salignus* (7), *Centaurea nigra* (6), *Hieracium* sp. (6), *Taraxacum* sp. (6), *Rubus fruticosus* agg. (4), *Cirsium palustre* (3), *Eryngium maritimum* (3), *Achillea millefolium* (2), *Eupatorium cannabinum* (2), *Leontodon saxatilis* (2), *Mentha aquatica* (2), *Rhododendron ponticum* (2), *Senecio inaequidens* (2), *Succisa pratensis* (2), *Trifolium repens* (2), *Achillea ptarmica* (1), *Brassica napus* (1), *Cardamine pratensis* (1), *Epilobium* sp. (1), *Hedera helix* (1), *Hyacinthoides hispanica* (1), *Impatiens glandulifera* (1), *Knautia arvensis* (1), *Leontodon autumnalis* (1), *Leontodon hispidus* (1), *Lotus corniculatus* (1), *Persicaria bistorta* (1), *Sedum* sp. (1), *Senecio aquaticus* (1), *Tanacetum vulgare* (1), *Trifolium pratense* (1), *Trifolium* sp. (1), *Verbena bonariensis* (1).

Cupido minimus (SMALL BLUE)
(Period 3) *Lotus corniculatus* (6), *Anthyllis vulneraria* (1), *Trifolium dubium* (1).

Aricia agestis (BROWN ARGUS)
(Period 3) *Lotus corniculatus* (1).

Polyommatus icarus (COMMON BLUE)
(Period 1) *Lotus corniculatus* (9), *Senecio jacobaea* (9), *Trifolium dubium* (9), *Trifolium repens* (8), *Chamerion angustifolium* (6), *Cirsium arvense* (6), *Vicia cracca* (4), *Aster x salignus* (3), *Centaurea nigra* (3), *Ranunculus acris* (3), *Trifolium pratense* (3), *Hieracium* sp. (2), *Leontodon saxatilis* (2), *Achillea millefolium* (1), *Anthemis arvensis* (1), *Brassica oleracea* (1), *Calluna vulgaris* (1), *Epilobium hirsutum* (1), *Geranium dissectum* (1), *Plantago lanceolata* (1), *Prunella vulgaris* (1), *Pulicaria dysenterica* (1), *Rubus fruticosus* agg. (1), *Solidago canadensis* (1), *Succisa pratensis* (1), *Trifolium hybridum* (1).
(Period 2) *Lotus corniculatus* (44), *Trifolium dubium* (18), *Trifolium repens* (17), *Ranunculus acris* (5), *Tripleurospermum inodorum* (5), *Trifolium pratense* (4), *Aster x salignus* (3), *Rubus fruticosus* agg. (3), *Centaurea nigra* (2), *Lathyrus pratensis* (2), *Leucanthemum vulgare* (2), *Taraxacum* sp. (2), *Vicia sativa* (2), *Cirsium arvense* (1), *Geranium dissectum* (1), *Heracleum sphondylium* (1), *Lythrum salicaria* (1), *Melilotus albus* (1), *Plantago lanceolata* (1), *Stellaria media* (1), *Vicia cracca* (1).
(Period 3) *Lotus corniculatus* (92), *Senecio jacobaea* (18), *Trifolium dubium* (18), *Lathyrus pratensis* (7), *Calluna vulgaris* (5), *Aster x salignus* (4), *Cirsium arvense* (4), *Lychnis flos-cuculi* (4), *Trifolium repens* (4), *Leontodon* sp. (3), *Leucanthemum vulgare* (3), *Vicia cracca* (3), *Crepis* sp. (2), *Eryngium maritimum* (2), *Hieracium* sp. (2), *Myosotis* sp. (2), *Pulicaria dysenterica* (2), *Ranunculus acris* (2), *Stellaria holostea* (2), *Vicia hirsuta* (2), *Vicia sepium* (2), *Anthemis arvensis* (1), *Bellis perennis* (1), *Brassica rapa* (1), *Centaurea scabiosa* (1), *Geranium dissectum* (1), *Lathyrus nissolia* (1), *Leontodon hispidus* (1), *Phlox drummondii* (1), *Trifolium* sp. (1), *Vicia sativa* (1).

Celastrina argiolus (HOLLY BLUE)
(Period 1) *Rubus fruticosus* agg. (4), *Buddleja davidii* (2), *Ligustrum ovalifolium* (2), *Sedum spectabile* (2), (Mud-puddling) (1), *Aster x salignus* (1), *Calluna vulgaris* (1), *Ceanothus x delileanus* (1), *Chamerion angustifolium* (1), *Cirsium arvense* (1), *Iberis umbellata* (1), *Prunus spinosa* (1), *Senecio jacobaea* (1).
(Period 2) *Ceanothus x delileanus* (5), *Symphoricarpos albus* (5), *Buddleja davidii* (4), (Mud-puddling) (3), *Calluna vulgaris* (3), *Ilex aquifolium* (2), *Rubus fruticosus* agg. (2), *Sorbus aucuparia* (2), *Cirsium arvense* (1), *Hebe x franciscana* (2), *Knautia arvensis* (1), *Lythrum salicaria* (1), *Malus domestica* (1), *Pontederia cordata* (1), *Senecio jacobaea* (1), *Senecio squalidus* (1), *Tanacetum vulgare* (1), *Viola x wittrockiana* (1).

(Period 3) (Mud-puddling) (10), *Chamerion angustifolium* (9), *Hebe* sp. (6), *Rubus fruticosus* agg. (6), *Senecio jacobaea* (6), *Cirsium arvense* (4), *Origanum vulgare* (4), *Buddleja davidii* (3), *Hedera helix* (3), *Ilex aquifolium* (3), *Eupatorium* sp. (2), *Hyacinthoides non-scripta* (2), *Prunus laurocerasus* (2), *Bryonia dioica* (1), *Calluna vulgaris* (1), *Cirsium palustre* (1), *Cotoneaster* sp. (1), *Crataegus monogyna* (1), *Echinops* sp. (1), *Heracleum sphondylium* (1), *Lavatera* sp. (1), *Ligustrum ovalifolium* (1), *Myosotis arvensis* (1), *Pelargonium x hybridum* (1), *Persicaria maculosa* (1), *Symphoricarpos albus* (1).

Hamearis lucina (DUKE OF BURGUNDY FRITILARY)
(Period 1) *Ajuga reptans* (1).
(Period 2) *Fragaria vesca* (1).

Vanessa atalanta (RED ADMIRAL)
(Period 1) *Buddleja davidii* (138), *Buddleja x weyeriana* (28), *Aster x salignus* (22), *Sedum spectabile* (14), *Cirsium arvense* (6), *Scabiosa columbaria* (6), *Senecio jacobaea* (4), *Fallopia baldschuanica* (2), *Ligustrum ovalifolium* (2), *Rubus fruticosus* agg. (2), *Anemone x hybrida* (1), *Buddleja globosa* (1), *Cotoneaster* sp. (1), *Eupatorium cannabinum* (1), *Hedera helix* (1), *Impatiens glandulifera* (1), *Nepeta x faassenii* (1), *Pulicaria dysenterica* (1), *Succisa pratensis* (1), *Tagetes patula* (1), *Veronica* sp. (1).
(Period 2) *Buddleja davidii* (540), *Sedum spectabile* (176), *Hedera helix* (164), *Aster x salignus* (102), *Buddleja x weyeriana* (18), *Aster novi-belgii* (7), *Mentha aquatica* (7), *Verbena bonariensis* (6), *Erysimum cheiri* (5), *Ligustrum ovalifolium* (3), *Malus domestica* FRUIT (3), *Rubus fruticosus* agg. (3), *Calluna vulgaris* (2), *Fallopia japonica* (2), (Honey-dew) (1), (Mud-puddling) (1), *Abelia* sp. (1), *Abelia x grandiflora* (1), *Arctium lappa* (1), *Calystegia silvatica* (1), *Centaurea nigra* (1), *Cirsium arvense* (1), *Impatiens glandulifera* (1), *Jasminum nudiflorum* (1), *Lythrum salicaria* (1), *Mahonia x media* (1), *Rubus fruticosus* agg. FRUIT (1), *Senecio jacobaea* (1), *Tagetes erecta* (1).
(Period 3) *Buddleja davidii* (1102), *Hedera helix* (826), *Sedum spectabile* (129), *Buddleja x weyeriana* (78), *Aster x salignus* (76), *Aster novi-belgii* (69), *Verbena bonariensis* (52), *Rubus fruticosus* agg. (23), *Arbutus unedo* (17), *Lythrum salicaria* (17), *Sedum* sp. (16), *Erysimum* 'Bowles's Mauve' (14), *Aster* sp. (12), *Cirsium arvense* (8), *Eupatorium purpureum* (8), *Rudbeckia* sp. (7), *Eupatorium cannabinum* (6), *Calluna vulgaris* (5), *Senecio jacobaea* (5), *Malus domestica* FRUIT (4), *Pyrus communis* FRUIT (4), *Fallopia japonica* (3), *Rubus fruticosus* agg. FRUIT (3), *Trifolium pratense* (3), (dung) (2), (Mud-puddling) (2), *Centranthus ruber* (2), *Dipsacus fullonum* (2), *Helianthus annuus* (2), *Ligustrum ovalifolium* (2), *Mahonia aquifolium* (2), *Mentha aquatica* (2), *Sambucus nigra* FRUIT (2), *Sonchus arvensis* (2), (rotten flesh) (1), *Abelia* sp. (1), *Achillea millefolium* (1), *Actaea simplex* (1), *Aster novae-angliae* (1), *Cirsium palustre* (1), *Cirsium vulgare* (1), *Crataegus monogyna* (1), *Dianthus barbatus* (1), *Heracleum sphondylium* (1), *Impatiens glandulifera* (1), *Knautia arvensis* (1), *Salix cinerea* (1), *Sambucus nigra* (1).

Vanessa cardui (PAINTED LADY)
(Period 1) *Buddleja davidii* (38), *Cirsium arvense* (15), *Aster x salignus* (9), *Sedum spectabile* (9), *Centaurea nigra* (8), *Rubus fruticosus* agg. (5), *Trifolium pratense* (4), *Senecio squalidus* (3), *Heracleum sphondylium* (2), *Hieracium* sp. (2), *Ligustrum ovalifolium* (2), *Ranunculus acris* (2), *Trifolium repens* (2), *Viburnum lantana* (2), *Vicia sativa* (2), *Anthemis arvensis* (1), *Bellis perennis* (1), *Buddleja globosa* (1), *Calluna vulgaris* (1), *Dipsacus fullonum* (1), *Epilobium montanum* (1), *Hesperis matronalis* (1), *Leucanthemum vulgare* (1), *Symphytum officinale* (1), *Tagetes patula* (1), *Taraxacum* sp. (1).
(Period 2) *Buddleja davidii* (221), *Senecio aquaticus* (47), *Sedum spectabile* (22), *Aster x salignus* (19), *Centaurea nigra* (16), *Cirsium arvense* (15), *Rubus fruticosus* agg. (14), *Calluna vulgaris* (5), *Erysimum cheiri* (2), *Hedera helix* (2), *Senecio jacobaea* (2), *Succisa pratensis* (2), *Achillea millefolium* (1), *Anthemis arvensis* (1), *Buddleja x weyeriana* (1), *Callistephus chinensis* (1), *Cirsium palustre* (1), *Echinacea purpurea* (1), *Epilobium* sp. (1), *Escallonia x langleyensis* (1), *Hieracium* sp. (1), *Hyacinthoides hispanica* (1), *Lavandula x intermedia* (1), *Mentha aquatica* (1), *Solidago canadensis* (1), *Symphytum officinale* (1), *Verbena bonariensis* (1).
(Period 3) *Buddleja davidii* (1309), *Centaurea nigra* (168), *Cirsium arvense* (42), *Verbena bonariensis* (40), *Lavandula x intermedia* (29), *Centranthus ruber* (23), *Sedum spectabile* (15), *Anthriscus sylvestris* (10), *Rubus fruticosus* agg. (10), *Trifolium pratense* (9), *Buddleja x weyeriana* (7), *Senecio jacobaea* (6), *Aster x salignus* (5), *Hedera helix* (5), *Knautia arvensis* (5), *Stachys officinalis* (5), *Cirsium palustre* (4), *Ligustrum ovalifolium* (4), *Dipsacus fullonum* (3), *Eupatorium cannabinum* (3), *Solidago canadensis* (3), *Trifolium* sp. (3), *Eryngium maritimum* (2), (Mud-puddling) (1), *Allium schoenoprasum* (1), *Cirsium vulgare* (1), *Cosmos bipinnatus* (1), *Cotoneaster* sp. (1), *Crataegus monogyna* (1), *Erysimum* 'Bowles's Mauve' (1), *Oenanthe crocata* (1), *Origanum vulgare* (1), *Pulicaria dysenterica* (1), *Pyracantha coccinea* (1), *Tussilago farfara* (1), *Vicia cracca* (1).

Aglais urticae (SMALL TORTOISESHELL)
(Period 1) *Buddleja davidii* (322), *Cirsium arvense* (155), *Taraxacum* sp. (97), *Sedum spectabile* (66), *Aster x salignus* (38), *Senecio jacobaea* (38), *Ligustrum ovalifolium* (12), *Tagetes patula* (11), *Medicago sativa* (10), *Centaurea nigra* (8), *Hieracium* sp. (8), *Tagetes erecta* (7), *Callistephus chinensis* (6), *Tussilago farfara* (6), *Iberis umbellata* (5), *Lavandula x intermedia* (5), *Ranunculus acris* (5), *Centranthus ruber* (4), *Hesperis matronalis* (4), *Rubus fruticosus* agg. (4), *Salix cinerea* (4), *Amberboa moschata* (3), *Brassica oleracea* (3), *Scabiosa columbaria* (3), *Eupatorium cannabinum* (2), *Helichrysum bracteatum* (2), *Heracleum sphondylium* (2), *Anthriscus sylvestris* (1), *Calluna vulgaris* (1), *Cardamine pratensis* (1), *Cirsium palustre* (1), *Dahlia pinnata* (1), *Echinacea purpurea* (1), *Hebe x franciscana* (1), *Hydrangea macrophylla* (1), *Lathyrus* sp. (1), *Petasites hybridus* (1), *Phlox drummondii* (1), *Prunus spinosa* (1), *Senecio squalidus* (1), *Sonchus arvensis* (1), *Spiraea* sp. (1), *Symphytum officinale* (1), *Trifolium pratense* (1), *Trifolium repens* (1).
(Period 2) *Cirsium arvense* (997), *Buddleja davidii* (471), *Taraxacum* sp. (105), *Aster tripolium* (100), *Aster x salignus* (75), *Centaurea nigra* (41), *Verbena bonariensis* (9), *Calluna vulgaris* (5), *Tussilago farfara* (5), *Tagetes erecta* (4), *Trifolium pratense* (4), (Mud-puddling) (3), *Anthemis arvensis* (2), *Buddleja x weyeriana* (2), *Cardamine pratensis* (2), *Allium* sp. (1), *Brassica oleracea* (1), *Buddleja globosa* (1), *Ceanothus x delileanus* (1), *Centranthus ruber* (1), *Succisa pratensis* (1), *Tagetes patula* (1), *Viburnum* sp. (1), *Vicia cracca* (1), *Vicia sativa* (1).
(Period 3) *Buddleja davidii* (523), *Cirsium arvense* (261), *Taraxacum* sp. (160), *Senecio jacobaea* (77), *Buddleja x weyeriana* (71), *Sedum spectabile* (43), *Aster x salignus* (40), *Salix* sp. (25), *Calluna vulgaris* (20), *Rubus fruticosus* agg. (18), *Ranunculus ficaria* (15), *Salix caprea* (13), *Knautia arvensis* (12), *Ligustrum ovalifolium* (12), *Tussilago farfara* (12), *Hedera helix* (8), *Centaurea nigra* (7), *Cirsium palustre* (7), *Ranunculus acris* (5), *Trifolium pratense* (5), *Hyacinthoides hispanica* (4), *Prunus spinosa* (4), *Solidago canadensis* (4), *Succisa pratensis* (4), *Tagetes patula* (4), *Verbena bonariensis* (4), (Mud-puddling) (3), *Lavandula x intermedia* (3), *Matthiola incana* (3), *Muscari* sp. (3), *Aster novi-belgii* (2), *Calluna* sp. (2), *Epilobium* sp. (2), *Mentha aquatica* (2), *Narcissus pseudonarcissus* (2), *Petasites hybridus* (2), *Salix cinerea* (2), *Vicia cracca* (2), *Allium ursinum* (1), *Anthemis arvensis* (1), *Bergenia crassifolia* (1), *Caltha palustris* (1), *Cardamine pratensis* (1), *Cirsium vulgare* (1), *Crataegus monogyna* (1), *Crocus* sp. (1), *Dipsacus fullonum* (1), *Eryngium maritimum* (1), *Erysimum* sp. (1), *Eupatorium cannabinum* (1), *Hieracium* sp. (1), *Hyacinthoides non-scripta* (1), *Hypochaeris radicata* (1), *Iberis umbellata* (1), *Jasminum* sp. (1), *Lathyrus pratensis* (1), *Leontodon hispidus* (1), *Myosotis* sp. (1), *Origanum vulgare* (1), *Pulicaria dysenterica* (1), *Rubus fruticosus* agg. FRUIT (1), *Sedum* sp. (1), *Syringa vulgaris* (1), *Tanacetum vulgare* (1), *Trachystemon orientalis* (1), *Valeriana officinalis* (1).

