

BURNET MOTHS - family ZYGAENIDAE

As the day-flying Burnet moths are a very conspicuous feature of Manchester's insect fauna and are regularly seen during butterfly-recording walks, often in the same habitats as several butterfly species, I include accounts here of the two species recorded in the area. They are not however included in any of the statistics in this work.

NARROW-BORDERED FIVE-SPOT BURNET, *Zygaena lonicerae* (Scheven, 1777)

Habitats. This moth is likely to occur in any rough grassland, waste land or regenerating site where there is a good growth of its leguminous hostplants and nectar flowers, especially thistles *Cirsium* spp. It often co-exists with the Large and Small Skippers *Ochlodes venata* and *Thymelicus sylvestris* and the Meadow Brown *Maniola jurtina*.

Hostplants. Legumes, particularly meadow vetchling *Lathyrus pratensis*, clovers *Trifolium pratense* and *T. repens*; in some sites it appears to use tufted vetch *Vicia cracca*.

Distribution (fig.169). The moth is found in suitable sites throughout most of the mapped area, including close to the city centre, but excluding the hilly ground in the north and east. It regularly abounds in myriads when its habitats are at their most suitable. Where habitat succession is unchecked, it can be shaded out. This happened on the south-west facing slope of the motorway embankment to the north of Crossford sports field, Sale (SJ7993), where it occurred in vast numbers in the mid-1980s but completely died out as the adjacent woodland matured and scrub on the bank reduced the extent of available habitat. It is however very quick to colonise "new" habitats and its range appears to have extended.

Behaviour. The slow, buzzing flight and bright colouration make the Burnets very easy to see even in dull weather. They regularly take nectar from flowers, often several of them on the same plant, or rest fully exposed on low-growing vegetation.

SIX-SPOT BURNET, *Zygaena filipendulae* (Linnaeus, 1758)

Habitats. Rough grassy sites, waste places, with some regenerating scrub. In each of the few sites where it has been found, *Z. lonicerae* also occurs.

Hostplants. Legumes, particularly bird's-foot trefoil *Lotus corniculatus* (Horwich), possibly tufted vetch *Vicia cracca* (Ardwick) and clovers *Trifolium* spp.

Broods. One annual brood, in July. Normally this species emerges slightly later than *Z. lonicerae*; there have not been sufficient observations within the Manchester area to confirm whether or not this is true here.

Distribution (fig.170). Until 1994 I was convinced that the only Burnet in the Manchester area was *Z. lonicerae*. That year, however, I came across a small colony of *Z. filipendulae* co-occurring with *Z. lonicerae* at a site adjacent to Red Moss, Horwich (SD6310), where the former ballast in an abandoned railway yard had attracted limestone flora including bird's-foot trefoil. The site also supported a strong colony of the Common Blue *Polyommatus icarus*. Shortly afterwards, *Z. filipendulae* was found at the Shell pond, Carrington (SJ7492); then the following year on waste land by Temperance Street, Ardwick (SJ8597), less than a mile south-east of Manchester city centre, again along with *Z. lonicerae* but in much lower numbers than that species. Further sites were found in 1996 including near Flixton (SJ7393) at the west end of the Mersey Valley, where again there has been an introduction of limestone flora, through capping a former fly-ash tip with subsoil from the Peak District. It is possible that the moth is

a recent colonist to the Manchester area; alternatively it may have been overlooked in the past or passed over as *Z. lonicerae*.

Behaviour. Similar to *Z. lonicerae* and the two species have been found nectaring together on the same plant of tufted vetch at the Ardwick site.

Table 1. RECORDS OF BUTTERFLY SPECIES IN THE 7 X 5 KM ZONE IN 1994, 1995, 1996 AND 1997.

NUMBERS OF 100 M SQUARES IN WHICH EACH SPECIES WAS RECORDED.

SPECIES	1994	1995	1996	1997
<i>Thymelicus sylvestris</i>	41	62	79	24
<i>Ochlodes venata</i>	85	102	14	17
<i>Gonepteryx rhamni</i>	8	1	7	9
<i>Pieris brassicae</i>	73	84	49	123
<i>Pieris rapae</i>	169	270	230	241
<i>Pieris napi</i>	61	112	100	108
<i>Anthocharis cardamines</i>	57	69	111	69
<i>Lycaena phlaeas</i>	31	30	24	22
<i>Polyommatus icarus</i>	14	13	24	15
<i>Celastrina argiolus</i>	3	1	4	13
<i>Vanessa atalanta</i>	21	32	49	26
<i>Vanessa cardui</i>	4	3	142	3
<i>Aglais urticae</i>	37	173	209	305
<i>Inachis io</i>	44	45	140	179
<i>Polygonia c-album</i>	26	32	31	47
<i>Pararge aegeria</i>	22	67	91	92
<i>Lasiommata megera</i>	39	27	26	10
<i>Pyronia tithonus</i>	1	0	4	1
<i>Maniola jurtina</i>	193	203	141	49

Table 2. NECTAR SOURCES NOTED DURING 1996 AND 1997

PLANT	SPECIES	SPP/DAYS
Creeping Thistle <i>Cirsium arvense</i>	17	175
Buddleia <i>Buddleja davidii</i>	14	282
Ragwort <i>Senecio jacobaea</i>	14	98
Michaelmas Daisy <i>Aster novi-belgii</i>	14	64
Bramble <i>Rubus fruticosus</i> agg.	13	52
[+ Bramble (fruit)]	1	1]
Red Clover <i>Trifolium pratense</i>	10	31
Black Knapweed <i>Centaurea nigra</i> agg.	10	27
Dandelion <i>Taraxacum officinale</i> agg.	8	89
Garden Privet <i>Ligustrum ovalifolium</i>	8	18
Buttercup <i>Ranunculus acris/repens</i>	8	13
Hawkweed/Hawkbit/Catsear <i>Hieracium</i> sp. etc.	8	9
Sweet Rocket <i>Hesperis matronalis</i>	7	16
White Clover <i>Trifolium repens</i>	7	18
Tufted Vetch <i>Vicia cracca</i>	5	22
Ice-plant <i>Sedum spectabile</i>	5	17
wild Brassica <i>Brassica</i> sp.	5	15
Spear Thistle <i>Cirsium vulgare</i>	5	14
Oxford Ragwort <i>Senecio squalidus</i>	5	10
Himalayan Balsam <i>Impatiens glandulifera</i>	5	8
Fool's Parsley <i>Aethusa cynapium</i>	5	8
Lavender <i>Lavandula officinalis</i>	4	16
Cuckoo Flower <i>Cardamine pratensis</i>	4	10
Coltsfoot <i>Tussilago farfara</i>	4	6
Lucerne <i>Medicago sativa</i>	4	5
Ox-eye Daisy <i>Leucanthemum vulgare</i>	4	4
French Marigold <i>Tagetes patula</i>	3	7
Garlic Mustard <i>Alliaria petiolata</i>	3	6
Hedge Bindweed <i>Calystegia sepium</i>	3	6
Great Willowherb <i>Epilobium hirsutum</i>	3	6
Hogweed <i>Heracleum sphondylium</i>	3	4
(unidentified yellow Crucifers)	3	4
Rosebay Willowherb <i>Epilobium angustifolium</i>	3	4
Daisy <i>Bellis perennis</i>	3	4
Red Valerian <i>Centranthus ruber</i>	3	4
Yarrow <i>Achillea millefolium</i>	3	3
Heather <i>Calluna vulgaris</i>	3	3
Comfrey <i>Symphytum officinale</i>	3	3
Hawthorn <i>Crataegus monogyna</i>	3	3
Honesty <i>Lunaria annua</i>	3	3
Bluebell <i>Endymion non-scriptus</i>	3	3
Black Horehound <i>Ballota nigra</i> (?)	3	3
Bird's-Foot Trefoil <i>Lotus corniculatus</i>	2	5
Black Medick <i>Medicago lupulina</i>	2	4
Meadow Vetchling <i>Lathyrus pratensis</i>	2	4
Sallow <i>Salix caprea/cinerea</i>	2	3
Common Vetch <i>Vicia sativa</i> agg.	2	2
unidentified garden flower (tall purple spikes)	2	2
Common Sowthistle <i>Sonchus oleraceus</i>	2	2
Teasel <i>Dipsacus fullonum</i>	2	2
Burdock <i>Arctium minus</i> agg.	2	2
Catmint <i>Nepeta cataria</i>	2	2
Hebe <i>Hebe</i> sp.	2	2
Marguerite	2	2

Petunia <i>Petunia</i> sp.	2	2
Hydrangea <i>Hydrangea</i> sp.	2	2
Wetted Thistle <i>Carduus acanthoides</i>	2	2
Corn Chamomile <i>Anthemis arvensis</i>	1	4
Greater Stitchwort <i>Stellaria holostea</i>	1	3
Guelder Rose <i>Viburnum opulus</i>	1	2
Bush Vetch <i>Vicia sepium</i>	1	2
(unidentified white Crucifer)	1	2
Everlasting-flower <i>Helichrysum</i> sp.	1	2
Lesser Celandine <i>Ranunculus ficaria</i>	1	1
Green Alkanet <i>Pentaglottis sempervirens</i>	1	1
Broad-leaved Willowherb <i>Epilobium montanum</i>	1	1
Alsike Clover <i>Trifolium hybridum</i>	1	1
Clover (unspecified) <i>Trifolium</i> sp.	1	1
Herb Robert <i>Geranium robertianum</i>	1	1
Common Chickweed <i>Stellaria media</i>	1	1
Wild Radish <i>Raphanus raphanistrum</i>	1	1
Scentless Mayweed <i>Matricaria perforata</i>	1	1
Greater Knapweed <i>Centaurea scabiosa</i>	1	1
Hedge Mustard <i>Sisymbrium officinale</i>	1	1
Water Mint <i>Mentha aquatica</i>	1	1
Butterbur <i>Petasitis hybridus</i>	1	1
Common Spotted Orchid <i>Dactylorhiza fuchsii</i>	1	1
Common Hemp-Nettle <i>Galeopsis tetrahit</i> agg.	1	1
Ivy <i>Hedera helix</i>	1	1
Horse-radish <i>Armoracia rusticana</i>	1	1
Red Campion <i>Silene dioica</i>	1	1
Groundsel <i>Senecio vulgaris</i>	1	1
Forget-me-not <i>Myosotis</i> sp.	1	1
Shepherd's Purse <i>Capsella bursa-pastoris</i>	1	1
Fleabane <i>Pulicaria dysenterica</i>	1	1
Canadian Golden-Rod <i>Solidago canadensis</i>	1	1
Lilac <i>Syringa vulgaris</i>	1	1
Aubretia <i>Aubrieta columnae</i>	1	1
Wallflower <i>Cheiranthus cheiri</i>	1	1
Orange Ball Tree <i>Buddleja globosa</i>	1	1
Phlox <i>Phlox drummondii</i>	1	1
Pansy <i>Viola tricolor</i>	1	1
Marigold <i>Calendula officinalis</i>	1	1
Sweet Pea <i>Lathyrus odoratus</i>	1	1
garden Eupatorium <i>Eupatorium</i> sp.	1	1
(cultivated Crucifer)	1	1
Lobelia <i>Lobelia</i> sp. (?)	1	1
Geranium <i>Pelargonium</i> sp.	1	1
Rose <i>Rosa</i> sp.	1	1
Potato <i>Solanum tuberosum</i>	1	1
garden Cranesbill <i>Geranium</i> sp.	1	1
garden Antirrhinum <i>Antirrhinum majus</i>	1	1
garden Spiraea <i>Spiraea</i> sp.	1	1
African Marigold <i>Tagetes</i> sp.	1	1
Everlasting Pea <i>Lathyrus latifolius</i>	1	1
Dahlia <i>Dahlia</i> sp.	1	1
(blue Lantana-like flower)	1	1
(unidentified yellow garden Composite)	1	1
(unidentified white-flowered shrub)	1	1
(other unidentified garden flowers)	2	3

Table 3. USAGE OF NECTAR SOURCES BY EACH BUTTERFLY SPECIES

(numbers in brackets are the number of days on which the species was observed to use the source).

SMALL SKIPPER *Thymelicus sylvestris*.

Creeping Thistle (20), Red Clover (13), Tufted Vetch (10), Ragwort (8), Spear Thistle (7), Black Knapweed (6) White Clover (3), Bird's-Foot Trefoil (3), Rosebay Willowherb (2), Black Medick (1), Bramble (1), Meadow Vetchling (1), Greater Knapweed (1), Buddleia (1), Hawkweed etc. (1), Yarrow (1).
Total 16.

LARGE SKIPPER *Ochlodes venata*.

Creeping Thistle (13), Tufted Vetch (4), Red Clover (4), Black Knapweed (1).
Total 4.

BRIMSTONE *Gonepteryx rhamni*.

Buddleia (2), Spear Thistle (1), Creeping Thistle (1), Michaelmas Daisy (1), Herb Robert (1),
Total 5.

LARGE WHITE *Pieris brassicae*.

Buddleia (41), Dandelion (4), Creeping Thistle (4), Sweet Rocket (2), Red Clover (2), Rosebay Willowherb (2), wild Brassica (2), Wall Rocket? (1), Bramble (1), Spear Thistle (1), Black Knapweed (1), Michaelmas Daisy (1), Hogweed (1), Honesty (1), Bluebell (1), Fool's Parsley (1), Ragwort (1), Himalayan Balsam (1), Black Horehound? (1), Great Willowherb (1), Hedge Bindweed (1), Ivy (1), Lavender (1), Ice-plant (1), Geranium (1), Catmint (1), Garden Privet (1), Lilac (1), Petunia (1).
Total 29.

SMALL WHITE *Pieris rapae*.

Buddleia (26), Creeping Thistle (25), Bramble (19), Dandelion (17), Michaelmas Daisy (11), Lavender (9), Ragwort (8), wild Brassica (5), Rosebay Willowherb (4), Hawkweed etc.(4), Oxford Ragwort (3), Hedge Bindweed (3), Common Sowthistle (3), Himalayan Balsam (3), Green Alkanet (2), Spear Thistle (2), Black Knapweed (2), Hedge Mustard (2), Buttercup (2), Red Clover (2), Sweet Rocket (2), Corn Chamomile (2), Great Willowherb (2), Daisy (2), Hebe (2), unidentified yellow Crucifer (2), unidentified white Crucifer (2), unidentified garden flower (tall purple spikes) (2), cultivated Crucifer (1), Wild Radish (1), Cuckoo Flower (1), Garlic Mustard (1), Coltsfoot (1), Hawthorn (1), Common Chickweed (1), Horseradish (1), Red Campion (1), Groundsel (1), White Clover (1), Lucerne (1), Burdock (1), Black Horehound? (1), Comfrey (1), Red Valerian (1), Garden Privet (1), Rose (1), Potato (1), Pansy (1), Marigold (1), Sweet Pea (1), Marguerite (1), Lobelia? (1), French Marigold (1), garden Cranesbill (1), Ice-plant (1), Catmint (1), Antirrhinum (1), unidentified garden flowers (3), unidentified white-flowering shrub (1).
Total 59.

GREEN-VEINED WHITE *Pieris napi*.

Creeping Thistle (16), Dandelion (13), Bramble (11), Ragwort (8), Sweet Rocket (5), wild Brassica (5), Michaelmas Daisy (4), Buttercup (4), Cuckoo Flower (3), Greater Stitchwort (3), White Clover (3), Rosebay Willowherb (3), Fool's Parsley (2), Black Knapweed (2), Hedge Bindweed (2), Himalayan Balsam (2), Hawkweed etc. (2), Comfrey (1), Buddleia (1), Forget-me-not (1), Bluebell (1), Honesty (1), Hawthorn (1), Shepherd's Purse (1), Watted Thistle (1), Common Spotted Orchid (1), Lucerne (1), Black Horehound? (1), Common Hemp-Nettle (1), Garden Privet (1), Lavender (1), French Marigold (1), Hydrangea (1).
Total 33.

ORANGE-TIP *Anthocharis cardamines*.

Cuckoo Flower (5), Garlic Mustard (4), Sweet Rocket (4), Bush Vetch (2), Dandelion (2), Fool's Parsley (1), Common Vetch (1), Rosebay Willowherb (1), Bluebell (1), Honesty (1),

wild Brassica (1), unidentified yellow Crucifer (1), Aubretia (1).
Total 13.

SMALL COPPER *Lycaena phlaeas*.

Ragwort (16), Creeping Thistle (4), Hawkweed etc. (4), Dandelion (2), Michaelmas Daisy (2), Oxford Ragwort (1), Daisy (1), Ox-eye Daisy (1), Yarrow (1), Corn Chamomile (1), Scentless Mayweed (1), Water Mint (1), Red Clover (1), Buttercup (1).
Total 14.

COMMON BLUE *Polyommatus icarus*.

Ragwort (4), White Clover (4), Black Medick (3), Creeping Thistle (3), Bird's-Foot Trefoil (3), Tufted Vetch (2), Michaelmas Daisy (2), Red Clover (1), Alsike Clover (1), Buttercup (1), Yarrow (1), Bramble (1), Hawkweed etc.(1), Canadian Golden Rod (1), Rosebay Willowherb (1), Fleabane (1).
Total 16.

HOLLY BLUE *Celastrina argiolus*.

Buddleia (1), Michaelmas Daisy (1), Garden Privet (1), garden Eupatorium? (1).
Total 4.

RED ADMIRAL *Vanessa atalanta*.

Buddleia (51), Michaelmas Daisy (5), Creeping Thistle (3), Ragwort (3), Garden Privet (2), Bramble (1), Himalayan Balsam (1).
Total 7.

PAINTED LADY *Vanessa cardui*.

Buddleia (31), Creeping Thistle (13), Michaelmas Daisy (5), Black Knapweed (4), Ragwort (3), Oxford Ragwort (3), Red Clover (3), Bramble (3), Guelder Rose (2), Buttercup (2), White Clover (2), Hogweed (2), Garden Privet (2), Dandelion (1), Daisy (1), Sweet Rocket (1), Ox-eye Daisy (1), Comfrey (1), Common Vetch (1), Hawkweed etc.(1), Orange Ball Tree (1), Corn Chamomile (1), Heather (1), French Marigold (1), Ice-plant (1).
Total 25.

SMALL TORTOISESHELL *Aglais urticae*.

Buddleia (69), Creeping Thistle (33), Dandelion (30), Ragwort (23), Michaelmas Daisy (15), Ice-plant (11), Garden Privet (10), Hawkweed etc.(5), Black Knapweed (4), French Marigold (4), Coltsfoot (3), Lavender (3), Hogweed (2), Sallow (2), Bramble (2), Lucerne (2), Red Valerian (2), garden Everlasting Flower (2), Cuckoo Flower (1), Oxford Ragwort (1), Sweet Rocket (1), Red Clover (1), White Clover (1), Tufted Vetch (1), Butterbur (1), Heather (1), Phlox (1), wild Brassica (1), Fool's Parsley (1), Welled Thistle (1), Burdock (1), Common Sowthistle (1), garden Spiraea (1), Hydrangea (1), African Marigold (1), Everlasting Pea (1), Hebe (1), Dahlia (1), yellow garden Composite (1), unidentified garden flower (tall purple spikes) (1), blue Lantana-like flower (1), unidentified garden flower (1).
Total 42.

PEACOCK *Inachis io*.

Buddleia (30), Dandelion (15), Creeping Thistle (11), Ragwort (6), Michaelmas Daisy (3), Bramble (3), Red Clover (2), Lesser Celandine (1), Sweet Rocket (1), Sallow (1), Coltsfoot (1), Hawthorn (1), Buttercup (1), Fool's Parsley (1), Hawkweed etc.(1), Hogweed (1), Lucerne (1), Black Knapweed (1), Teasel (1), Red Valerian (1), Garden Privet (1), Petunia (1).
Total 22.

COMMA *Polygonia c-album*.

Buddleia (15), Michaelmas Daisy (8), Creeping Thistle (4), Ice-plant (3), Bramble (2), Bramble (fruit)(1), Ragwort (1), Cow Parsley (1), Coltsfoot (1).
Total 8.

SPECKLED WOOD *Pararge aegeria*.

Bramble (2), Ragwort (2), Buddleia (1), Creeping Thistle (1), Michaelmas Daisy (1), Himalayan Balsam (1).

Total 6.

WALL *Lasiommata megera*.

Oxford Ragwort (2), Buttercup (1), Hawkweed etc.(1), Ragwort (1), Heather (1), Buddleia (1), Creeping Thistle (1), Wallflower (1).

Total 8.

GATEKEEPER *Pyronia tithonus*.

Creeping Thistle (2), Ox-eye Daisy (1), Ragwort (1), Buddleia (1), Bramble (1).

Total 5.

MEADOW BROWN *Maniola jurtina*.

Creeping Thistle (20), Ragwort (14), Tufted Vetch (5), Black Knapweed (5), White Clover (4), Bramble (3), Red Clover (2), Clover (unspecified) (1), Hogweed (1), Hawkweed etc.(1), Spear Thistle (1), Meadow Vetchling (1), Michaelmas Daisy (1), Marguerite (1).

Total 14.

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ENVIRONMENTS - WHOLE AREA

Fig.1. GREATER MANCHESTER - ADMINISTRATIVE DISTRICTS

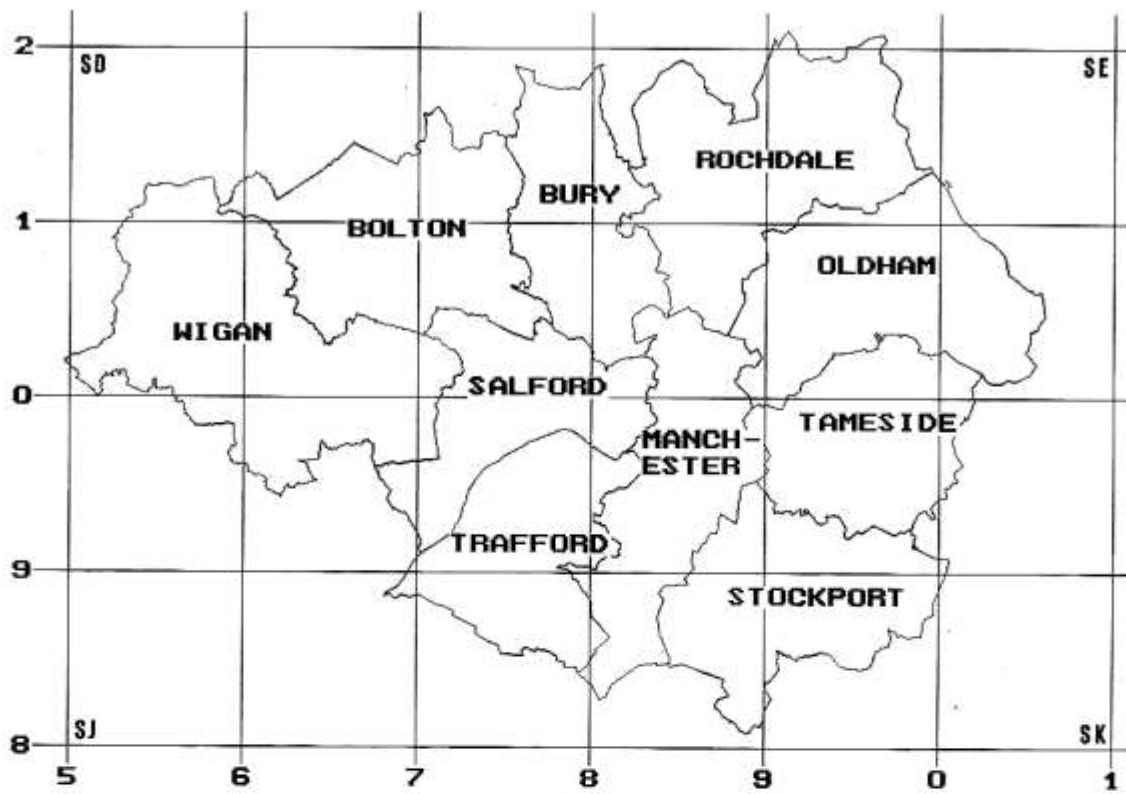
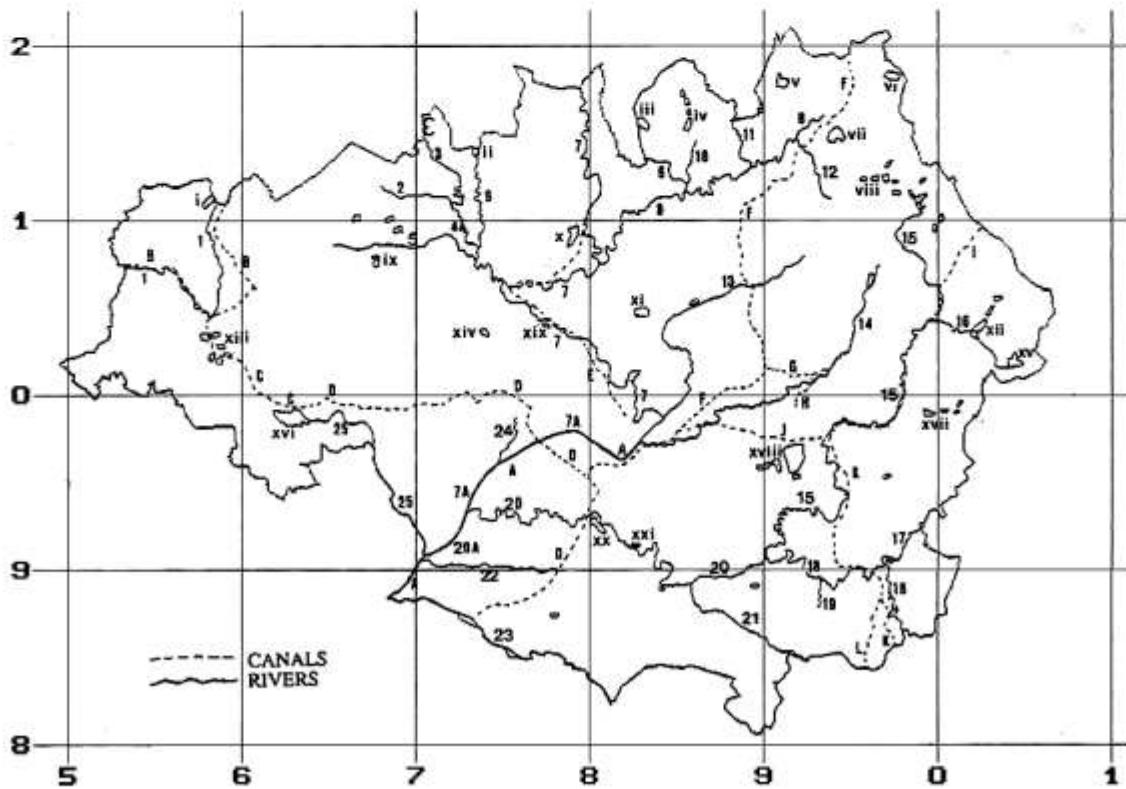


Fig.2. CANALS, RIVERS AND STANDING WATER



ENVIRONMENTS - WHOLE AREA

Fig.3. RAILWAYS AND MAIN ROADS

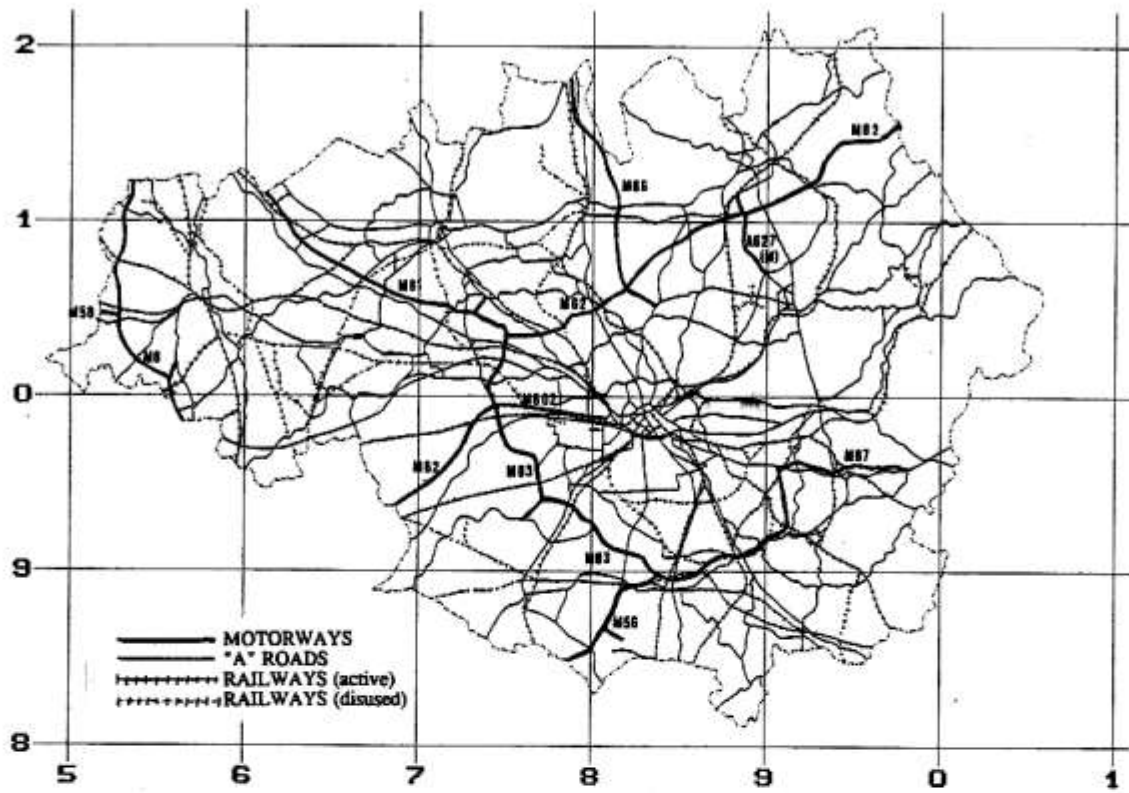
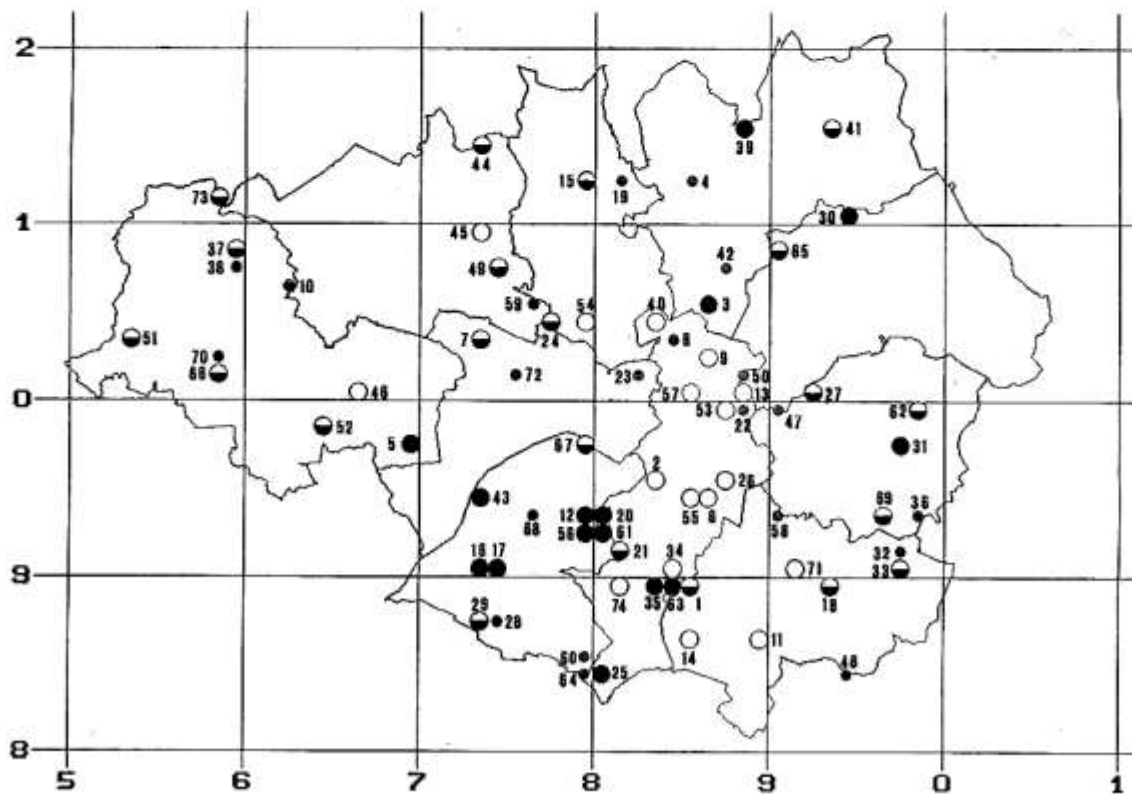


Fig.4. NATURE RESERVES, PARKS, OTHER NOTABLE WILDLIFE SITES



RIVERS

1. Douglas
2. Dean Brook/Astley Brook
3. Eagley Brook
4. Tonge
5. Croal
6. Bradshaw Brook
7. Irwell
- 7A. Manchester Ship Canal (canalisation of Irwell)
8. Roch
9. Cheesden Brook
10. Ashworth
11. Spodden
12. Beal
13. Irk
14. Medlock
15. Tame
16. Chew Brook
17. Etherow
18. Goyt
19. Poise Brook
20. Mersey
- 20A. Manchester Ship Canal (canalisation of Mersey + Irwell)
21. Lady Brook/Micker Brook
22. Timperley Brook/Sinderland Brook/Red Brook
23. Bollin
24. Salteye Brook
25. Pennington Brook/Glaze Brook

CANALS

- A. Manchester Ship Canal (canalisation of rivers Irwell + Mersey)
- B. Leeds & Liverpool Canal
- C. Leeds & Liverpool Canal (Leigh Branch)
- D. Bridgewater Canal
- E. Manchester, Bolton & Bury Canal
- F. Rochdale Canal
- G. Fairbottom Branch Canal
- H. Hollinwood Branch Canal
- I. Huddersfield Narrow Canal
- J. Manchester & Ashton-under-Lyne Canal
- K. Peak Forest Canal
- L. Macclesfield Canal