Nymphalis polychloros (LARGE TORTOISESHELL)
(Period 2) *Verbena bonariensis* (1).

Nymphalis antiopa (CAMBERWELL BEAUTY)
(Period 1) *Malus domestica* FRUIT (1), *Pyrus communis* FRUIT (1).

Aglais io (PEACOCK)
(Period 1) *Buddleja davidii* (169), *Cirsium arvense* (93), *Taraxacum* sp. (75), *Senecio jacobaea* (16), *Aster x salignus* (8), *Centaurea nigra* (7), *Ligustrum ovalifolium* (4), *Rubus fruticosus* agg. (4), *Trifolium pratense* (3), *Eupatorium cannabinum* (2), *Ranunculus ficaria* (2), *Salix cinerea* (2), *Solidago canadensis* (2), *Anthriscus sylvestris* (1), *Crataegus monogyna* (1), *Dipsacus fullonum* (1), *Fallopia baldschuanica* (1), *Heracleum sphondylium* (1), *Hesperis matronalis* (1), *Hieracium* sp. (1), *Medicago sativa* (1), *Petunia x hybrida* (1), *Ranunculus acris* (1), *Scabiosa columbaria* (1), *Sedum spectabile* (1), *Succisa pratensis* (1), *Tagetes erecta* (1), *Tussilago farfara* (1), *Ulex europaeus* (1).
(Period 2) *Buddleja davidii* (412), *Pulicaria dysenterica* (190), *Cirsium arvense* (97), *Taraxacum* sp. (69), *Centaurea* sp. (61), *Centaurea nigra* (33), *Sedum spectabile* (31), *Senecio jacobaea* (16), *Aster x salignus* (10), *Prunus* sp. (6), *Rubus fruticosus* agg. (6), *Hydrangea macrophylla* (4), *Salix cinerea* (4), *Trifolium pratense* (4), *Mentha aquatica* (3), (Mud-puddling) (2), *Buddleja x weyeriana* (2), *Calluna vulgaris* (2), *Chamerion angustifolium* (2), *Cirsium palustre* (2), *Crocus* sp. (2), *Hyacinthoides non-scripta* (2), *Prunus laurocerasus* (2), *Prunus spinosa* (2), *Alliaria petiolata* (1), *Arctium lappa* (1), *Cornus sanguinea* (1), *Erysimum cheiri* (1), *Eupatorium cannabinum* (1), *Hebe x franciscana* (1), *Hedera helix* (1), *Heracleum sphondylium* (1), *Hieracium* sp. (1), *Hyacinthoides hispanica* (1), *Ilex aquifolium* (1), *Lunaria annua* (1), *Phlox paniculata* (1), *Pieris japonica* (1), *Ranunculus acris* (1), *Ribes sanguineum* (1), *Rubus fruticosus* agg. FRUIT (1), *Skimmia japonica* (1), *Succisa pratensis* (1).
(Period 3) *Buddleja davidii* (708), *Taraxacum* sp. (115), *Trifolium pratense* (100), *Succisa pratensis* (70), *Cirsium arvense* (67), *Buddleja x weyeriana* (61), *Senecio jacobaea* (38), *Salix* sp. (32), *Calluna vulgaris* (26), *Salix cinerea* (26), *Centaurea nigra* (25), *Salix caprea* (21), *Eupatorium cannabinum* (18), *Sedum*

spectabile (12), *Prunus spinosa* (9), *Eryngium maritimum* (7), *Eupatorium purpureum* (6), *Knautia arvensis* (6), *Aster x salignus* (5), *Matthiola incana* (5), *Rubus fruticosus* agg. (5), *Cirsium palustre* (4), *Dendranthema* sp. (4), *Dipsacus fullonum* (4), *Hebe* sp. (4), *Hyacinthoides hispanica* (4), *Ligustrum ovalifolium* (4), *Solidago canadensis* (3), *Chamerion angustifolium* (2), *Hyacinthoides non-scripta* (2), *Lavandula x intermedia* (2), *Lobelia* sp. (2), *Mentha aquatica* (2), *Narcissus pseudonarcissus* (2), *Origanum vulgare* (2), *Pulicaria dysenterica* (2), *Anemone nemorosa* (1), *Bellis perennis* (1), *Cardamine pratensis* (1), *Crataegus monogyna* (1), *Heracleum sphondylium* (1), *Ilex aquifolium* (1), *Ranunculus acris* (1), *Ranunculus ficaria* (1), *Senecio squalidus* (1), *Tagetes patula* (1), *Tussilago farfara* (1), *Viburnum opulus* (1).

Polygonia c-album (COMMA)
(Period 1) *Buddleja davidii* (39), *Aster x salignus* (24), *Cirsium arvense* (9), *Sedum spectabile* (8), *Rubus fruticosus* agg. (7), *Scabiosa columbaria* (5), *Buddleja x weyeriana* (3), *Rubus fruticosus* agg. FRUIT (3), *Senecio jacobaea* (3), *Taraxacum* sp. (2), *Anthriscus sylvestris* (1), *Buddleja fallowiana* (1), *Eupatorium cannabinum* (1), *Hedera helix* (1), *Ligustrum ovalifolium* (1), *Mentha aquatica* (1), *Salix cinerea* (1), *Tussilago farfara* (1), *Veronica* sp. (1).
(Period 2) *Aster x salignus* (87), *Buddleja davidii* (84), *Sedum spectabile* (46), *Cirsium arvense* (29), *Rubus fruticosus* agg. (16), *Calluna vulgaris* (14), *Buddleja x weyeriana* (10), *Mentha aquatica* (7), *Rubus fruticosus* agg. FRUIT (7), *Aster novi-belgii* (5), *Chamerion angustifolium* (5), *Taraxacum* sp. (5), (Mud-puddling) (3), *Cardamine pratensis* (3), *Hedera helix* (3), *Ligustrum ovalifolium* (3), *Salix cinerea* (3), (Honey-dew) (2), *Senecio jacobaea* (2), *Verbena bonariensis* (2), (dung) (1), *Angelica sylvestris* (1), *Epilobium hirsutum* (1), *Erysimum cheiri* (1), *Eupatorium cannabinum* (1), *Impatiens walleriana* (1), *Phlox paniculata* (1), *Prunus padus* (1), *Ranunculus ficaria* (1), *Ribes sanguineum* (1), *Spiraea x billardii* (1), *Tagetes erecta* (1).
(Period 3) *Buddleja davidii* (151), *Hedera helix* (73), *Aster x salignus* (47), *Rubus fruticosus* agg. FRUIT (47), *Rubus fruticosus* agg. (31), *Sedum spectabile* (29), *Verbena bonariensis* (27), *Cirsium arvense* (26), *Aster novi-belgii* (9), *Senecio jacobaea* (9), *Buddleja x weyeriana* (8), *Ligustrum ovalifolium* (7), *Salix caprea* (6), *Sedum* sp. (5), *Erysimum* 'Bowles's Mauve' (4), *Eupatorium cannabinum* (4), *Knautia arvensis* (4), *Salix* sp. (4), (Mud-puddling) (3), *Prunus domestica* FRUIT (3), (dung) (2), (Honey-dew) (2), *Calluna vulgaris* (2), *Crocus* sp. (2), *Narcissus pseudonarcissus* (2), *Ranunculus ficaria* (2), *Salix cinerea* (2), *Sambucus nigra* FRUIT (2), *Cirsium palustre* (1), *Fragaria x ananassa* FRUIT (1), *Fraxinus excelsior* (1), *Malus domestica* FRUIT (1), *Mentha aquatica* (1), *Muscari* sp. (1), *Origanum vulgare* (1), *Primula* sp. (1), *Prunus domestica* (1), *Prunus spinosa* (1), *Pulicaria dysenterica* (1), *Rudbeckia* sp. (1), *Taraxacum* sp. (1), *Tussilago farfara* (1), *Viburnum* sp. (1).

Boloria selene (SMALL PEARL-BORDERED FRITILLARY)
(Period 3) *Lotus corniculatus* (1).

Boloria euprhrosye (PEARL-BORDERED FRITILLARY)
(Period 1) *Ajuga reptans* (2).
(Period 2) *Ajuga reptans* (1).
(Period 3) *Ajuga reptans* (1), *Lotus corniculatus* (1), *Viburnum opulus* (1).

Argynnis adippe (HIGH BROWN FRITILLARY)
(Period 1) *Buddleja davidii* (1), *Centaurea* sp. (1), *Eupatorium cannabinum* (1), *Viburnum opulus* (1).
(Period 2) *Centaurea nigra* (1).

Argynnis aglaja (DARK GREEN FRITILLARY)
(Period 2) *Cirsium arvense* (1).
(Period 3) *Trifolium pratense* (9), *Cirsium palustre* (7), *Cirsium* sp. (3), *Rubus fruticosus* agg. (3), *Cirsium vulgare* (2), *Centaurea nigra* (1), *Cirsium arvense* (1), *Leucanthemum vulgare* (1), *Senecio jacobaea* (1), *Stachys officinalis* (1), *Trifolium repens* (1)

Argynnis paphia (SILVER-WASHED FRITILLARY)
(Period 2) *Rubus fruticosus* agg. (8), *Centaurea nigra* (3), *Arctium lappa* (1), *Buddleja davidii* (1), *Cirsium palustre* (1), *Filipendula ulmaria* (1).
(Period 3) *Buddleja davidii* (1), *Centaurea nigra* (1), *Ligustrum ovalifolium* (1).

Pararge aegeria (SPECKLED WOOD)
(Period 1) *Rubus fruticosus* agg. (11), *Senecio jacobaea* (8), *Sedum spectabile* (6), *Aster x salignus* (5), (Mud-puddling) (2), *Anthriscus sylvestris* (2), *Buddleja davidii* (1), *Cirsium arvense* (1), *Crataegus*

monogyna (1), *Epilobium hirsutum* (1), *Eupatorium cannabinum* (1), *Impatiens glandulifera* (1), *Rubus fruticosus* agg. FRUIT (1), *Trifolium pratense* (1).
(Period 2) *Aster x salignus* (77), *Rubus fruticosus* agg. FRUIT (34), *Senecio jacobaea* (23), *Buddleja davidii* (21), *Sedum spectabile* (11), *Rubus fruticosus* agg. (9), (Mud-puddling) (7), *Cirsium arvense* (4), *Taraxacum* sp. (4), *Calluna vulgaris* (3), *Hedera helix* (3), *Ranunculus acris* (3), *Heracleum sphondylium* (2), *Hydrangea aspera* (2), *Hydrangea macrophylla* (2), *Malus domestica* FRUIT (2), (cuckoo-spit) (1), *Buddleja x weyeriana* (1), *Chamerion angustifolium* (1), *Crataegus monogyna* (1), *Erysimum cheiri* (1), *Geranium* sp. (1), *Leontodon hispidus* (1), *Leucanthemum vulgare* (1), *Mentha aquatica* (1), *Sambucus nigra* FRUIT (1), *Symphoricarpos albus* (1), *Vicia cracca* (1).
(Period 3) *Rubus fruticosus* agg. FRUIT (36), *Senecio jacobaea* (22), *Aster x salignus* (16), *Rubus fruticosus* agg. (15), *Hedera helix* (12), *Sedum spectabile* (11), *Buddleja davidii* (8), (Honey-dew) (7), *Buddleja x weyeriana* (7), (Mud-puddling) (6), *Origanum vulgare* (6), *Cirsium arvense* (5), *Eupatorium cannabinum* (5), *Pulicaria dysenterica* (4), *Impatiens glandulifera* (2), *Lythrum salicaria* (2), *Rudbeckia fulgida* (2), *Salvia involucrata (?)* (2), *Sorbus aucuparia* FRUIT (2), *Achillea millefolium* (1), *Aster* sp. (1), *Bellis perennis* (1), *Calluna vulgaris* (1), *Caryopteris x clandonensis* (1), *Centaurea nigra* (1), *Cirsium* sp. (1), *Crataegus monogyna* (1), *Geranium endressii* (1), *Hebe* sp. (1), *Heracleum sphondylium* (1), *Ilex aquifolium* (1), *Knautia arvensis* (1), *Ligustrum ovalifolium* (1), *Malus domestica* FRUIT (1), *Mentha aquatica* (1), *Odontites vernus* (1), *Pyrus communis* FRUIT (1), *Rhododendron ponticum* (1), *Senecio aquaticus* (1), *Taraxacum* sp. (1), *Vaccinium myrtillus* (1).

Lasiommata megera (WALL)
(Period 1) *Cirsium arvense* (3), *Ranunculus acris* (3), *Senecio jacobaea* (3), *Aster x salignus* (2), *Erysimum cheiri* (2), *Senecio squalidus* (2), *Taraxacum* sp. (2), *Calluna vulgaris* (1), *Centaurea nigra* (1), *Hypochaeris radicata* (1), *Leucanthemum vulgare* (1), *Scabiosa columbaria* (1), *Succisa pratensis* (1).
(Period 2) *Cirsium arvense* (13), *Senecio jacobaea* (6), *Hieracium* sp. (3), *Buddleja davidii* (1), *Lythrum salicaria* (1), *Mentha spicata* (1), *Ranunculus acris* (1).
(Period 3) *Cirsium arvense* (18), *Hieracium* sp. (9), *Ranunculus acris* (7), *Leontodon saxatilis* (5), *Cirsium palustre* (4), *Vicia sativa* (4), *Leontodon hispidus* (3), *Taraxacum* sp. (3), *Lotus corniculatus* (2), *Lotus pedunculatus* (2), *Bellis perennis* (1), *Buddleja davidii* (1), *Claytonia sibirica* (1), *Geranium robertianum* (1), *Hyacinthoides non-scripta* (1), *Leontodon autumnalis* (1), *Potentilla erecta* (1), *Pulicaria dysenterica* (1), *Senecio jacobaea* (1).

Hipparchia semele (GRAYLING)
(Period 3) *Senecio jacobaea* (11), *Eryngium maritimum* (7), *Cirsium arvense* (3), *Buddleja davidii* (1).

Pyronia tithonus (GATEKEEPER)
(Period 1) *Cirsium arvense* (7), *Senecio jacobaea* (6), *Rubus fruticosus* agg. (3), *Achillea millefolium* (1), *Buddleja davidii* (1), *Calluna vulgaris* (1), *Leucanthemum vulgare* (1).
(Period 2) *Senecio jacobaea* (71), *Cirsium arvense* (26), *Centaurea nigra* (7), *Rubus fruticosus* agg. (6), *Brassica oleracea* (1), *Lavandula x intermedia* (1), *Mentha aquatica* (1), *Mentha* sp. (1).
(Period 3) *Senecio jacobaea* (251), *Cirsium arvense* (97), *Rubus fruticosus* agg. (30), *Origanum vulgare* (27), *Calluna vulgaris* (11), *Centaurea nigra* (6), *Buddleja davidii* (4), *Mentha aquatica* (4), *Solidago canadensis* (3), *Cirsium vulgare* (2), *Eupatorium cannabinum* (2), *Succisa pratensis* (2), *Trifolium pratense* (2), *Trifolium repens* (2), *Achillea millefolium* (1), *Achillea ptarmica* (1), *Aster x salignus* (1), *Echinacea purpurea* (1), *Epilobium hirsutum* (1), *Geranium* sp. (1), *Hebe* sp. (1), *Lotus corniculatus* (1), *Lythrum salicaria* (1), *Pulicaria dysenterica* (1), *Senecio aquaticus* (1), *Vicia cracca* (1).