LAKES AND RESERVOIRS

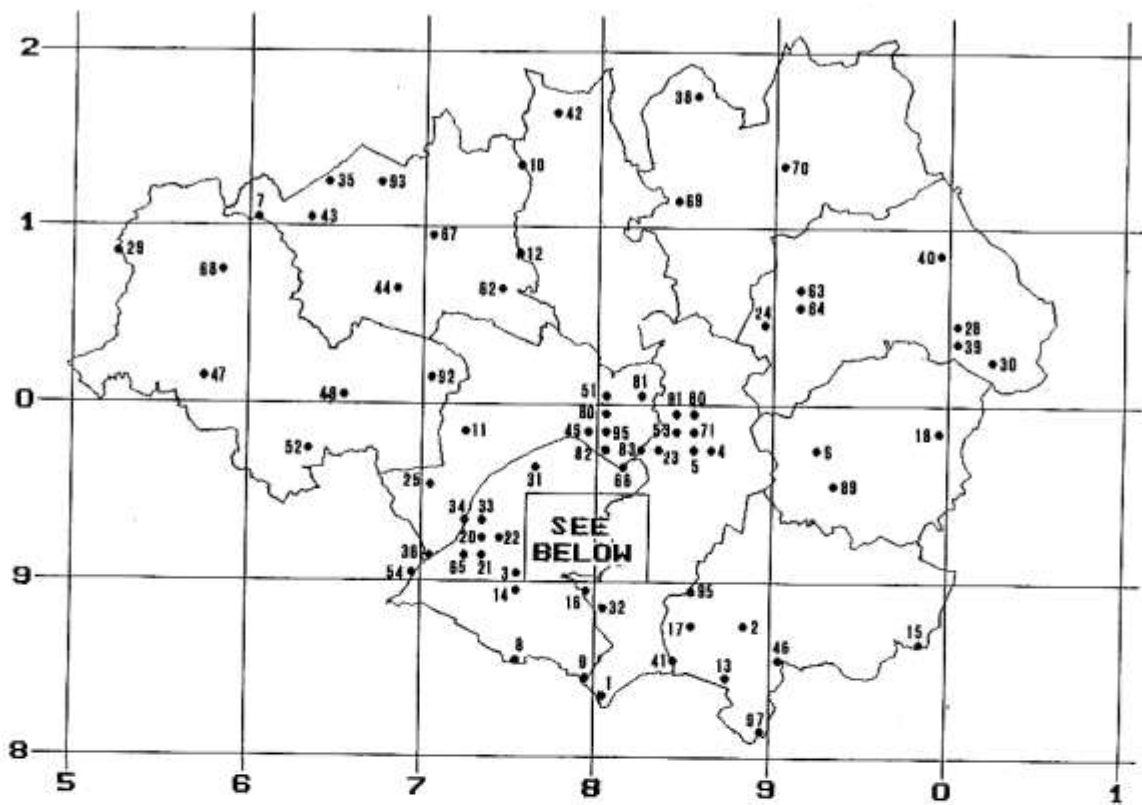
- i. Worthington Lakes
- ii. Jumbles Reservoir
- iii. Ashworth Moor Reservoir
- iv. Naden & Greenbooth Reservoirs
- v. Watergrove Reservoir
- vi. Blackstone Edge Reservoir
- vii. Hollingworth Lake
- viii. complex including Ogden, Piethorn, Rooden, Dowry and other Reservoirs
- ix. Rumworth Lodge Reservoir
- x. Manchester, Bolton & Bury reservoir
- xi. Heaton Park Reservoir
- xii. Dovestone Reservoir
- xiii. Wigan Flashes including Scotsman's Flash, Pearson's Flash
- xiv. Blackleach Reservoir
- xv. Chew Reservoir
- xvi. Pennington Flash
- xvii. Gorton & Audenshaw Reservoirs
- xix. Clifton Water Park
- xx. Sale Water Park
- xxi. Chorlton Water Park

DESIGNATED NATURE RESERVES (BLACK SYMBOLS), COUNTRY PARKS (BLACK/WHITE SYMBOLS), URBAN PARKS WITH WILDLIFE INTEREST (WHITE SYMBOLS) AND OTHER NOTABLE WILDLIFE SITES WITH PUBLIC ACCESS (WOODLANDS, WETLANDS) (SMALL GREY SYMBOLS) (with, where appropriate, species account, or introductory section, under which they are mentioned)

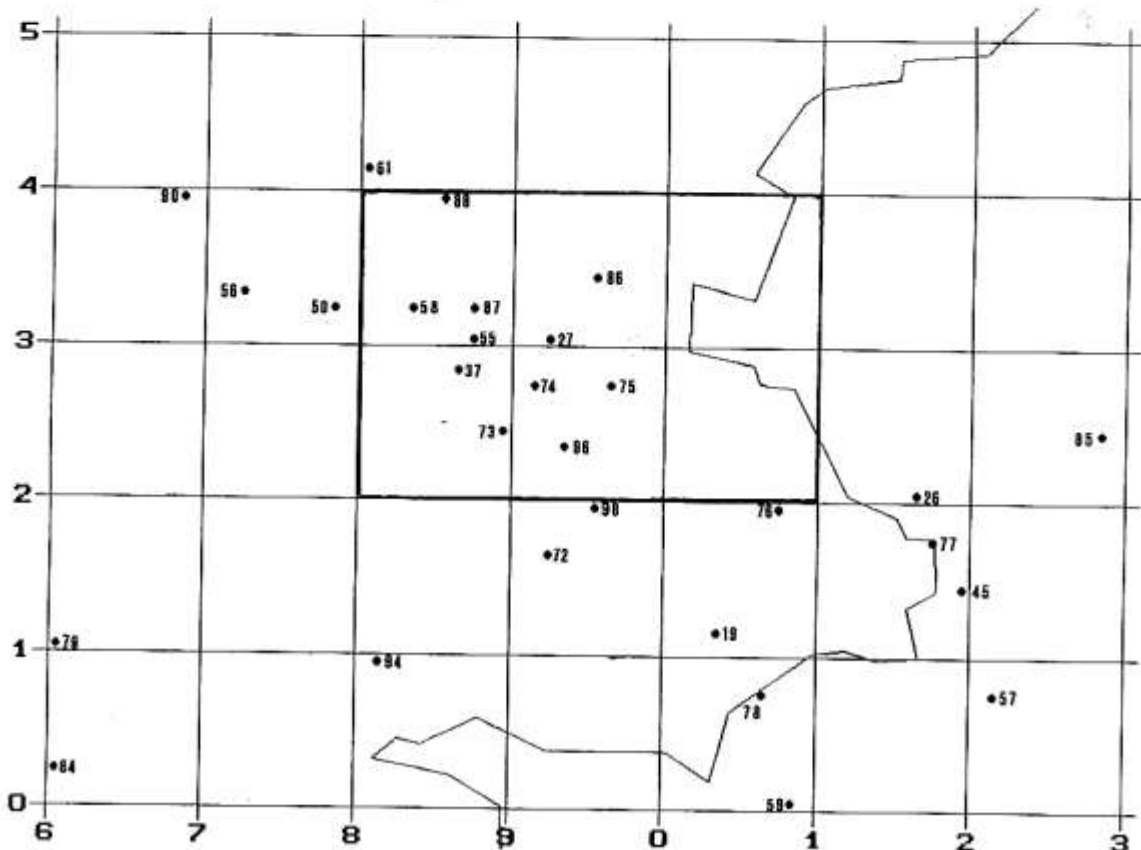
1. Abney Hall Park SJ8589
2. Alexandra Park SJ8395
3. Alkrington Woods SD8604/8605
(*A. aglaja*)
4. Ashworth Valley SD8512
5. Astley Moss SJ6997
6. Birchfields Park SJ8694 (species richness & distribution)
7. Blackleach Country Park SD7303
8. Blackley Forest SD8403
9. Boggart Hole Clough SD8602
10. Borsdane Wood SD6206
11. Bramhall Park SJ8986
12. Broad Ees Dole (Sale Water Park) SJ7993/8093 (distribution changes)
13. Brookdale Park SD8800/8900
14. Bruntwood Park SJ8586/8587
15. Burrs Country Park SD7912
16. Carrington Moss (Birchmoss Covert, Brookheys Covert, Hogswood Covert) SJ7490
17. Carrington Moss (Dark Lane) SJ7390
(*C. rubi*)
18. Chadkirk Country Park SJ9389/9489
(*S. w-album*, *V. cardui*, *M. jurtina*)
19. Chesham Woods, Bury SD8112
20. Chorlton Ees SJ8093 (distribution changes, *P. aegeria*)
21. Chorlton Water Park SJ8191/8291
22. Clayton Vale SJ8899 (*P. icarus*)
23. The Cliff/Kersal Vale SD8201
24. Clifton Country Park SD7704
25. Cotterill Clough SJ8083
26. Crowcroft Park SJ8795 (*P. c-album*)
27. Daisy Nook SD9200
28. Dunham New Park SJ7487/7587
29. Dunham Park SJ7387
30. Dunwood Park SD9410
31. East Wood SJ9797
32. Ernecroft Wood SJ9791
33. Etherow Country Park, Compstall SJ9690/9790 (*S. w-album*)
34. Fletcher Moss Park SJ8490
35. Gatley Carrs SJ8389
36. Great Wood/Hurst Clough SJ9893
37. Haigh Hall & Country Park SD5908
(*I. io*, *P. tithonus*)
38. Haigh Plantations SD5907
39. Healey Dell SD8815
40. Heaton Park SD8304
41. Hollingworth Lake Country Park SD9315
42. Hopwood Clough SD8707
43. Jack Lane, Flixton SJ7393
44. Jumbles Country Park SD7314
45. Leverhulme Park SD7309
46. Lilford Park SD6600 (*V. atalanta*)
47. Medlock Vale SJ9099
48. Middle Wood SJ9484
49. Moses Gate Country Park SD7406/7407
(*V. atalanta*, *A. urticae*)
50. Moston Fairway SD8801
51. Orrell Water Park SD5303
52. Pennington Flash Country Park SJ6398/6399/6498/6499 (*P. icarus*)
53. Philips Park, Bradford SJ8799
54. Philips Park, Prestwich SD7904
55. Platt Fields Park SJ8594
56. Priors, Sale SJ7992/8092 (distribution changes, *P. brassicae*, *A. cardamines*, *A. urticae*, *P. aegeria*)
57. Queen's Park, Harpurhey SD8500
58. Reddish Vale (Tame Valley) SJ9093
(*P. napi*)
59. Ringley Wood SD7605 (*V. atalanta*, *P. c-album*)
60. Rossmill (Bollin Valley) SJ7884
(*A. cardamines*)
61. Sale Water Park SJ8092 (distribution changes, *G. rhamni*, *P. aegeria*)
62. Stalybridge Country Park (Walkerwood, Brushes etc.) SD9799/9899
63. Stenner Woods SJ8490
64. Sunbank Wood SJ7984
65. Tandle Hill Country Park SD9008
66. Three Sisters Country Park SD5801
67. Trafford Ecology Park SJ7997
68. Urmston Meadows SJ7693/7694
69. Werneth Low Country Park SJ9693
70. Wigan Flashes SD5802/5803
71. Woodbank Park SJ9190
72. Worsley Woods SD7501 (*P. aegeria*)
73. Worthington Lakes SD5810/5811
74. Wythenshawe Park SJ8189

WHOLE AREA

Fig.5. OTHER SITES MENTIONED IN THE TEXT



7 km x 5 km ZONE



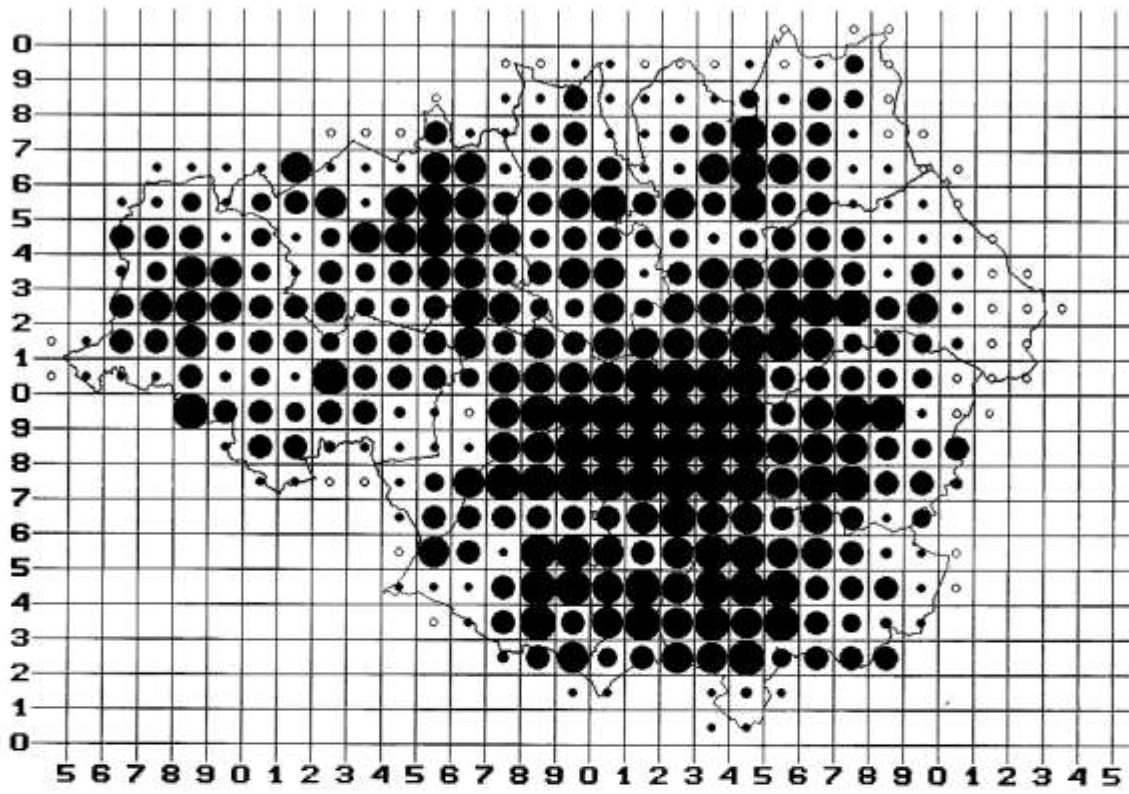
OTHER SITES MENTIONED IN TEXT (with species account, or introductory section, under which they are mentioned). Private gardens are not included.

1. A.538 road cutting, near airport SJ8083 (*T.sylvestris*, *O.venata*, *P.tithonus*, *M.jurtina*, *C.pamphilus*)
2. Adswood tip SJ8887 (*C.croceus*, *C.pamphilus*)
3. Altrincham sewage farm (railway near) SJ7590 (*Q.querqus*)
4. Ardwick, disused railway yard SJ8697 (*T.sylvestris*, *M.jurtina*)
5. Ardwick, Temperance Street SJ8597 (*Z.filipendulae*)
6. Ashton-under-Lyne sewage farm SJ9297 (*P.tithonus*)
7. Blackrod SD6010+ (*I.io*)
8. Bollin Valley, Bowdon SJ7585 (*A.cardamines*)
9. Bollin Valley, woods near Rossmill/Pigley Stairs) SJ7884/7983/7984 (*A.cardamines*, *P.aegeria*)
10. Bolton, hills east of SJ7513 (*A.urticae*)
11. Botany Bay Wood SJ7298/7398/7399 (distribution changes, *C.rubi*, *I.io*)
12. Bradley Fold SD7508 (*A.urticae*, *I.io*)
13. Bramhall, former military site SJ8784 (*I.io*)
14. Broadheath (Sinderland Road & Dairyhouse Farm) SJ7589/7590 (*P.rapae*, *V.atalanta*, *V.cardui*)
15. Brookbottom SJ9886 (*C.rubi*)
16. Brooklands estate, wood SJ7989 (distribution changes; *P.aegeria*)
17. Bruntwood hay meadow (destroyed) SJ8587 (conservation)
18. Brushes, Cock Wood SJ9998 (*C.rubi*)
19. Budworth Road sports field, Sale SJ8091 (*A.urticae*)
20. Carrington, horse field SJ7392 (*P.tithonus*)
21. Carrington Moss, disused railway & nearby SJ7391 (*L.megera*, *P.tithonus*)
22. Carrington, Shell pond SJ7492 (*Z.filipendulae*)
23. Castlefield SJ8397 (*P.licarus*)
24. Chadderton sewage farm SD8904 (*P.napi*)
25. Chat Moss SJ7095 (distribution changes)
26. Chorlton tip SJ8192 (*A.aglaja*)
27. Crossford sports field, Sale SJ7993 (conservation; *A.cardamines*, *A.urticae*, *I.io*, *Z.lonicerae*)
28. Dick Clough, Tunstead SE0004 (*C.rubi*)
29. Douglas Valley, Gathurst SD5208 (*A.cardamines*)
30. Dovestone Reservoir, field east of SE0202 (*I.io*)
31. Dumplington (largely destroyed) SJ7696/7796 (conservation)
32. Fairywell Brook SJ8088 (*P.aegeria*)
33. Flixton fly-ash tip SJ7393 (*P.licarus*, *A.aglaja*, *P.tithonus*, *Z.filipendulae*)
34. Flixton, wood nr. Manchester ship canal SJ7293 (*P.tithonus*)
35. Foxholes SD6412 (*C.rubi*)
36. Glaze/Manchester ship canal confluence, wood near SJ7091 (*A.cardamines*)
37. Glebelands Road sports field, Sale (destroyed) SJ7892 (conservation)
38. Greenbooth reservoir SD8517 (*C.pamphilus*)
39. Greenfield, 1937 social club SE0003 (*M.jurtina*)
40. Harrop Edge SD9908 (*S.w-album*)
41. Heald Green, railway cutting SJ8485 (*T.sylvestris*, *C.croceus*, *P.tithonus*, *C.pamphilus*)
42. Holcombe Moor SD7716 (*O.venata*, *C.rubi*, *M.jurtina*)
43. Horwich, former railway sidings nr. Red Moss SD6310 (*P.licarus*, *Z.filipendulae*)
44. Hunger Hill SD6806 (*T.sylvestris*)
45. Kenworthy SJ8191/8291 (*V.atalanta*)
46. Ladybrook Valley SJ9085 (*O.venata*)
47. Land Gate, former tip SD5701 (*P.licarus*)
48. Leigh (waste ground) SD6500 (*V.atalanta*)
49. Little Bolton, mineral railway SJ7998 (*V.atalanta*)
50. Little Ees Lane, Ashton-on-Mersey SJ7793 (*A.urticae*)
51. Littleton Road playing fields, Salford SD8000/8001/8100 (*A.urticae*)

52. Lowton Common SJ6397 (*A.urticae*)
53. Manchester city centre SJ8498 (species richness & distribution, *V.atalanta*)
54. Manchester Ship Canal, Warburton SJ6990 (*P.napi*)
55. Mersey bank, Stretford SJ7892/7893 (conservation; *O.venata*, *C.croceus*, *A.cardamines*, *L.phlaeas*, *P. icarus*, *V.atalanta*, *L.megea*, *P.tithonus*, *M.jurtina*)
56. Mersey valley, Ashton-on-Mersey golf course SJ7793 (*A.cardamines*)
57. Mersey Valley, Northenden SJ8290 (*A.cardamines*)
58. Mersey Valley, site near Stretford sewage farm SJ7893 (*T.sylvestris*, *P.c-album*, *P.aegeria*, *P.tithonus*)
59. Nan Nook Wood SJ8090 (*P.aegeria*)
60. New Allen Street SJ8599 (*M.jurtina*)
61. Newcroft tree nursery SJ7894 (*A.cardamines*)
62. Nob End SD7406 (*P. icarus*)
63. Oldham (open site) SD9106 (*V. cardui*)
64. Oldham (waste) SD9105 (*V. cardui*)
65. Partington, site near B.P.works SJ7291 (distribution changes; *O.venata*, *P. icarus*, *P.c-album*, *P.tithonus*)
66. Pomona docks SJ8196 (*P. icarus*)
67. Queen's Park, Bolton SD7009 (*L.boeticus*)
68. Red Rocks disused railway, north of Wigan SD5807/8 (*P.tithonus*)
69. Roch Valley, Hooley Bridge SD8411 (*A.cardamines*)
70. Roch Valley, Rochdale SD9013 (*C.pamphilus*)
71. Rochdale Canal, Ancoats SJ8598 (*P.rapae*)
72. Sale, abandoned tennis court SJ7991 (*A.urticae*)
73. Sale, alley behind Harley Road SJ7892 (*P.rapae*)
74. Sale, alley behind Meadows Road SJ7992 (*P.brassicae*)
75. Sale, former Bethell's tip SJ7992 (distribution changes; *P. icarus*)
76. Sale golf club SJ8091 (*C.argiolus*)
77. Sale, limestone "raft" by electricity station SJ8191 (*P. icarus*)
78. Sale/Northern Moor, old nurseries (destroyed) SJ8090 (conservation)
79. Sale, "Racecourse" estate SJ7691 (*G.rhamnii*)
80. Salford (Fitzwarren Street) SJ8098 (*V.atalanta*)
81. Salford (Great Clowes Street) SD8200 (*L.phlaeas*)
82. Salford Quays SJ8097 (Manchester's environments; *V.atalanta*)
83. Salford (waste land) SJ8297 (*L.phlaeas*)
84. Sinderland Brook SJ7590/7690 (*P. icarus*, *P.tithonus*)
85. Southern Cemetery SJ8292 (*L.phlaeas*)
86. Stretford cabbage fields, Mosley Acre Farm SJ7993 (*P.brassicae*, *P.rapae*, *A.urticae*)
87. Stretford, New Manor Farm SJ7893 (*P.brassicae*, *V. cardui*)
88. Stretford tip SJ7893/4 (distribution changes; *T.sylvestris*, *P. icarus*, *V.atalanta*, *M.jurtina*)
89. Tame Valley, Denton SJ9395 (*M.jurtina*)
90. Urmston oxbow SJ7693 (*I.io*)
91. Victoria station, waste ground near (Scotland & Angel Meadow) SJ8499 (*M.jurtina*)
92. Walkden - Leigh disused railway SD6901-7201 (*P.aegeria*)
93. Walker Fold SD6712 (*P.napi*)
94. Walton Road Park, Sale SJ7890 (*P.aegeria*)
95. Waterside Hotel, Didsbury SJ8589 (*N.antiopa*)
95. Waste cemetery SJ8097/8 (*L.phlaeas*)
96. Winstanley Road allotments, Sale SJ7992 (*P.rapae*, *P.napi*)
97. Woodford SJ8981 (*A.cardamines*)
98. Worthington Park SJ7991/2 (*P.aegeria*)

URBAN COVER - WHOLE AREA

Fig.6. URBAN COVER



- Nil cover
- 1-5% cover
- 6-10% cover
- 11-20% cover
- 21-50% cover
- 51-75% cover
- 76-100% cover

RECORDING COVERAGE - WHOLE AREA
 Symbols graded from 1 visit (smallest size) to 100+ visits. Crosses, no visits.

Fig.7. RECORDING COVERAGE BY TETRADS

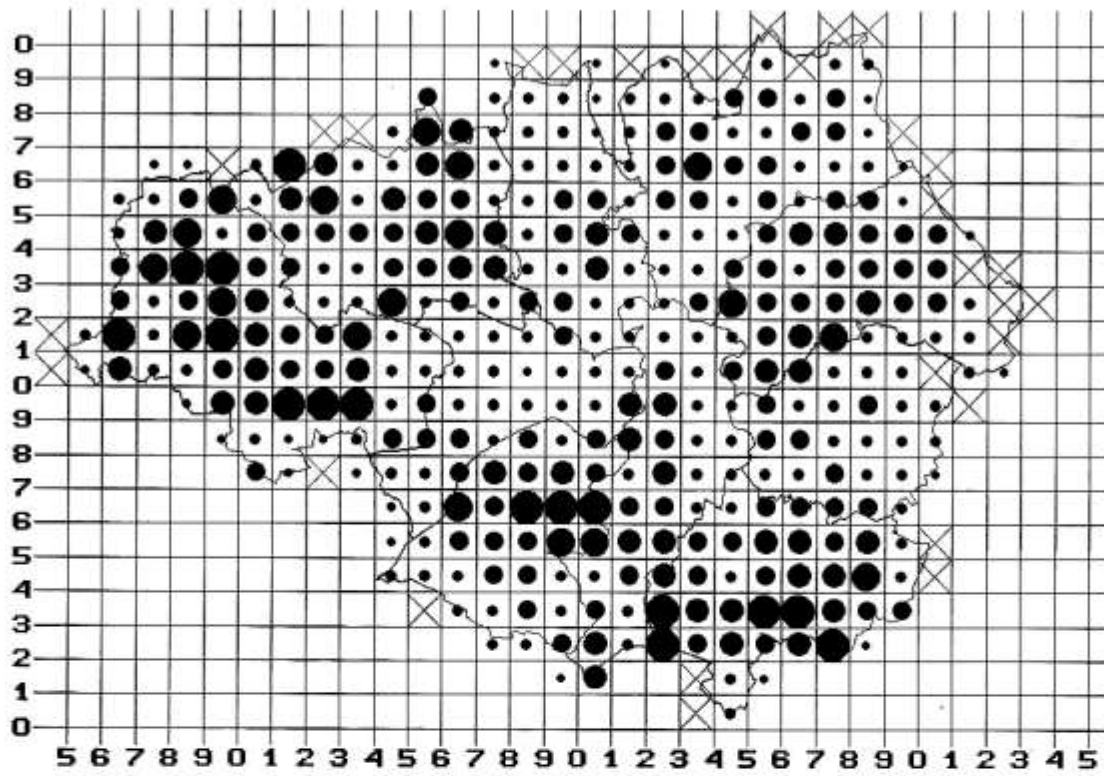
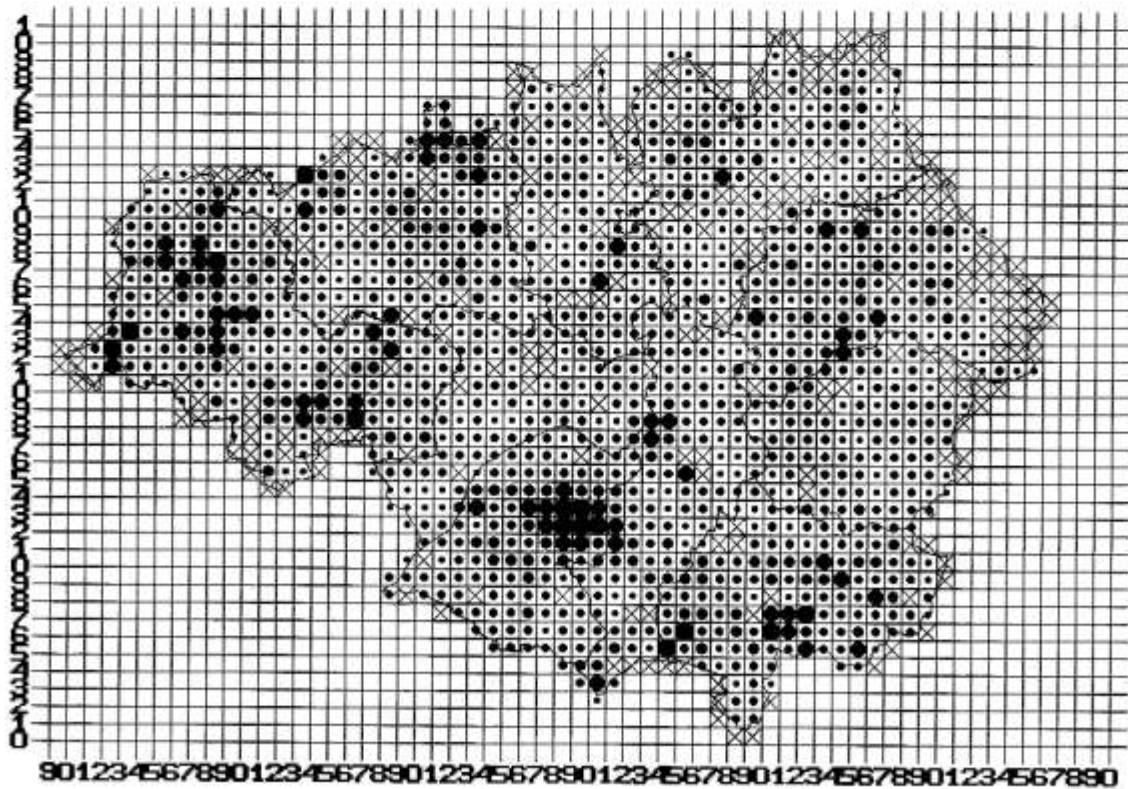
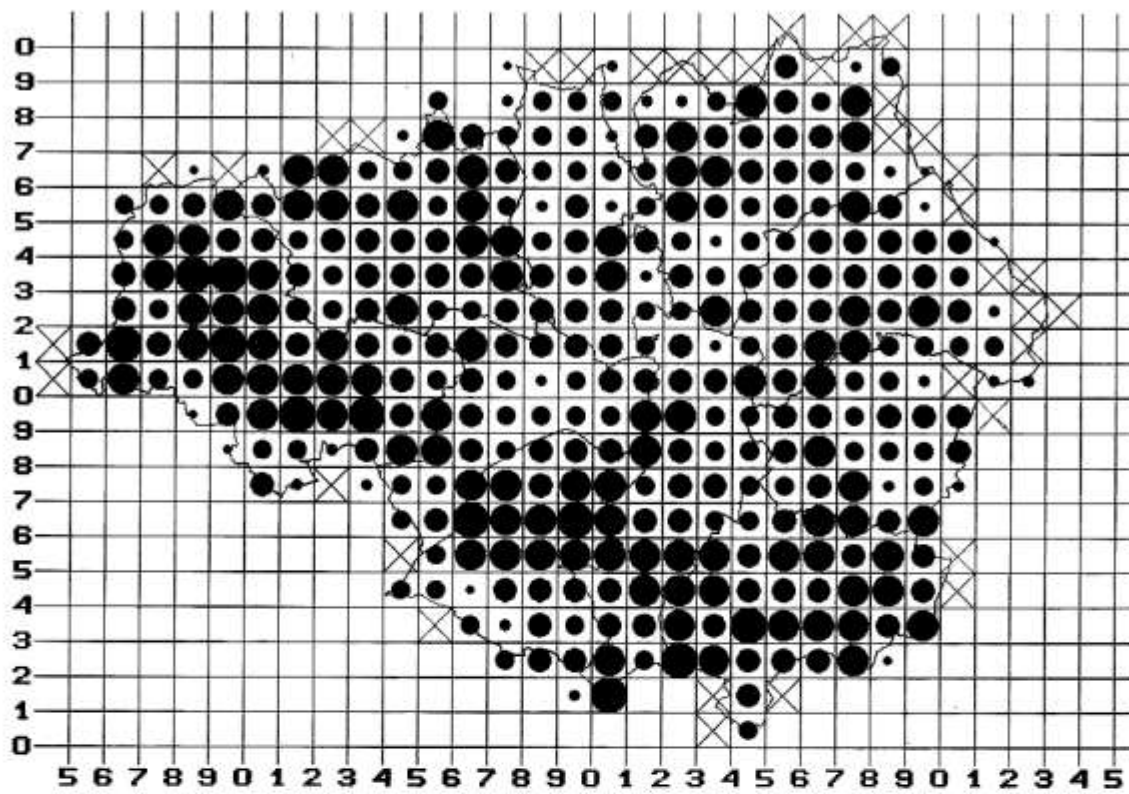


Fig.8 RECORDING COVERAGE BY 1KM SQUARES



BUTTERFLY DISTRIBUTIONS, 1980-1997 - WHOLE AREA

Fig.9. RECORDS FOR ALL BUTTERFLY SPECIES PER TETRAD



NUMBERS OF SPECIES RECORDED IN EACH TETRAD

									0	0	0																													
								1	0	0	2	0	0	0	0	10	0	3	6																					
					7			4	7	7	7	2	2	5	15	14	7	15	0																					
					0	0	2	17	14	9	6	8	2	11	17	13	14	10	12	15	0	0																		
					0	1	0	3	15	14	7	6	14	16	10	5	8	7	8	15	17	13	12	10	8	3	1	0												
					5	6	10	17	11	15	14	10	19	8	16	6	3	13	2	8	15	14	8	14	8	15	11	1	0											
					8	16	17	12	12	9	4	13	14	14	16	15	9	10	15	11	7	4	9	9	12	12	11	10	11	1										
					14	18	20	21	17	14	7	10	14	13	14	17	13	9	15	4	10	8	13	12	12	12	14	12	8	0	0									
					13	6	15	18	17	12	7	11	17	6	9	11	14	12	10	5	7	16	14	11	11	15	11	15	14	2	0	0								
					0	11	21	12	17	21	17	10	17	14	9	12	16	12	13	12	11	9	11	4	8	11	15	15	8	6	9	7	0							
					0	6	18	9	7	16	17	17	17	15	13	9	13	8	2	8	10	14	12	11	15	13	18	6	8	4	0	2	2							
						1	12	16	21	19	20	11	16	10	7	6	6	6	15	15	7	5	13	12	7	13	12	12	0											
						1	8	8	4	10	16	16	10	9	10	12	11	15	13	6	9	14	17	8	9	8	11													
							12	4	0	4	7	8	16	16	13	15	16	8	14	10	8	6	11	15	4	8	4													
								8	10	21	15	18	20	19	14	13	5	8	11	16	15	13	18																	
								0	9	17	15	17	18	16	17	17	10	17	18	12	16	10	0																	
								9	6	1	12	12	11	14	17	18	15	13	13	14	18	19	10	0																
									0	9	4	11	6	14	11	19	13	20	19	16	17	14	18																	
										6	11	13	16	7	21	19	13	11	14	16	1																			
											4	21																												

Fig.10. *Thymelicus sylvestris*

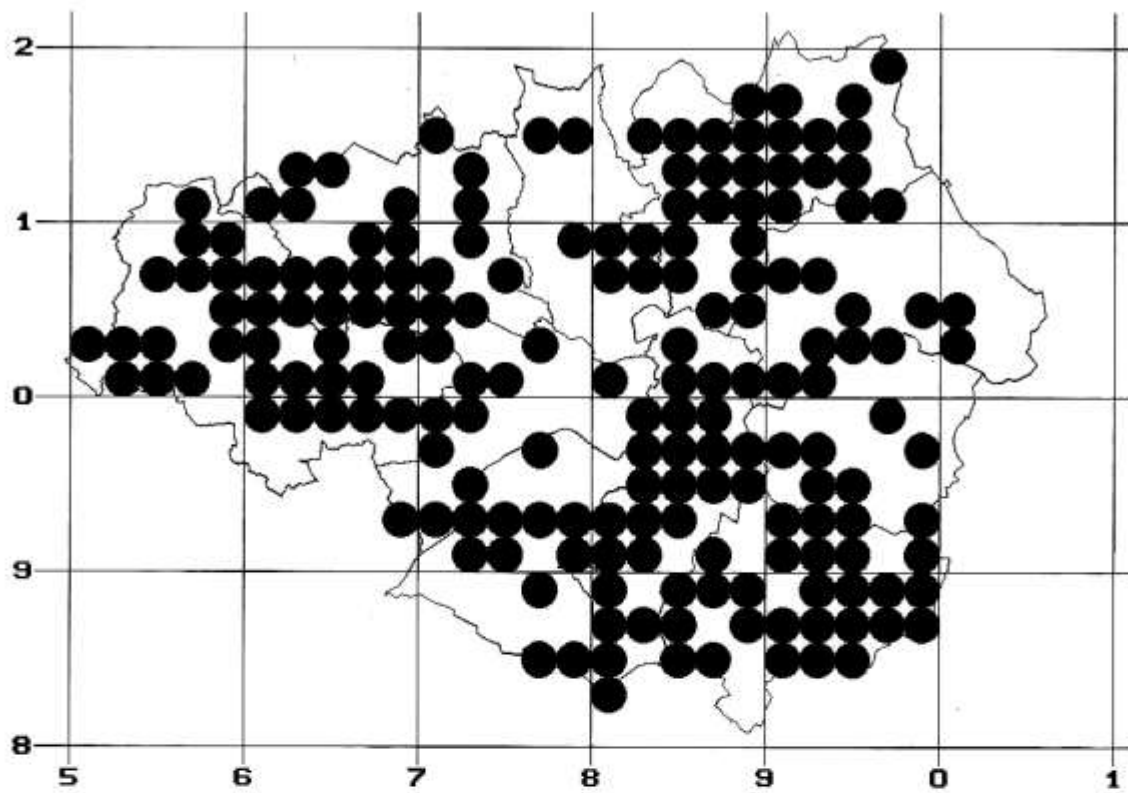


Fig.11. *Ochlodes venata*

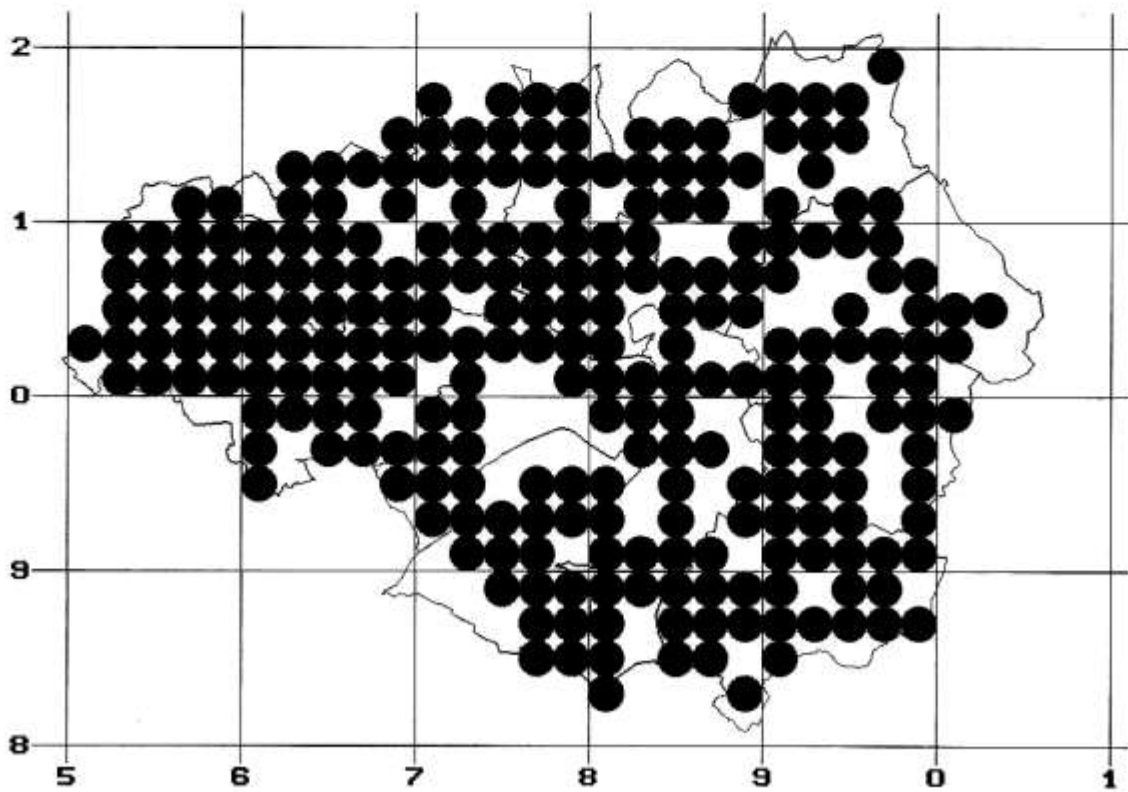


Fig.12. *Colias croceus*

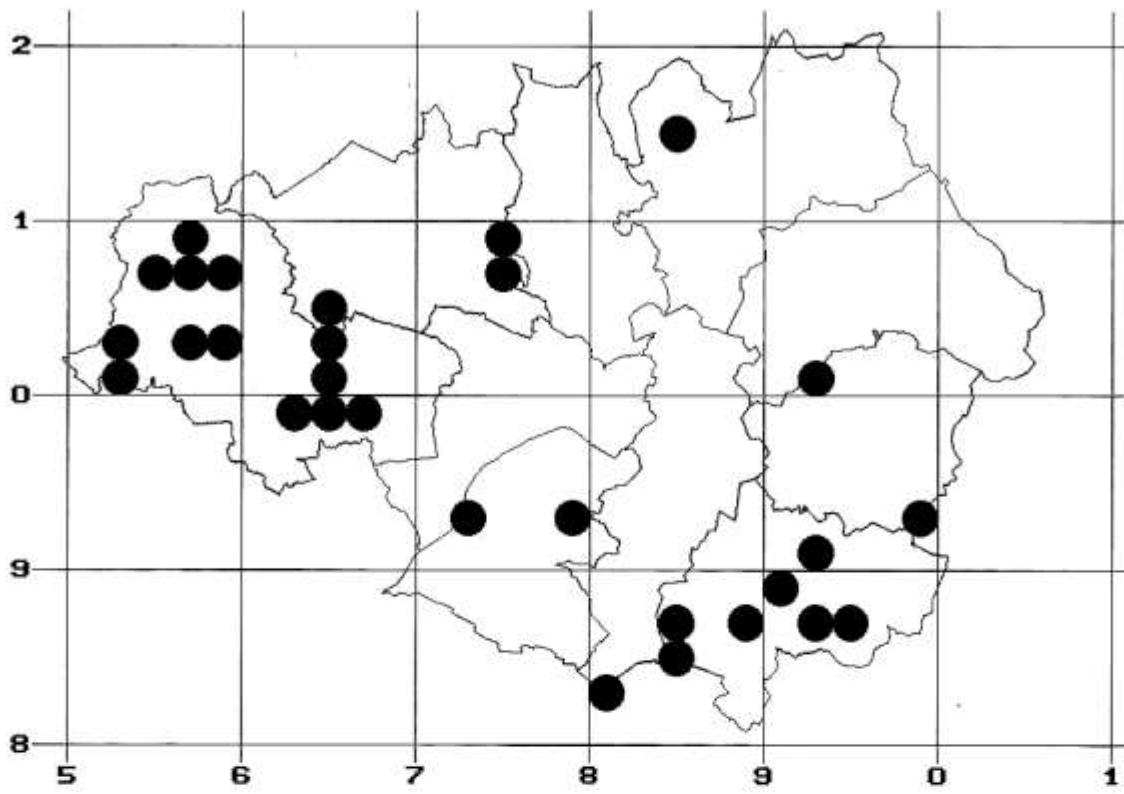
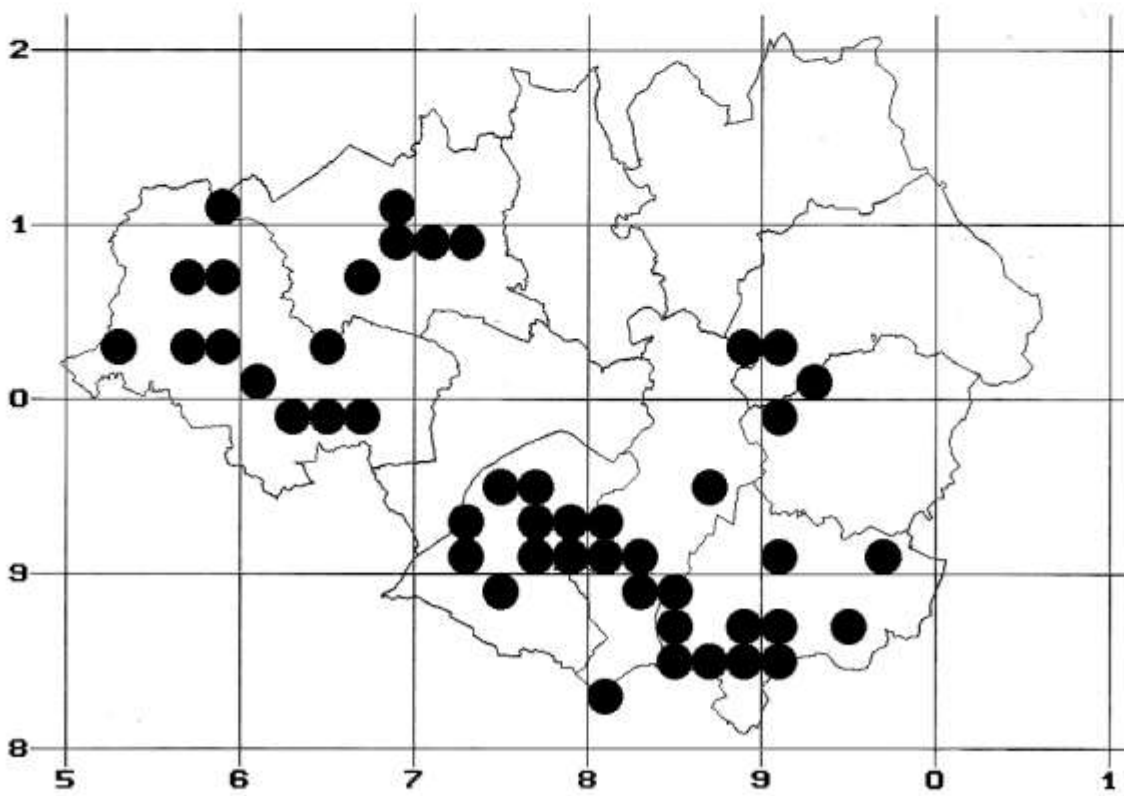


Fig.13. *Gonepteryx rhamni*



BUTTERFLY DISTRIBUTIONS, 1980-1997 - WHOLE AREA

Fig.14. *Pieris brassicae*

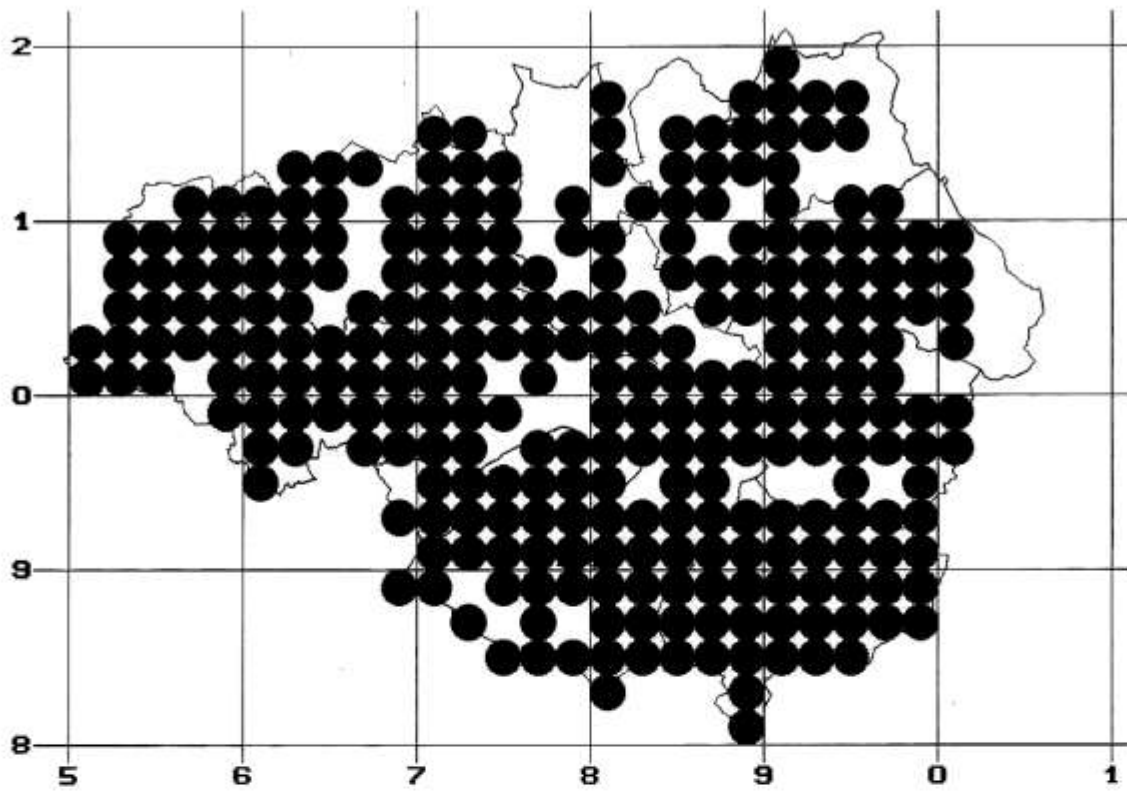
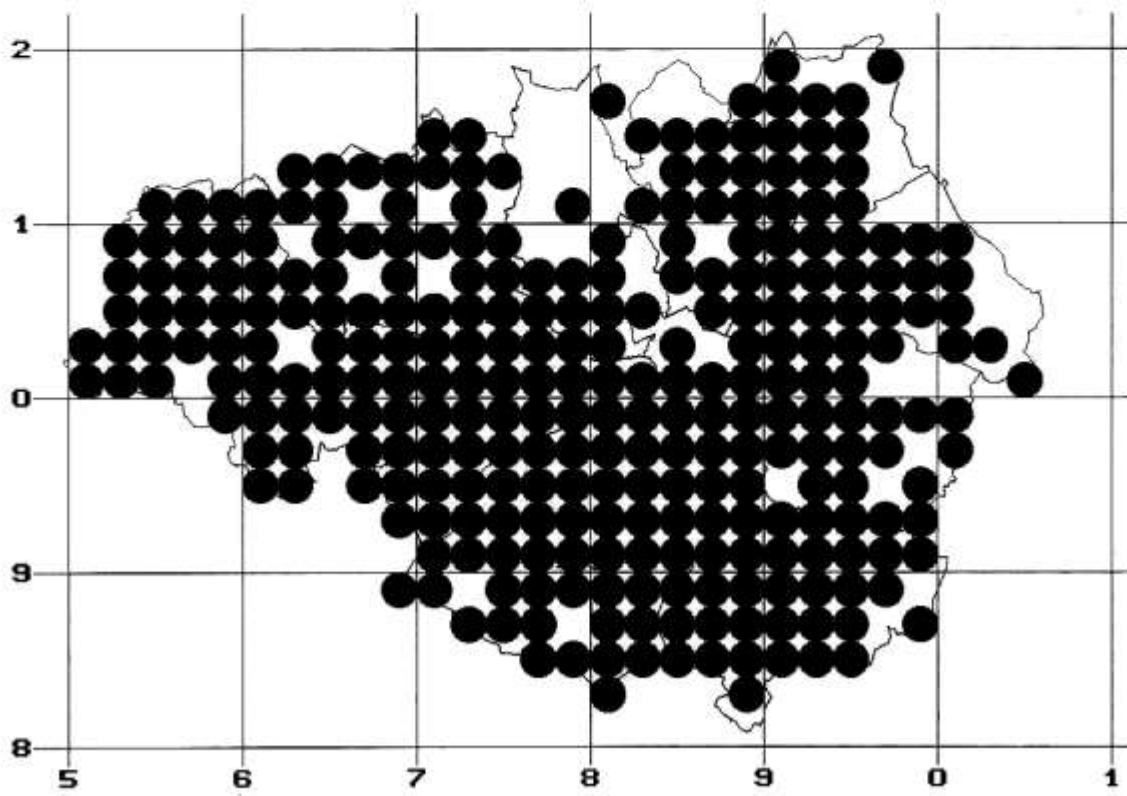


Fig.15. *Pieris rapae*



BUTTERFLY DISTRIBUTIONS, 1980-1997 - WHOLE AREA

Fig.16. *Pieris napi*

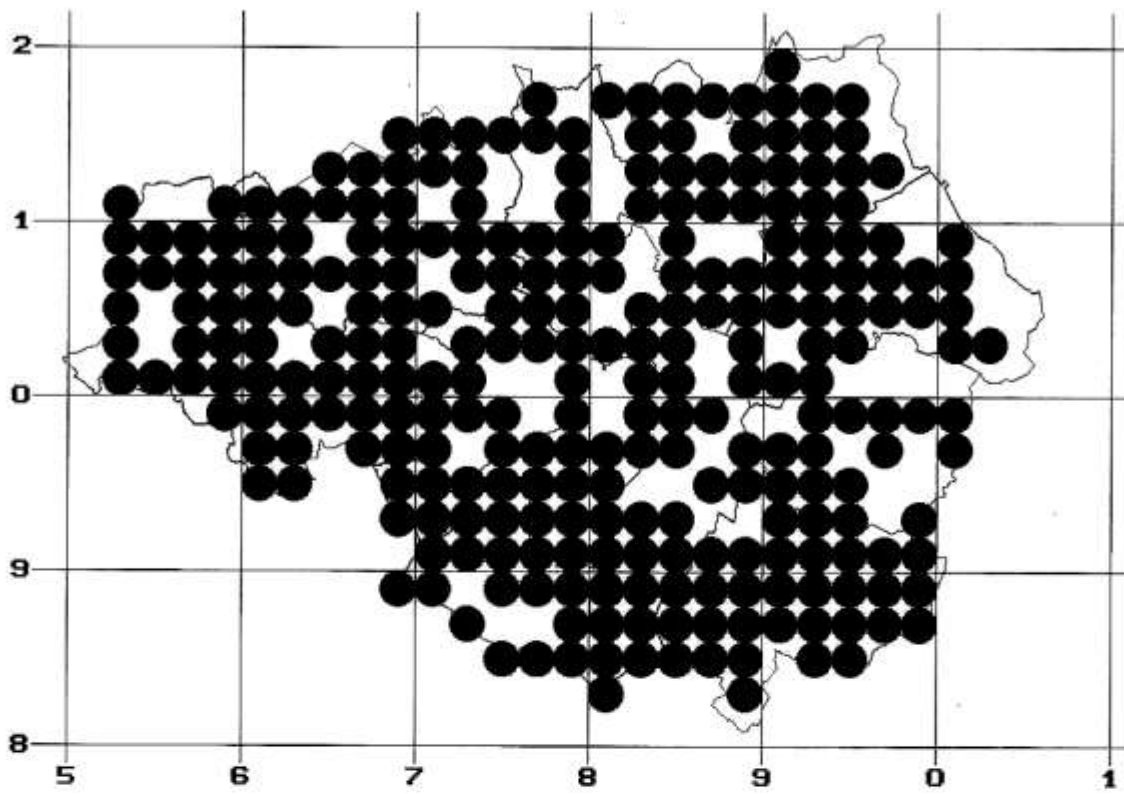


Fig.17. *Anthocharis cardamines*

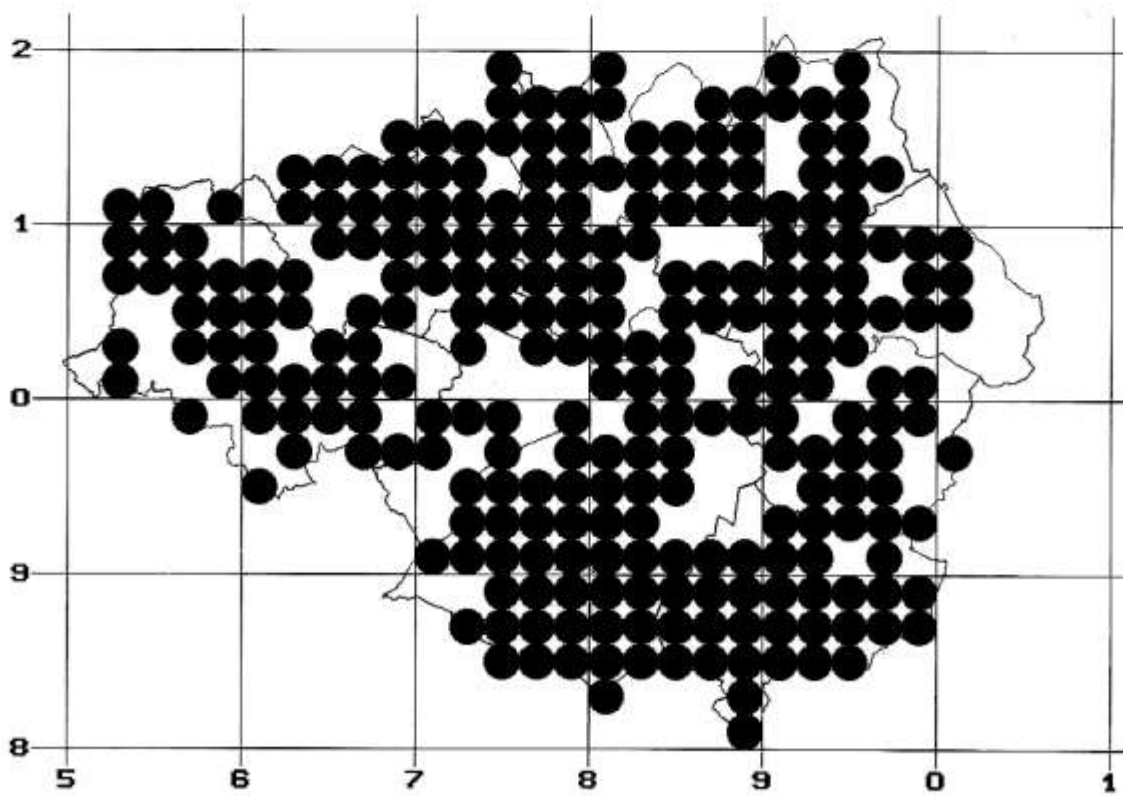


Fig.18. *Callophrys rubi*

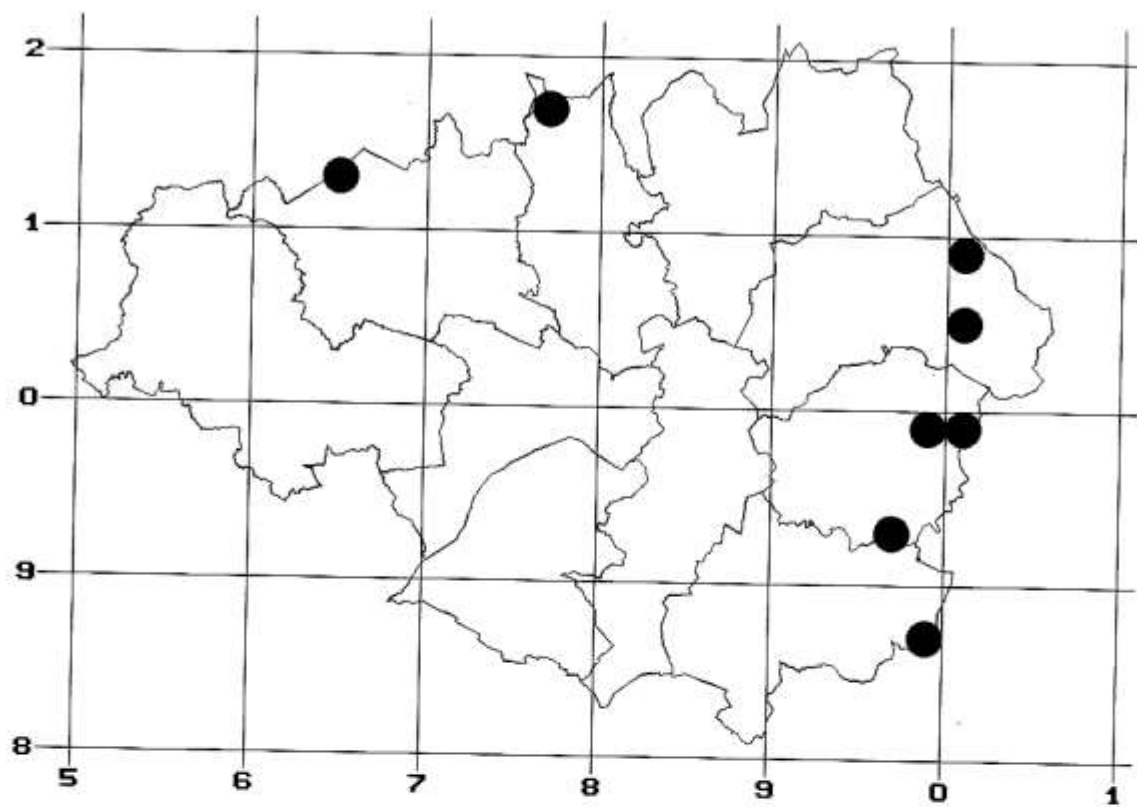
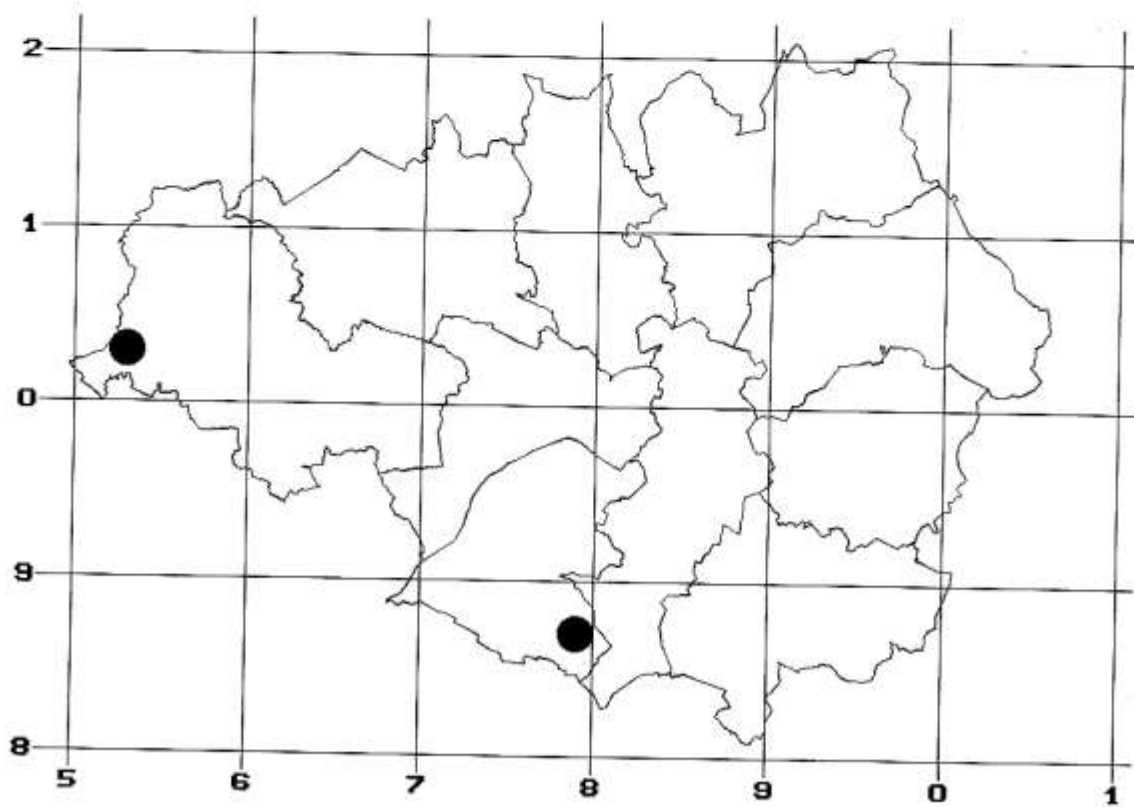


Fig.19. *Quercusia quercus*



BUTTERFLY DISTRIBUTIONS, 1980-1997 - WHOLE AREA

Fig.20. *Satyrrium w-album*

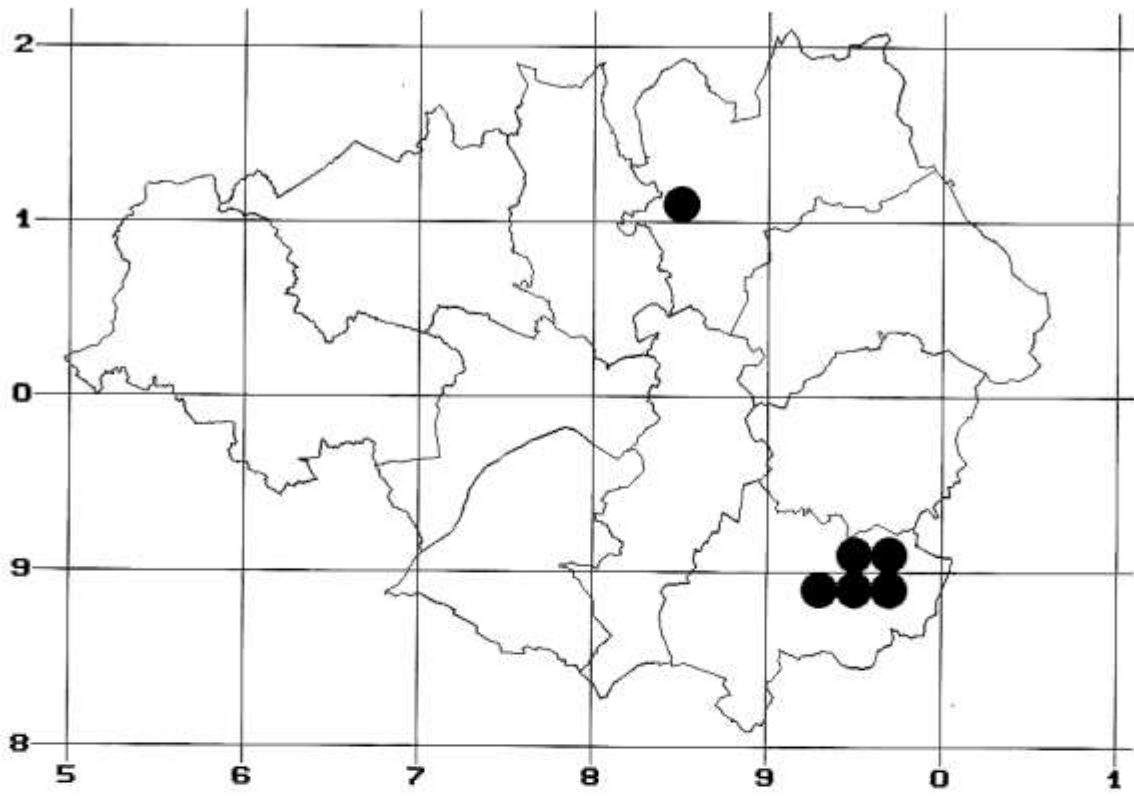
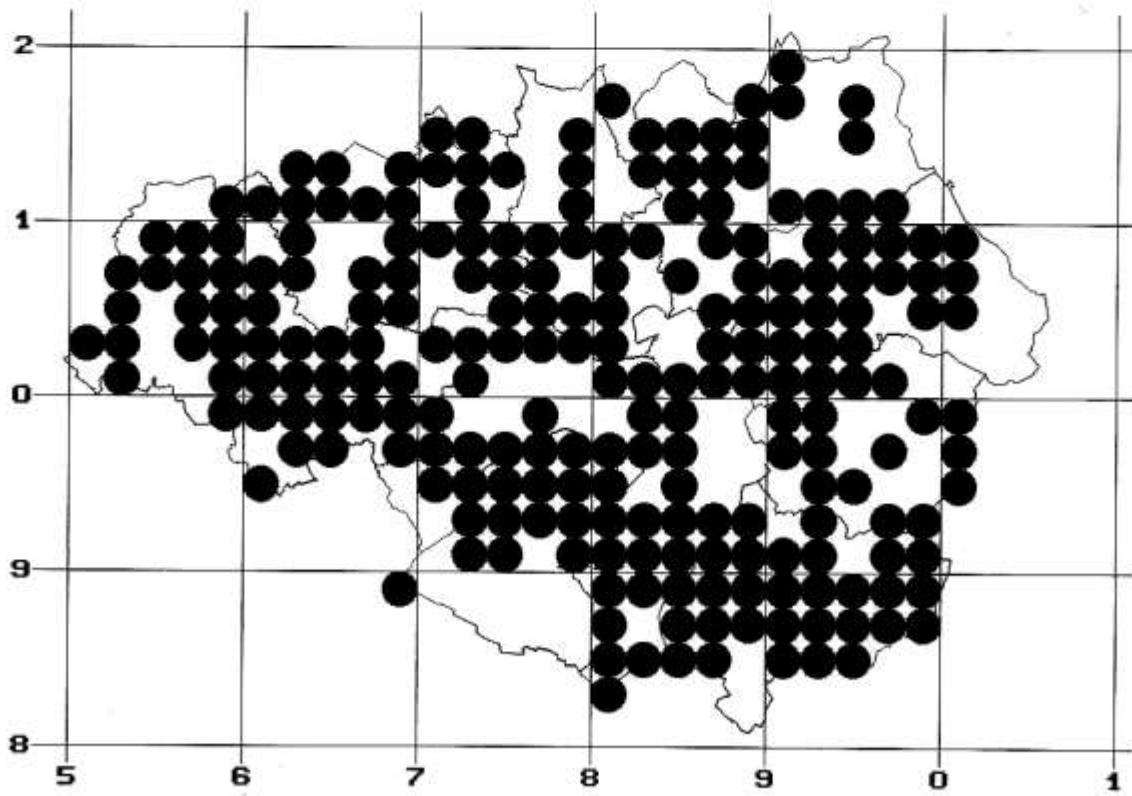