Maniola jurtina (MEADOW BROWN)
(Period 1) *Cirsium arvense* (67), *Senecio jacobaea* (36), *Rubus fruticosus* agg. (22), *Vicia cracca* (14), *Centaurea nigra* (8), *Ranunculus acris* (5), *Buddleja davidii* (4), *Trifolium pratense* (4), *Trifolium repens* (4), *Lotus corniculatus* (3), *Aster x salignus* (2), *Erica cinerea* (2), *Hieracium* sp. (2), *Argyranthemum frutescens* (1), *Chamerion angustifolium* (1), *Heracleum sphondylium* (1), *Lathyrus pratensis* (1), *Leontodon saxatilis* (1), *Ligustrum ovalifolium* (1), *Origanum vulgare* (1), (dung) (1).
(Period 2) *Cirsium arvense* (62), *Rubus fruticosus* agg. (44), *Senecio jacobaea* (44), *Centaurea nigra* (31), *Buddleja davidii* (21), *Heracleum sphondylium* (15), *Trifolium pratense* (9), *Aster x salignus* (7), *Vicia cracca* (5), *Trifolium repens* (4), *Lathyrus pratensis* (3), *Arctium lappa* (2), *Cirsium palustre* (2), *Dactylorhiza purpurella* (2), *Achillea millefolium* (1), *Anthemis arvensis* (1), *Calluna vulgaris* (1), *Cirsium vulgare* (1), *Lamium purpureum* (1), *Leontodon saxatilis* (1), *Lythrum salicaria* (1), *Ranunculus acris* (1), *Taraxacum* sp. (1).
(Period 3) *Cirsium arvense* (383), *Senecio jacobaea* (229), *Rubus fruticosus* agg. (148), *Centaurea nigra* (55), *Buddleja davidii* (48), *Cirsium palustre* (46), *Pulicaria dysenterica* (26), *Origanum vulgare* (16),

Cirsium vulgare (15), *Trifolium pratense* (15), *Ranunculus acris* (14), *Eupatorium cannabinum* (13), *Trifolium repens* (12), *Vicia cracca* (8), *Calluna vulgaris* (6), *Knautia arvensis* (5), *Solidago canadensis* (5), *Succisa pratensis* (4), *Centaurea scabiosa* (3), *Leontodon saxatilis* (3), *Lythrum salicaria* (3), *Chamerion angustifolium* (2), *Crepis* sp. (2), *Dactylorhiza* sp. (2), *Lathyrus pratensis* (2), *Leontodon hispidus* (2), *Leontodon* sp. (2), *Lobelia* sp. (2), *Lotus corniculatus* (2), *Mentha aquatica* (2), *Taraxacum* sp. (2), *Achillea millefolium* (1), *Centaurium littorale* (1), *Chrysanthemum segetum* (1), *Clinopodium ascendens* (1), *Dianthus barbatus* (1), *Heracleum sphondylium* (1), *Hypochaeris radicata* (1), *Leucanthemum vulgare* (1), *Lysimachia punctata* (1), *Potentilla fruticosa* (1), *Prunella vulgaris* (1), *Sedum spectabile* (1), *Senecio aquaticus* (1), *Stachys officinalis* (1), *Trifolium hybridum* (1), *Verbena bonariensis* (1).

Coenonympha pamphilus (SMALL HEATH)
(Period 1) *Centaurea nigra* (1).
(Period 2) *Rubus fruticosus* agg. (11), *Ranunculus acris* (2), *Cardamine pratensis* (1), *Cirsium arvense* (1), *Cirsium palustre* (1), *Leucanthemum vulgare* (1), *Persicaria bistorta* (1), *Potentilla erecta* (1), *Trifolium repens* (1).
(Period 3) *Cirsium arvense* (20), (Mud-puddling) (3), *Potentilla erecta* (2), *Ranunculus acris* (2), *Senecio jacobaea* (2), *Calluna vulgaris* (1), *Cirsium vulgare* (1), *Eryngium maritimum* (1), *Galium saxatile* (1), *Hypochaeris radicata* (1), *Rubus fruticosus* agg. (1), *Stellaria media* (1), *Trifolium pratense* (1), *Trifolium repens* (1).

Coenonympha tullia (LARGE HEATH)
(Period 1) *Erica cinerea* (1).

Aphantopus hyperantus (RINGLET)
(Period 2) *Lathyrus pratensis* (1), *Ranunculus acris* (1).
(Period 3) *Rubus fruticosus* agg. (22), *Ranunculus acris* (7), *Senecio jacobaea* (7), *Cirsium arvense* (5), *Origanum vulgare* (5), *Chamerion angustifolium* (2), *Cirsium palustre* (2), *Eupatorium cannabinum* (2), *Centaurea nigra* (1), *Lathyrus pratensis* (1), *Leontodon hispidus* (1), *Senecio aquaticus* (1), *Taraxacum* sp. (1), *Trifolium repens* (1).

Danaus plexippus (MILKWEED)
(Period 3) *Buddleja davidii* (1).

IN STILL GREATER DETAIL – THE SPECKLED WOOD *Pararge aegeria* IN THE PRIORY, SALE IN 2008

In 2008 (period 2), when *P. aegeria* was at the height of its abundance, a detailed survey of its distribution and ecological requirements was undertaken in and around this site by the author, assisted by his son Limmuel Hardy and Phillip M. Kinder. The intention was that the data should be statistically analysed and included in a publication on resource-based habitat; this unfortunately did not prove possible. The findings however do give a very clear demonstration of just how much of any given space actually provides suitable habitat for a butterfly.

DESCRIPTION AND HISTORY OF THE SITE

The main entrances to this complex are on Dane Road, Sale at SJ797925 and 798924. The author has been familiar with the site since his early childhood, when it was known as the "Priory Woods", or simply the "Priory", and some contemporaries used to tell him that there had once been a monastery here, although there was no longer any sign of a building. It consists of an old woodland comprising the remains of the formal gardens that belonged to Sale Priory (or Sale Hall Priory), plus further land added to the public space following construction of the motorway (originally M62, later M63 and currently M60) in 1974. Sale Hall Priory was a large house, situated at SJ798924, owned by a Doctor Thomas White who practised medicine in Manchester, and then by his son Charles White who wrote a treatise on forestry and probably planted many of the trees on the site; presumably there must have originally been an actual priory at this location. The house, which is marked on old maps from the late nineteenth century and labelled as "Sale Priory", was demolished in 1932. The original woodland is at the south-centre of the site; it falls within parts of the 100 metre squares SJ797924, 797925, 798924 and 798925, and its area is 1.3 hectares; it consists of quite widely-spaced mature trees, mainly deciduous but including four large yews, and in the memory of the author is little changed from how it was in his childhood in the 1950s. Where canopy is dense there is little ground flora, though there is a distinct glade, into which sunlight penetrates for most of the day, in the centre of the wood in SJ797925, and there are further small glades in the east of the wood in SJ798924. In these glades the ground is largely covered by short grass with some brambles. There is some sapling growth beneath the canopy; the wood has seen very little in the way of "management" over the years. Clearly, it is this part of the Priory complex which contains the most mature woodland.

Most of what lies to the north and north-west of the original woodland is reclaimed rubbish tips. From the 1950s until the early 1970s an active council tip steadily spread northwards from the former boundary of the wood over the flat meadows of the flood-plain, which had been used for grazing cattle and sheep, towards the river. To the east the tip reached an unsurfaced lane, named on some maps as "Cow Lane" though it never bore this name on any sign-board, leading from Arnesby Avenue to a farm beside the river; the southern section of this old lane still remains as a public footpath through SJ800925 and 801926 to the new footbridge over the motorway which was constructed in 1974, effectually bringing to an end the flat grazing meadows. By then tipping had ceased in SJ797926, 797927, 797928, 798925, 798926, 798927, 799926, 799927, 800926 and 801926. After the motorway had been

built, fast-growing tall trees were planted along the slopes of the former tip, on the north-west side (SJ796926, 796927), the south-west side immediately to the north-east of the original woodland and the gardens to the west of it (SJ797926, 797925 and 798925), in a due north-south row along the entrance track (SJ799925) and in a due west-east line along the southern edge of the eastern section immediately north of a horse-farm (SJ799926 and 800926); thicker woodlands of smaller trees were planted and/or evolved naturally in the north-west section (SJ797927, 797928) and at the north-eastern side, that is on the west of the old lane and to the south of the motorway (SJ800926 and 801926). A further belt of trees extended north-eastwards from the edge of the original woodland towards the motorway in SJ798926, and a thinner belt developed running in a north-west to south-east direction across SJ798926. There were thus four main blocks of grassland between the belts of trees: the most westerly, in SJ797926, comprising medium-length rough grass and some tall herbs; the next to the east, in SJ798925 and 798926, including more longer grass and large patches of brambles especially on the western edge, this with the last one forming a central plateau bordered by trees; north of these two, mainly in SJ798927 and extending into 799927, grassland sloped slightly downward to the north-east towards the motorway; the grass was shorter and the whole more open; in the low-lying patch close to the motorway boundary some damp ground developed which in the 1990s was ideal habitat for *Pieris napi* and *Anthocharis cardamines*, but was destroyed in the motorway widening in 2003-6; further east, in SJ799926 and 800926, a further plateau bounded to the north by a developing woodland edge was for some years used as a hay-meadow; but following the total destruction of the woodland during the motorway widening, and subsequent planting of a token new wood, the mowing seems to have ceased and latterly the grass has become rougher and mixed with sedges and rushes, and some damp ground has evolved.

To the north-west of the original "Priory", and accessible by a separate gate from Dane Road at SJ796925, was a private tip owned by Bethell's, and tipping continued on this site long after it had ceased on the council tips – indeed right up to the late 1980s. Going back to the 1950s, children (including the author) used to climb over the boards at the rear of the gardens on Lynn Avenue (belonging to certain obliging householders!) in SJ795927 or 795928 to reach a pond, well to the west of what was then the limit of the tipping area, and in the extreme south-western corner close to the railway line, and hunt for hours for frogs, newts and all manner of wildlife; some nicknamed the location the "World of Insects" though perhaps this was rather an overstatement. Over the years the access over the boards was closed off, and the tip steadily advanced and the pond disappeared under it. After tipping ceased it again became possible to enter the site; the first instance recorded in the author's diary of his doing so is 19.5.1992. The tip was in a much earlier state of regeneration than the council tip and unlike the latter the regeneration had not been assisted by the application of any topsoil; the site was quickly colonised by butterflies including the Common Blue *Polyommatus icarus*. Succession to scrub was however quite rapid and the butterflies became scarce. The site – which extends over SJ795927, 795928, 795929, 796926, 796927, 796928, 796929, a small part of 797927 and a fragment of 795926 – was further disturbed in 1994 when a construction company "Kilroe" established a temporary base on it and in the course of their activities that year caused much disturbance to the surface and destroyed most of the vegetation;

following their moving out, however, the colonisation process began again and the butterflies reappeared, in greater numbers. The next disturbance was less advantageous: the motorway immediately to the north was widened, and some of the best parts of the site were destroyed in the process. Since the settling-down following the widening, natural succession has proceeded apace, and by 2008 the site was largely covered in scrub, with tree belts on the west side (SJ795928 and 795929) and the south-west side bordering the gardens in Lynn Avenue (SJ796926, 795926, 795927, 795928); some rough grassland remained especially in SJ795928 and SJ796927 (this has since become largely choked by brambles), whereas quite dense woodlands had developed in the east of SJ796926 and the north of SJ795928. This sector was not officially included in the public open space until 2006, after the motorway widening, at which point the original entrance on Dane Road was gated and an alternative public entrance was constructed via some steps up the slope at the extreme west end of the extension of the woodland behind the gardens on Dane Road.

Prior to the motorway widening in 2003-6, there was a deep gully between the north-eastern edge of the former Bethell's tip and the motorway embankment (SJ795929 and 796929), which in itself formed a valuable south-west-facing slope at this point; the gully was good butterfly habitat especially for the spring Pierids and the motorway bank a good thermoregulating and adult feeding site for Nymphalines especially in early spring and autumn; the gully was filled in and a great deal of habitat lost during the motorway widening. A little further to the south-east, however, in SJ796928, there remains a wide, shallower gully, with a steep, wooded slope on the south-west side up to the former Bethell's tip and a much gentler slope, largely vegetated with tall herbs, brambles and some open woodland, to the former council tip on the north-east side.

In the 1990s, the land to the east of the old lane (SJ801925, 801926, 802925, 802926, 803924 and 803925) became the "Priory nature reserve", and was a fine mixture of wetland, woodland of varying ages and some grass and tall herb elements. The motorway widening destroyed a good half of this "reserve" and completely altered the character of the remainder; nevertheless some interesting biotopes developed out of it for a time. Above a large stagnant pond, the land rises to the north-west to a steep grassy bank terminating in a high wooden fence bordering the motorway; this grass was largely planted with tree whips (which as at 2008 had not made much growth headway, but have since developed into an impenetrable thicket); further east, behind the houses on Arnesby Avenue, is a narrow strip of land between the slope up to the motorway and the garden fence, with a shallow and normally dry drainage ditch at the bottom and many low non-native shrubs planted along the side of the drain. Trees overhang from several of the gardens so that in 2008 the strip was in a way analogous to a deep woodland ride. In the west section, where the motorway embankment smothered the former reserve, the new grassy slopes were planted with tree whips, as a token compensation for destroying the woodland; these have since developed into a dense thicket.

Following the motorway widening in 2003-6 squares SJ798928, 800927 and 802926 no longer have any of their area within the site, and the sections of SJ795929,

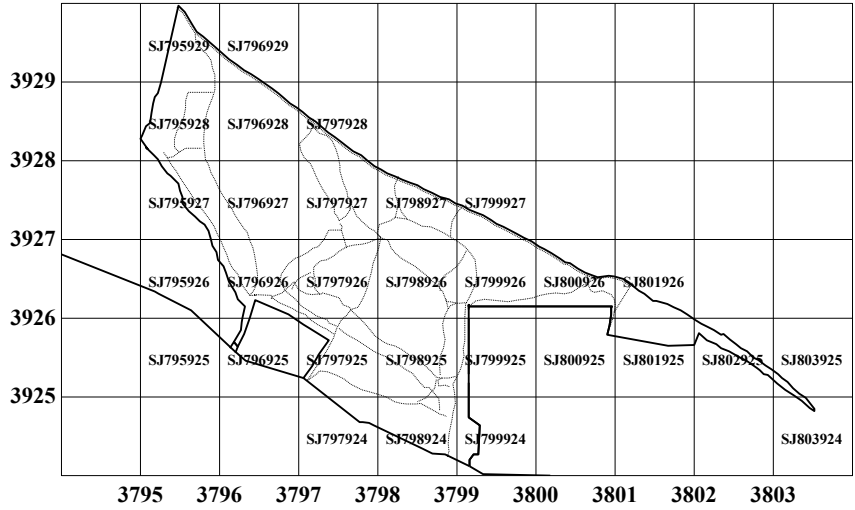
796929, 797928, 798927, 799927, 800926, 801926, 802925 and 803925 which fall within the site have been drastically reduced. The area of the whole complex considered in this study is 14.15 hectares; prior to the motorway widening it was 17.67 hectares. Its average altitude is 25 metres above mean sea level.

METHODS

Throughout the 2008 season, from the date when the first *P. aegeria* was noted (30th April) until the date when the last was noted (5th October) the site was visited whenever an opportunity presented, noting details of weather (temperature, insolation, wind), the location where each butterfly was seen (aiming to measure it to a ten-figure grid reference, using a Garmin "Geko" GPS machine), the biotope, vegetation, substrate, aspect (where a feature such as a slope, woodland edge, glade or similar was involved), the behaviour(s) of the butterflies concerned and the height above ground at which those behaviours occurred.

Commencing at the end of August 2008, when the butterfly season was beginning to run down, visits were made to each 10 m square within the Priory, using the "Geko" to obtain its position, and a visual estimate was made of the percentage of the square which was bare ground, the percentage which was covered in grass (potential hostplant), the percentage of canopy cover, and the percentage covered by any potential nectar source: Bramble *Rubus fruticosus* agg. (flowers and fruit), Thistle *Cirsium arvense/vulgare*, Ragwort *Senecio jacobaea*, Michaelmas Daisy *Aster x salignus* and Buddleia *Buddleja davidii*, the only plants which *P. aegeria* had been observed using in the Mersey Valley.

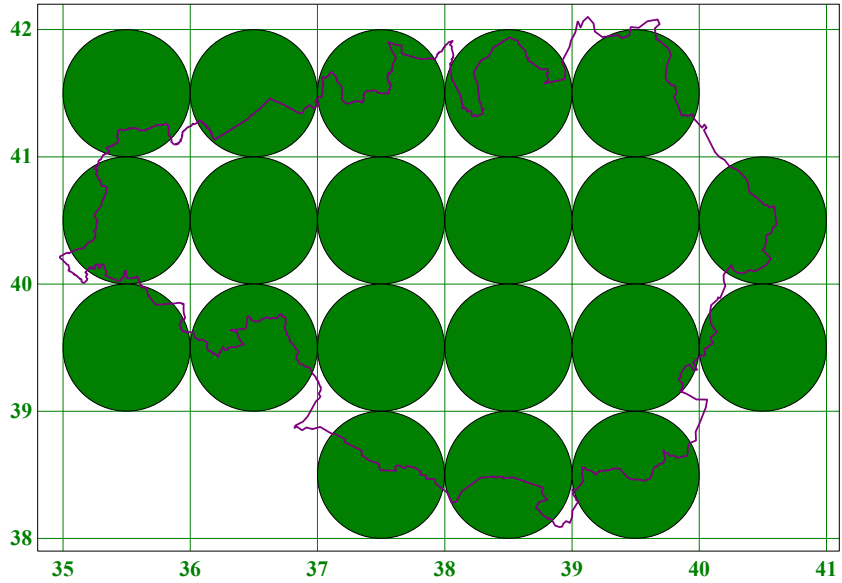
To achieve even coverage of the entire site throughout the recording season was clearly impossible. Due to other commitments (family, employment) and other constraints including the weather, some visits were less thorough than others. For most of the time observations were limited to the network of public paths running through the site, and those nearer the entrance were clearly visited more than those further away. The recorders have to admit to a certain bias towards the locations most favoured by the butterflies, though they did their best to ensure that other parts of the site were not neglected. Some parts however were very difficult of access (huge patches of brambles; impenetrable grass/tall-herb communities; fenced newly-planted woodland; low-lying parts under water). Nevertheless, it is felt that the results give a fair indication as to what parts of the complex *P. aegeria* did, and did not, use.



SCALES OF MAPPING

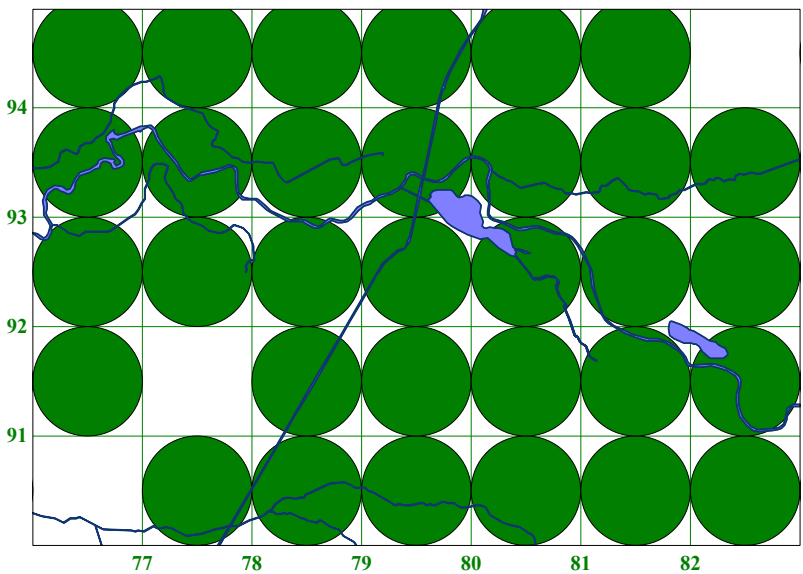
In the section on Recording, it has been mentioned how mapping at a coarse scale can give a very disproportionate impression of the extent to which a butterfly's distribution can occupy a given area. The maps on the following pages illustrate this point.

Pararge aegeria

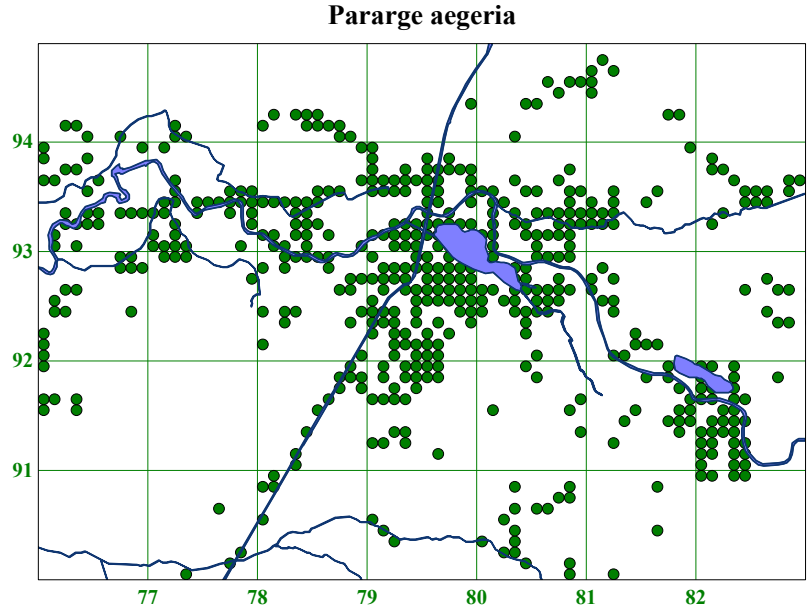


The above is a map at a 10 km scale of the whole of Greater Manchester; it appears to show a continuous distribution of *P. aegeria* all over the Manchester area. This map includes records from 2000 to 2008 inclusive, i.e. most of period 2.

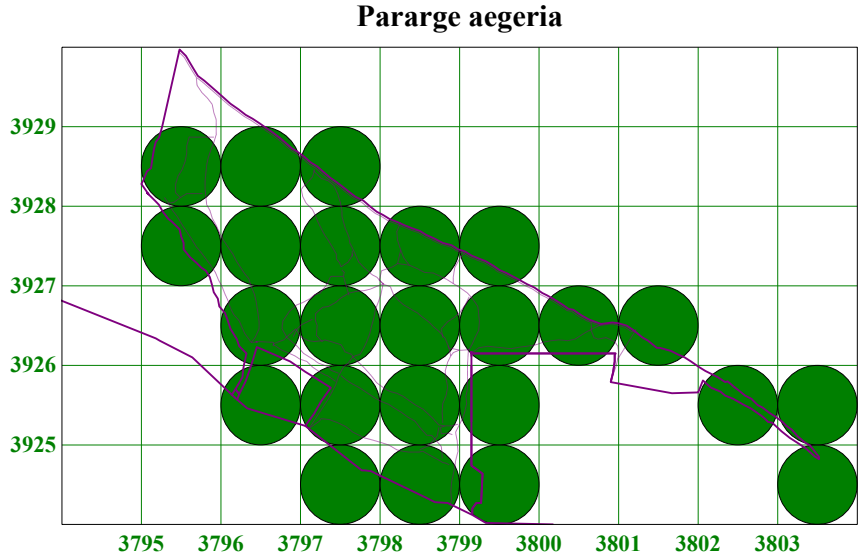
Pararge aegeria



A map at a 1 km scale of the 7 X 5 km rectangle contained by SJ7690, 7694, 8290 and 8294 likewise shows an apparently continuous distribution with all but three (urban) squares blacked. Again this is of records from 2000 to 2008.

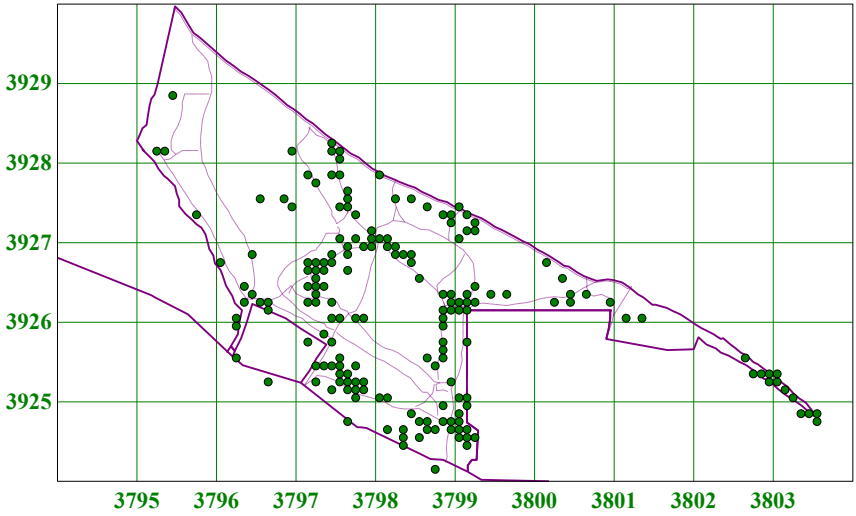


Mapping of the same area and exactly the same records at 100 m gives a more meaningful idea of the general distribution, with concentrations of records over the green locations and scarcity or absence over the heavily built-up areas.



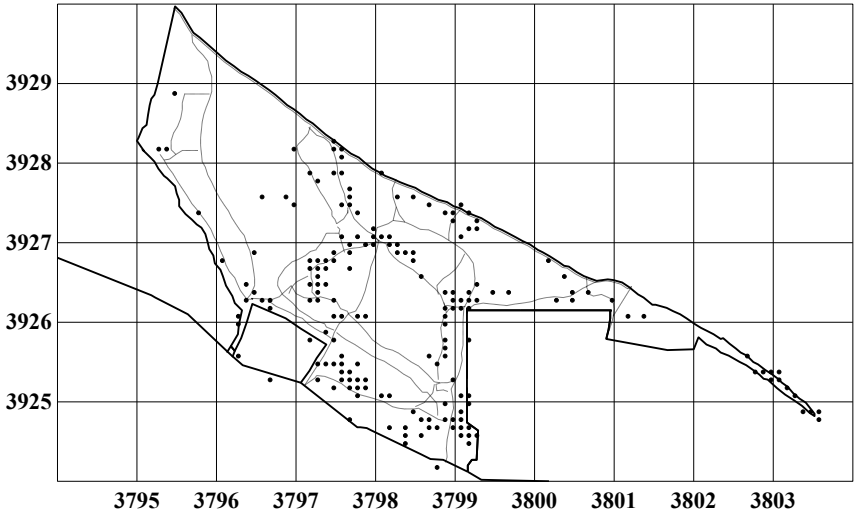
The above is a map at the same 100 m scale as the previous one but of the Priory alone: even at this scale it implies that almost every square in the Priory is fully occupied from edge to edge. This map only shows records in 2008 and only those within the Priory – not those outside, of which there were just a few.

Pararge aegeria



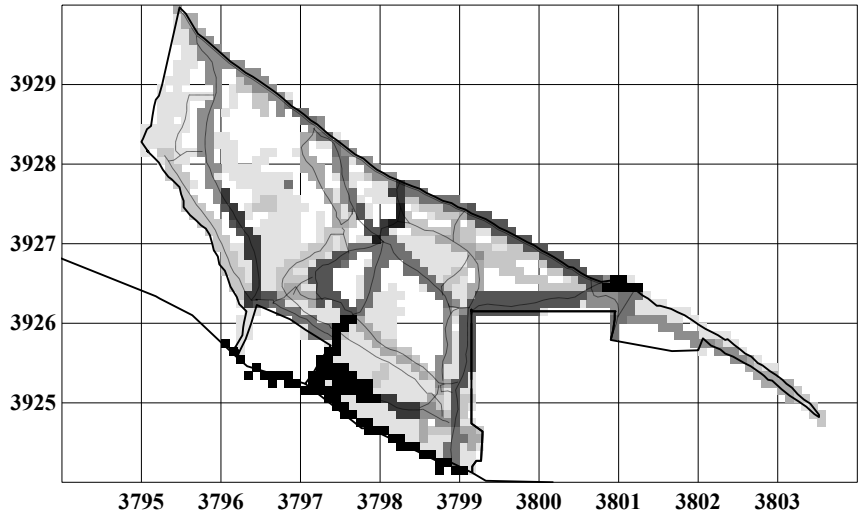
The above map shows the same records as the previous one, mapped at a resolution of 10 m. This is a far finer scale than that used in any of the county or regional atlases, and shows that records tended to group in certain parts of the site whereas in other parts there were few or none – including along some of the main footpaths.

Pararge aegeria



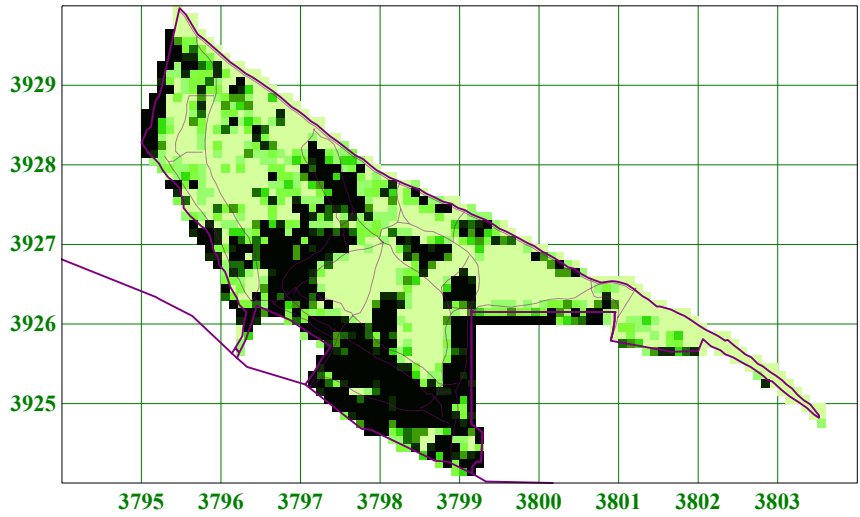
By mapping the same records at a resolution of 5 m, a more accurate impression still of the butterfly's distribution is gained, and the considerable areas within the site which it does NOT inhabit begin to show. These maps also show the paths in the Priory as they appeared in 2008 – probably not all of them are "official" – as thin lines.

Coverage



The above map is of 10 m squares on a scale of 9 shades of grey, the lightest denoting 1 visit only during the butterfly season (which in this project was from 30th April, the date when the first *P. aegeria* was seen in the Priory, to 5th October, when the last was seen), the second lightest 2 to 4 visits, the third 5 to 7 visits, the fourth 8 to 10 visits, the fifth 11 to 13 visits, the sixth 14 to 16 visits, the seventh 17 to 19 visits, the eighth 20 to 22 visits, and the darkest 23 to 31 visits. Squares left blank were not visited during the butterfly season – though all were visited during the winter to map the vegetation.

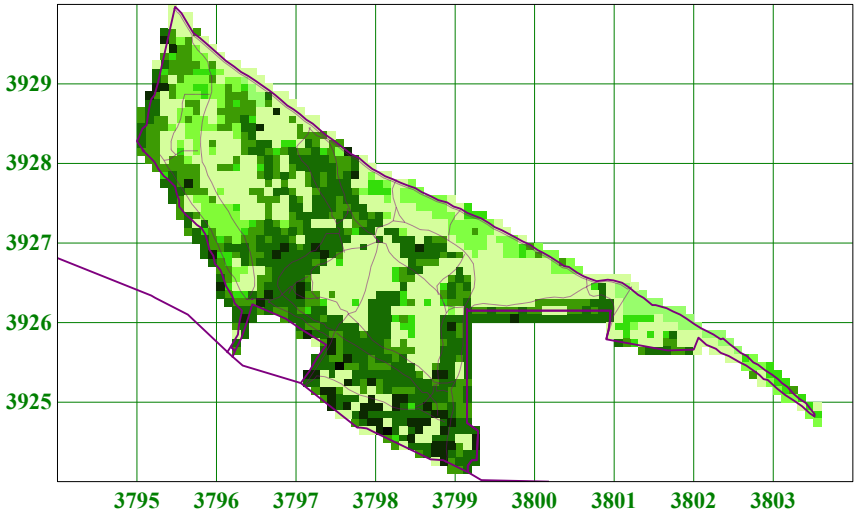
Canopy/grass



The above map is again on a 9-point scale, ranging from very light green to almost black. The lightest green denotes grass with no (or not more than 5%) tree canopy; the second lightest 10 to 15% canopy; the third 20 to 25%, the fourth 30 to 35%; the

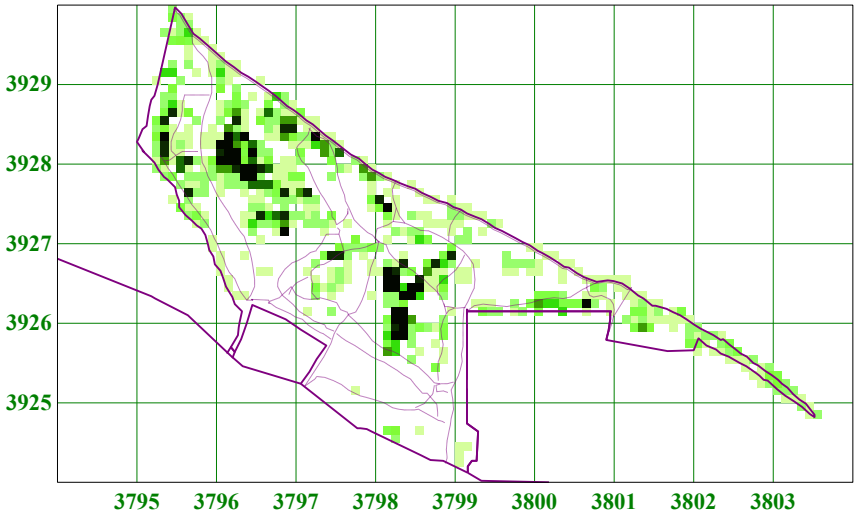
fifth 40 to 45%; the sixth 50 to 55%; the seventh 60 to 65%; the eighth 70 to 75%; and the ninth and darkest 80 to 100% canopy cover.