Fig.21. *Lycaena phlaeas*



BUTTERFLY DISTRIBUTIONS, 1980-1997 - WHOLE AREA

Fig.22. *Lampides boeticus*

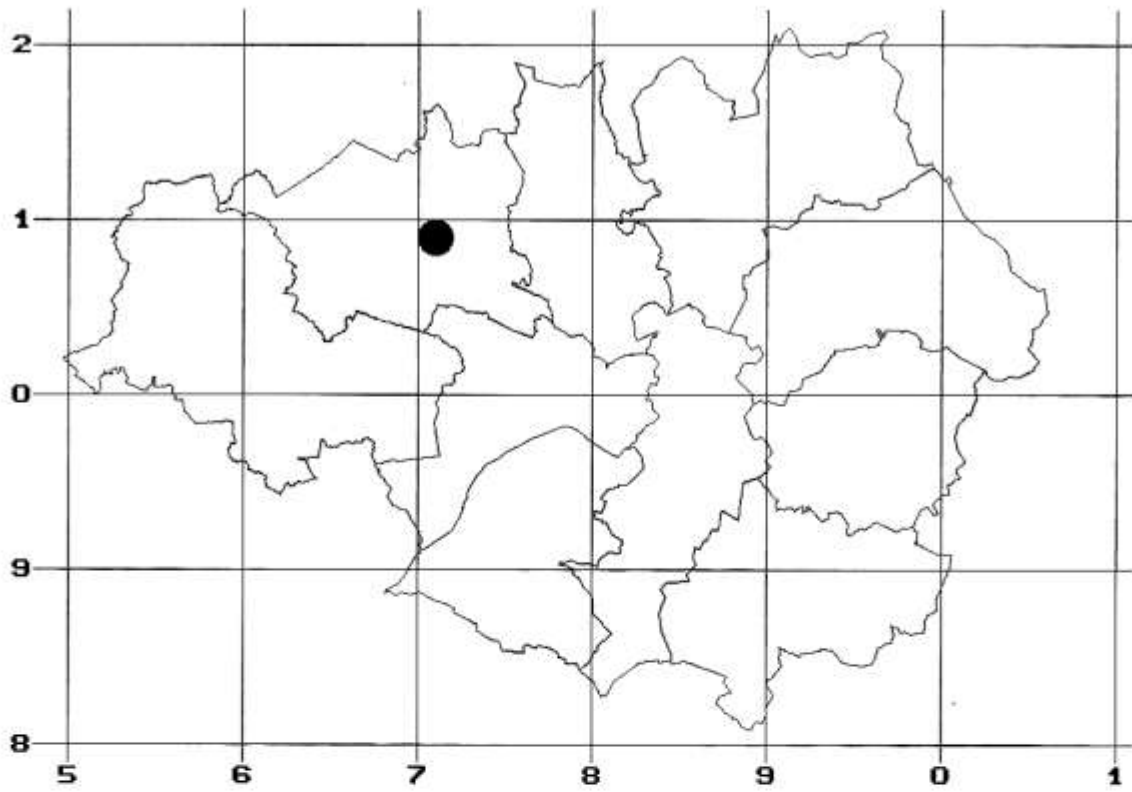


Fig.23. *Polyommatus icarus*

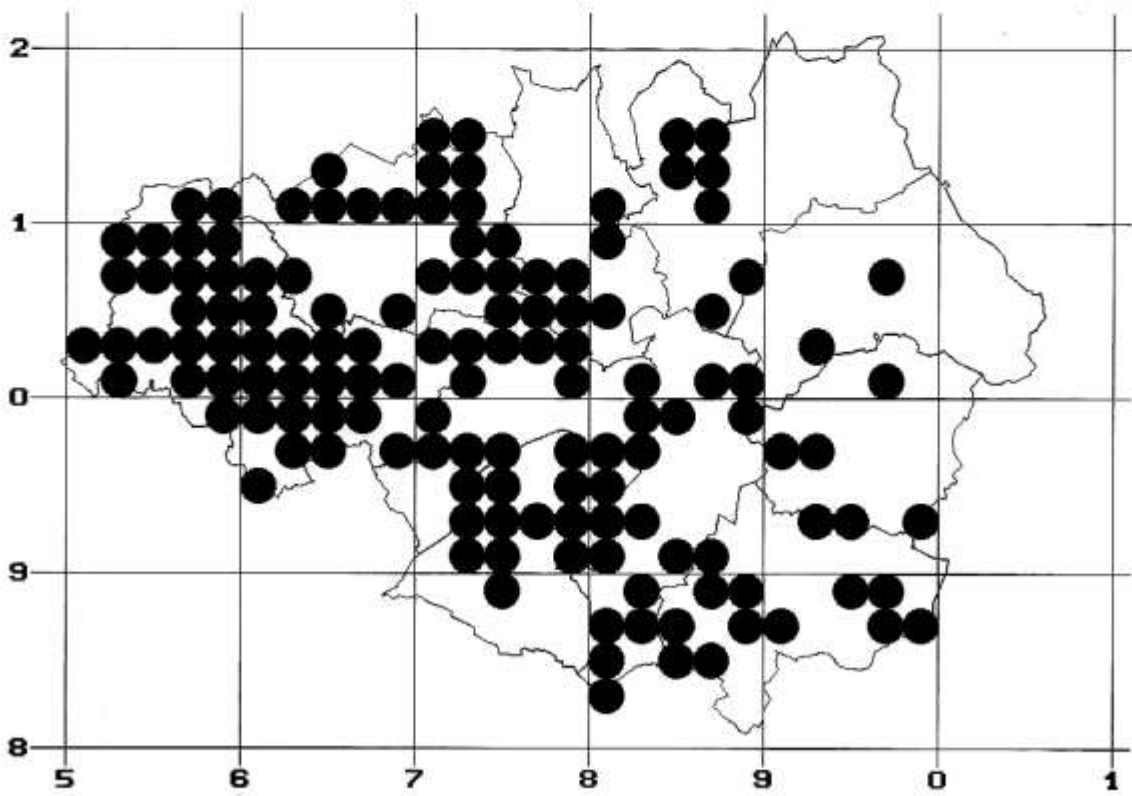


Fig.24. *Celastrina argiolus*

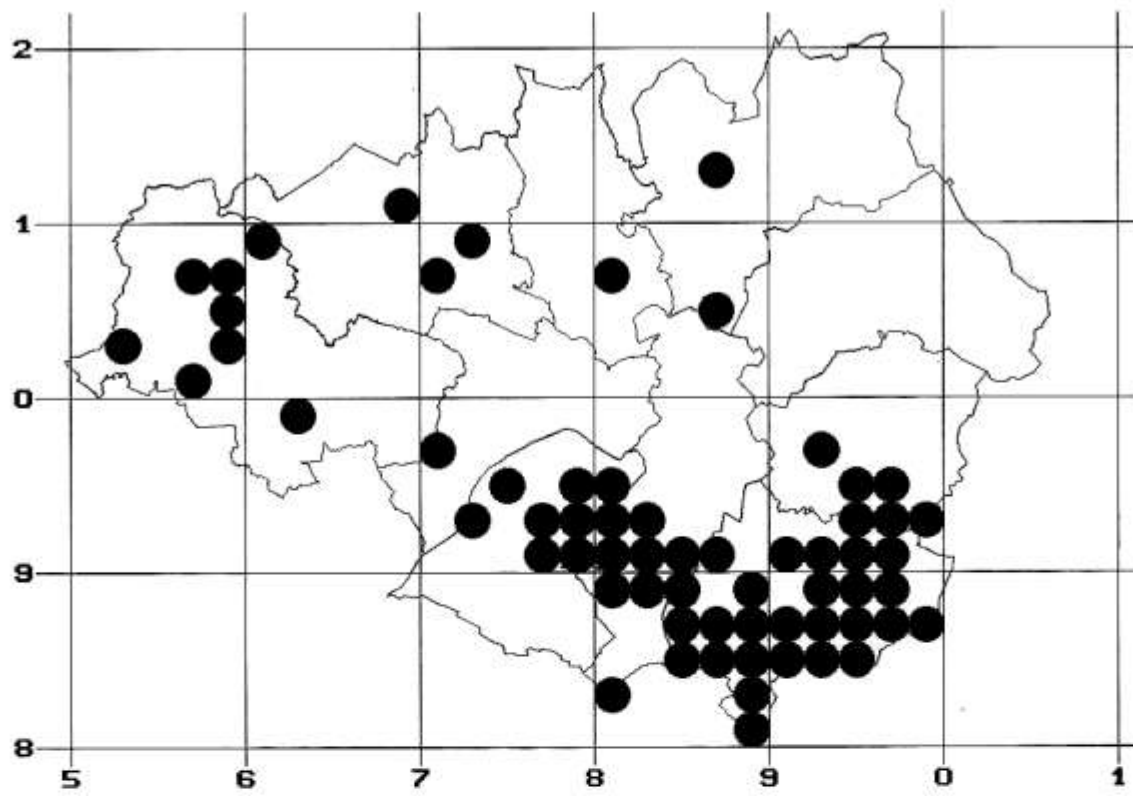


Fig.25. *Vanessa atalanta*

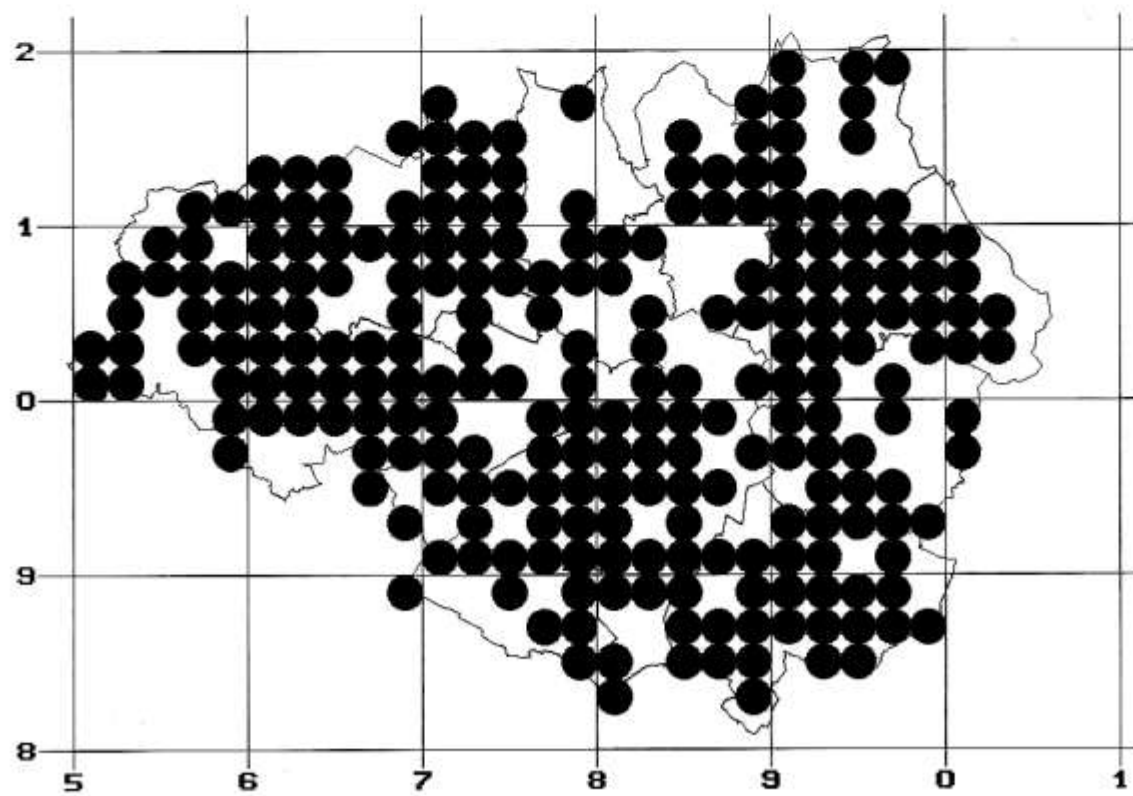


Fig.26. *Vanessa cardui*

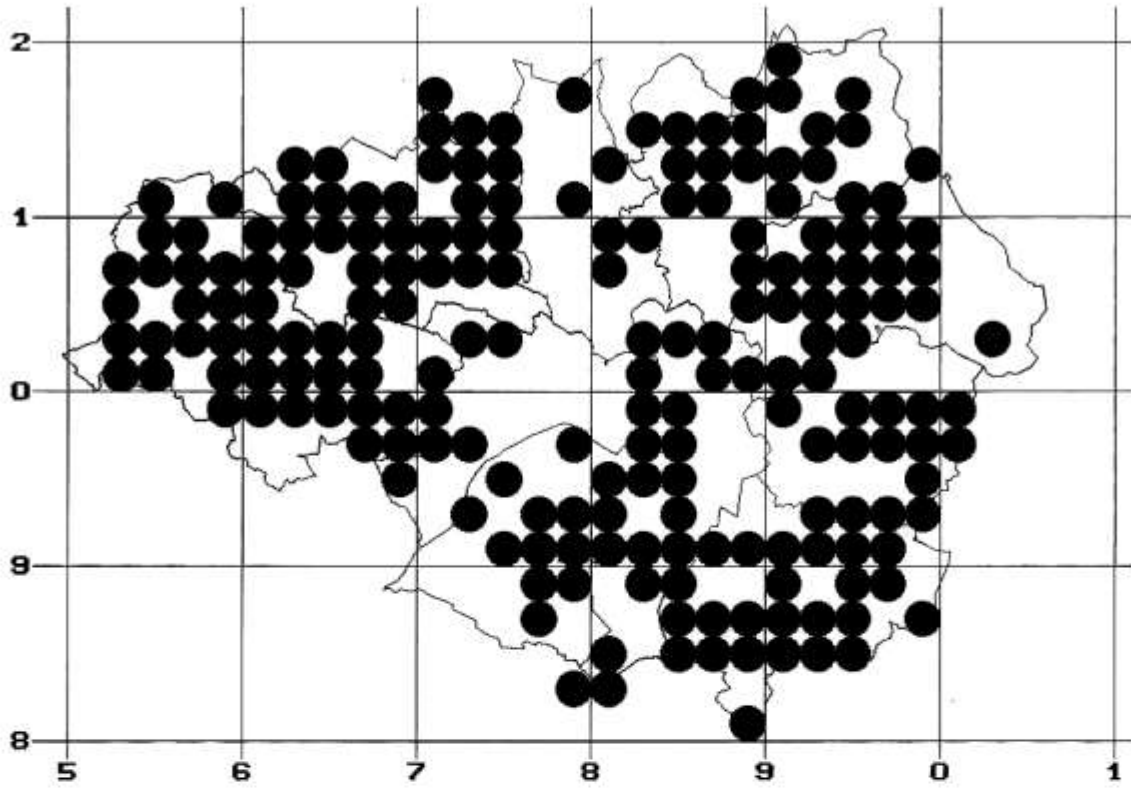


Fig.27. *Aglais urticae*

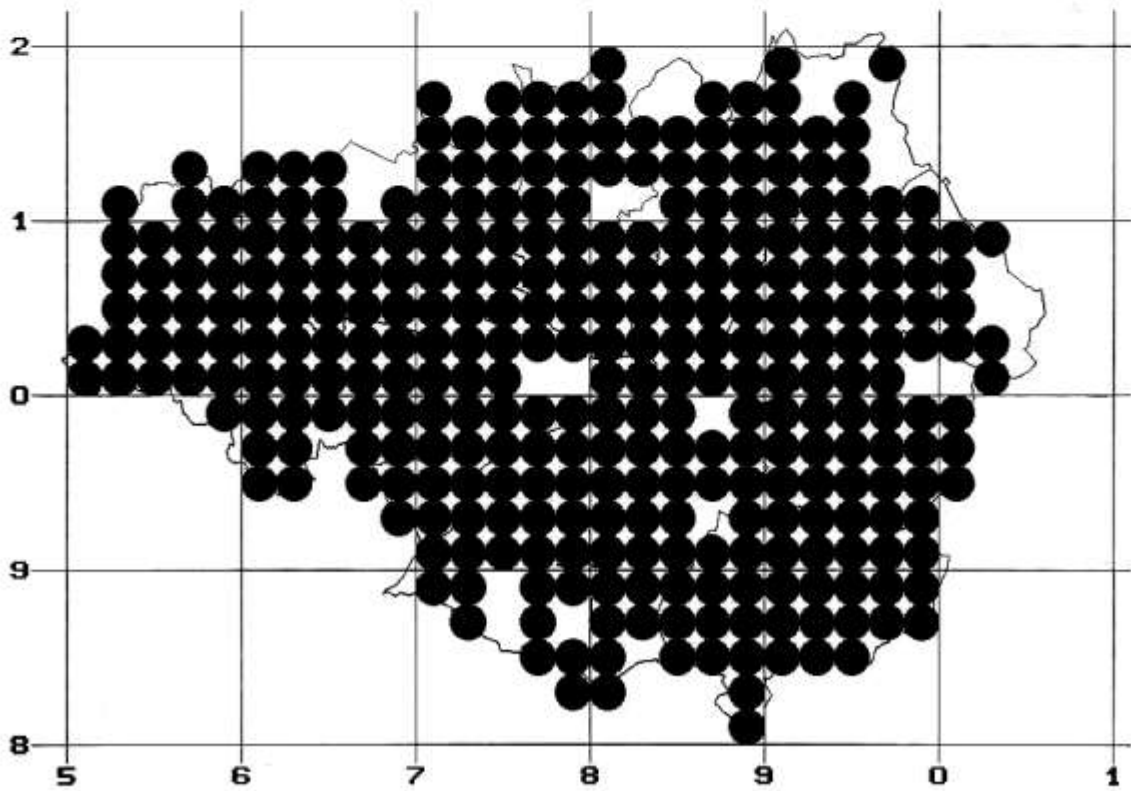


Fig.28. *Nymphalis antiopa*

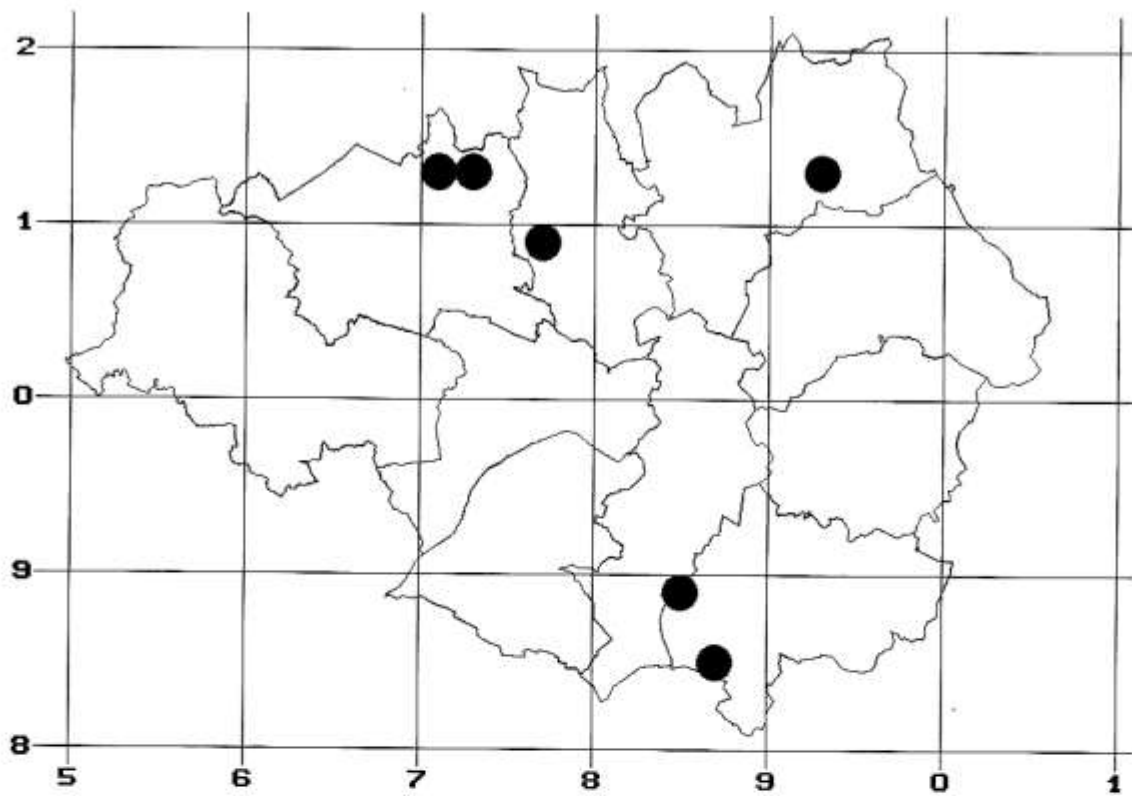


Fig.29. *Inachis io*

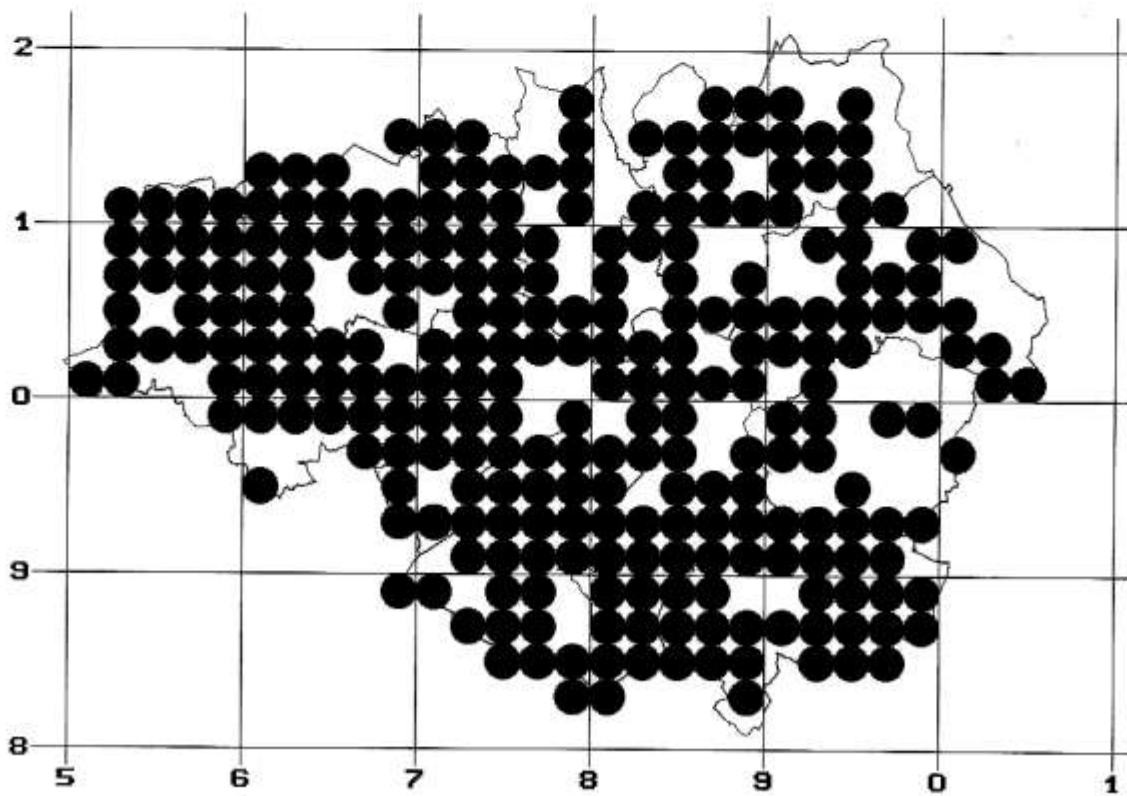


Fig.30. *Polygonia c-album*

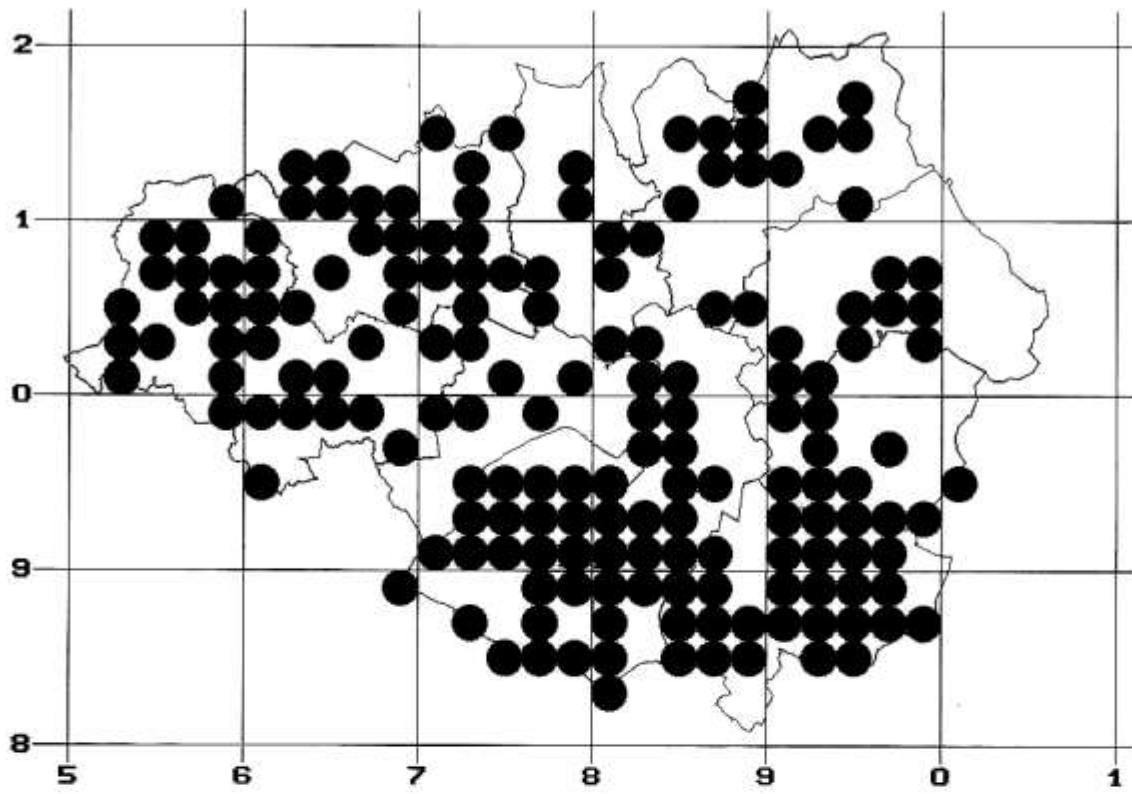


Fig.31. *Argynnis aglaja*

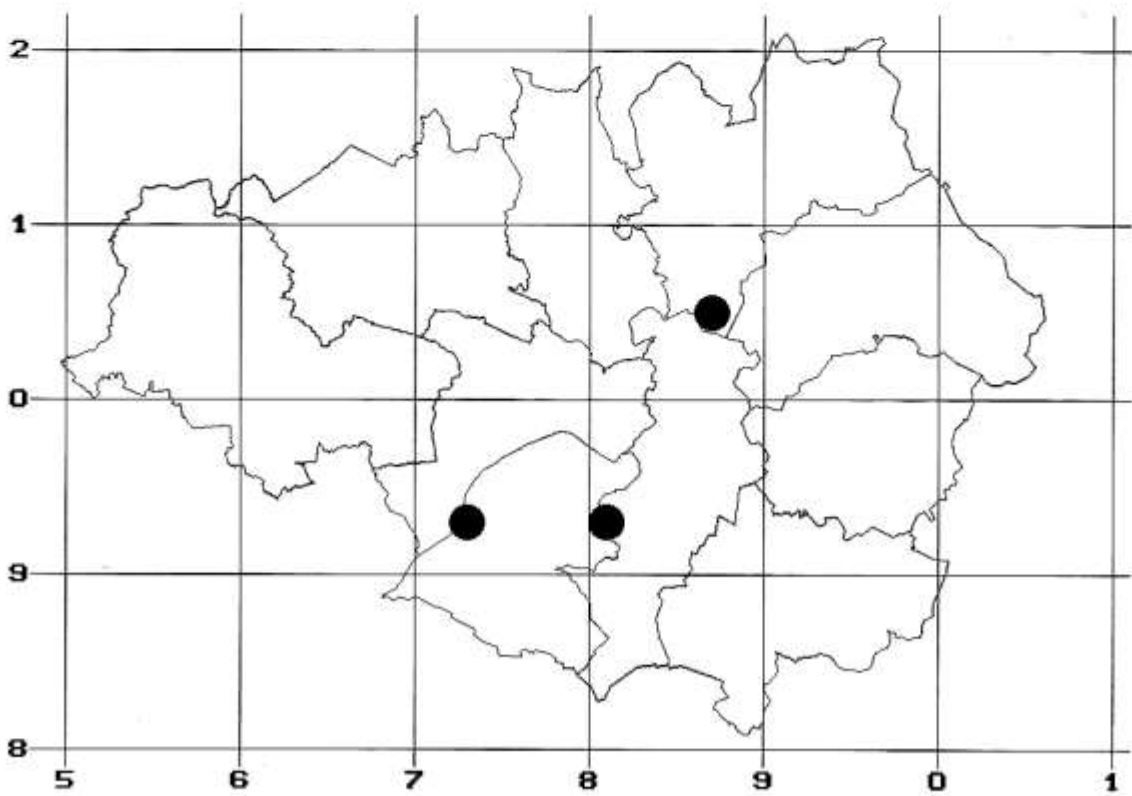


Fig.32. *Pararge aegeria*

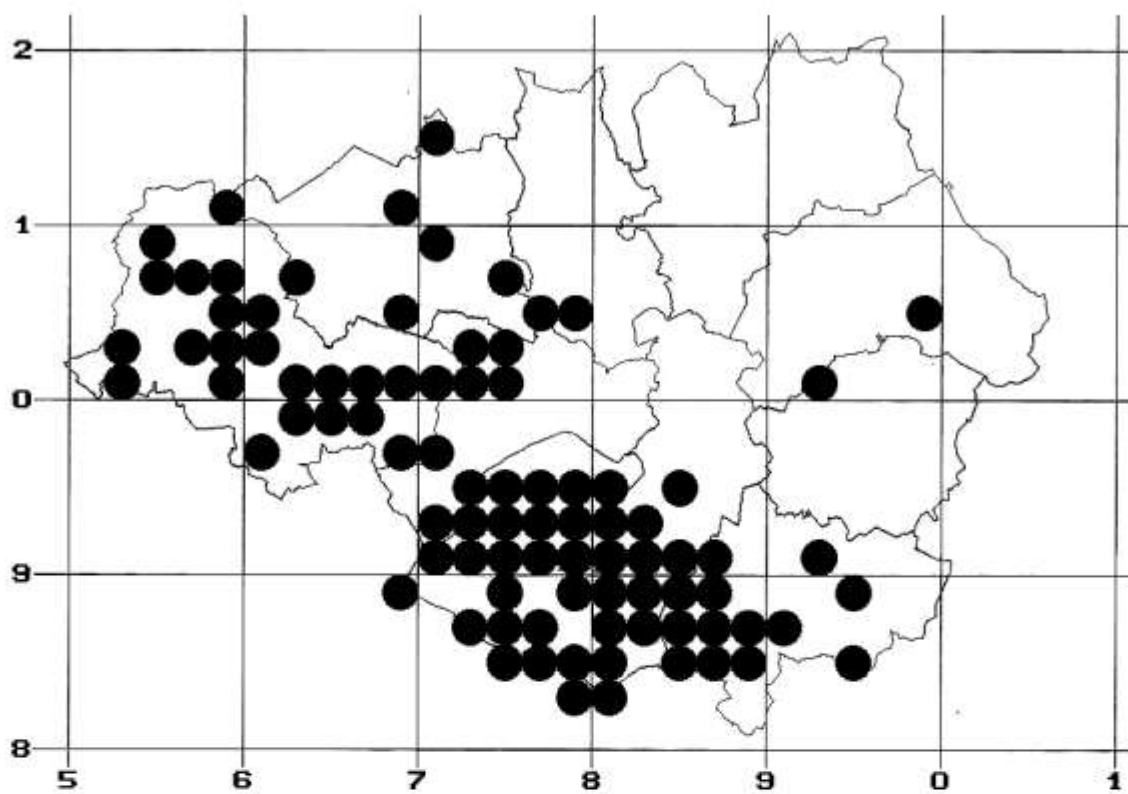


Fig.33. *Lasiommata megera*

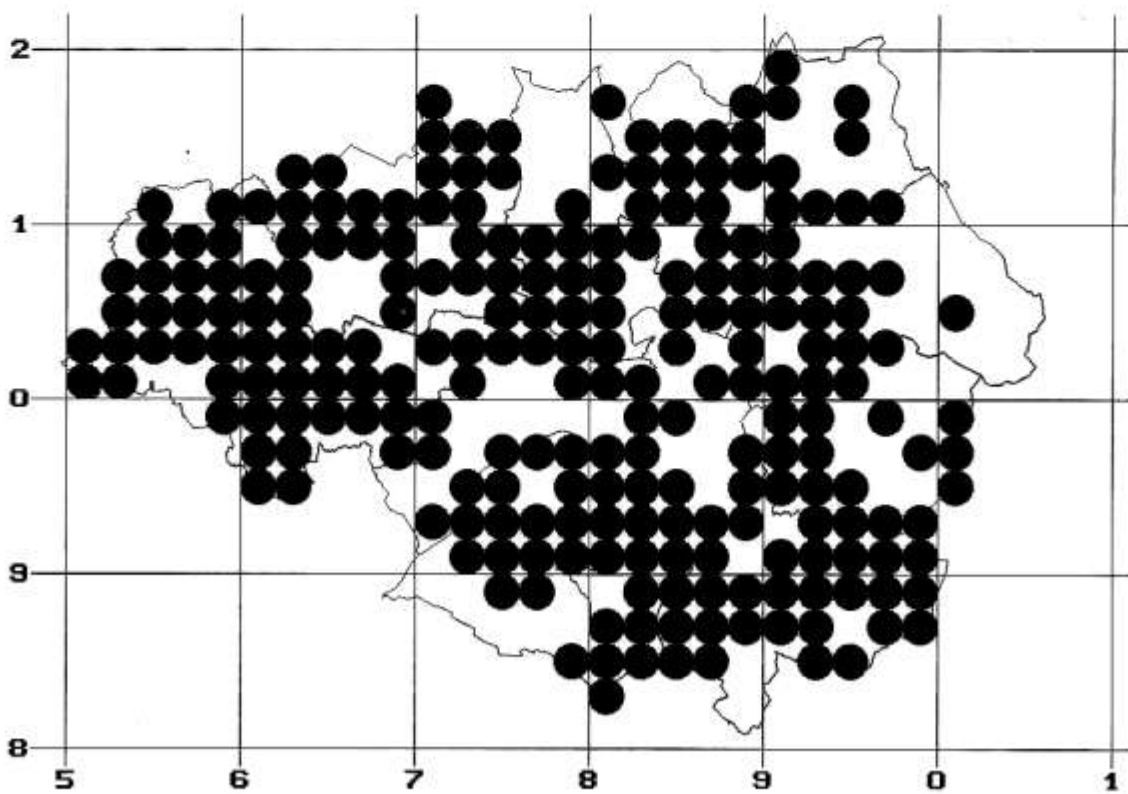


Fig.34. *Pyronia tithonus*

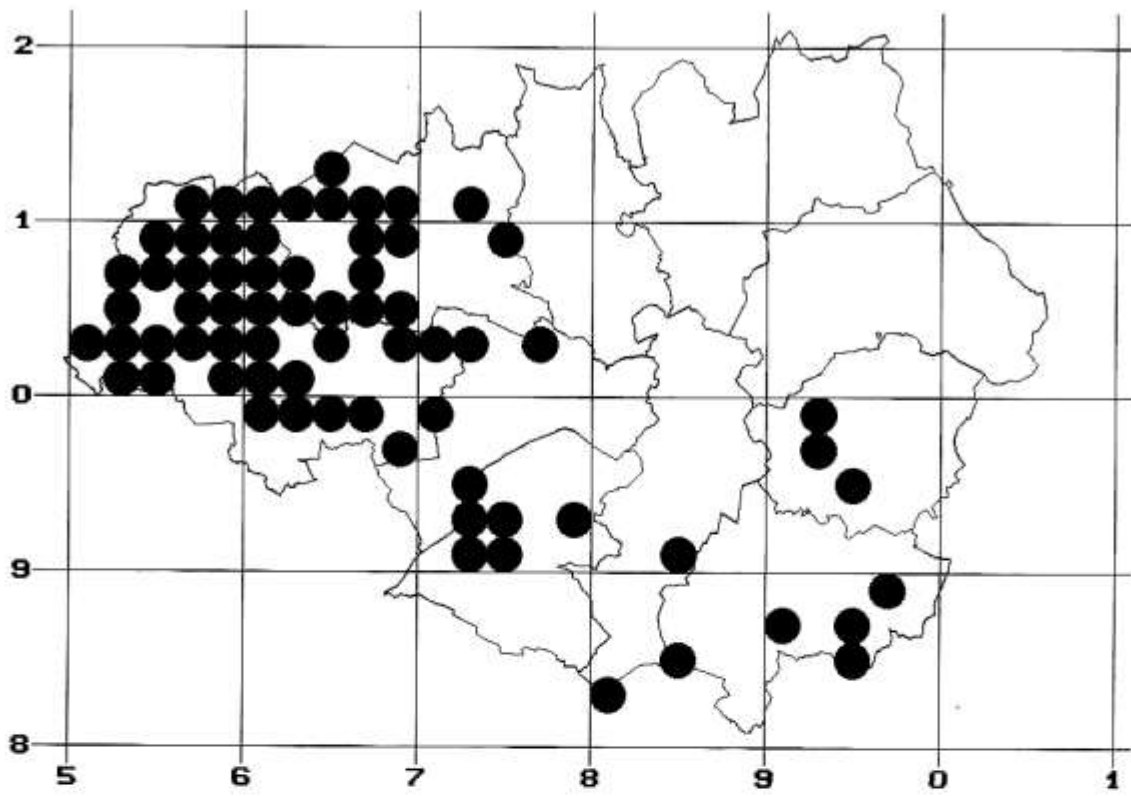
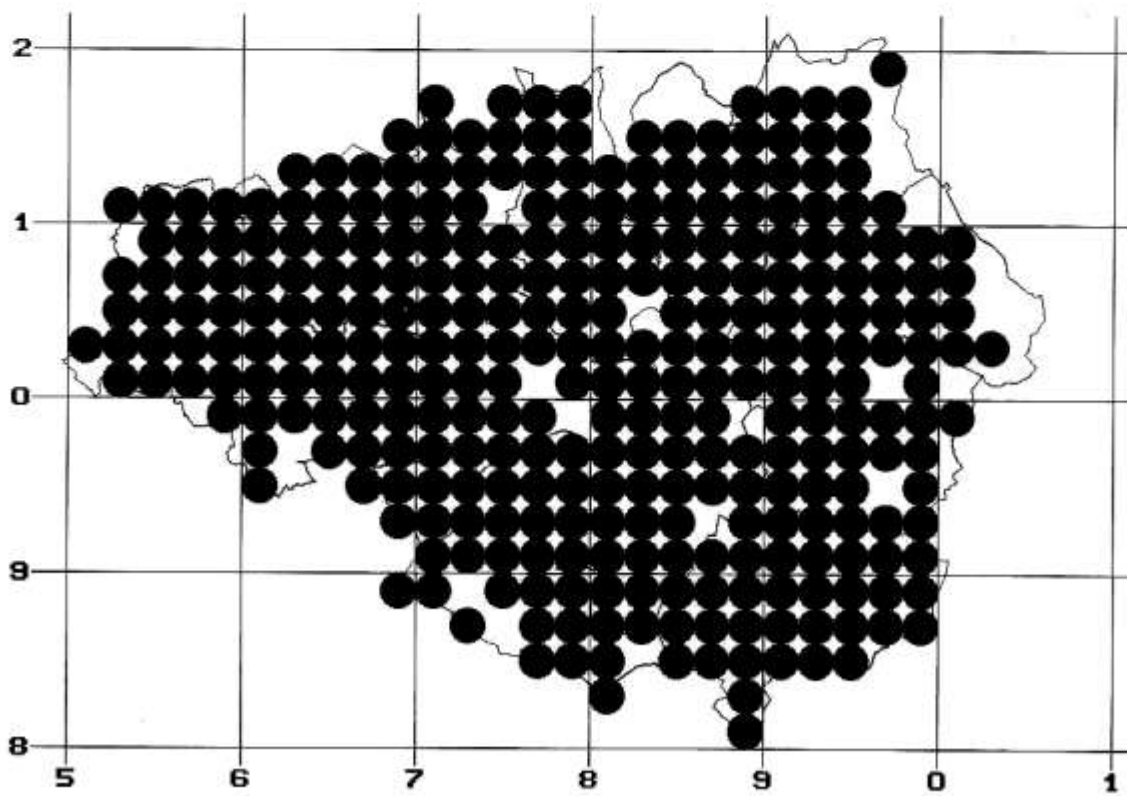
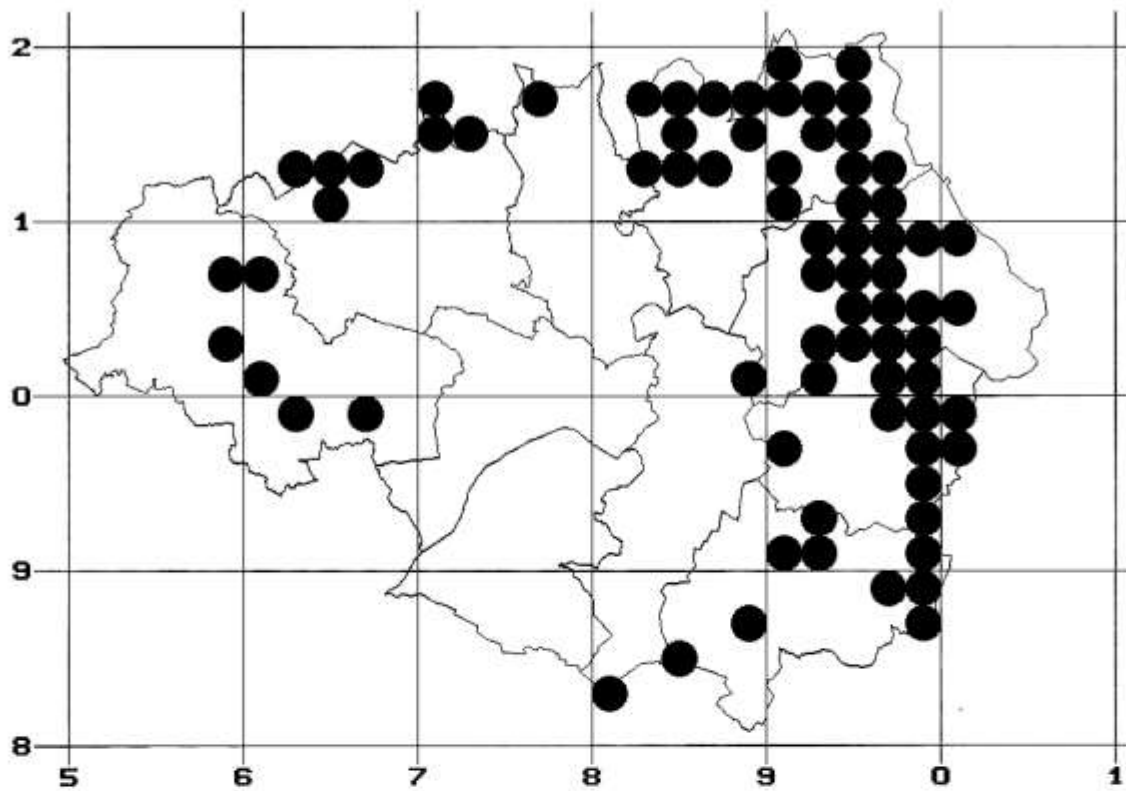


Fig.35. *Maniola jurtina*



BUTTERFLY DISTRIBUTIONS, 1980-1997 - WHOLE AREA

Fig.36. *Coenonympha pamphilus*



BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS

Symbols for figures 37 to 72:

- records prior to 1900 only

Open circles - records up to 1939 only

Closed circles - records up to 1979

Half-size symbols - records from 10 km square, but uncertain whether locality is inside or outside the present Greater Manchester boundary.

BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS
For explanation of symbols see page 78

Fig.37. *Thymelicus sylvestris*

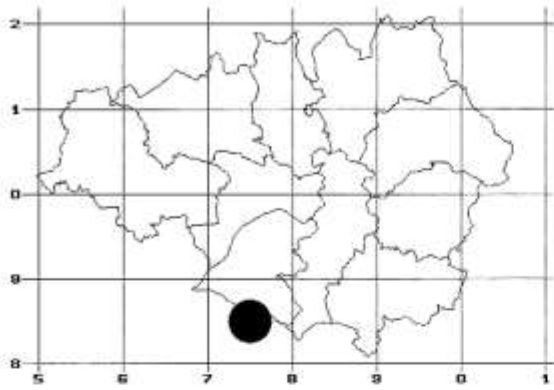


Fig.38. *Ochlodes venata*

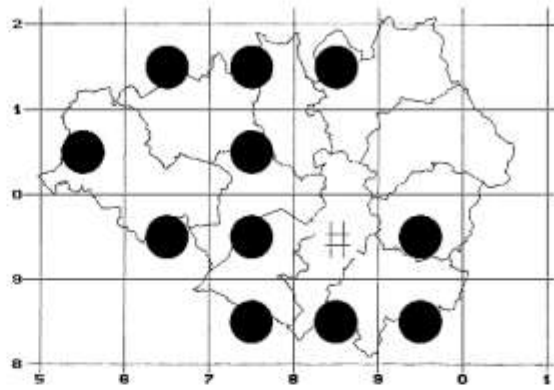


Fig.39. *Erynnis tages*

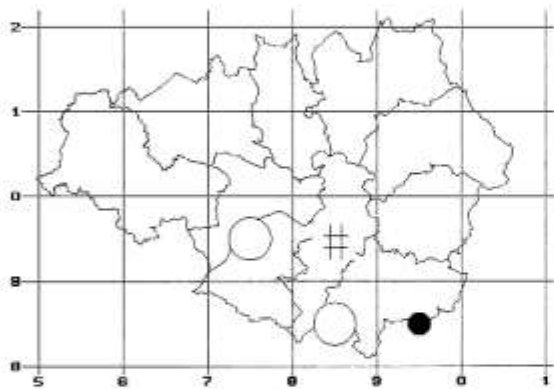


Fig.40. *Leptidea sinapis*

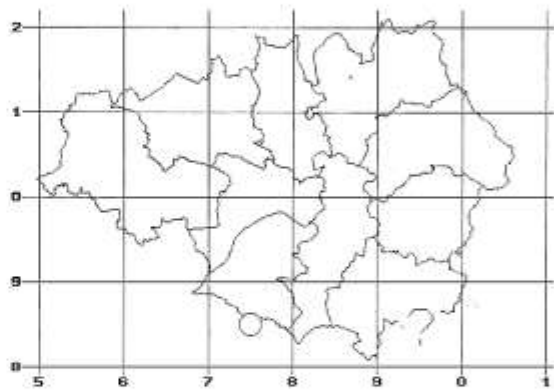


Fig.41. *Colias croceus*

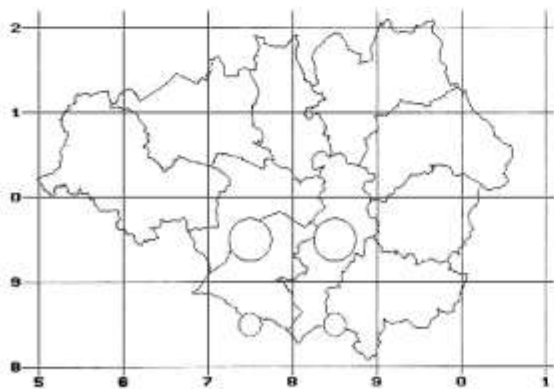
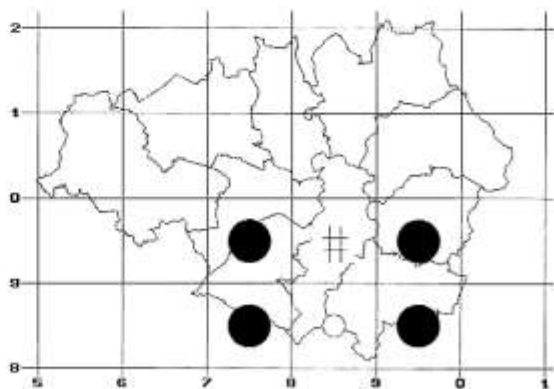


Fig.42. *Gonepteryx rhamni*



BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS
For explanation of symbols see page 78

Fig.43. *Pieris brassicae*

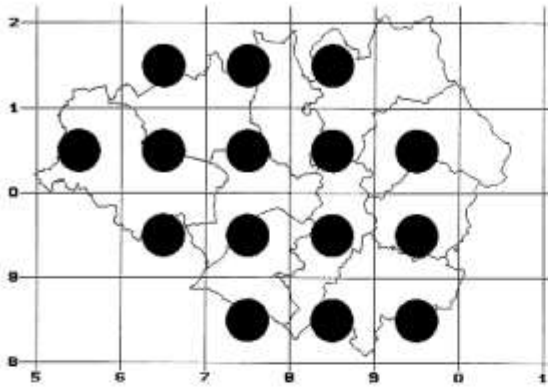


Fig.44. *Pieris rapae*

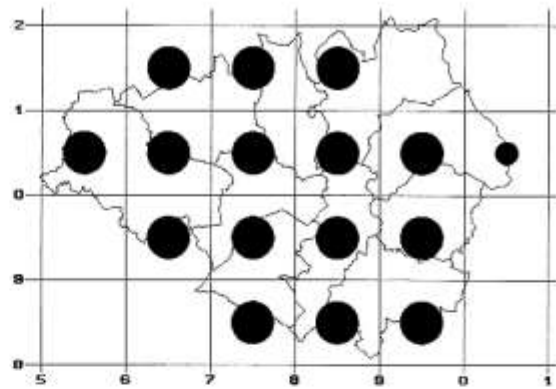


Fig.45. *Pieris napi*

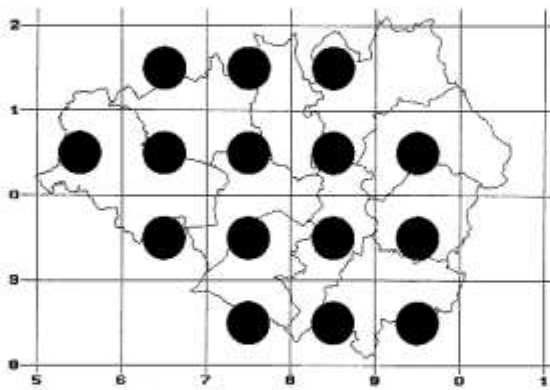


Fig.46. *Anthocharis cardamines*

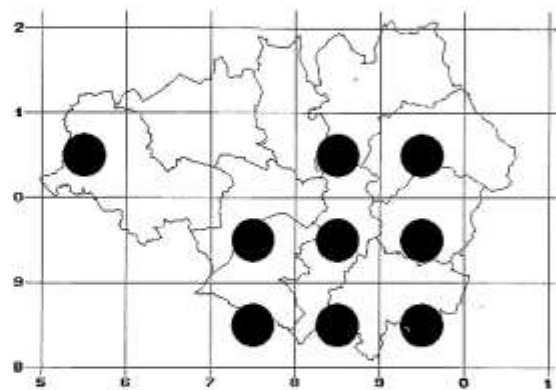


Fig.47. *Callophrys rubi*

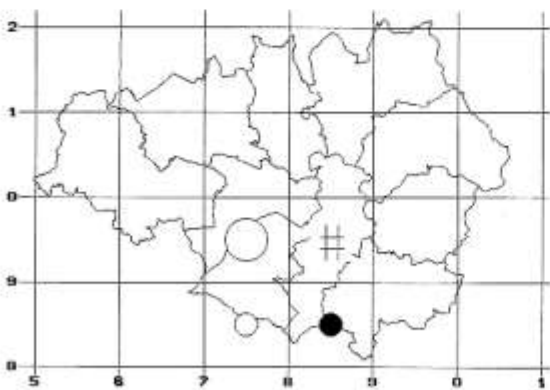
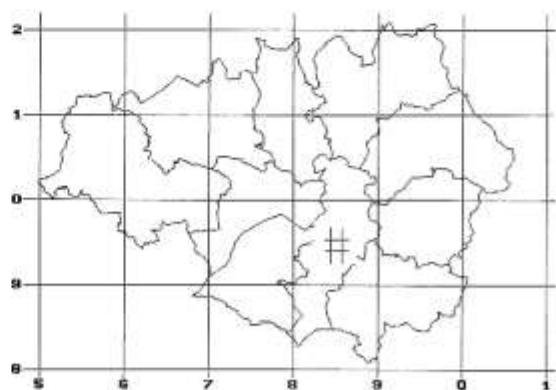


Fig.48. *Quercusia quercus*



BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS
 For explanation of symbols see page 79

Fig.49. *Satyrrium w-album*

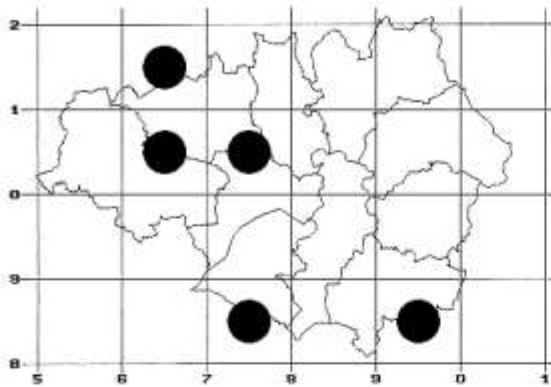


Fig.50. *Lycaena phlaeas*

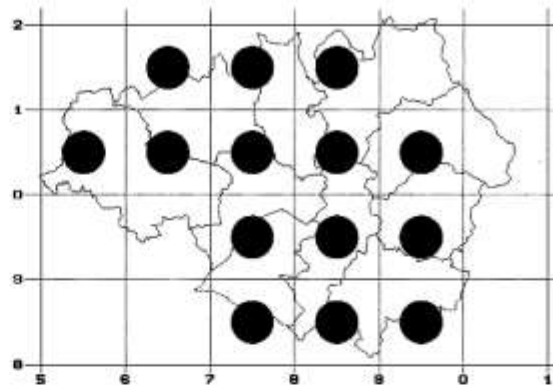


Fig.51. *Cupido minimus*

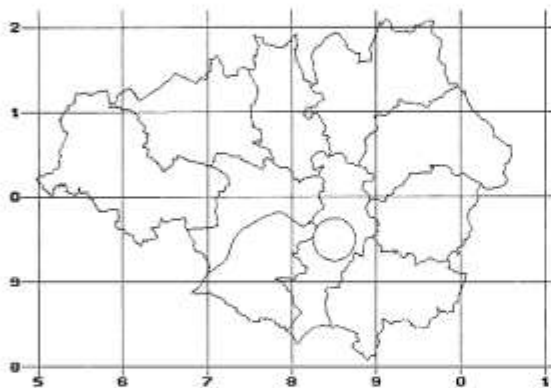


Fig.52. *Plebejus argus*

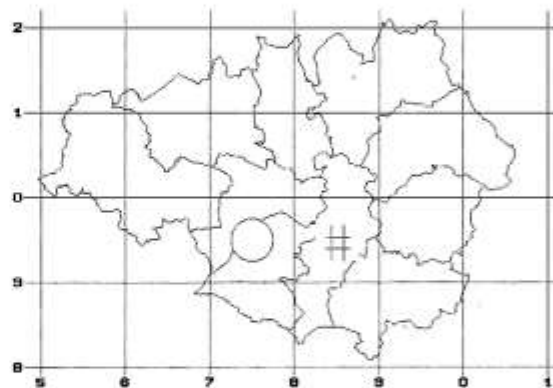


Fig.53. *Aricia artaxerxes*

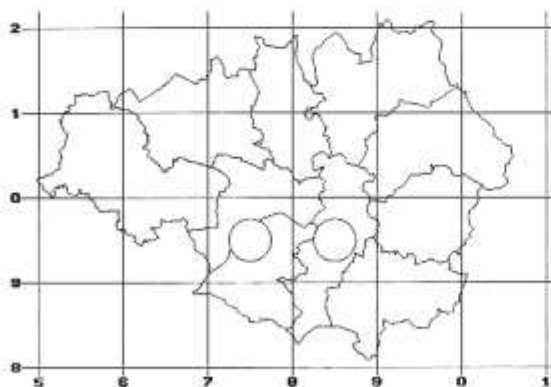
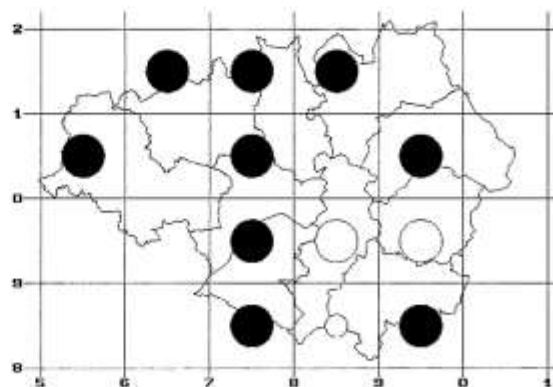


Fig.54. *Polyommatus icarus*



BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS
For explanation of symbols see page 78

Fig.55. *Celastrina argiolus*

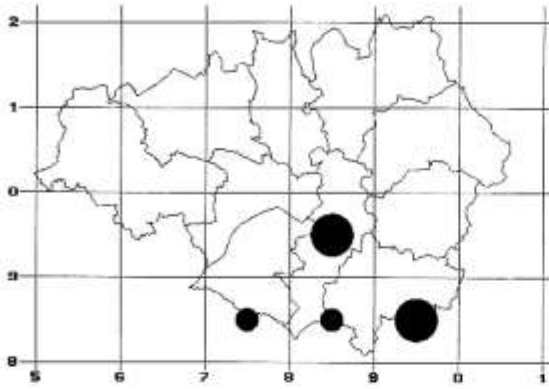


Fig.56. *Vanessa atalanta*

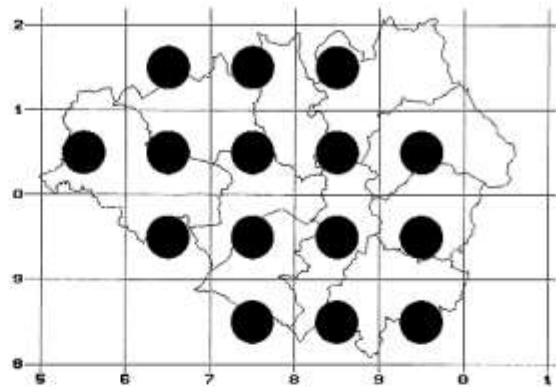


Fig.57. *Vanessa cardui*

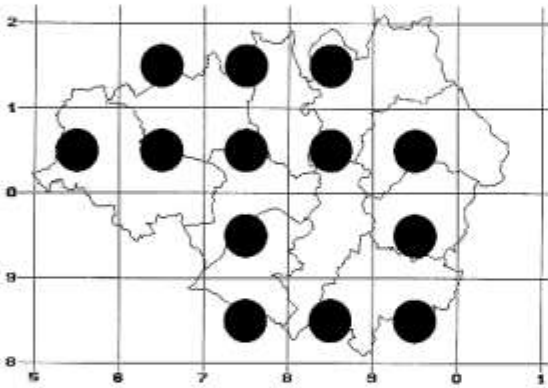


Fig.58. *Aglais urticae*

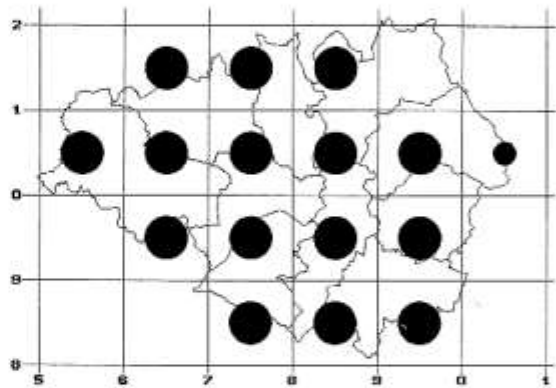


Fig.59. *Nymphalis polychloros*

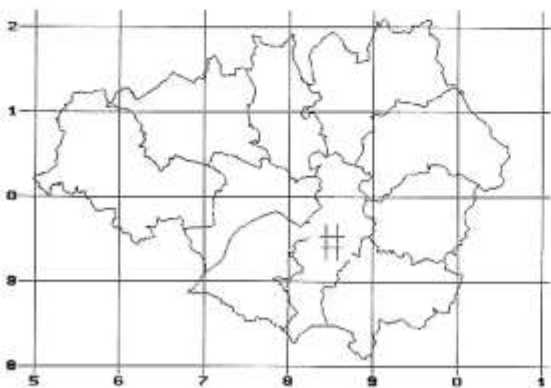
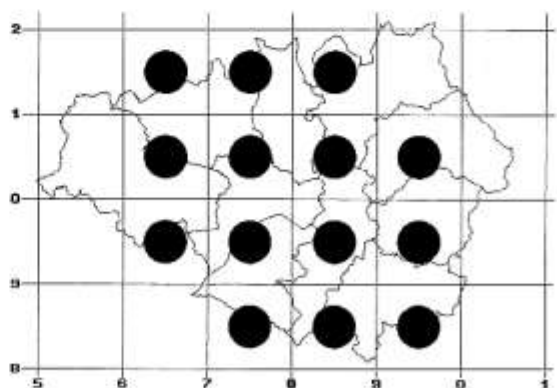


Fig.60. *Inachis io*



BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS
For explanation of symbols see page 78

Fig.61. *Polygonia c-album*

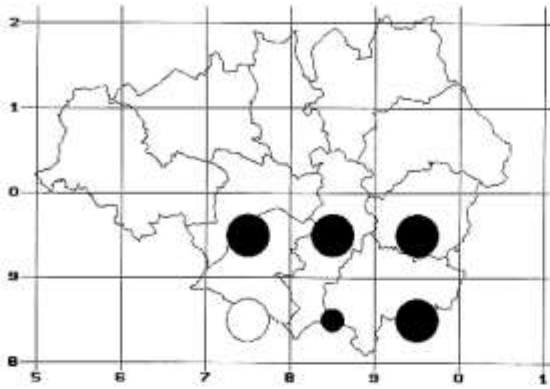


Fig.62. *Boloria selene*

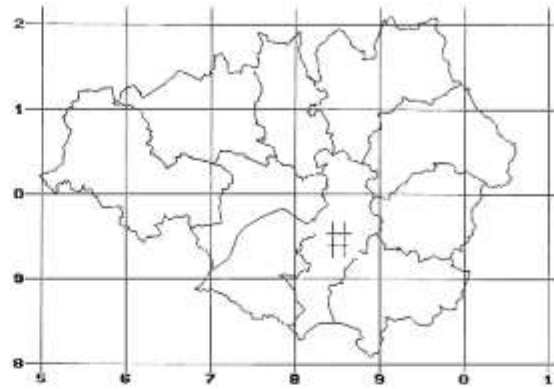


Fig.63. *Boloria euphrosyne*

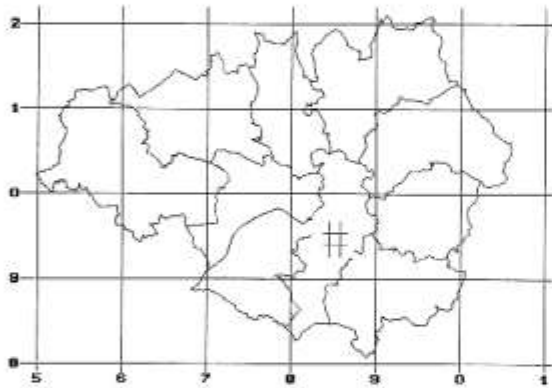


Fig.64. *Argynnis paphia*

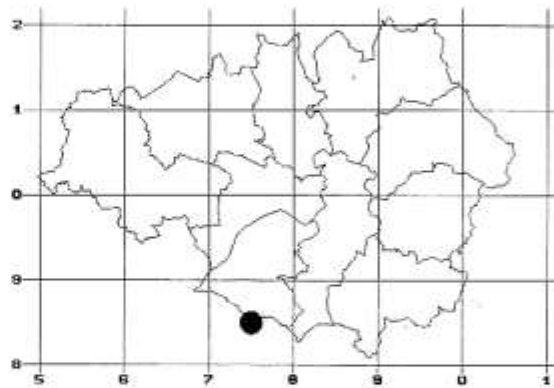


Fig.65. *Euphydryas aurinia*

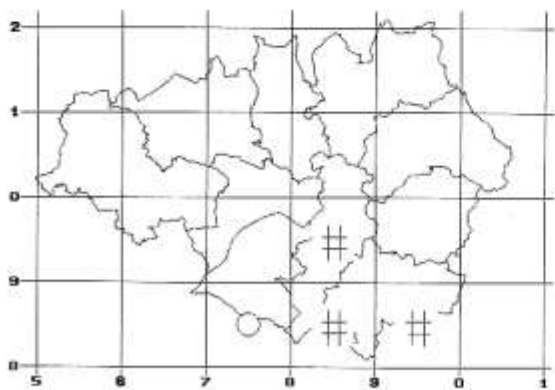
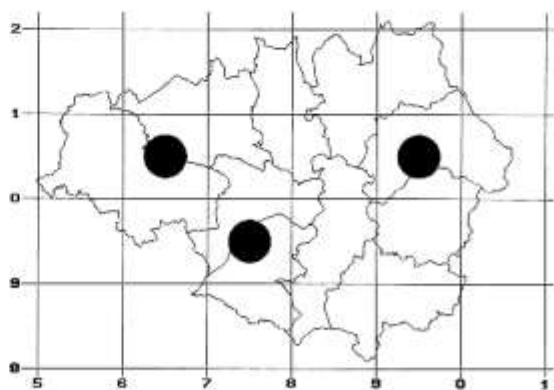


Fig.66. *Pararge aegeria*



BUTTERFLY DISTRIBUTIONS - HISTORIC RECORDS
 For explanation of symbols see page 78