Maturity 1 tree



The above map aims to show the **maturity** of the woodland, based on the size of the largest tree in each 10 m square. The lightest green denotes grassland with no trees or shrubs; the second lightest, grassland with newly-planted tree whips; the third, shrubs (whether naturally growing or, as in most cases, planted); the fourth, scrub; the fifth denotes that the largest tree in the 10m square had a trunk diameter of less than 10 cm; the sixth, the largest tree with a diameter of 10 to 24 cm; the seventh 25 to 49 cm; the eighth 50 to 99 cm, and the ninth and darkest 100 cm or over.

Nectar (Bramble, Buddleia, Ragwort, Thistle, Michaelmas Daisy)



The final map, on the previous page, shows the combined distribution of plants used as nectar sources by *P. aegeria*. The lightest green denotes that not more than 5% of the area of the 10 m square is covered by one or other of the plant species listed in the heading – regardless of whether a butterfly had actually been seen using them or not; the second lightest 10 to 15%; the third 20 to 25%, the fourth 30 to 35%; the fifth 40 to 45%; the sixth 50 to 55%; the seventh 60 to 65%; the eighth 70 to 75%; and the ninth and darkest 80 to 100% cover – this last category mainly comprising the large patches of brambles. *P. aegeria* often uses bramble fruit (ripe blackberries) as a source of nutrition, as well as the flowers, and very probably also obtains much of its nutrition from honey-dew, as this species is not very often seen taking nectar..

RESULTS OF THE SURVEY
The following are tabulations of the data which were recorded

Total *P. aegeria* seen in the Priory during the 2008 season (first sighting 30.4.2008, last 5.10.2008)
- 360

Biotopes and numbers of *P. aegeria* observed
- Mature woodland (closed canopy) – 7
- Mature woodland (edge) – 5
- Mature woodland (glade) – 83
- Mature woodland (ride) – 3
- Semi-mature woodland (closed canopy) – 3
- Semi-mature woodland (edge) – 145
- Semi-mature woodland (glade) – 16
- Semi-mature woodland (ride) – 23
- Young woodland (edge) – 14
- Young woodland (glade) – 9
- Grassland and short/tall herb community – 12
- Grassland near but not adjacent to woodland edge – 7
- Scrub – 6
- Linear bottom of slope between motorway and gardens – 28
- Hedge on south-east edge of wood by road – 1
- Road bounding site on south-east side – 2
- Gardens adjoining site – 2
- Unsurfaced car-park – 2

(total more than 360 as some were observed in more than one class)

Vegetation (or other feature) above or on which *P. aegeria* were observed
- Bare ground – 16
- Cut grass or moss – 12
- Short uncut grass or short herbs – 87
- Tall grass or tall herbs (e.g. Nettles) – 73
- Low shrubs (e.g. Brambles) – 72
- Tall shrubs – 21
- Trees – 136
- Road surface – 4
- Motor car – 1

(total more than 360 as some were observed in more than one class)

Substrates upon which *P. aegeria* were recorded (for resting, thermoregulation (basking), roosting or feeding
- Soil – 7
- Brick – 1
- Live leaves – 119
- Dead/dry leaves – 4

- Live stems – 2
- Dead stem – 1
- Twig – 1
- Flowers – 12
- Seed heads – 6
- Grass – 50
- Dry grass – 1
- Log – 1
- Metal – 1

(total much less than 360 as only includes settled butterflies)

Height above ground at which *P. aegeria* were observed, whether in flight or settled, and numbers of butterflies

- <2cm (less than 1") – 17
- 2 – 10cm (1" – 4") – 15
- 10 – 50 cm (4" – 1' 6") – 89
- 50cm – 1m (1' 6" – 3') – 140
- 1m – 2m (3' – 6') – 115
- > 2m (6' +) – 89

(total more than 360 as some were observed in more than one class)

Aspect of location and numbers of *P. aegeria* seen

- E – 53
- N – 46
- NE – 7
- NW – 6
- S – 136
- SE – 14
- SW – 16
- W – 35

(total less than 360 as not all habitats had distinct aspects)

Behaviours and numbers of occasions witnessed

- Direct linear flight – 70
- Search flight – 143
- Inspection – 10
- Resting – 41
- Basking – 97
- Taking nectar – 16
- Interaction with same species – 85
- Interaction with different species – 8
- Disturbance by recorder; previous behaviour not seen – 53
- Attempted courtship – 6
- Walking – 1
- Vertical descent from tree roost – 1

(total more than 360 as some were observed in more than one class)

The following behaviours, all of which clearly must occur, were not noted: roosting; copulation; mud-puddling; oviposition; disturbance by other animal or insect; undergoing predation.

Shade temperatures and numbers of *P. aegeria* seen

- 11° – 1
- 13° – 4
- 15° – 14
- 16° – 14
- 17° – 54
- 18° – 80
- 19° – 46
- 20° – 55
- 22° – 64
- 23° – 17
- 25° – 5
- 27° – 6

[Total butterflies 360]

Weather conditions and numbers of *P. aegeria* seen

- Cloud – 62
- Cloud, some sun – 57
- Cloud/bright – 1
- Cloud/haze – 15
- Hazy – 1
- Heavy cloud – 5
- High cloud – 6
- High cloud/brief sun – 1
- Slight rain – 3
- Sun – 114
- Sun, some cloud – 95

[Total butterflies 360]

Wind and numbers of *P. aegeria* seen

- Nil – 116
- Very light NE – 4
- Very light NW – 7
- Very light E – 6
- Very light W – 7
- Very light, direction not recorded – 8
- Light E – 36
- Light NW – 22
- Light SE – 34
- Light SW – 48
- Light W – 6
- Light, direction not recorded – 15

- Moderate SW – 27
- Moderate/strong NE – 6
- Moderate/strong SW – 3
- Moderate/strong W – 11
- Strong NW – 4

[Total butterflies 360]

Sexes of *P. aegeria* recorded

- M – 79
- F – 41

(others, sex unknown)

The months in 2008 when butterflies were seen, with the numbers of recording days when the site was visited (in brackets) and the total numbers of *P. aegeria* seen each month

- April (1) – 2
- May (12) – 66
- June (8) – 40
- July (8) – 24
- August (9) – 146
- September (10) – 80
- October (2) – 2

[Total butterflies 360]

On two of the above recording days, one in July and one in August, no butterflies were seen. Visits to the site before 30.4.2008 (the date when the first *P. aegeria* was seen) and after 5.10.2008 (the date when the last was seen) have not been included.

Starting times (to the nearest hour) of the recording walks and numbers of *P. aegeria* seen

- 9 a.m. – 7
- 12 noon – 69
- 1 p.m. – 87
- 2 p.m. – 62
- 3 p.m. – 38
- 4 p.m. – 78
- 5 p.m. – 19

[Total butterflies 360]

THE WHITE-LETTER HAIRSTREAK *Satyrium w-album* IN OLDHAM 2018 – A Remarkable Season
by Stephen B. Smith

Introduction

After completing the 5 year Butterfly Survey of Oldham in 2017, I decided that this year I would give special attention to two of the three Hairstreaks occurring in Oldham, namely the White-letter *Satyrium w-album* and Purple *Favonius quercus* Hairstreaks. The Green Hairstreak *Callophrys rubi* had already been well documented during the 5-year butterfly survey. As it turned out, I ended up putting all my efforts, for a few weeks in June and July, to searching out and recording *w-album*, a very much under-recorded species.

Somehow the Oldham wych elm *Ulmus glabra* seems to have managed to survive the various bouts of dutch elm disease that have ravaged the U.K. during the past 50–60 years. This could be due to the fact that wych elm, the dominant elm in Oldham, has resisted the disease better than the other *Ulmus* species. The tree is by no means immune from attack, as two that supported the butterfly have recently succumbed – one in 2017 and the other early in 2018. Sadly, on my travels around Oldham in 2018, I have noted a few trees that have already 'died' or are showing signs of disease. But the problems are not just disease, for just as the general countryside is under attack, chiefly by man, so are the elm trees. I know of two healthy mature trees in a local garden that have been cut down in 2017. And a healthy tree in Copster Park has also been cut down – I can only assume simply because it was partially overhanging the bowling green as other (diseased) trees in the park are still standing. To my mind this is nothing more than wanton vandalism. But overall, as you will see, the wych elm is doing very well in Oldham.

I had previously thought that the survey would take two or three seasons or maybe four to complete due to the vagaries of the weather. At the outset in mid-June, with the first of the sightings of *w-album*, little did I realise how wrong my estimate would be!

Previous records

As far as I am aware, no historical records of *w-album* in Oldham exist. More recently there is a reference to a possible sighting near Diggle in the 1990s which could not be verified (Butterflies in Greater Manchester, Peter B. Hardy 1998) and in the 2012 Butterfly Conservation etc. Branch Report, the Oldham area on the dot distribution map for this species tantalisingly showed two dots. On enquiry, further details were not forthcoming.

In the year I started the 5-year survey (2013) a positive sighting was reported (confirmed with a photograph) by Kenneth Garside on 31st July at Yeoman Hey Reservoir (SE022046) nectaring on creeping thistle. My first record was in 2014 at two locations on the same day, 12th July – Alexandra Park and Royal George. In

2015 only two previously known locations in Greenfield were confirmed with no new colonies added. Two new colonies were added in 2016. In the last year of the survey more time was spent searching, the result being that a further 8no new colonies were discovered, bringing the total colonies in the 5-year period to 20no.

The flight period in all five years was pretty consistent from early July to early/mid August, the earliest date being 3rd July (2015) and latest 12th August (2016).

In my 2017 Oldham butterfly report I commented that I wondered if *w-album* did exist in greater numbers and had not been recorded simply because it was a case of lack of recorders and that I was sure that there were yet more colonies still to be discovered.

Survey Format

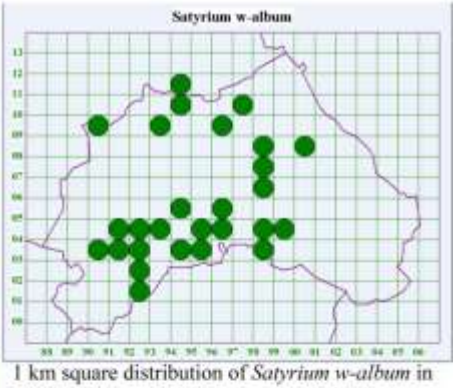
During the previous five years I had been noting the locations of elm trees as I travelled around the Borough. With over 100no elms recorded, this knowledge would prove to be a good base to work from.

As in previous years, I always check out the reliable trees on my doorstep in Werneth to alert me to the start of the flight season. With the fine weather in May extending into June, I suspected an earlier than usual emergence. So I was not surprised with the first local sighting on 19th June – the only surprise was that it was a new tree I had not previously looked at. After that early sighting, by some two weeks, and further sightings from my reliable trees during the next few days, I decided to start a diary of my exploits.

I didn't know how long the fine weather would last, so with the intention of covering as much ground as possible I limited looking at individual trees to 15/20 minutes. This also was, from experience, the period of time that if the butterfly were active it would be generally, but not always, flying above the canopy. Also another way to maximise the time was that as soon as I had a confirmed sighting, even though the temptation was to linger, I would move on to the next tree. By focusing solely on elm trees I soon began to discover further trees not previously noted. A turning point in the survey occurred on Saturday 30th June when I discovered 6no new trees quite close together in Jubilee – and all of them had butterflies flying. I realised then that something special was happening in 2018. At that point, I decided not to look at immature trees (small saplings or sucker growth) or trees that didn't look as though the butterfly was present, because with so many trees to inspect I needed to make best use of my time – not forgetting other more menial time constraints!

That re-adjustment proved to be a good decision because, as the sun continued to beam down, it gave me time to revisit trees that looked promising but on which I had not had a confirmed sighting. The trees on Abbey Road are a good example.

Copster Park, Werneth: August 6th, 2016
Tree behind Park Caff SD922031



1 km square distribution of *Satyrium w-album* in 2018. Flight period 19th June to 23rd July

Royal George: Wych elm *Ulmus glabra*

Greenacres Cemetery: the 'magnificent' elm with the other elm to the left of the picture

Werneth: Copster Park - behind the Park Caff on Hollins Road

Chadderton: South Chadderton Metro Station

Data tables

Rather than give a descriptive narrative of the season as it unfolded – which could make for some boring reading, make finding the important detail difficult to assimilate and also result in a messy report – I have tabulated the information in date order. This will make it easier to track my movements around the Borough and, crucially, be able to see quickly the relevant details without having to wade through pages of text.

In Table 1, the trees with sightings are only listed the first time they were confirmed. Subsequent sightings have been omitted unless the number of butterflies seen was greater than on the initial confirmation. This only happened on one occasion. Also previously known colonies are highlighted in bold type for ease of reference.
Table 2 lists trees looked at without a confirmed sighting. In the notes column I have commented on the probability of a tree supporting a colony by referring to 'leaf activity'. This should not be taken that other undesignated trees may not support a colony but that this information will be a point of reference when searching in subsequent seasons.

TABLE 1. White-letter Hairstreak *Satyrium w-album* in Oldham 2018: Data of trees supporting the butterfly

No.	Date	Location description	No. of trees supp butfly	Max. no. butflies obsd.	Grid reference	Notes
1	19th June	Selden Street, Werneth off Werneth Hall Road.	1	2	SD915041	Flying above canopy at 8.20am. Air temperature 15degC, warm in sunshine. One observed at canopy level on leaf maximising sun's rays by slanting body. Mainly still but shuffled slightly.
2	21st June	**Hollies Area, Werneth Park -** a short distance in from the footpath access off Frederick Street near to Wellington Road.	1	2	SD916038	(am) Spiralling above canopy. Existing colony first recorded in 2014.
3	22nd June	At the road junction of Edward Street with Tamworth Street, Werneth.	1	1	SD913044	Flying at canopy level. Then observed settled on leaf at 9.30am.
4	22nd June	**Everton Road** at the junction with College Road, Werneth.	1	2	SD918034	Spiralling above canopy at 10.25am.
5	22nd June	**Copster Park, Werneth.**	1	1	SD922031	The butterfly was flying on the tree directly behind Park Caff on Hollins Road at 11.00am. 7no trees in Park.

6	24th June	**Ashton Road, Bardsley** opposite Smokies Park.	1	1	SD929015	Single mature tree. Seen flying above canopy at 8.44am. Existing colony first seen in 2017.
7	24th June	Waste ground, Bardsley – in open area.	1	1	SD927020	Isolated single tree. Flying at canopy level at 9.14am; observed on leaf slanting body facing sun.
8	24th June	**Hollins Road, Werneth** at entrance to St. Paul's Conservative Club.	2	1	SD926032	Spiralling above canopy at 9.24am.
9	24th June	**Copster Park, Werneth.**	4	5	SD922029 SD921030 SD922031	11no trees in 2017. Now only 7no. Noted on 4no trees - single on tree adjacent tree behind Park Caff, 3no trees on western boundary and a single on tree behind tennis courts. Between 9.30 and 10.00am. Existing colony - since 2014. See 22nd June.
10	24th June	**South Chadderton -** tree on east side of Metro Station.	1	1	SD905034	Immediately on arrival seen flying then settled on leaf. 10.40am. Existing colony first seen in 2017.
11	25th June	**Greenfield –** boundary of cricket club on bank of Chew Brook.	1	1	SD995042	Flying above canopy at 11.20am.
12	27th June	Royal George – group of 3no trees adjacent footbridge over R. Tame and tennis courts.	1	2	SD983038	Not seen on expected tree next to footbridge where previously recorded – first in 2014 – but on tree behind tennis courts. 2no spiralling above canopy 11.50am.
13	27th June	**Alexandra Park** – one tree on top level just after steps up from main car park. Other at side of children's play area.	2	2	SD930042 SD931040	Single sighting on each tree – flying above canopy at 12.25 & 12.35 respectively.
14	28th June	**Frederick Street** – corner with Wellington Road, Werneth.	1	1	SD916038	Flying above canopy at 8.37am.
15	28th June	Fernholme Court off Grange Road, Werneth.	1	1	SD913037	Seen flying above canopy immediately on arrival at 9.06am.
16	28th June	Abbey Hills Road – tree on verge on north side of road.	1	2	SD948032	3no trees close together – other two on south side verge. 2no spiralling in aerial dispute at 10.46am.
17	28th June	Lees New Road – trees close together opposite nos. 171 & 175.	2	2	SD956039	Single butterflies in flight above canopy at 11.10 & 11.25am. Trees best viewed from field behind trees.
18	28th June	**Standedge Road, Diggle** – three trees: one in garden of property, other two on boundary overhanging lay-by on east side of road (one tree is dead).	2	3	SE002086	2no on garden tree spiralling at 2.26pm and 1no flying on lay-by tree at 2.31pm. Trees are easily viewed from the lay-by.

19	28th June	Werneth Park – tree is at the side of the brick boundary wall to Frederick Street adjacent to the Music Room.	1	2	SD915041	2no spiralling above the canopy then one observed settled on leaf – 5.07pm.
20	28th June	Werneth Park – single tree behind bowling green adjacent to the allotments.	1	1	SD914039	Tall tree surrounded by other trees. 1no flying in continual short bursts above canopy at 5.14pm.
21	28th June	Manchester Road, Werneth – single tree in grounds of properties on road boundary close to a pedestrian crossing.	1	2	SD912038	2no in aerial dispute above canopy. One butterfly observed on leaf at canopy level before being disturbed resulting in another spiralling dispute – 5.24pm. Best viewed from middle of road crossing.
22	28th June	Grange Ave., Werneth – tree on corner in grounds of Anselms Court.	2	2	SD914037	Tall tree – 2no in aerial dispute above canopy at 5.37pm.
23	28th June	Grange Ave., Werneth – two trees close together opposite nos.108 and 112.	2	2	SD914037	Visited earlier (am). 2no in aerial dispute opposite no.108 at 5.44pm. One then settled on tree opposite no.112. One then seen flying above canopy opposite no.108. Probably same two in dispute.
24	29th June	College Ave/Everton Road – 3no trees: two tall trees on Everton Rd. close together with closed canopy; one smaller tree on College Ave.	2	3	SD917034	First sighting of 1no flying around tree on College Ave at 4.12pm. 2no flying separately on Everton Rd. tree furthest from College Ave. junction at 4.15pm. 1no on remaining tree – flying then observed on leaf at 4.19pm. See 22nd June.
25	29th June	Copster Park, Werneth.	1	3	SD921030	Re-visit to look at two trees (out of 7no) not confirmed. Tree on west boundary – 2no flying in separate areas at mid point at 5.16pm. Then 3no flying at 5.20pm – two in aerial dispute, other separately.
26	29th June	**Abbey Hills Road.**	1	1	SD949032	Revisit to look at two trees out of three not confirmed. 1no flying at mid-point on tree by bus stop at 6.04pm.
27	30th June	Milnrow Road, Jubilee – from Metro overbridge to the boundary with Rochdale. All trees on east side of road.	6	10	SD942107 SD942108 SD942109 SD941111 (3no)	Just discovered the trees on this visit. On four trees were 2no butterflies with singles on the other two. It was at this point that I realised something special was happening. Seen between 9.45 and 10.12am.
28	30th June	Dobcross New Road, Dobcross – tree in garden of property in New Bank Close on boundary of River Tame.	1	1	SD988063	Flying above canopy then observed on leaf slanting to face sun at 11.59am. Although in a garden, good view from road bridge over R. Tame.

29	30th June	**Sam Road, Diggle** – on north side of road at junction with Huddersfield Road.	1	2	SE003080	Previously recorded at this location. 2no in aerial dispute on tree furthest from Huddersfield Road at 12.26pm. Then one observed on a leaf at 12.30pm.
30	30th June	Oldham Road, Greenfield – on south side of this busy road, smothering a lamp standard**.**	1	1	SD989046	Flying above canopy at 12.48pm.
31	30th June	Chamber Road, Werneth – junction with Frederick Street.	1	1	SD918036	Flying at side of tree at 3.31pm then observed on the end of a leaf directly facing the sun.
32	2nd July	Wall Hill Road, Tame Water – tree on east side of road near junction with Delph New Road.	1	2	SD987064	Spiralling above canopy at 3.51pm.
33	2nd July	Oldham Road – tree in fork at junction with Oaklands Road.	1	1	SD988045	Flying at 5.00pm.
34	3rd July	Oldham Road, Shaw Hill – tree in car park of Farrars Arms on south side of road.	1	2	SD985045	A tall mature tree hemmed in by trees. Spiralling above canopy at 3.30pm. Best views are from the timber tables at the front of the 'Arms'.
35	3rd July	Oldham Road – tree at junction with Oaklands Road on opposite side to tree in fork of junction (see no.33)	1	2	SD988045	A larger tree than the tree opposite. Spiralling above the canopy at 3.40pm.
36	4th July	Well-i-Hole Road – trees either side of Mann's Wharf Bridge on east side of road.	2	3	SD985042	North tree partly hidden by surrounding trees – best viewed from canal towing path. South tree larger and quite exposed. 1no flying above canopy on north side of tree at 2.06pm. 2no spiralling above canopy on south tree at 2.15pm.
37	4th July	Royal George – close to stile on footpath to east of cricket ground.	1	2	SD983037	Tree in wooded section. Harrying each other just above canopy rather than continual flight conflict at 2.40pm.
38	4th July	Well-i-Hole Road – west side of road and to north side of Wellhole Bridge over R. Tame.	1	2	SD985041	In aerial dispute at mid-point of tree at 3.01pm. Then one seen flying above canopy and observed settled on leaf at 3.02pm. One of the pair?
39	4th July	Abbey Hills Road – tree on south side of road nearest to junction with Lees New Road.	1	2	SD949032	The last of the 3no trees in this area to be confirmed. Spiralling horizontally away from tree at 5.04pm. Then one observed on leaf in partly shaded area.
40	6th July	Oldham Road, Old Tame – opposite no.47 on west side of road.	1	1	SD968097	Flying above canopy at 3.37pm.

41	6th July	Oldham Road, Denshaw – on east side of road opposite no.12. Close to downhill side road.	1	1	SD974104	Flying to side of tree on road side at 4.09pm.
42	7th July	Lower Turf Lane, Austerlands – tree nearest to junction with Huddersfield Road – in fork of junction.	1	2	SD965057	Waited 15mins for clouds to clear. Pair immediately seen spiralling – 2.06pm. Then a single seen flying just above the canopy.
43	7th July	Huddersfield Road, Delph – north side of road and to east of R. Tame close to crossroads.	1	1	SD987074	Flying just above the canopy at 2.30pm.
44	7th July	Rochdale Road, Denshaw – at crossroads opposite the Junction Inn.	1	2	SD974106	Spiralling at 3.40pm.
45	7th July	Denshaw Road, Delph – in garden on Alney Wood backing on to Hull Brook.	1	2	SD984081	Flying separately just above the canopy at 3.55pm.
46	7th July	Horest Lane, Old Tame – small tree in garden at junction with Oldham Road.	1	1	SD968096	Flying above canopy then around garden. Observed settled on leaf of unidentified tree/shrub at 4.43pm. Possibly a butterfly from the trees on Oldham Road.
47	10th July	Disused railway line, Springhead – 7no trees close together with closed canopies (cluster of 4no and 3no). Immediately on entry from Ashbrook Road walking east.	2	3	SD959044	1no flying above canopy on tree nearest to Ashbrook Road at 4.16pm. 2no spiralling above canopy on tree furthest from Ashbrook Road – 4.21pm. Most likely a single colony.
48	11th July.	Thornham Old Road, Summit – tree on north side of dirt road in an avenue of trees. Only elm tree for quite some distance.	1	1	SD908095	Flying at the top of the canopy at 12.00 noon. Then three short bursts of flight within 6 mins.
49	12th July	Greenacres Cemetery – large tree on boundary with Greenacres Road. A magnificent tree! Other tree on western boundary close to large tree.	2	3	SD945053	1no flying at canopy level on smaller tree at 4.20pm. Then observed on leaf. 2no spiralling above canopy at 4.24pm and again at 4.26pm. On large tree 1no flying at canopy level at 4.20pm.
50	12th July	Ashbrook Road, Springhead – in rear garden of no.3.. Close to cluster of trees on disused railway line.	1	1	SD959044	Flying above canopy at 3.11pm.. Probably from colony on disused railway line.
51	12th July	Park Road – large tree on south side of road reasonably close to trees in Alexandra Park.	1	2	SD934042	2no spiralling sideways from tree towards properties for some 20-30mins. before breaking up at 4.45pm. 1no flying at canopy level soon afterwards – 4.50pm.

52	14th July	Cooper Street, Springhead – group of 5no trees giving impression of one tree. West side of road in garden at junction with Oldham Road.	1	1	SD961045	Not flying but observed at low level shuffling on a leaf in dappled sunlight at 11.25am.
53	14th July	New Barn Street, Shaw – in a garden at the end of the short street where a footpath starts.	1	1	SD933092	Through binoculars noticed *w-album* on a branch at mid point. It then proceeded to walk along the branch for about 15cm before taking flight into the leaf cover at 3.35pm. In the same area, a *w-album* took flight above the canopy at 3.41pm. Probably the same butterfly.
54	14th July	A62 central reservation, Oldham town centre – in tree-lined section opposite Hobson Street. Nearest elm trees are in Alexandra Park. A surprising location.	1	1	SD926046	Only noticed tree because of 30mph speed restriction. Flying just above the canopy at 4.26pm. It was active as it made several short flights in the 7mins. I was there.
55	15th July	Chamber Road, Werneth – in grounds of Polish Club on roadside boundary opposite no.59.	1	1	SD913032	Flying just above the canopy before observed settling on leaf of the adjacent ash tree at 10.20am. Took flight again at 10.24am.
56		Polonia Court off Chamber Road, Werneth – a new housing development backing on to Polish Club.	1	2	SD912032	Noticed line of trees through railings of Polish Club from Chamber Road. In aerial dispute above canopy at 4.26pm. On investigation there are 8no trees best viewed in Polonia Court..
		TOTALS	**73no**	**104no**		

TABLE 2. White-letter Hairstreak *Satyrium w-album* in Oldham 2018: Data of trees not supporting the butterfly

District	Location	No. trees	Grid reference	Notes
Werneth/ Hollinwood	Copster Park – by bowling green	1	SD922030	Some evidence of leaf activity. Other 6no trees support butterfly.
	Hollinwood Cemetery	2 1	SD913021 SD913023	Some evidence of leaf activity.
	Werneth Hall Road – opposite Selden Street	1	SD915041	Tall, straggly tree – no leaf activity.
	Frederick Street – on boundary of Hulme Grammar School	2	SD919036	Tree close by supports butterfly.
	Chamber Road – on boundary in grounds of Polish Club	2	SD913032	Adjacent tree supports butterfly.

	Polonia Court – to rear of Polish Club	7	SD912032	Butterfly on cluster of 4no trees with closed canopy – logged as separate trees but in effect one tree.
Chadderton	Middleton Road – entrance to cemetery – car park of St. Herbert's Church – at entrance to Krokus Square – in cemetery opposite no.75	1 1 1 1	SD903055 SD903055 SD904054 SD900055	large tree. evidence of leaf activity. evidence of leaf activity. evidence of leaf activity. All trees probably support *w-album*. Visits were too late in the season.
	Chadderton Park Road – opposite no.14	1	SD897057	
Denshaw/ Old Tame	Rochdale Road – on verge close to Clough Manor, Cherry Clough – close to crossroads	1 1	SD968111 SD973107	Isolated tree, probably too exposed to the elements.
	Oldham Road – close together on east side of road close to crossroads	3	SD974104	
	Oldham Road, Old Tame – east side of road – either side of Top o'th' Fold – on east side of road opposite Top o'th' Fold	1 2 1	SD968094 SD968096 SD968096	
	Tame Lane – on south side of lane	1	SD975091	
Delph/ New Delph	Delph Station environs – off footpath accessed from Station Road	2	SD985072	Trees close together – one diseased. Difficult to view.
	The Sound, Delph – on mill car park close to crossroads with A62	1	SD987076	
	Greenland Road, New Delph – on east side, close together	3	SD988073	Two look diseased.
	Denshaw Road, Delph – one tree on Denshaw Lane opposite the White Lion pub. Other at the back of the fishing lodge best viewed from Denshaw Road	2	SD984081	Tree on Ainley Wood supports *w-album* close to tree at the back of the lodge.
	Hill End Road, Delph – by road just past the Church	1	SD986079	Diseased.
Greenfield/ Uppermill/ Royal George/ Dacres	Open area, Royal George – in close proximity to footbridge over R. Tame	2	SD983038	Tree directly over footbridge has supported *w-album*. Change in line of footpath means now not easy to view. Tree close by at back of tennis courts supports *w-album*.
	Near cricket ground, Royal George – on east boundary adjacent footpath	2	SD983037	More exposed than tree near stile which supports *w-album*.
	Manchester Road, Dacres – in front garden of no.135 on road boundary	1	SD992039	

	Oldham Road, Greenfield – not too far above Greenfield Station	2	SD990046	Smaller more exposed than trees further west supporting *w-album*. Busy road – air turbulence could be a problem.
	Canal towing path, Royal George – in a line of trees	1	SD984041	Very difficult to view – from virtually underneath.
	Halls Cottages, Halls Way, Greenfield – opposite cottages on bank of R. Tame	2	SD994049	Much larger tree was diseased in 2017 – supported a colony. Seems to be making a recovery.
	Oldham Road junction – in fork of junction with Mossley Road, Shaw Hill	1	SD985045	
	Bridge Street, Uppermill – by R. Tame both sides of bridge	2	SD996054	Either side of street. Another tree leaning over the river is now dead.
	Canalside, Uppermill – overhangs both Oldham Road and the canal	1	SD995054	Best viewed from bench seat off Oldham Road.
Jubilee/ Shaw/ Crompton Fold	Shaw Cemetery – close to the entrance, follow road to left. Largest tree at corner of dead end to road.	3	SD933093	All trees not easy to view. Two look diseased.
	Manchester Road, Shaw – opposite no.39	1	SD934084	Tree looks diseased.
	Rochdale Road, Shaw – in garden to rear of the Black Horse pub	1	SD933092	Signs of leaf activity. Supported tree not far away on New Barn Street.
	Jubilee Colliery off Milnrow Road – central in colliery near ovens	1	SD943108	
	Milnrow Road, Jubilee – next to each other opposite closed former Jubilee pub	2	SD942106	One tree is diseased.
	Buckstones Road, Crompton Fold – adjacent to Crompton Hall to south side of road	1	SD948099	
Dobcross	Wall Hill Road, Dobcross – close together at lower end of road near junction with Delph New Road	3	SD987064	Tree on east side of road supports *w-album*. These three trees are on opposite side of road close by.
Diggle	Sam Road, Diggle – one on corner at junction with Huddersfield Road. Other on Huddersfield Road close by	2	SE003080	Another tree close to one at junction supports *w-album*.
Dove Stone	Trees are adjacent to the boat yard. Single in boat yard; two at side of footpath close together	3	SE015032 SE017032	The main tree by the vehicular gate access next to the boat yard is dead. All right in 2017. Two other trees next to the two at side of footpath are also dead. Will the remaining trees survive?
Springhead/ Grotton/ Austerlands/ Lees/ Sun Hill	Station Road, Grotton – tall, straggly tree close to junction with Oldham Road. Other tree opposite no.15 further along road	2	SD964045 SD964044	Leaf activity on tree opposite no.15 but viewing could be better.

	Station Road, Springhead – small tree opposite no.5	1	SD958046	Probably not mature enough to support *w-album*, but looked like there were signs of some leaf activity.
	Huddersfield Road/Lower Turf Lane, Austerlands – two in fork at road junction, other close by on Lower Turf Lane	3	SD965057	Another tree in fork supports *w-album*.
	Constantine Road, Sun Hill – close together at back of car park	3	SD950051	Easy viewing from car park. No sign of leaf activity.
	Cooper Street/Oldham Road, Springhead – group of 4 trees together at road junction. Single trees on Oldham Road east of junction; one in garden no.207, other on verge close by	6	SD961045 SD962045	Made comment elsewhere that a fifth tree in the group supports *w-album*. Treated as individual trees but in effect one tree. Other trees show signs of leaf activity.
	Lees New Road, Lees – in garden at junction with Knowls Lane	1	SD957041	
	Ashbrook Road/disused railway line, Springhead	9	SD958045	Two other railway line trees support *w-album* (7no trees in total). Other trees on Ashbrook/post office site show signs of leaf activity.
TOTAL		96no		

Summary

By looking at the location of the supported trees and the distance between them, I estimate that when movement between trees in close proximity is considered, the 72no trees constitute at least 50no colonies. Also the totals from Tables 1 and 2 show 72no trees supporting and 96no unsupporting. This equates to approximately 43% occupancy. But when clusters of trees, where only one tree is confirmed, are taken into account, and again considering movement between trees in close proximity, then that figure is probably over 50%. Although I covered quite a large area of the Borough, it is worth pointing out that there will, of course, be trees that I have missed – but hopefully not too many. Also the location of the supporting trees is predominantly on roadsides – 45no – with parks, gardens and cemeteries supporting 17no trees.

It will be interesting to see what has happened across the U.K. in 2018. It all really depends on the number of observers and hours spent in the field. One thing is certain – *w-album* is not a scarce species in Oldham. The intriguing point is that without historical records it will never be known whether its wide distribution in Oldham is recent and brought about by changes in climate, a key factor in the expansion of the butterfly's range, or whether the butterfly has always been present in good numbers but not seen due to lack of observers. And in 2019 and beyond? Well, the survey does not stop here. As always, gaps need to be filled so the project carries on – obviously.