Fig.67. *Lasiommata megera*

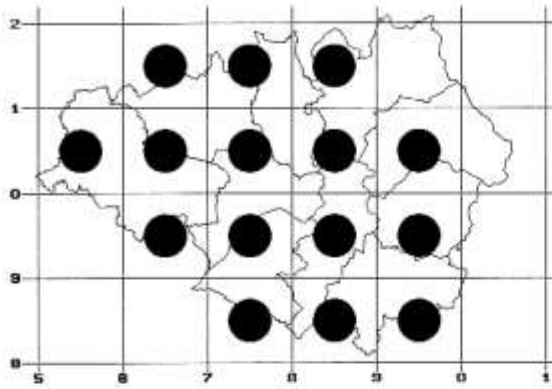


Fig.68. *Hipparchia semele*

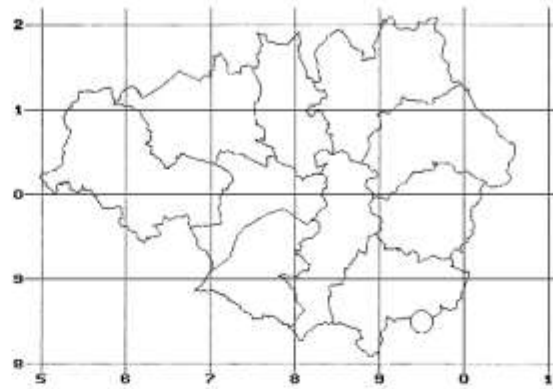


Fig.69. *Pyronia tithonus*

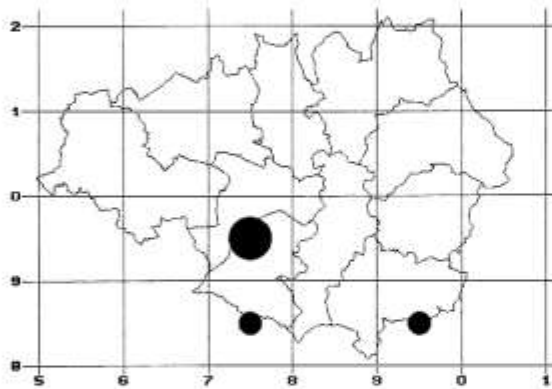


Fig.70. *Maniola jurtina*

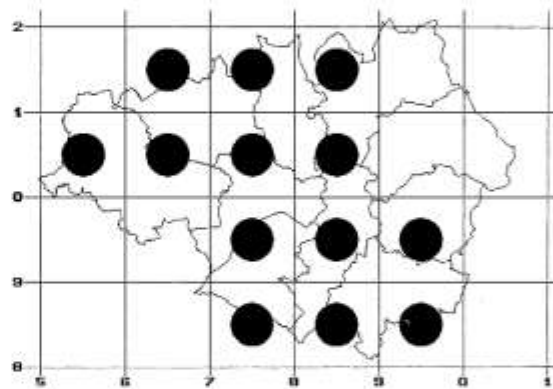


Fig.71. *Coenonympha pamphilus*

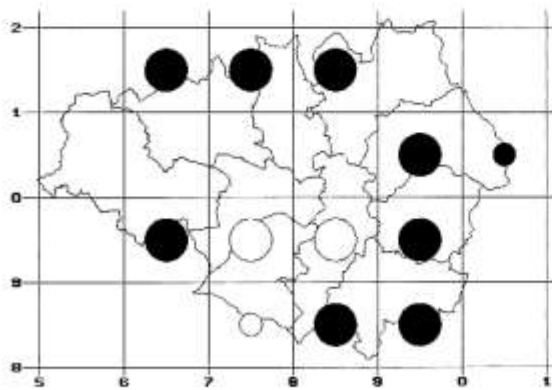
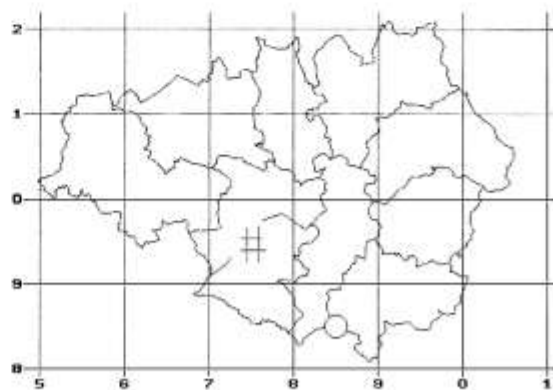


Fig.72. *Coenonympha tullia*



ENVIRONMENTS - 7 X 5 KM ZONE

Fig.73. THE 7 X 5 KM ZONE

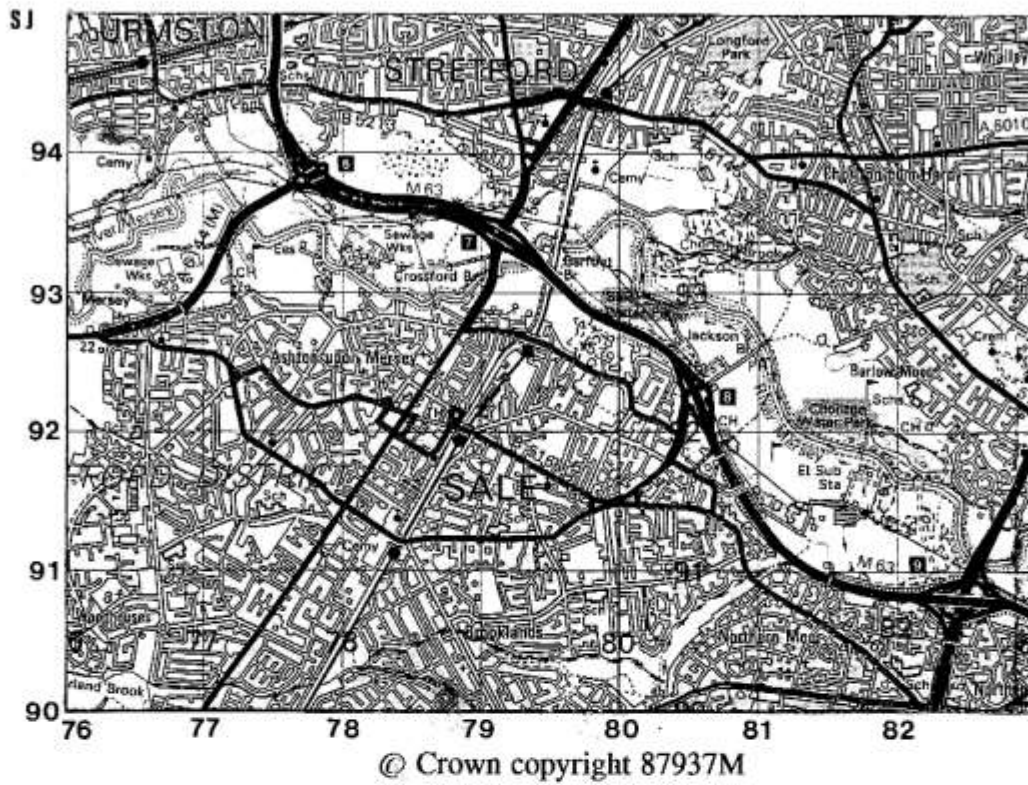
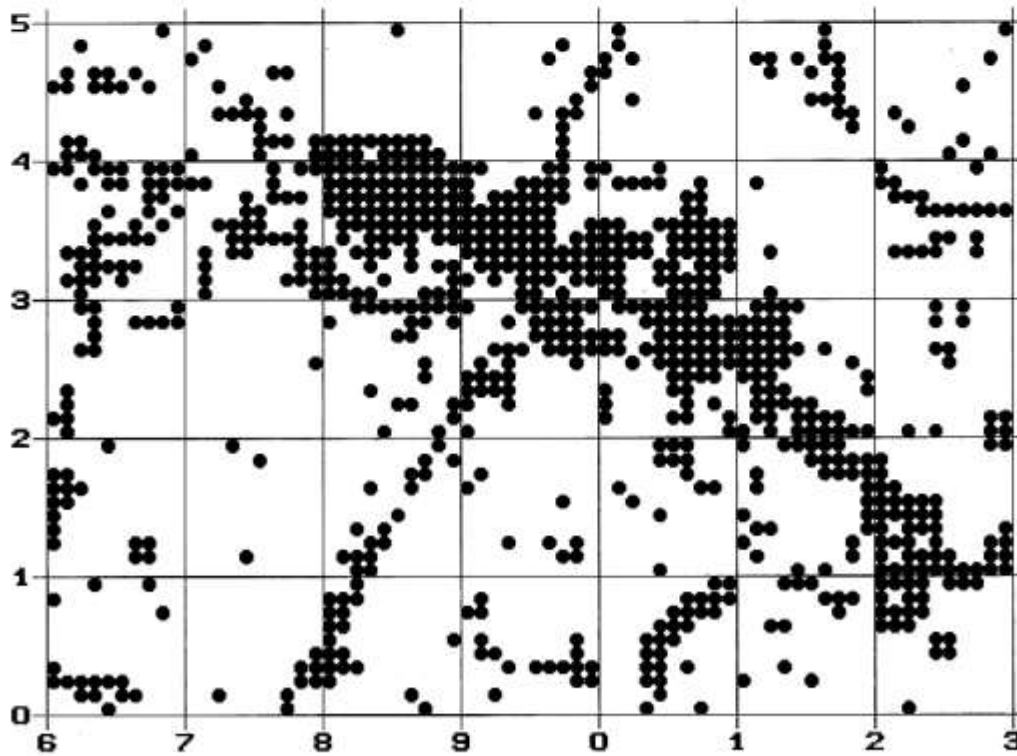


Fig.74. GRASS AND SEMI-NATURAL VEGETATION POTENTIALLY SUITABLE AS HABITAT



ENVIRONMENTS - 7 X 5 KM ZONE

Fig.75. HEAVILY GRAZED SITES UNSUITABLE AS HABITAT

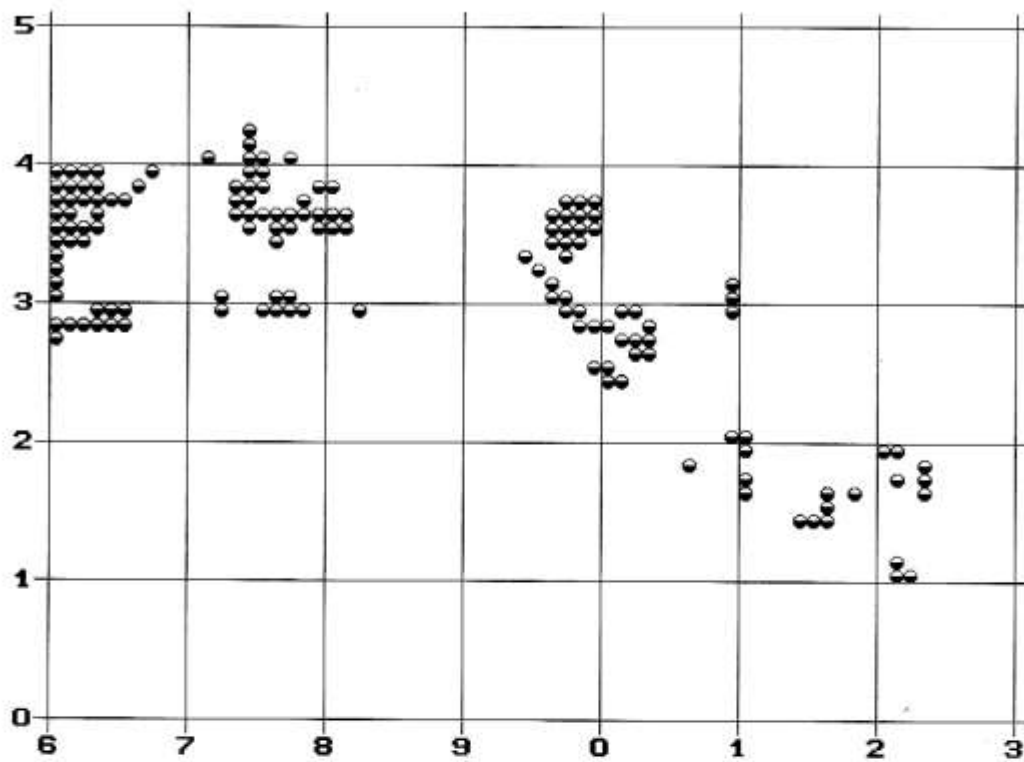
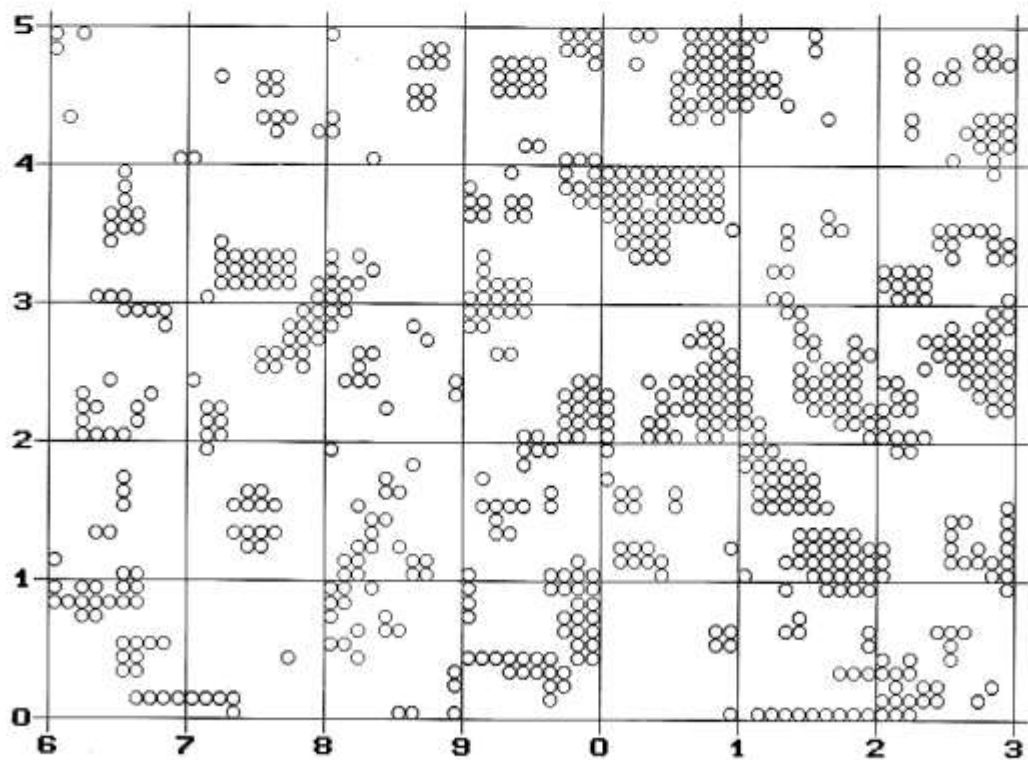


Fig.76. FORMAL OPEN SPACES WITH MOWN GRASS, UNSUITABLE AS HABITAT



URBAN COVER - 7 X 5 KM ZONE
Full-size symbols, 50-100% cover. Half-size symbols, less than 50% cover.

Fig.77. URBAN COVER in 1996

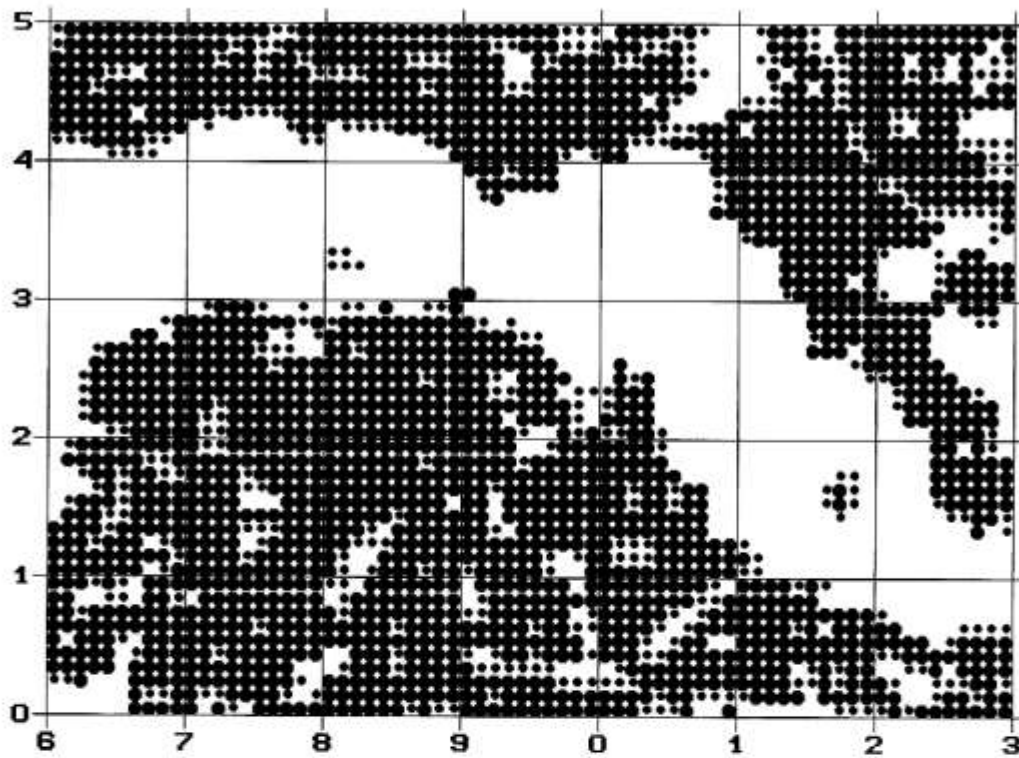
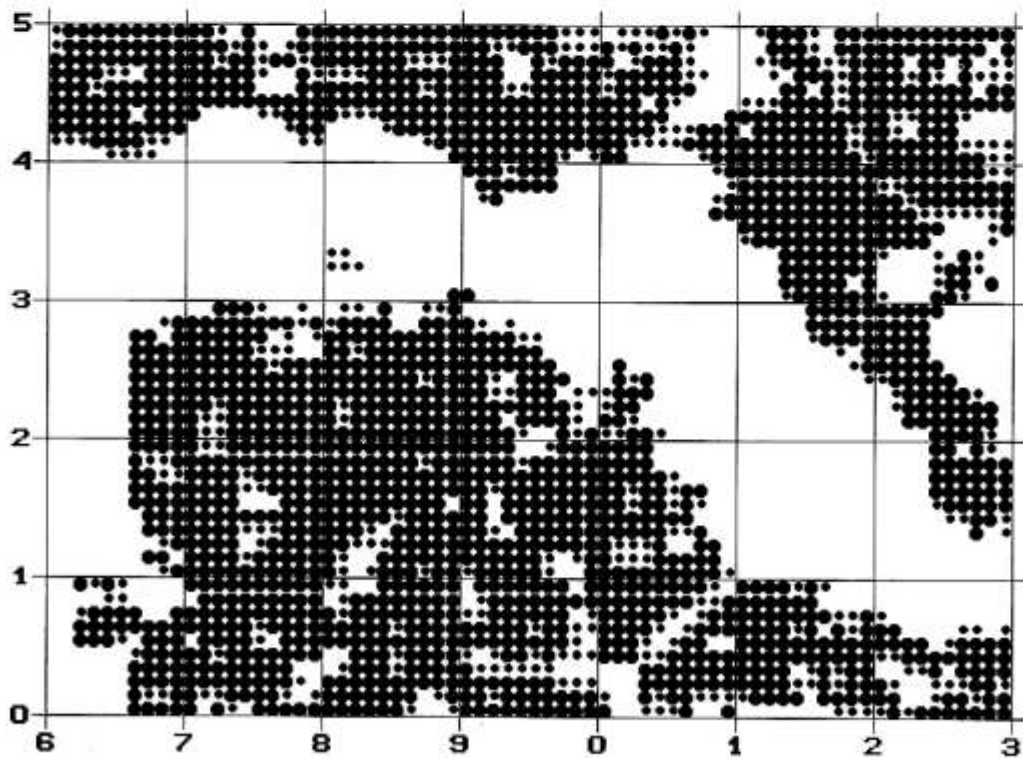


Fig.78. URBAN COVER PRIOR TO 1960



RECORDING COVERAGE - 7 X 5 KM ZONE
Open circles in fig.79, visits in winter only. Other symbols, graded from smallest size (dot) 1 visit during period to largest size 100+ visits.

Fig.79. RECORDING COVERAGE 1994-7, WHOLE YEAR

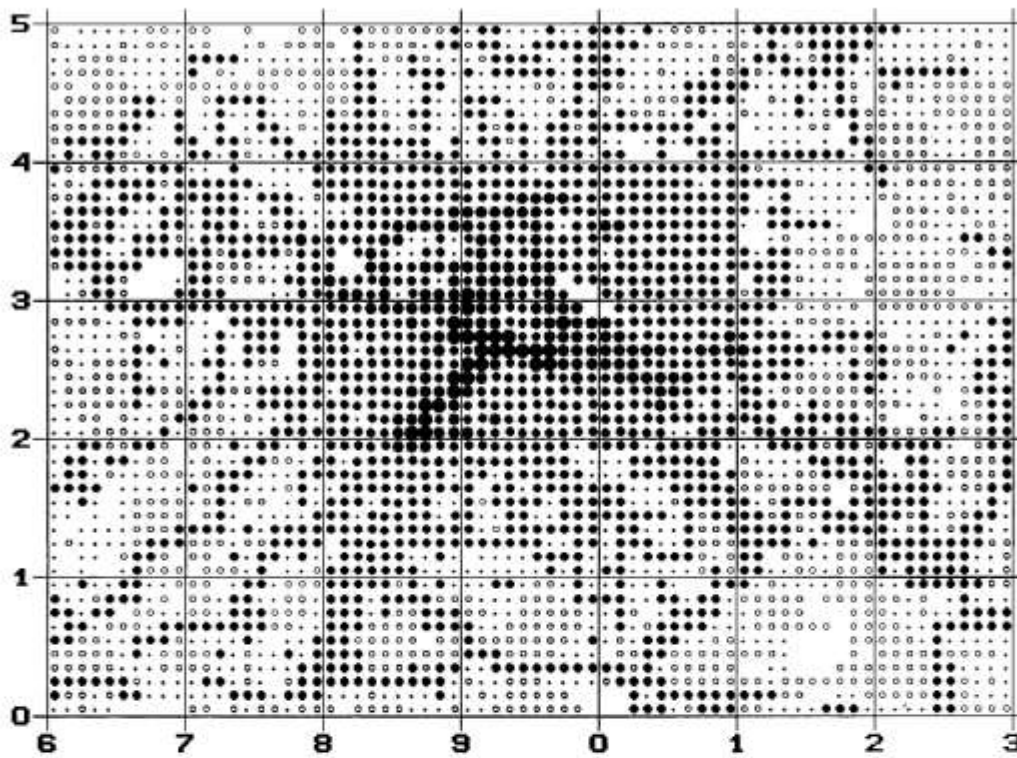
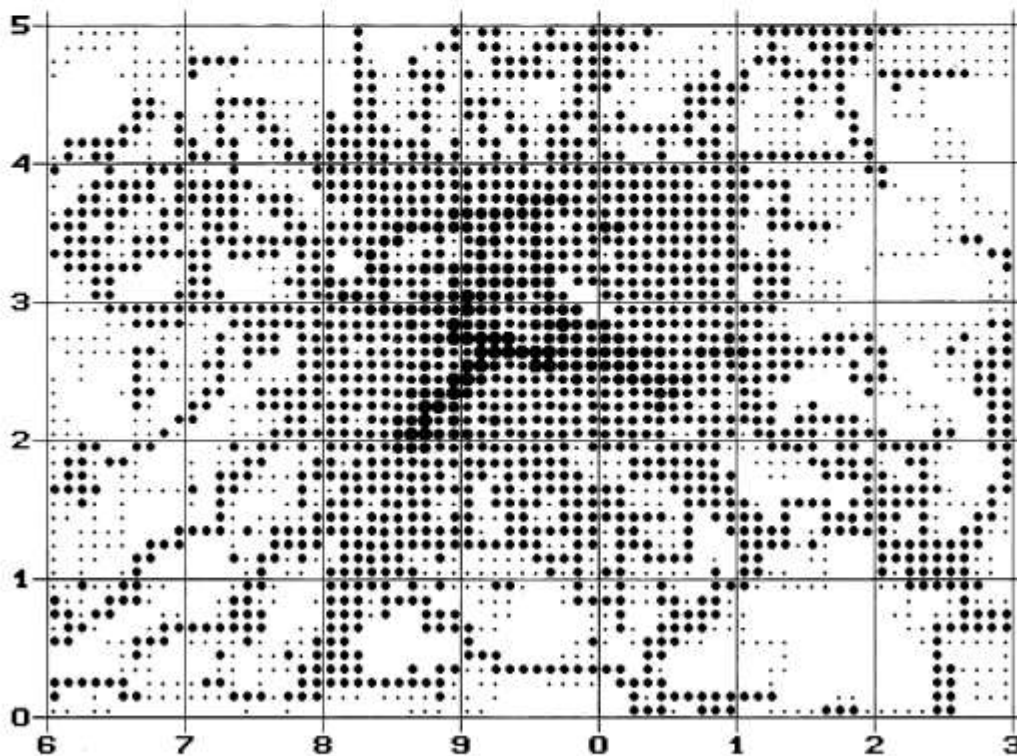
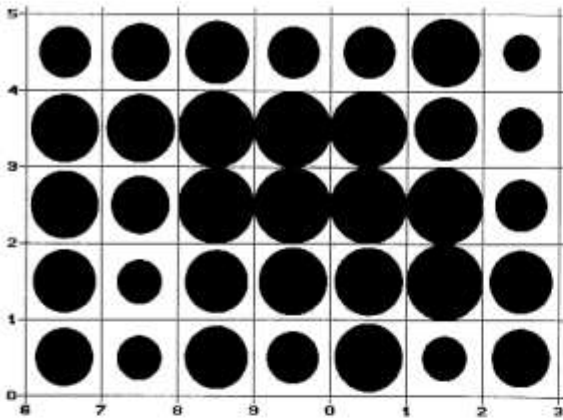


Fig.80. RECORDING COVERAGE 1994-7, DURING BUTTERFLY SEASON



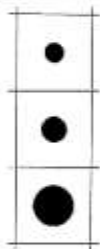
BUTTERFLY DISTRIBUTIONS, 1992-1997 - 7 X 5 KM ZONE

Fig.81. RECORDS OF ALL BUTTERFLY SPECIES IN 7 X 5 KM ZONE



7	9	12	7	8	13	3
13	14	20	20	16	12	6
13	10	19	19	17	17	7
11	6	12	13	14	17	12
10	6	11	7	14	6	9

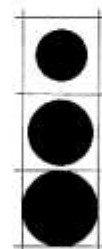
In the following figures 82 to 101, the symbols denote the percentage of the 100 m squares visited, within the 1 km square, in which the butterfly species was recorded:



1-5%

6-10%

11-20%



21-50%

51-75%

76-100%

Fig.82. *Thymelicus sylvestris*

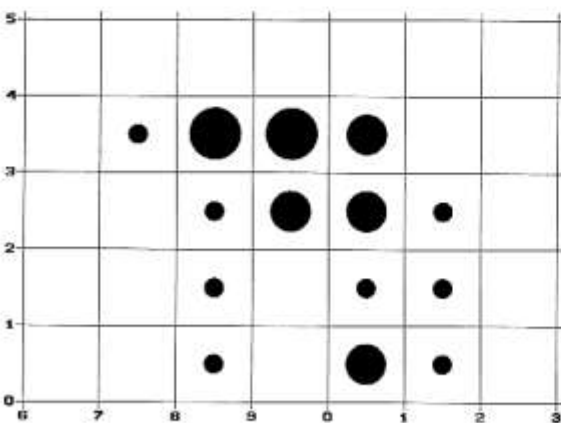
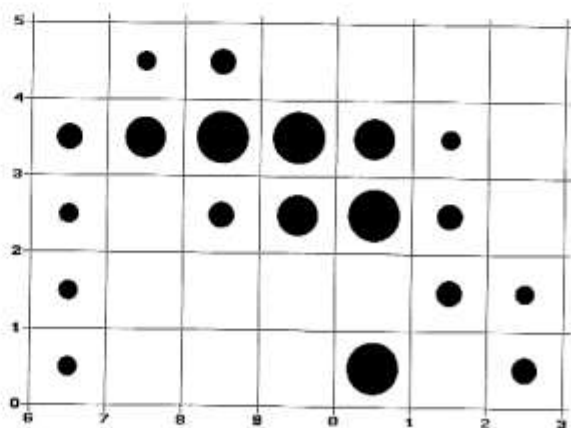


Fig.83. *Ochlodes venata*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 7 X 5 KM ZONE
 For explanation of symbols see page 89

Fig.84. *Colias croceus*

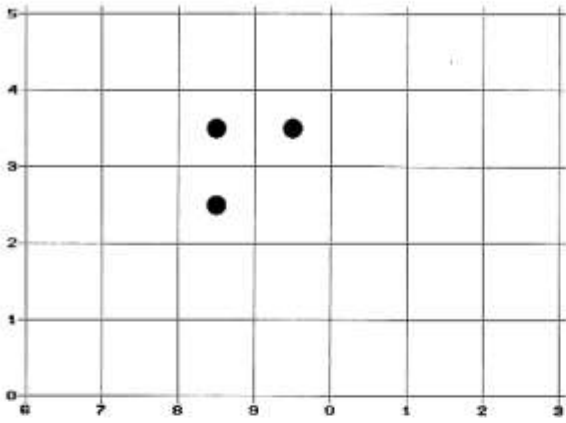


Fig.85. *Gonepteryx rhamni*

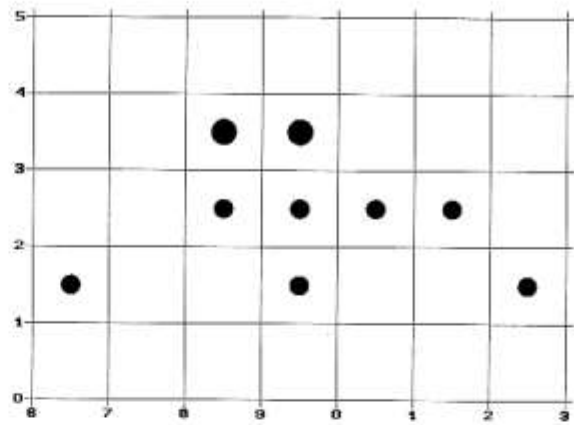


Fig.86. *Pieris brassicae*

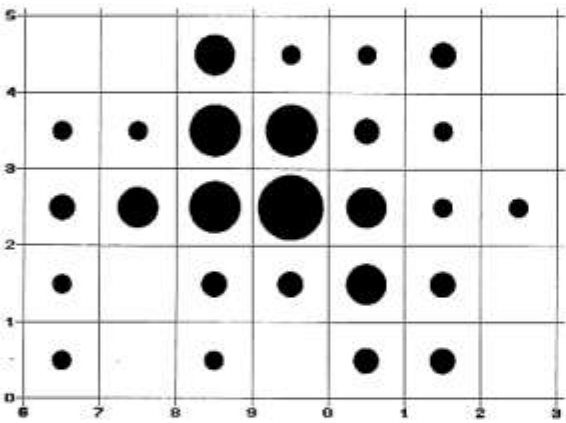


Fig.87. *Pieris rapae*

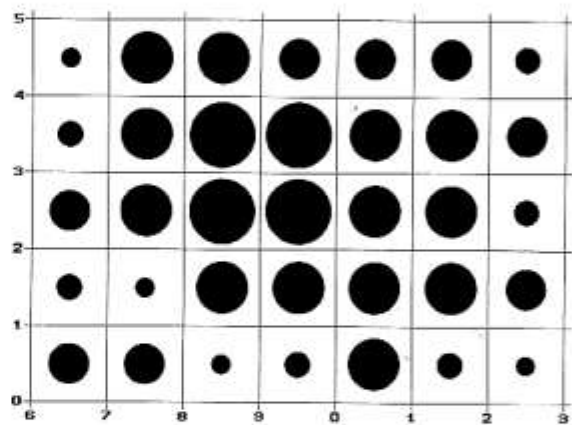


Fig.88. *Pieris napi*

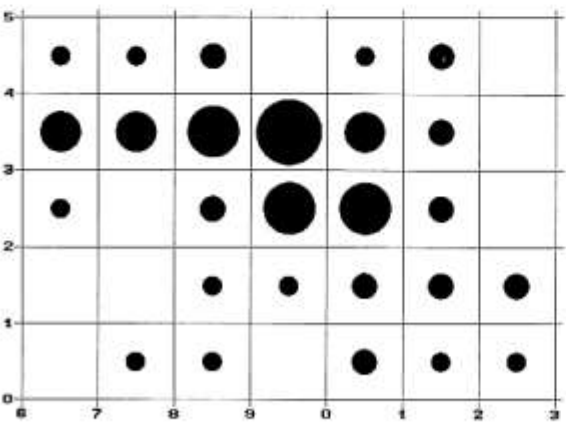
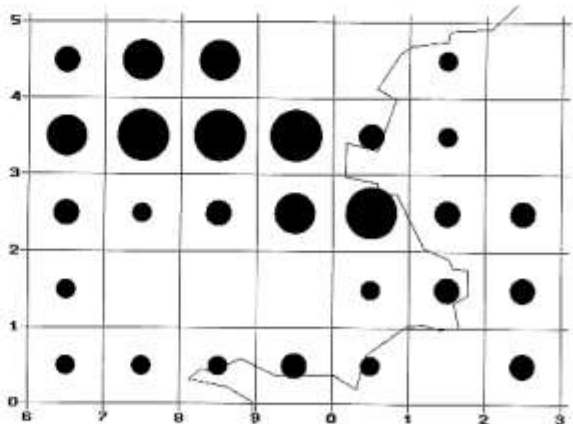


Fig.89. *Anthocharis cardamines*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 7 X 5 KM ZONE
 For explanation of symbols see page 89