Shaw Hall: tree on car park of Farrars Arms viewed from the outside seating

Denshaw: opposite the Junction Inn at the crossroads

Werneth: Everton Road at junction with College Avenue

Failsworth: Moston Brook – this dead tree supported a colony in 2017. Fortunately, not a common sight in Oldham.

Royal George: tree behind tennis courts

Royal George: by bridge at side of R. Tame, Well-i-Hole Road

Springhead: disused railway line – clusters on 4no and 3no trees with closed canopies

Oldham Town Centre: on central reservation of dual carriageway

The Diary

SEARCHING FOR THE WHITE-LETTER HAIRSTREAK, *Satyrium w-album*

Sunday 24th June, 2018

Start of day – sunny, air temperature 14 deg C.

Ashton Road, Bardsley (opposite Smokies Park)
8.40 – 8.45am
1no flying (8.44). SD929015

Waste Ground, Bardsley
9.01 – 9.15am
1no flying then viewed on leaf slanting body to face sun (9.14). SD927020

Hollins Road, St. Paul's Conservative Club
9.24 – 9.25am
2no spiralling above canopy immediately I arrived (9.24). SD926032

Copster Park
9.29 – 10.05am
Only 7no trees now – 11no in 2017. Butterflies seen on 5no. Two singles on both trees together on entrance adjacent Park Caff on Hollins Road. 3no on two of the three trees on the western boundary and a single on the tree south of the tennis courts. SD922029, 921030, 922031

Frederick Street corner with Wellington Road
10.08 – 10.15am
2no trees close together – nothing seen in a shortened visit.

Grange Avenue/Fernholme Court
10.20 – 10.30am
4no trees looked at – no sightings. Again shortened visit in this area.

South Chadderton
10.40 – 10.41am
A single tree by the Metro stop. 1no seen flying then settled on leaf immediately on looking at tree (10.40). SD905034

Monday 25th June, 2018

Start of day – sunny, air temperature 16 deg C.

Alexandra Park
8.40 – 9.15am
Looked at tree on upper terrace close to entrance from car park and tree next to play area. SD930042 & SD931040 respectively
No sightings

Alt
9.31 – 9.55am
Two trees – one by bus stop and other close by on north side of Abbey Hills Road. SD948032.
No sightings.

Lees New Road
10.07 – 10.35am
Two trees on verge (opposite nos. 171 and 175). SD956039
Single tree in the grounds of the property at junction with Knowls Lane. SD957041
No sightings

Air temperature 20 deg C at 10.40

Royal George
10.46 – 11.05am
Three trees in close proximity to footbridge over R. Tame/cricket ground. SD983038
No sightings

Greenfield
11.15 – 11.21am
Single tree on bank of Chew Brook at rear of cricket ground. SD995042
1no flying (11.20)

Uppermill
11.30 – 11.40am
Two trees close together on Bridge Street (a further tree leaning over river is now dead). SD996054
No sightings.

Wall Hill
11.55 – 11.55am
Single tree off footpath from Broadgate near to Wall Hill Brook. SD984063
Tree is a skeleton – dead. Must have died a couple of years ago.
Air temperature now 24 deg C.

Waste Ground, Bardsley
2.15 – 2.25pm
Checked on tree visited yesterday – no sightings.

Copster Park
2.45 – 3.20pm
1no flying on tree behind Park Caff – looked at all trees; only sighting. SD922031

Hollinwood Cemetery
3.30 – 4.00pm
Two number trees – no sightings. SD913021
Air temperature 25 deg C at 4.00pm.

Wednesday 27th June, 2018

Start of day – sunny, air temperature 19 deg C.

Standedge Road, Diggle
9.30 – 9.45am
Two number trees – one in garden, one overhanging lay-by – no sightings. Too breezy for flight? c.900ft. above sea level. SE002086

Sam Road, Diggle
9.54 – 10.12am
Three trees – no sightings. c.700ft. above sea level. SE003080

Uppermill
10.22 – 10.40am
Two trees on Bridge Street (SD996054) and a single tree by canal side (SD995054) – no sightings.

Halls Cottages, Halls Way, Greenfield
11.15 – 11.20am
Single tree (was diseased in 2017 but seems to have recovered) – no sightings

Royal George
11.35 – 11.50am
Three trees viewed.
Two number spiralling above canopy on tree between tennis courts and R. Tame (11.50). Single seen on same tree slightly earlier (11.45) – could have been one of later pair seen? SD983038

Park Road
12.10 – 12.14pm
Single tree by roadside – no sightings. Not an area to linger in. SD934042

Alexandra Park
12.20 – 12.47pm
Two trees (as 25th June)
Single sighting on tree on upper level close to car park (12.25). SD930042
Single on tree adjacent play area (12.35). SD931040

Air temperature now 24 deg. C.

Thursday 28th June, 2018

Start of day – sunny, air temperature 16 deg. C.

Selden Street
8.00 – 8.12am
Single tree – 1no flying (8.10). SD915041

Werneth Park, adjacent to Music Room
8.14 – 8.24am
Single tree – 1no flying (8.30)

Werneth Park, The Hollies area
8.28 – 8.32am
Single tree – 1no flying (8.30). SD916038

Frederick Street, corner with Wellington Street
8.36 – 8.43am
Single tree – 1no flying (8.37). SD916038

Grange Avenue, corner with Anselms Court
8.48 – 9.03am
Single tree – no sighting. SD913037

Fernholme Court off Grange Road
9.06 – 9.10am
Single tree – 1no seen flying immediately on arrival (9.06). SD913037

Grange Avenue
9.12 – 9.20am
Two trees – opposite nos. 108 and 112 – no sighting. SD914037

Air temperature now 20 deg. C.

Abbey Hills Road
10.26 – 10.57am
Three trees – two on south side of road, other on north side. 2no in aerial dispute – tree on north side of road (10.46). Other trees show evidence of activity.
South trees – SD949032, and North tree – SD948032

Lees New Road
11.04 – 11.25am
Two trees – opposite nos.171 and 175. 1no on tree opposite no.175 (11.10); 1no on tree opposite no.171 (11.25). SD956039

Standedge Road, Diggle
2.25 – 2.35pm
One tree in garden, two trees (one dead) on boundary overhanging lay-by. 2no on garden tree in aerial dispute (2.26). 1no flying on lay-by tree (2.31). SE002086

Sam Road, Diggle
2.44 – 2.58pm
Three trees – no sightings. SE003080

Air temperature now 26 deg. C.

Werneth Hall Road
4.51 – 5.00pm
Single tall upright straggly tree opposite Selden Street. No evidence of leaf activity. Probably too exposed? SD915041

Werneth Park, adjacent to Music Room
5.04 – 5.09pm
Single tree on road boundary – 2no spiralling above canopy. One then settled on leaf in full view. SD915041

Werneth Park
5.14 – 5.17pm
Single tree behind bowling green adjacent to allotments. 1no flying in continual short bursts above canopy (5.14). SD914039

Manchester Road
5.22 – 5.25pm
2no in aerial dispute above canopy. One then viewed on leaf before being disturbed by another – resulting in another spiralling dispute (5.24). SD912038

Grange Avenue, corner with Anselms Court
5.30 – 5.40pm
Visited earlier today. 2no in aerial dispute above canopy (5.37). SD913037

Grange Avenue
5.41 – 5.50pm
Visited earlier today. First sighted when 2no in aerial dispute on tree opposite no.108 (5.44). One then settled on tree opposite no.112. One then seen above canopy on tree opposite 108. SD914037

Air temperature now 25 deg. C.

Friday 29th June, 2018

Start of session – sunny, 28 deg. C.

College Avenue/Everton Road
4.05 – 4.20pm
Viewed all three trees, which are close together. 1no flying on tree in College Avenue (4.12). 2no on Everton Road tree furthest from junction with College Avenue (4.15). Flying in separate areas. 1no on Everton Road tree at junction with College Avenue (4.19). Flew then viewed on leaf. All SD917034

Hollinwood Cemetery
4.31 – 4.55pm
Three trees – two close together. No sightings but evidence of activity on two trees. SD913021 and SD013023 (remote tree)

Copster Park
5.05 – 5.30pm
Called to look at the two trees where not recorded *w-album* this season. 2no flying in separate areas of tree at mid point of tree on sunny side of tree (5.16). 3no flying – two in aerial dispute, the other flying separately (5.20). No sightings at the other tree. SD921030

Abbey Hills Road
5.45 – 6.15pm
As for Copster Park, called to look at the two trees where not recorded *w-album* this season. 1no flying at mid point of tree on sunny side by bus stop (6.04). No sightings on other tree on same side of road. SD949032

Lees New Road
6.22 – 6.35pm
Tree in garden of property at junction with Knowls Lane – no sightings. SD957041

Chamber Road, Werneth
6.50 – 6.55pm
Tree on roadside boundary in grounds of Hulme Grammar School – no sightings. SD918036

Air temperature now 26 deg. C.

Saturday 30th June, 2018

Start of day – sunny, air temperature 16 deg. C.

Shaw Cemetery
9.02 – 9.30am
Three trees with the mature tree furthest from entrance. Other two trees too enclosed by other foliage/trees. All three trees not easy to view. Two larger trees look diseased. No sightings. SD933093

Milnrow Road, Jubilee
9.43 – 10.45am
Starting from Metro overbridge, on the west side of the road up to the Rochdale boundary there are 6no trees – butterflies on all of them.
Tree side of Metro overbridge – 2no in aerial dispute (9.45). SD942107
1st tree north from bridge – 1no flying (9.56). SD942108
2nd from bridge – 1no flying (10.02). SD942109
3rd from bridge – 2no in aerial dispute (10.07). SD941111
4th from bridge – 2no flying separately (10.12). SD941111
5th from bridge – 2no in aerial dispute (10.10). SD941111

Two further trees opposite former Jubilee pub were viewed – no sightings. One tree is diseased. SD942106

Air temperature now 22 deg. C.

Wall Hill Road
11.35 – 11.50am
Four trees at lower end of road near to junction with Delph New Road. Three on the west side of the road, the other on the east side – all close together. No sightings. SD987064

Dobcross New Road
11.55am – 12.05pm
Two trees – one by bridge over R. Tame, other in garden backing on to R. Tame (property in New Bank Close). 1no flying above canopy on tree in garden then observed on leaf slanting to face sun (11.59). SD988063

Sam Road, Diggle
12.15 – 12.35pm
Another visit to this known colony from the last few years. 2no in aerial dispute on tree furthest from junction with Huddersfield Road (12.26). One butterfly observed on a leaf (12.30). No sightings on other two trees. SE003080

Oldham Road, Greenfield
12.46 – 1.05pm
Three trees on south side of road. 1no flying on tree smothering lamp standard (12.48). SD989046
No sighting at tree going east towards Greenfield Station SD990046 or tree nearest to Station by road sign SD990046.

Air temperature now 24 deg. C.

Start of afternoon visits, air temperature 28 deg. C.

Chamber Road, Werneth
3.26 – 3.37pm
1no flying then viewed static facing the sun on the end of leaf (3.31). SD918036

Abbey Hills Road
4.07 – 4.25pm
Visit to confirm that *w-album* is present on the only tree of three at this location. Just looked at this tree during visit. No sighting (again). SD949032

Hollinwood Cemetery
4.53 – 5.05pm
Looked at the two trees close together. No sightings.

Air temperature now 24 deg. C.

Monday 2nd July, 2018

Delph Station environs
3.19 – 3.25pm
2no trees – one diseased – off footpath from former station site. Difficult to view – no sightings. SD985072

Wall Hill Road
3.35 – 3.54pm
Previously visited. 2no spiralling in dispute on tree to east side of road (3.51). No sightings at other trees. SD987064

Halls Cottage, Halls Way, Greenfield
4.26 – 4.37pm
Previously visited. Actually 2no trees. Other tree is close to bridge over R. Tame and more a sapling. Much larger mature tree was diseased in 2017 but seems to be making a recovery. Butterflies observed there prior to 2017. As expected, no sightings but one to look at in future years.

Oldham Road
4.55 – 5.08pm
Tree in fork of junction with Oaklands Road. 1no flying (5.00pm). SD988045

Oldham Road
5.10 – 5.25pm
Tree on opposite side of junction with Oaklands Road. Surprisingly, no sightings from this larger mature tree than that on opposite side of junction. SD988045

Oldham Road, Greenfield
5.26 – 5.40pm
Looked at the 2nd and 3rd of three trees on way towards Greenfield railway station on south side of road. Previously visited – today no sightings. A little breezy. SD990046

Oldham Road, Shaw Hall
5.49 – 6.00pm
Large tree in car park opposite Farrars Arms pub. No sightings. SD985045.

Air temperature now 25 deg. C.

Tuesday 3rd July, 2018

Air temperature 24 deg. C.

Oldham Road, Shaw Hall
3.30 – 3.32pm
Revisit to tree in car park opposite Farrars Arms. On looking at tree, immediately 2no butterflies seen spiralling in dispute above the canopy (3.30). SD985045

Oldham Road
3.36 – 3.45pm
Tree looked at yesterday at junction with Oaklands Road. 2no spiralling in dispute above canopy (3.40). SD988045

Oldham Road, Greenfield
3.47 – 4.02pm
Another visit to the 2nd and 3rd trees heading towards Greenfield. Still no sightings. The trees are not as large as the 1st tree of these three or the tree at Oaklands Road junction. Very busy road so it is possible that the turbulence caused by passing traffic has an adverse effect on these smaller elms. To add to this theory, as I walked past the first tree back to the car, I glanced up and saw 2no *w-album* flying above the canopy.

Dove Stone
4.20 – 5.25pm
Saddened to see that the main mature elm (the main reason for the visit), by the vehicular access gate adjacent to the boat yard, was diseased and virtually (but not quite) a skeleton. This tree was healthy in 2017. A tree inside the boat yard at this point did not yield any sightings. SE015032.
Further along the footpath skirting the boat yard there are 4no small elms – two of which are skeletons (diseased in 2016). No sightings even though I persisted looking longer than I normally would, more in hope, after the 20 minutes gazing "barrier" was passed, than expectation. SE017032

Abbey Hills Road
5.45 – 6.00pm
Another visit to look at the only tree of three without a confirmed sighting of *w-album*, and after 15 minutes, looking in bright warm sunshine, that is still the case. SD949032

Air temperature now 22 deg. C.

Wednesday 4th July, 2018

Milnrow Road, Jubilee
10.05 – 10.20 and 10.37 – 10.40am
Viewed the two trees looked at previously on 30th June. No sightings. SD942106
As I walked past the tree at the side of the Metro overbridge, 2no flew up in dispute (10.24) – the same two I saw on my last visit, maybe?

Shaw Cemetery
11.10 – 11.21am
Another revisit from 30th June. No sightings again.

Manchester Road, Shaw
11.30 – 11.32am
Single tree opposite no.39. Tree diseased. No sightings. SD934034

Huddersfield Road, Scouthead
1.29 – 1.36pm
Two trees some 50m apart. Both diseased.. No sightings. SD967058

Oldham Road junction with Mossley Road, Shaw Hall
1.45 – 1.52pm
Tree in fork at road junction. No sightings. SD985045

Well-i-Hole Road
2.00 – 2.16pm
Two trees on east side of road bridge over canal (Mann's Wharf Bridge) – one to north, one to south. North tree partially hidden by surrounding trees. South tree, exposed and isolated. 1no on north tree above canopy (2.06). 2no spiralling in aerial dispute on to side of south tree (2.15). SD985042

Canal Towing path
2.20 – 2.25pm
Tree at towing path boundary. Difficult to view. No sightings. SD984041

Royal George
2.31 – 2.55pm
Three trees, east of bowling green/cricket ground. Two in an open location, other in wooded area adjacent to stile. 2no on "stile" tree – harrying each other just above the canopy (2.40). SD983037

Well-i-Hole Road
3.00 – 3.05pm
Tree by road bridge (Wellhole Bridge) over R. Tame to north side. 2no in aerial dispute at mid-point of tree (3.01). Then one seen flying above canopy (3.02) – one of the pair? Observed settled on leaf at canopy level. SD985041

Manchester Road, Dacres
3.15 – 3.27pm
Tree in front garden at road boundary (no.135). No sightings. SD992039

Oldham Road, Greenfield
4.00 – 4.05pm
Another (final?) look at the two trees that appear to be affected by traffic turbulence. A short visit – no sightings.

Oldham Road, Shaw Hall
4.15 – 4.35pm
The Farrars Arms tree observed from the seating at the front of the "Arms" enjoying a cool drink watching the tree in the car park opposite. 1no flying (4.20). 2no spiralling (4.25). 1no flying (4.29) and same butterfly again (4.31).

Abbey Hills Road
5.00 – 5.07pm
Another look at the last of the three trees at this location still lacking a sighting. Success – 2no spiralling horizontally away from tree (5.04), before one returned to the partly shaded side of the tree rather than the full sun side. Observed on leaf. With the evidence of leaf activity, perseverance paid off.

Air temperature now 26 deg. C.

Friday 6th July, 2018

Oldham Road, Old Tame
3.21 – 3.27pm
Tree on east side of road. No sighting. SD968094

Oldham Road, Old Tame
3.30 – 3.33pm
Tree on east side of road opposite no.92. No sighting. SD968096

Oldham Road, Old Tame
3.35 – 3.50pm
Three trees close together – two either side of Top o'th' Fold; other tree a short distance further north opposite no.47. All on west side of road. Tree opposite no.47, 1no flying (3.37). SD968097
No sightings on other trees. Both SD968096

Oldham Road, Denshaw
3.55 – 4.11pm
Four trees on east side of road. One opposite no.12. Others close together near crossroads. 1no flying (4.09). SD974104
No sighting at other trees closer to Denshaw crossroads. SD974105

Tame Lane
4.20 – 4.30pm
Tree on south side of Lane – small isolated tree. No sighting. SD975091.

The Sound, Delph
4.50 – 5.05pm
Tree on mill car park close to junction with A62. No sighting. SD987076

Gatehead Road, New Delph
5.10 – 5.15pm
Three trees on east side of road. A couple look diseased. No sightings. SD988073

Huddersfield Road, Delph
5.25 – 5.42pm
Two trees on north side of road, either side of R. Tame. No sightings. SD987074

Saturday 7th July, 2018

Air temperature at start 20 deg. C. (am). Reached 27 deg. C. (pm).

Huddersfield Road/Lower Turf Lane, Austerlands
9.25 – 9.40am and 1.55 – 2.15pm
4no trees. 2no spiralling (2.06) on tree at junction of roads; then a single seen flying just above the canopy. SD965057

Huddersfield Road, Delph
9.52 – 10.12am and 2.25 – 2.40pm
2no trees either side of R. Tame on north side of road. Tree closest to road junction only a sucker/sapling; other a mature tree. 1no on mature tree flying just above the canopy (2.30). SD987074

The Sound, Delph
10.15 – 10.23am and 2.25 – 2.40pm
1no mature tree on mill car park. No sightings. SD987076

Denshaw Road, Delph
2.50 – 3.10pm and 3.50 – 4.05pm
1no small tree on Denshaw Lane opposite the White Lion pub.
2no trees at the back of the fishing lodge – best viewed from Denshaw Lane. 2no flying just above the canopy on the "lodge" tree in the garden on Ainley Wood (3.55). SD984081
Hill End Road, Delph
4.08 – 4.15pm
1no tree by road, just past the church. Diseased. SD986079.

Rochdale Road, Denshaw
10.31 – 10.41am and 3.16 – 3.41pm

2no trees – one opposite the Junction Inn, other just along Rochdale Road. 2no spiralling above the tree opposite the pub (3.40). SD974106

Oldham Road, Denshaw
10.45 – 10.55am and 3.16 – 3.41pm
4no trees on Oldham Road – no sightings.

Buckstones Road, Crompton Fold
11.10 – 11.18am
Mature tree adjacent to Crompton Hall on Buckstones Road – no sighting. SD948099

Oldham Road, Old Tame
4.35 – 4.55pm
Revisit to the 5no trees reasonably close together. Noticed a small elm in a garden on Horest Lane – surprisingly 1no flying just above the canopy before flying around the garden. Observed settled on leaf of unidentified tree/shrub (4.43). Possibly a butterfly from the trees on Oldham Road? SD968096

Tuesday 10th July, 2018

Thornham Old Road, Summit
11.45 – 11.55am
Single tree on this tree-lined section of road. Evidence of leaf activity – no sightings. SD908095

Disused Railway line, Springhead
4.15 – 4.27pm
7no trees immediately on access to the railway line east of Ashbrook Road – a cluster of 4no and 3no forming a closed canopy all within a distance of 40m. Another tree in the rear garden of no.3 Ashbrook Road is remote but close to this line of trees. 2no trees of the cluster of three look diseased.
1no flying above canopy on tree nearest to Ashbrook Road (4.16) and 2no spiralling above canopy on tree furthest from Ashbrook Road (4.21). SD959044

Station Road, Springhead
4.30 – 4.35pm
Single small tree opposite no.5. Probably not mature enough to support *w-album*? No sighting. SD958046

Ashbrook Road, Springhead
4.35 – 4.40pm
This is the tree in the rear garden of no.3.. No sighting. SD959044

Station Road, Grotton
4.45 – 4.55pm

Isolated tall straggly mature tree close to junction with Oldham Road. No sighting. SD964045

Station Road, Grotton
4.55 – 5.00pm
Single tree further along road from above tree – opposite no.15. Evidence of leaf activity but viewing poor. SD964044

The Sound, Delph
5.25 – 5.35pm
Another visit to the tree on the mill car park. Ideal conditions for flight but no sighting. SD987076

Denshaw Road, Delph
5.40 – 5.50pm
Another visit to the three trees close to this area. One opposite the White Lion pub and the other two behind the Lodge but best viewed from Denshaw Road. No sightings.

Denshaw
5.25 – 6.20pm
Looked at all 6no trees close to the crossroads. No sightings.

Oldham Road, Old Tame
6.24 – 6.35pm
Looked at all 6no trees on this section of road. No sightings. Although still sunny with clear blue sky and air temperature around 22 deg. C., it is probably too late for flight.

Wednesday 11th July, 2018

Air temperature 16 deg. C. at start with clear blue sky (and a slight chill to the light breeze)

Thornham Old Road, Summit
9.10 – 9.30am and 11.55am – 12.10pm
Another look (which turned into two) at this single tree that must support *w-album*. No sightings on first visit but with a higher air temperature of 22 deg. C., a single butterfly flying at the top of the canopy (12.00). Three short bursts of flight in approximately 6 minutes.

A frustrating morning of no sightings of *w-album* apart from the above last visit. I can only assume that the chill in the air was the reason, because the air temperature was all right and the sun was shining strongly. The other morning visits are as follows:

Oldham Road, Old Tame
9.50 – 10.20am

Denshaw (crossroads)
10.25 – 10.50am

Milnrow Road, Jubilee, including Jubilee Colliery
11.05 – 11.35am
Noted a "new" tree in the Colliery – a tall, mature tree. SD943108

Rochdale Road, Shaw
11.45am
Noted "new" trees – one in front garden adjacent to no.186. SD933092
Another single tree close by at the end of New Barn Street. SD933092
Did not linger. To be visited again.

Disused railway line, Springhead
1.35 – 2.08pm
1no flying above the canopy on tree furthest from Ashbrook Road (1.42). SD959044

Also noted a previously "missed" tree on Ashbrook Road a short distance from the railway line on the west side of the road (SD958045) with signs of leaf activity. Behind the post office on Oldham Road and close to the adjacent car park at the junction with Ashbrook Road are 3no previously "missed" trees (SD958045). Again showing signs of leaf activity. No sightings on those trees.

Station Road, Grotton
2.14 – 2.20pm
Clouds starting to build. No sightings on the 2no trees.

The sky became overcast and sometimes dull. Little chance of *w-album* flight. A few brighter intervals but no further sunshine so I spent the rest of the afternoon photographing a few of the elm trees.
At Royal George on the tree behind the tennis courts, immediately after photographing the tree a single *w-album* took flight at canopy level in a spell of brightness in the gloom (3.30). SD983038
On my way home at 4.00pm, I noticed elm trees on Huddersfield Road at the junction with Cooper Street:
1 tree in garden of no.27 Oldham Road, east of Cooper Street. SD962045
1 tree on verge of Oldham Road close by. SD962045
5 trees in garden on west side of junction on Oldham Road/Cooper Street. These trees are very close together and, therefore, form a closed canopy which takes on the appearance of one large elm tree. SD961045. Still cloudy – a revisit required in better flying conditions.

Air temperature now 23 deg. C.

Thursday 12th July, 2018

Air temperature at start 19 deg. C. Overcast but bright.

Greenacres Cemetery
1.40 – 1.55pm and 3.58 – 4.30pm
2no trees – large tree on boundary with Greenacres Road. Showing signs of leaf activity. A magnificent elm! Other tree on west boundary close to larger tree. This tree overhangs the side passageway and garden. Not suitable for flight on first visit. Later visit in sunny spells. 1no on tree to west boundary flying at canopy level (4.20) then viewed settled on leaf. Then two spiralling above canopy (4.24) and again (4.26).1no flying at canopy level on large tree (4.20). SD945053

Constantine Road, Greenacres
2.05 – 2.20pm and 3.30 – 3.40pm
3no trees close together at the back of the car park. First visit in overcast conditions with hazy sun. Return visit in bright sunshine. No sightings. SD950051

Cooper Street, Springhead
2.46 – 3.05pm
Looked at the group of trees at the junction with Oldham Road. Weather again not ideal for flight. Unsurprisingly, no sightings.

Disused railway line, Springhead
3.10 – 3.30pm
Immediately on arrival, 1no flying at canopy level on the tree in the rear garden of no.3 Ashbrook Road. SD959044
Looked at other trees close by on Ashbrook Road and at the Post Office – no sightings.

Park Road
4.42 – 4.52pm
Revisit to this large tree at the roadside – in bright sunshine. 2no spiralling sideways from tree for some 20/30 metres before breaking up (4.45). 1no flying at canopy level soon afterwards (4.50). SD934042

Air temperature now 23 deg. C.

Saturday 14th July, 2018

Air temperature at start 20 deg. C. Cool feel to light breeze.

Cooper Street, Springhead
11.03 – 11.27am
Another visit to the group of trees at this location. Nothing flying above canopy but 1no in good condition observed at low level shuffling on a leaf in dappled sunlight in

the bank of 5no trees – which effectively should be classed as one tree (11.25). SD961045

Station Road, Grotton
11.31 – 11.45am
No sightings on the 2no trees.

Ashbrook Road, Springhead
11.50am – 12.15pm
This location includes the confirmed trees on the disused railway line etc. but I am interested in the 3no trees to the side/rear of the closed Post Office. The single tree to the rear is the one with leaf activity, but again, disappointingly, no sightings.

Constantine Road, Greenacres
12.34 – 12.45pm
Another visit – this time in bright sunshine. No sightings.

Air temperature now 23 deg. C.

Jubilee
2.25 – 2.45pm
Revisit to look at the 2no trees opposite the closed Jubilee pub on Milnrow Road and the single tree recently seen in the Colliery. No sightings.

Rochdale Road, Shaw
2.57 – 4.00pm
Extended revisit to the trees noticed on 11th July. Extended because of a "new" tree seen in the garden to the rear of the car park of the Black Horse pub on the corner of New Barn Street. This tree showed signs of leaf activity but no butterfly activity. On the tree at the end of New Barn Street, observed *w-album* walking along a branch for about 15 cm before taking flight into the leaf cover (3.35). In the same area, a single butterfly took flight above the canopy a little later (3.41). Probably the same butterfly. SD933092

Central reservation of A62, Oldham Town Centre
4.25 – 4.32pm
Only noticed this tree in the last few days because of road works meaning a speed restriction. Normally the traffic zooms along. The central reservation is tree-lined and as I was cruising at 20 mph (no traffic behind me – 30 mph max) I noticed the tree. It is opposite Hobson Street. This is an isolated tree. The nearest trees are some distance away in Werneth.
Looked more in hope than expectation but I was surprised that, as soon as I arrived, a butterfly was flying just above the canopy (4.26). It was active too as it made several short flights in the time I was there.

Werneth Hall Road
4.50 – 4.55pm
Last visited on 28th June. Although there are plenty of occupied trees close by (Selden Street being the nearest), this tree does not appear to support the butterfly. Short visit.

Air temperature now 26 deg. C.

Today effectively ends the intensive searching for trees and looking skywards. Satisfied that most areas covered have been confirmed as supporting *w-album*. Not every tree, obviously, but a tree in a group/area which confirms a colony – the extent of the colonies can be determined in future years. Also where single trees have indications of supporting the butterfly, but its presence has not been confirmed in 2018, these can be checked in future years. I will try to revisit these trees before the end of the season (I suspect the season will be over in 10 days' time) if time allows.

Sunday 15th July, 2018

Chamber Road, Werneth
10.20 – 10.30am
In early morning I decided to take photographs of the local elm trees in Werneth. On my way home after 10.00am, I noticed an elm tree on the boundary of the Polish Club on Chamber Road. There are actually 3no elm trees on the boundary, 2no opposite no.569 and the other opposite no.579, some 20m apart.
Immediately on looking at the main tree opposite no.569, I observed a butterfly above the canopy before settling on a leaf of the adjacent ash tree (10.20). It took flight again (10.24). SD913032

Frederick Street, corner with Wellington Road
6.00 – 6.15pm
A brief walk around some of the local trees adjacent to Werneth Park. 1no flying just above the canopy at this location (6.10).

Air temperature 26 deg. C.

Monday 16th July, 2018

Chamber Road, Werneth
4.20 – 4.50pm
Wandered down to the Polish Club to check the trees first seen yesterday. On looking through the railing towards the back of the club, noticed a new line of elm trees with 2no in aerial dispute above the canopy (4.26). A new small housing development backs on to the club. There are 8no trees in this area and all are best viewed from this development, Polonia Court. SD912032
1 no tree behind block of flats nos.9, 10, 11, 12
1no tree to the side of nos.1 and 2

4no trees in a bank with closed canopy behind no.18 (effectively one tree)
1no tree rear of no.572 Chamber Road
1no tree side of no.558 Chamber Road.
Aborted visit because thundery clouds were building as forecast.

Tuesday 17th July, 2018

Rochdale Road, Denshaw
11.15am
Noticed an isolated exposed elm on the verge close to Clough Manor, Cherry Clough. Stopped briefly for a quick inspection as the weather was cloudy. Little sign of leaf activity. No sighting. SD968111

The weather stayed cloudy, sometimes dull, all day with just a few sunny intervals. Air temperature 19 deg. C. Decided in the afternoon to look for previously unrecorded elms in **Chadderton** and **Middleton**.

3no within a short distance of each other near Chadderton Cemetery;
1no next to entrance to cemetery on Middleton Road. SD903055
1no in car park of St. Herbert's Church adjoining the cemetery
1no on Middleton Road on the Oldham side of the junction with Broadway – at the pedestrian crossing to Krokus Square. Evidence of leaf activity. SD904054.
During a 15 minutes sunny spell (4.00 – 4.15pm), I looked at this tree. No sighting.
1no on Middleton Road opposite no.795. Evidence of leaf activity. SD900055
1no Chadderton Park Road opposite no.14. SD897057

Wednesday 18th July, 2018

Middleton Road, Chadderton
10.00 – 10.40am
Revisit to the 4no trees first noticed yesterday. No sighting.

Chamber Road, Werneth
10.55 – 11.20am
Called in at Polonia Court off Chamber Road – 8no trees and including the 3no in the car park of the Polish Club, 11no in total. No sighting.

The Hollies, Werneth Park
11.25 – 11.35am
A final morning call to check on a reliable tree where I first recorded *w-album* in 2014. No sighting.

The skies were generally overcast with hazy sunshine throughout. Fleeting stronger sunny spells. Air temperature only 19/20 deg. C.
The flight season is certainly past its peak now. The butterfly will start to wander and should be more visible at ground level rather than observed flying at canopy level.

Thursday 19th July, 2018

Middleton Road, Chadderton
9.21 – 10.39am
Further visit in bright warm sunshine – air temperature 18 deg. C. at start. Conditions ideal for flight. Alternating viewing between the four trees without success. Probably a few days too late in finding these trees – flight season could have now ended.

Sunday 22nd July, 2018

Werneth Park & environs
5.25 – 6.15pm
Late afternoon the sun broke through after an overcast day. Humid and sunny at time of visit to look at 6no trees in and around Werneth Park.
1no *w-album* flying above the canopy then being observed on a leaf at the very top of the tree in bright sunshine before taking flight again away out of sight. Tree at junction of Frederick Street and Wellington Road (6.02).

Monday 23rd July, 2018

Copster Park
10.55 – 11.40am
A warm, humid morning – air temperature 24 deg. C. Turning increasingly cloudy but still bright with sunny spells. Just seeing if anything flying now it is the end of the season. Nothing on the favoured tree behind Park Caff but 1no flying just above the canopy on the middle tree of three on the west boundary (11.19).

Wednesday 25th July 2018

Werneth District
Visited at various points of the day several known colonies – morning, mid and late afternoon. weather mainly sunny with air temperatures ranging from 18 deg. C. in the morning to 26 deg. C. in late afternoon. No sightings. I also looked at ragwort and thistles as well as low down on the trees for straying butterflies. Appears to be the end of the flight season.

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