Fig.90. *Lycaena phlaeas*

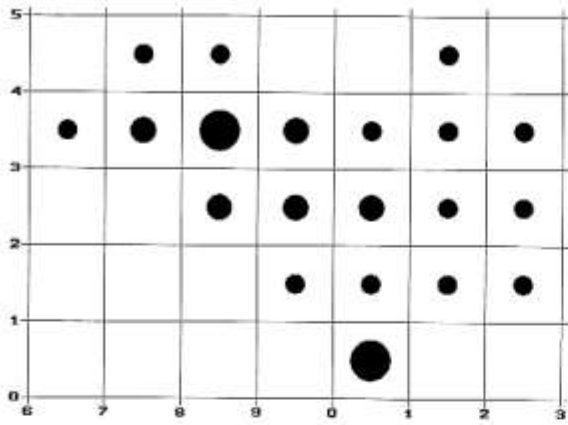


Fig.91. *Polyommatus icarus*

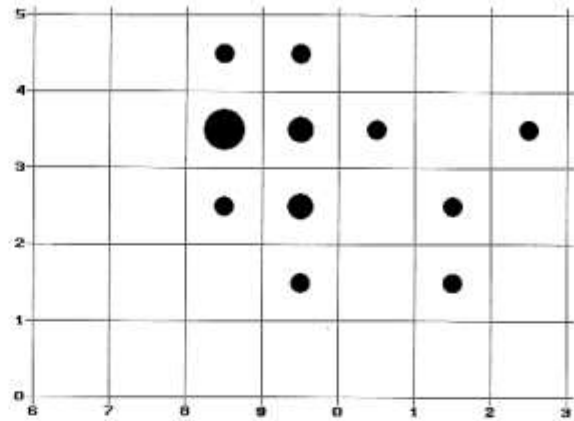


Fig.92. *Celastrina argiolus*

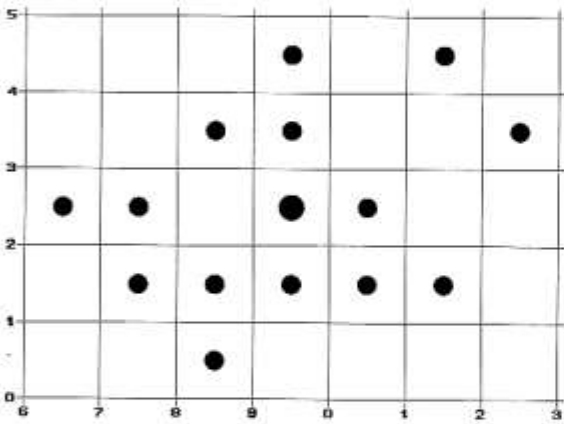


Fig.93. *Vanessa atalanta*

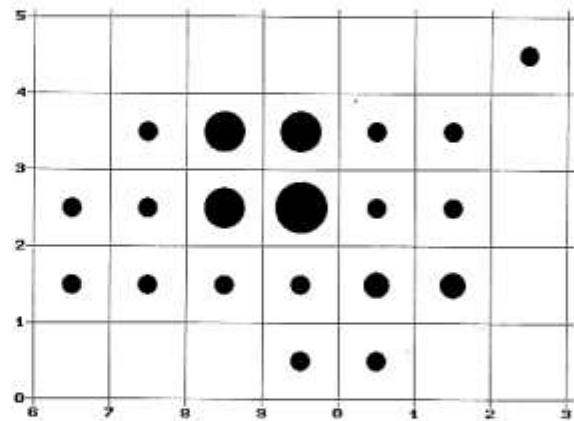


Fig.94. *Vanessa cardui*

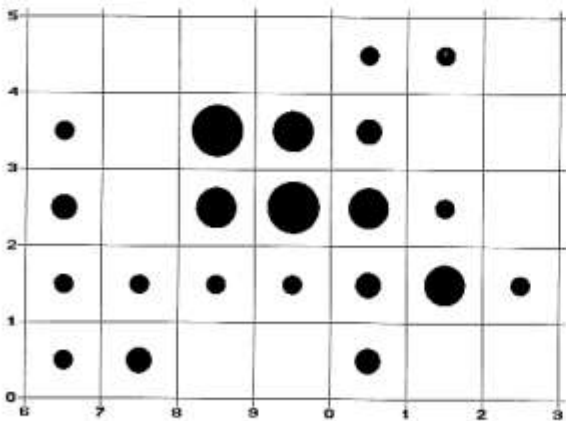
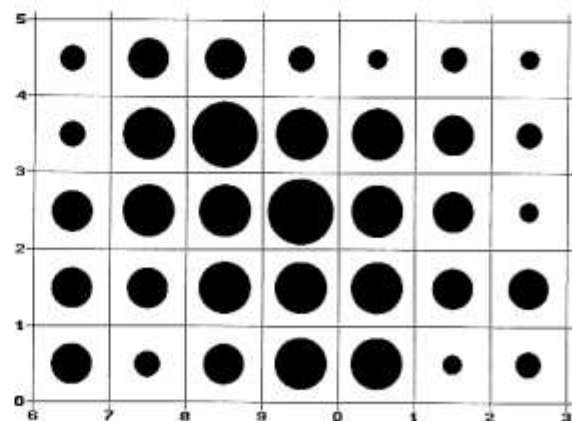


Fig.95. *Aglais urticae*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 7 X 5 KM ZONE
 For explanation of symbols see page 89

Fig.96. *Inachis io*

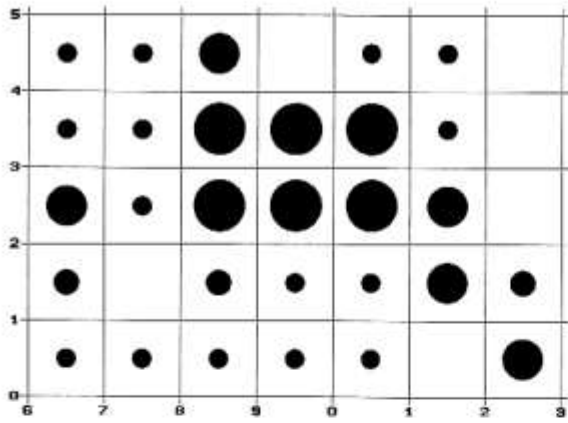


Fig.97. *Polygonia c-album*

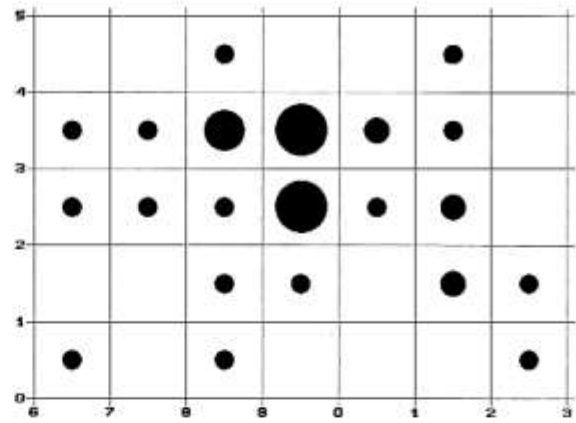


Fig.98. *Pararge aegeria*

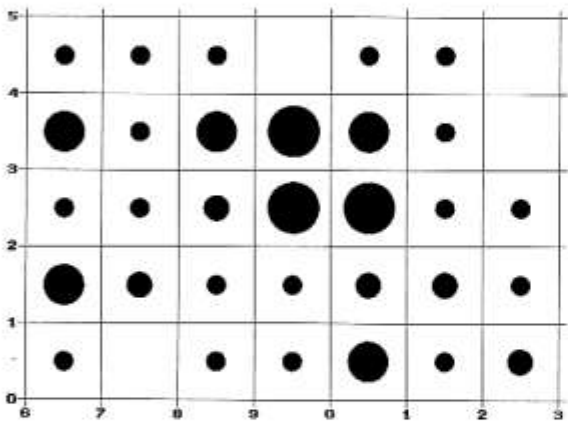


Fig.99. *Lasiommata megera*

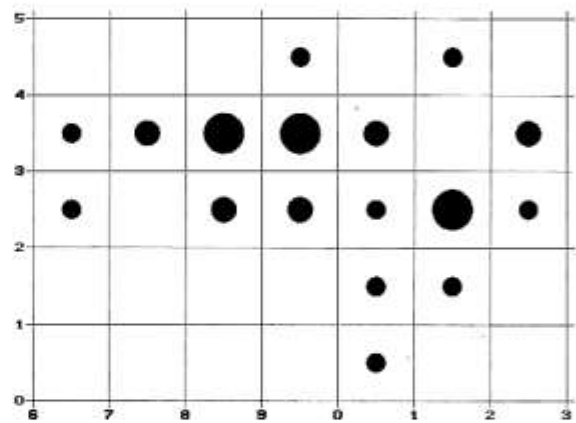


Fig.100. *Pyronia tithonus*

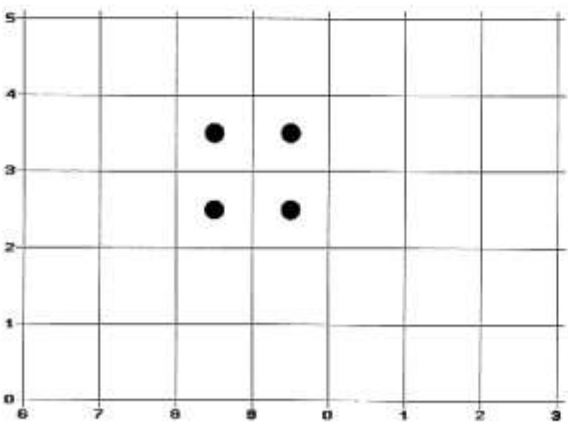
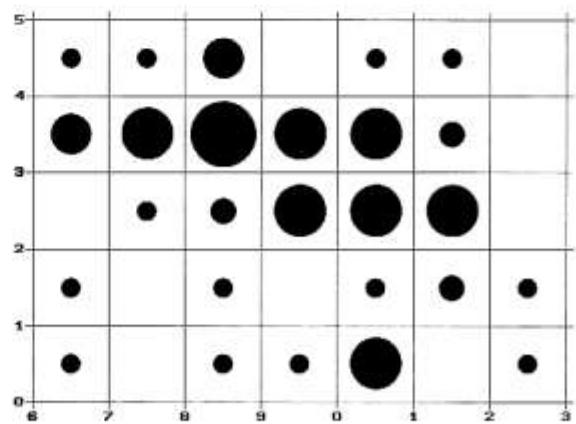


Fig.101. *Maniola jurtina*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.102. GRASSLAND, hostplant-habitat for Hesperids & Satyrines

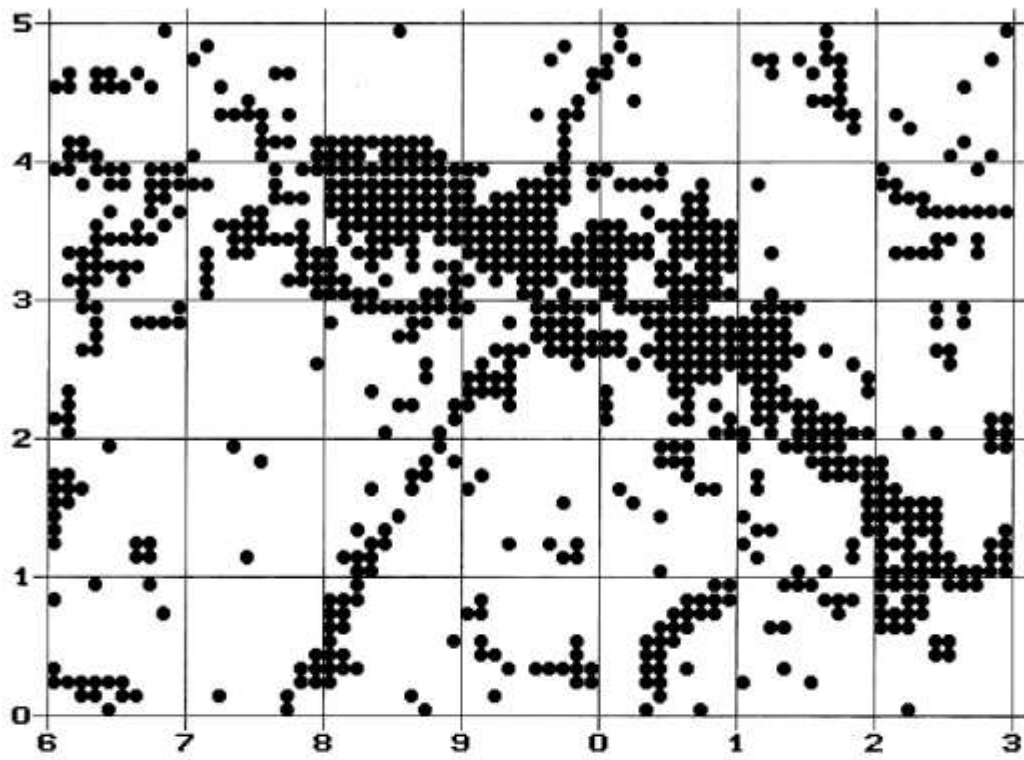
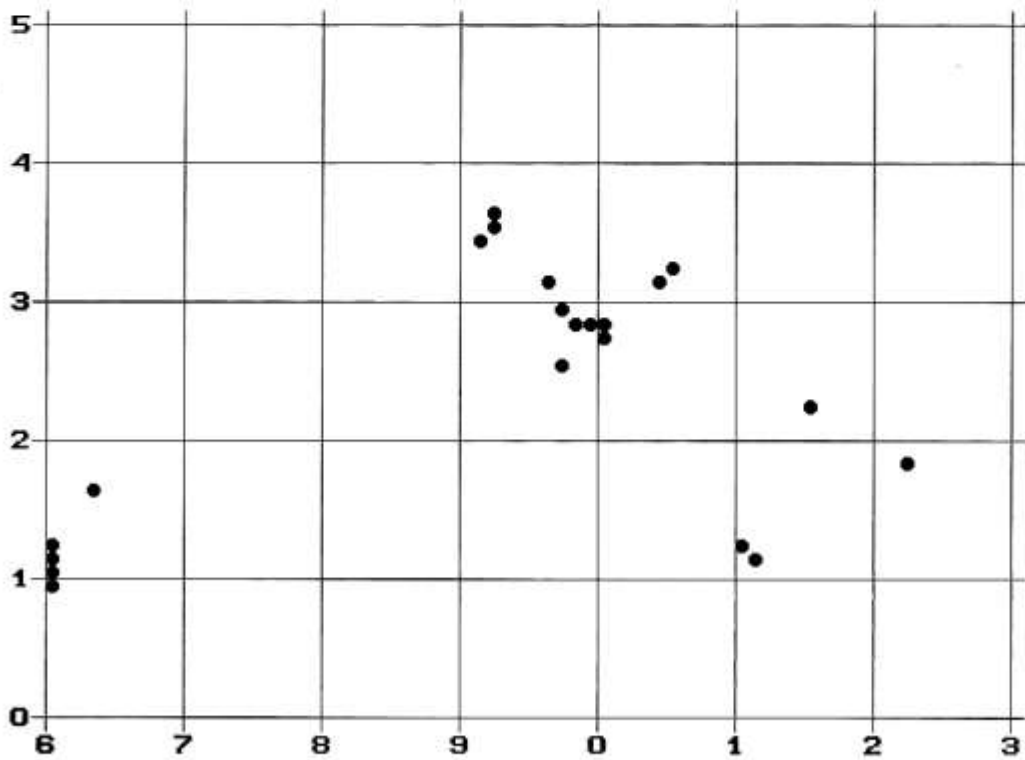


Fig.103. ALDER BUCKTHORN, hostplant-habitat for *G.rhamni*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.104. CULTIVATED CRUCIFERS, hostplant-habitat for *P.brassicae* & *P.rapae*

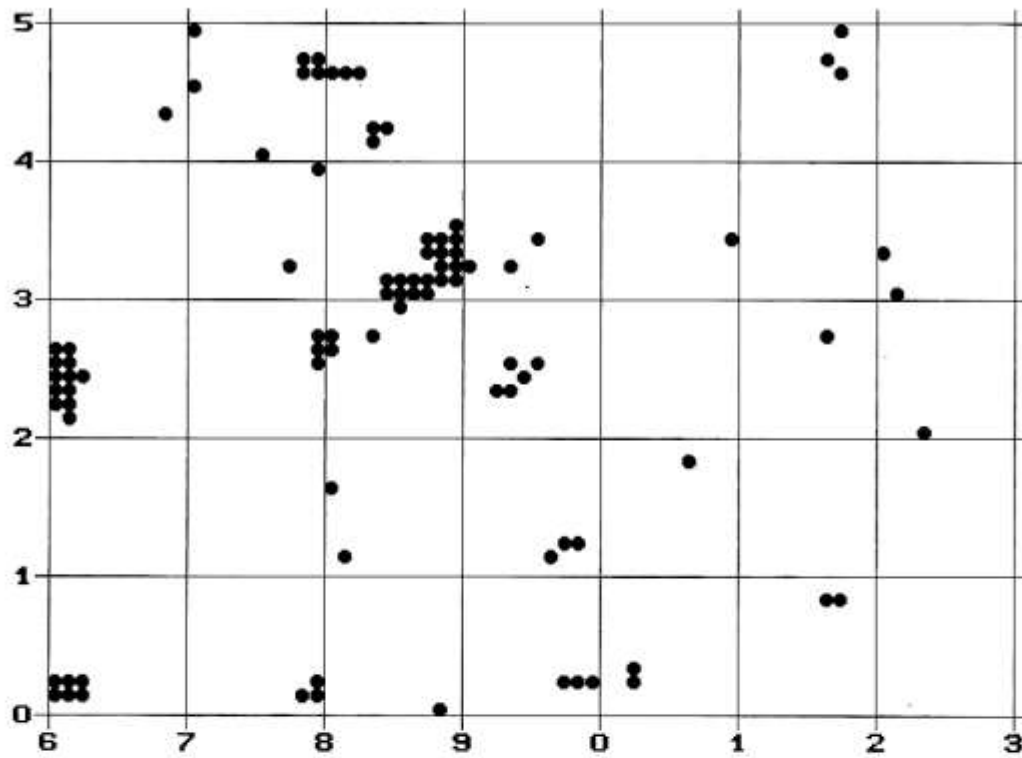
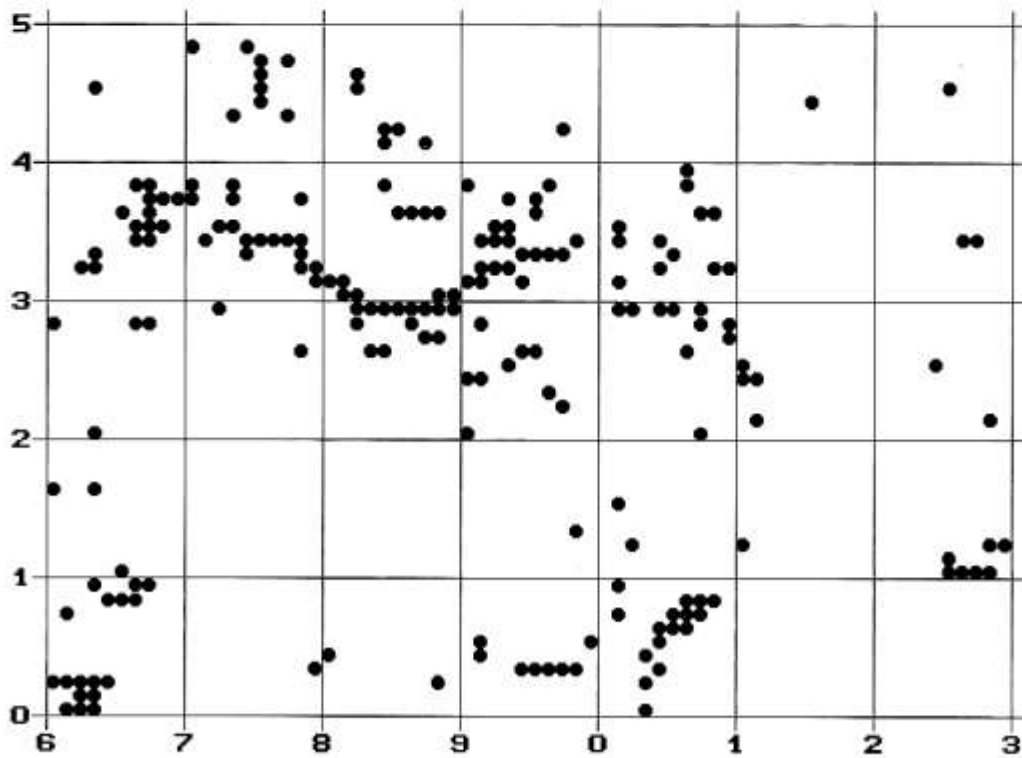


Fig.105. WILD CRUCIFERS, hostplant-habitat for *P.brassicae*, *P.rapae*, *P.napi*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.106. CUCKOO FLOWER, hostplant-habitat for *A.cardamines* & *P.napi*

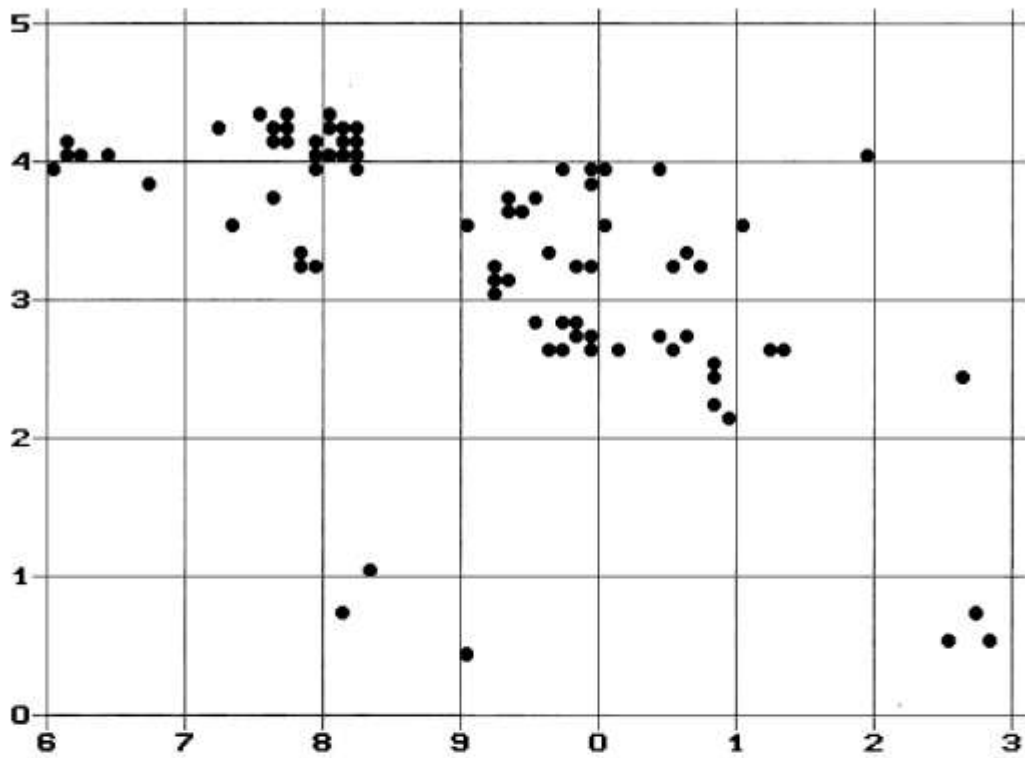
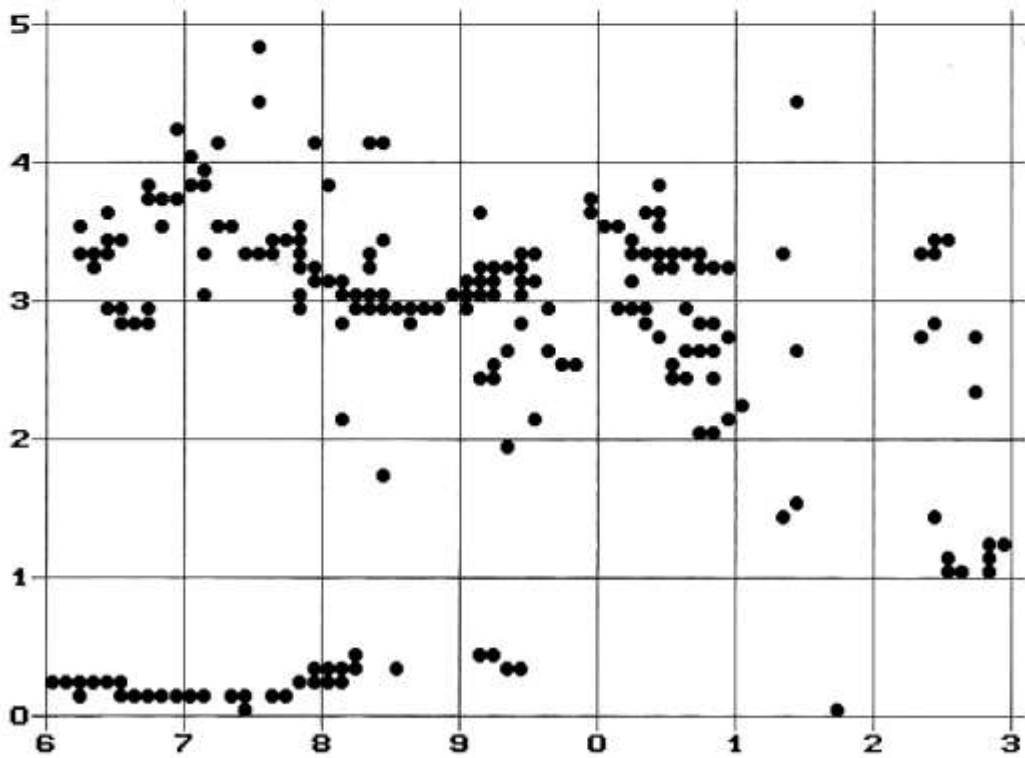


Fig.107. GARLIC MUSTARD, hostplant-habitat for *A.cardamines* & *P.napi*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.108. SWEET ROCKET, alternative hostplant for *A.cardamines*

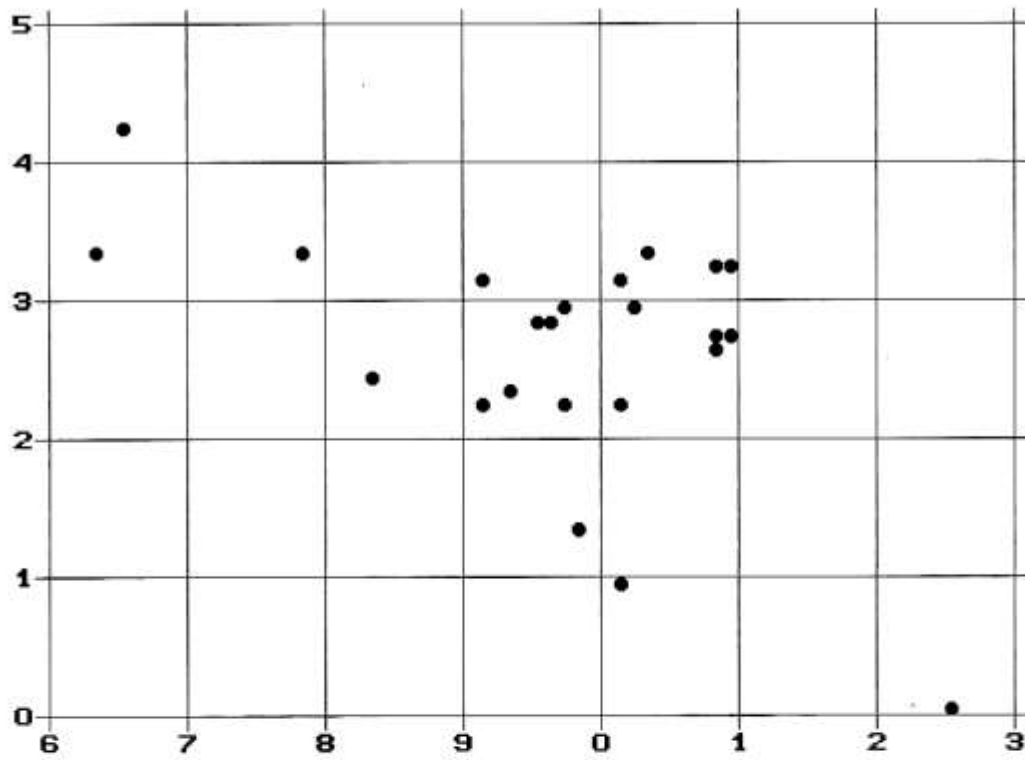
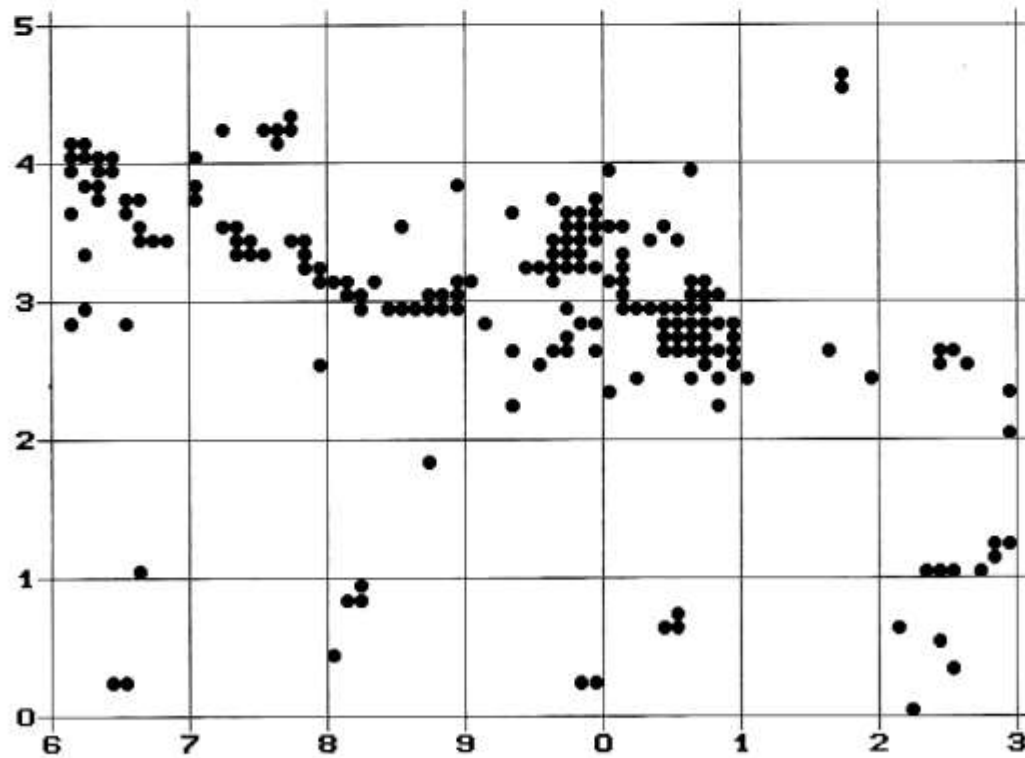


Fig.109. SORREL, hostplant-habitat for *L.phlaeas*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.110. CLOVER, hostplant/habitat for *C.croceus* and *P. icarus*

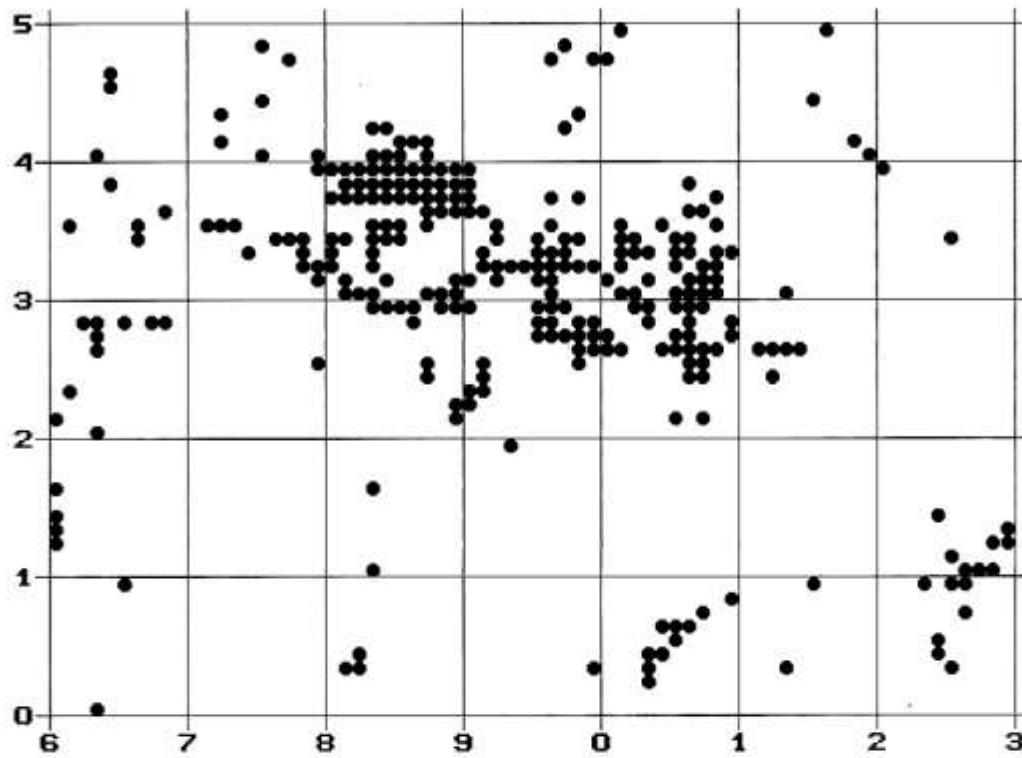
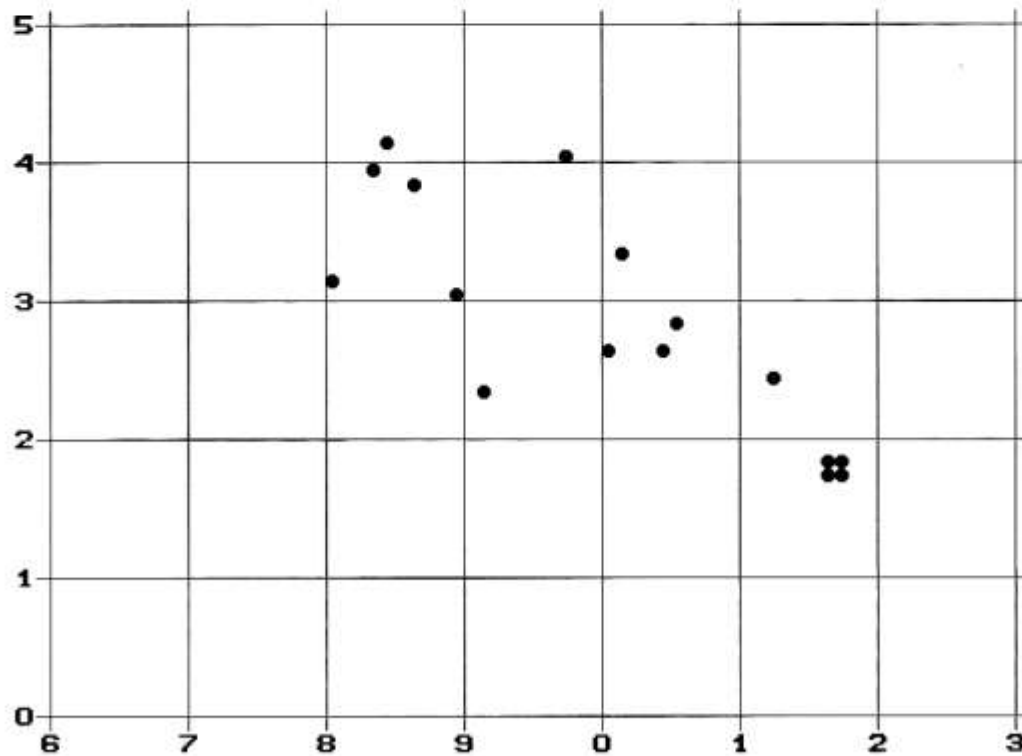


Fig.111. BIRD'S-FOOT TREFOIL, hostplant-habitat for *P. icarus*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.112. HOLLY, hostplant-habitat for *C.argiolus*

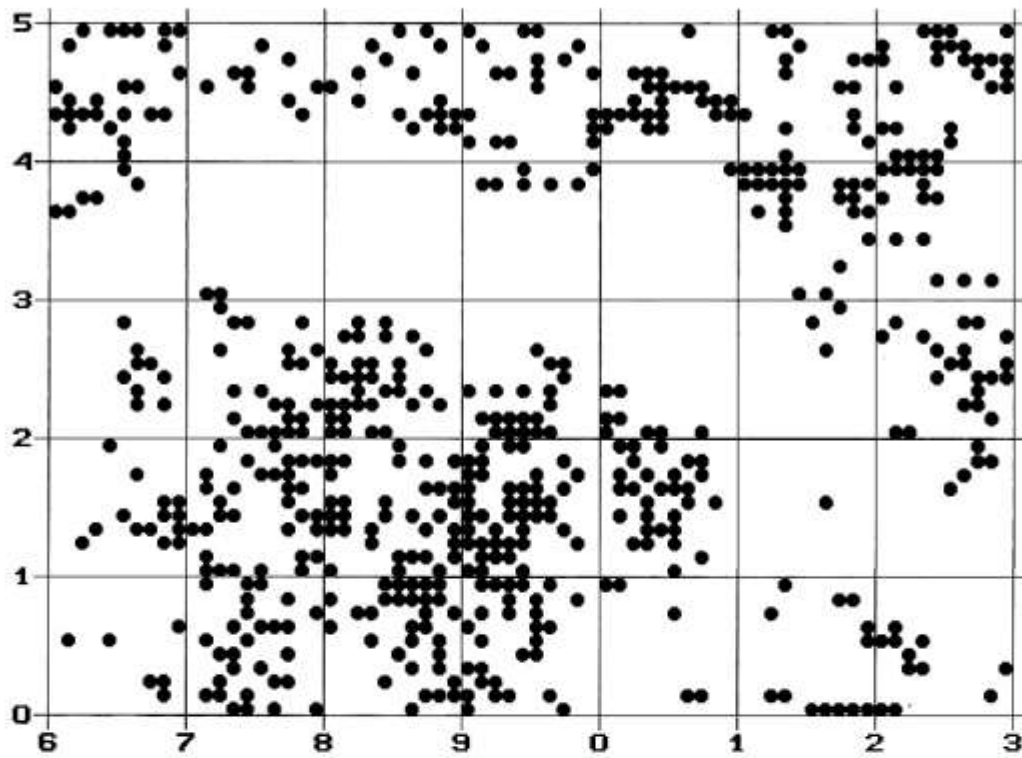
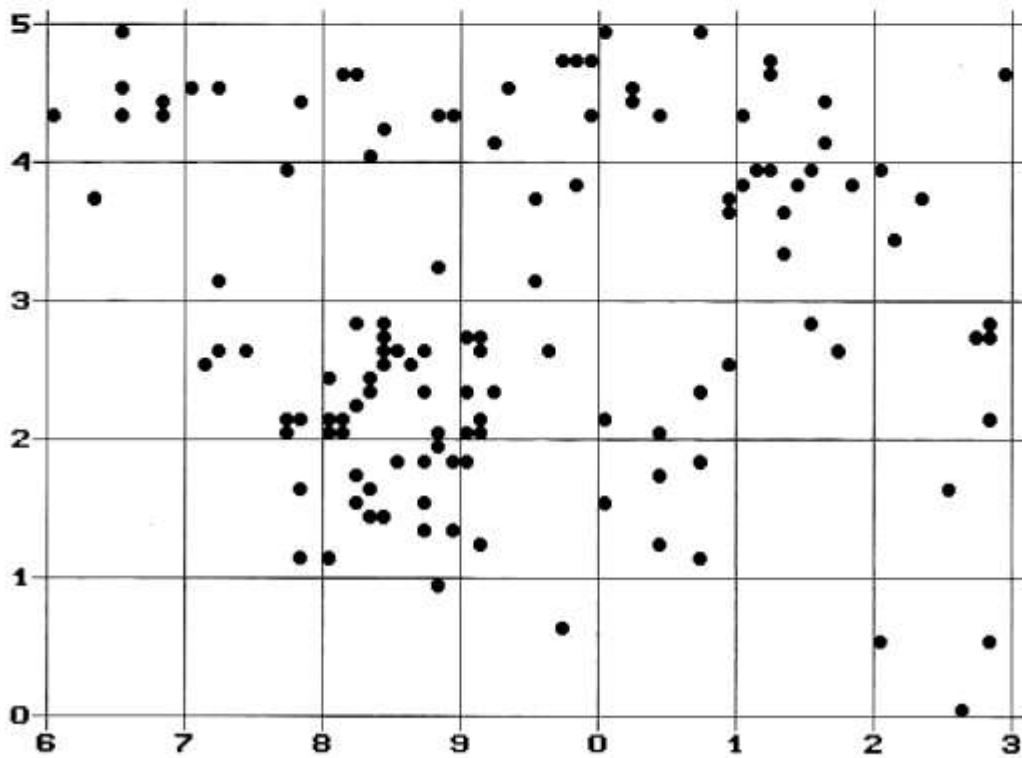


Fig.113. IVY, hostplant-habitat for *C. argiolus*



HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.114. NETTLE, hostplant-habitat for *V.atalanta*, *A.urticae*, *I.io*, *P.c-album*

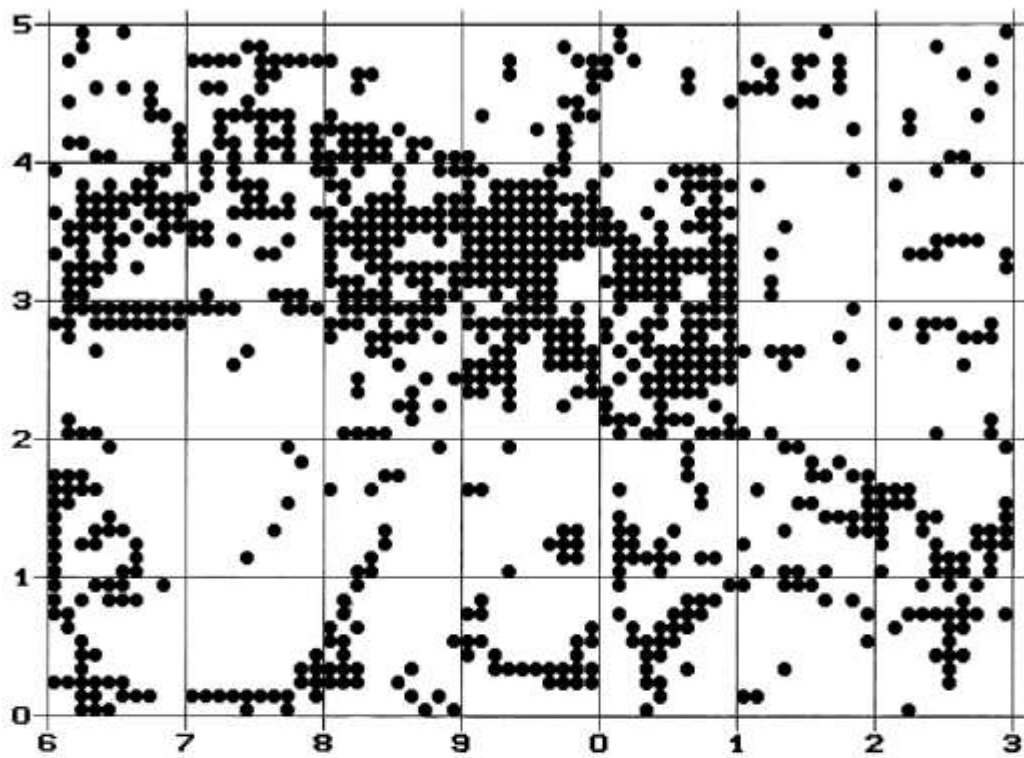
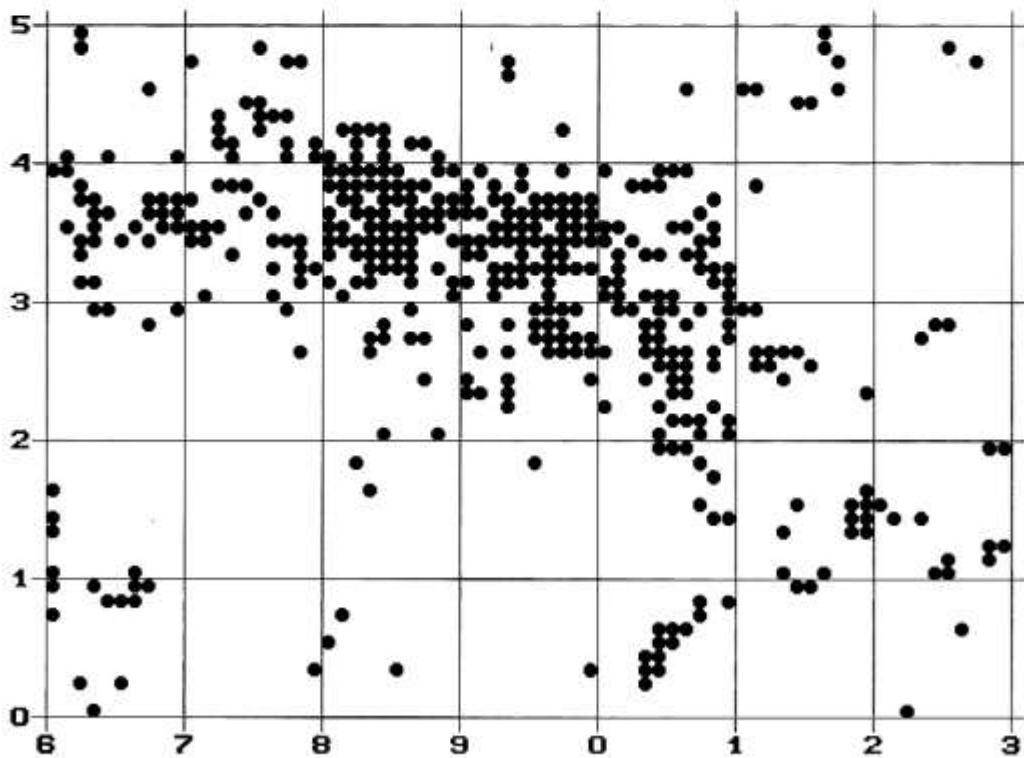
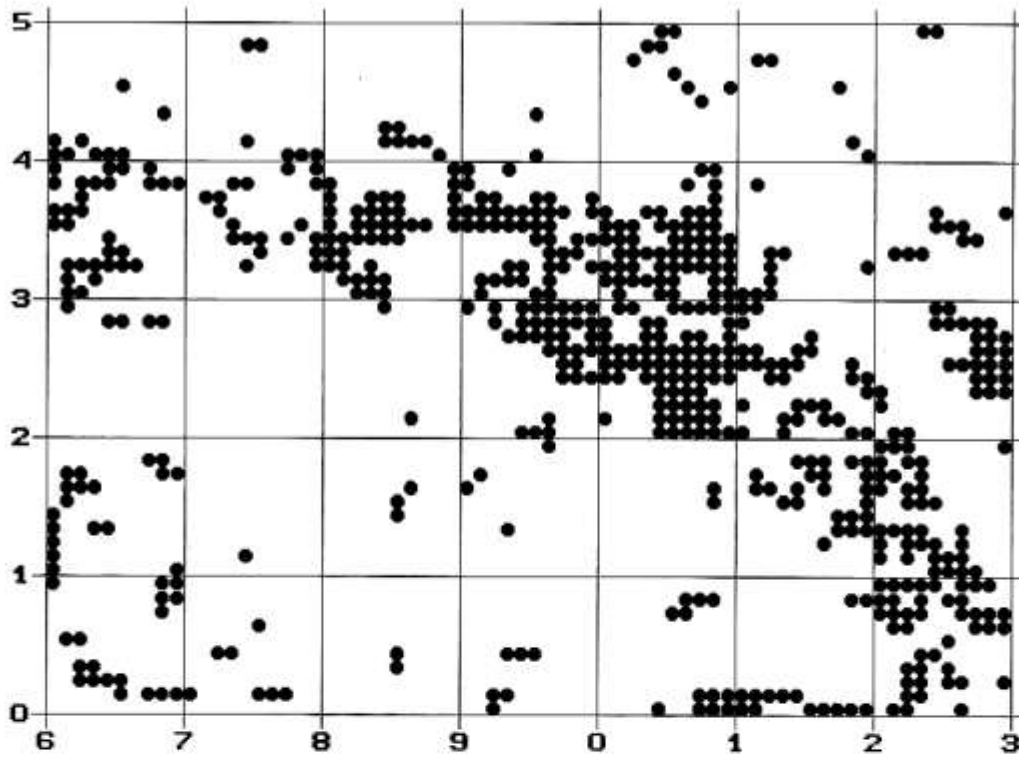


Fig.115. THISTLE, hostplant-habitat for *V.cardui*



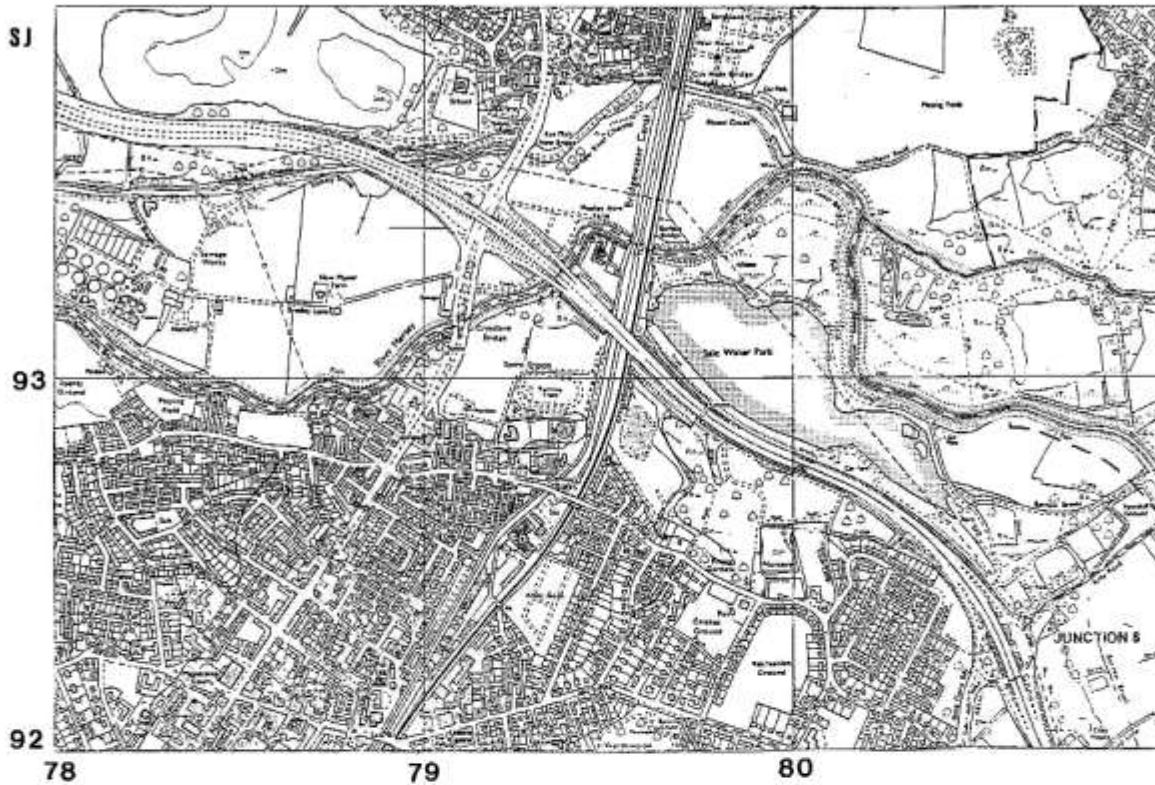
HOSTPLANT-HABITATS - 7 X 5 KM ZONE

Fig.116. WOODLAND WITH GRASS, hostplant-habitat for *P.aegeria*



3 X 2 KM ZONE

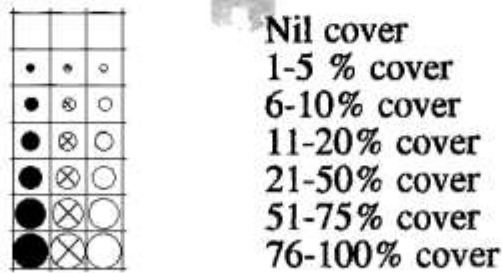
Fig.117. THE 3 X 2 KM ZONE



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ENVIRONMENTS IN THE 3 X 2 KM ZONE

In figures 118 to 125, the graded symbols denote the approximate percentage of each 100 m square covered by the environment type, thus:



The above symbols also apply to the Hostplant-habitat maps, figures 148 to 162.

ENVIRONMENTS - 3 X 2 KM ZONE
For explanation of symbols see page 101

Fig.118. GRASSLAND ASSESSED AS POTENTIALLY SUITABLE HABITAT

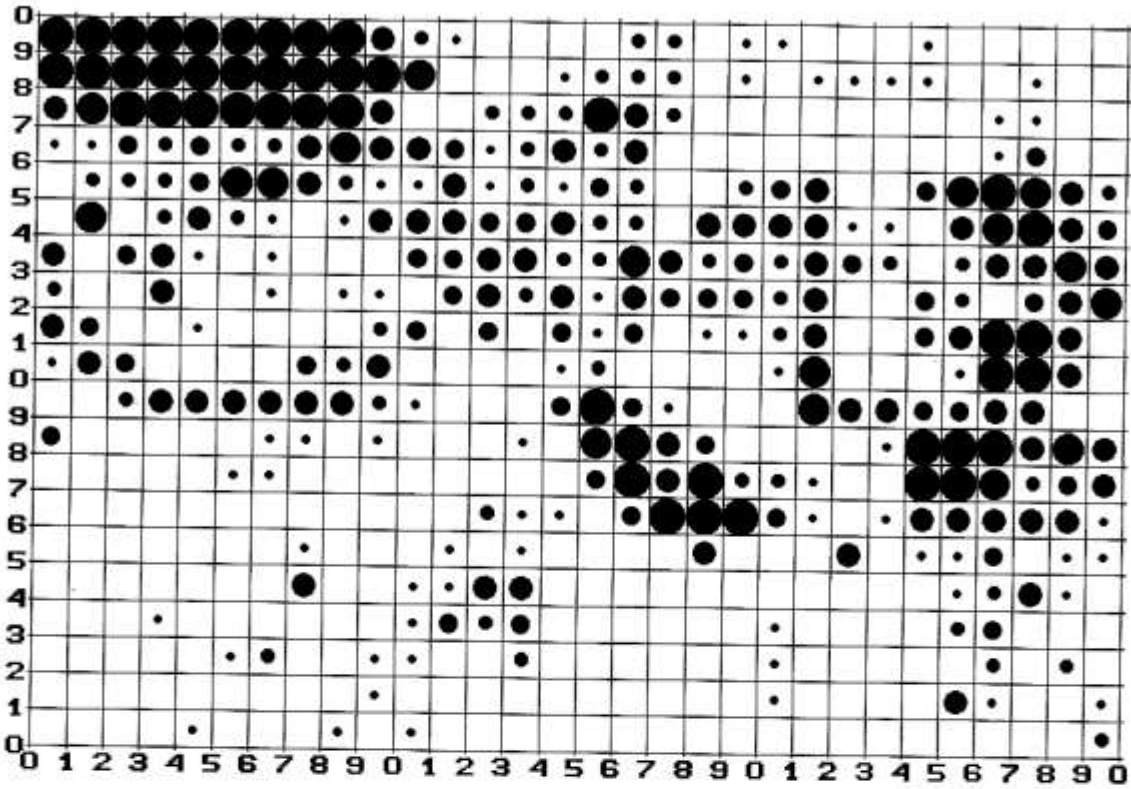
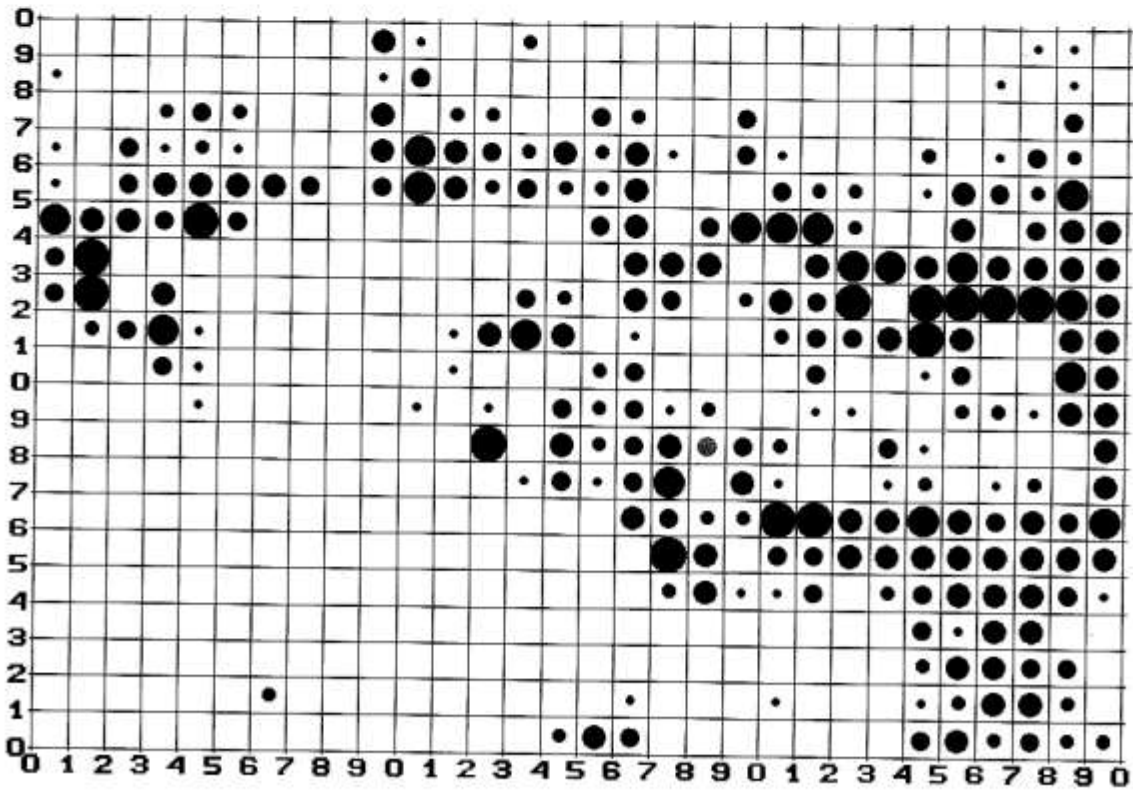


Fig.119. WOODLAND AND SCRUB



ENVIRONMENTS - 3 X 2 KM ZONE
For explanation of symbols see page 101

Fig.120. OPEN SPACES UNSUITABLE AS HABITAT

Black, heavily grazed grass. Circles/crosses, mown grass. Open circles, marsh & long grass

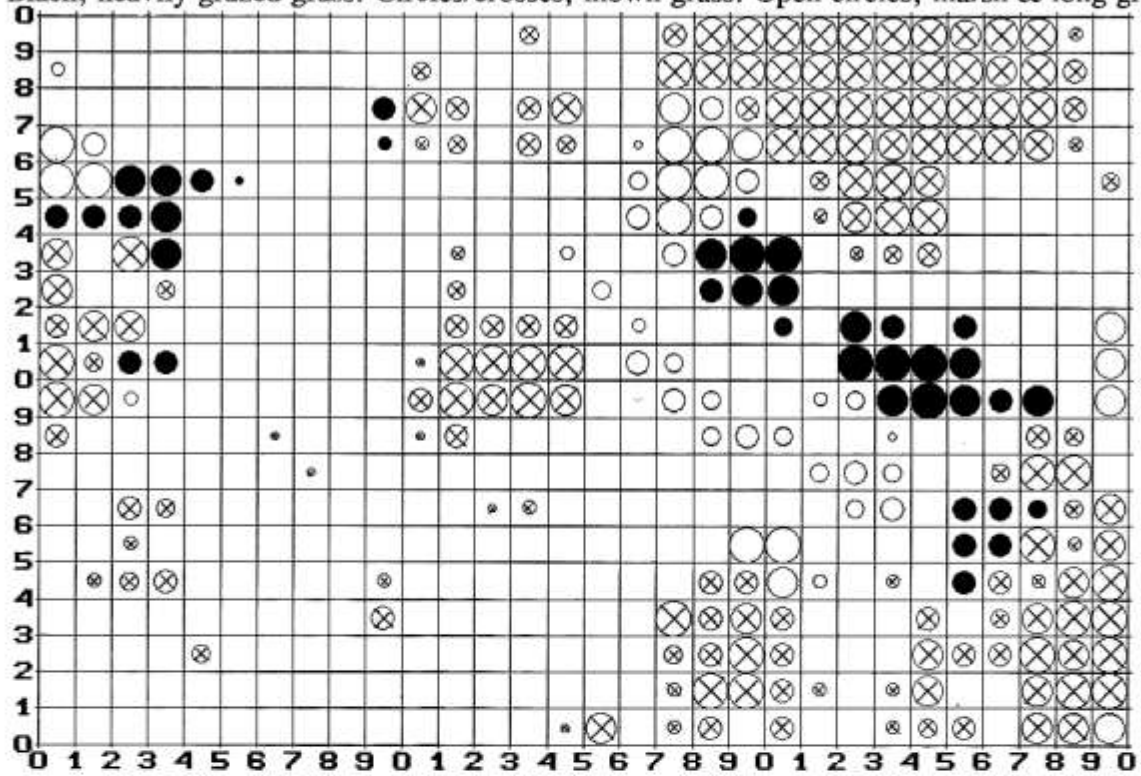
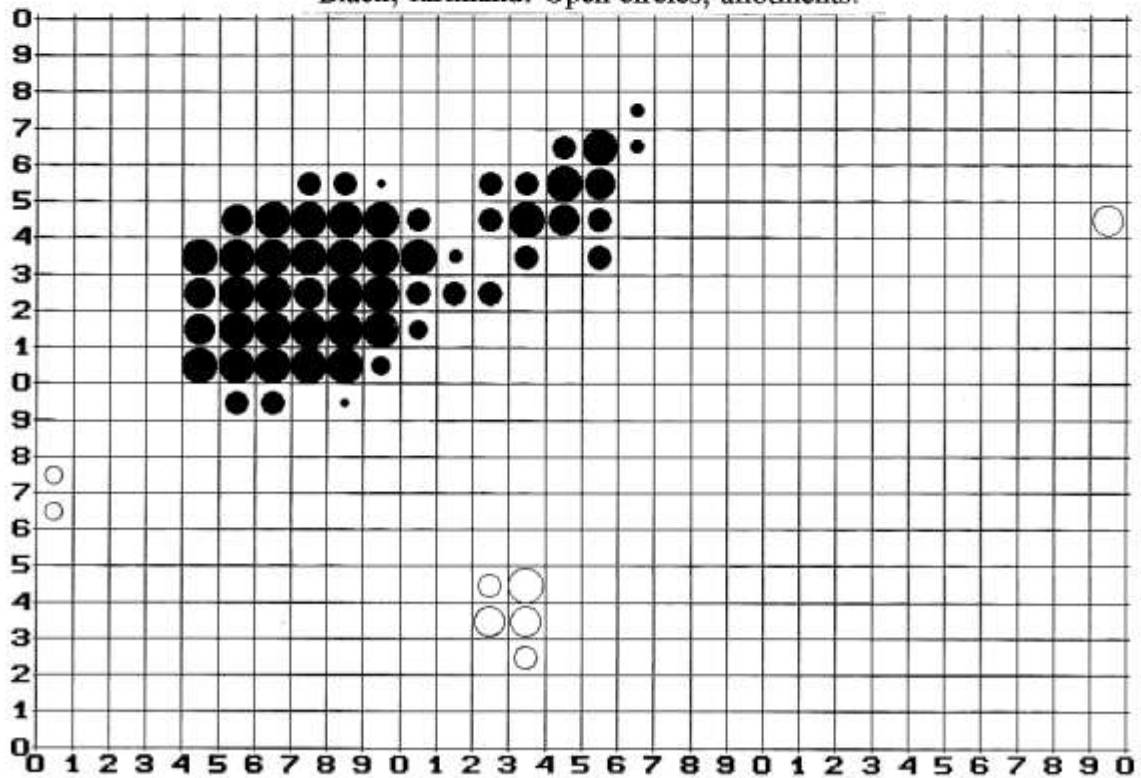


Fig.121. FARMLAND AND ALLOTMENTS
Black, farmland. Open circles, allotments.



ENVIRONMENTS - 3 X 2 KM ZONE
For explanation of symbols see page 101

Fig.122. URBAN COVER - HOUSES AND GARDENS

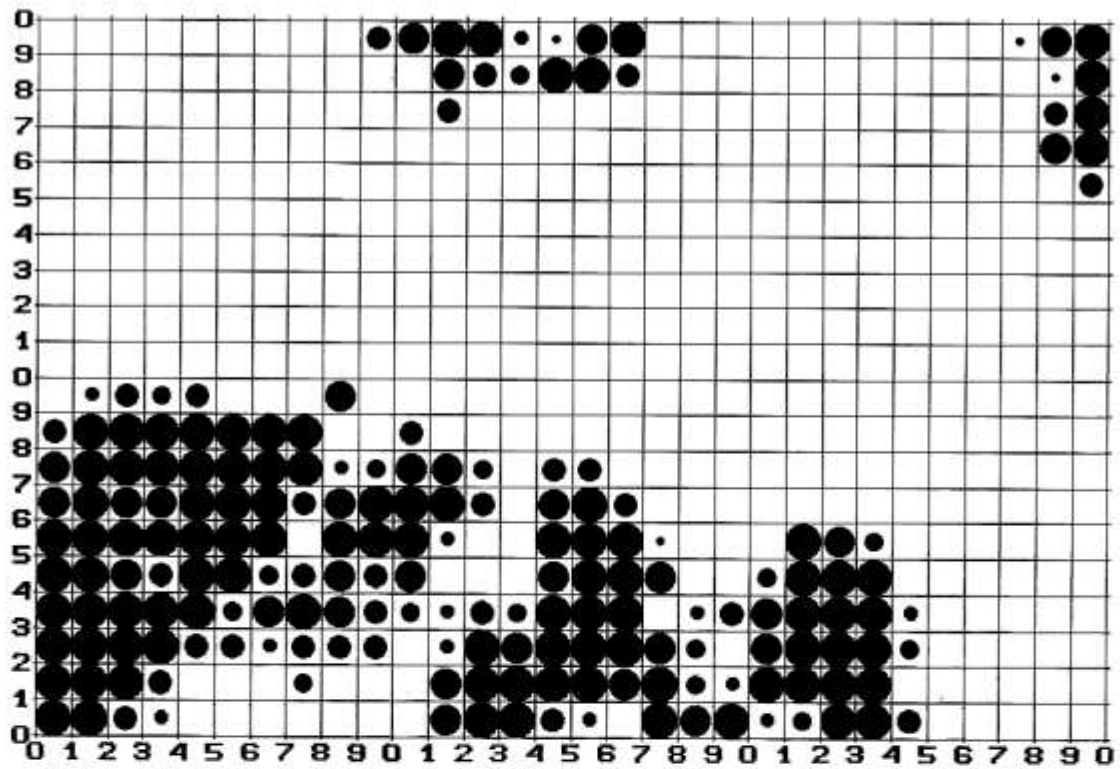
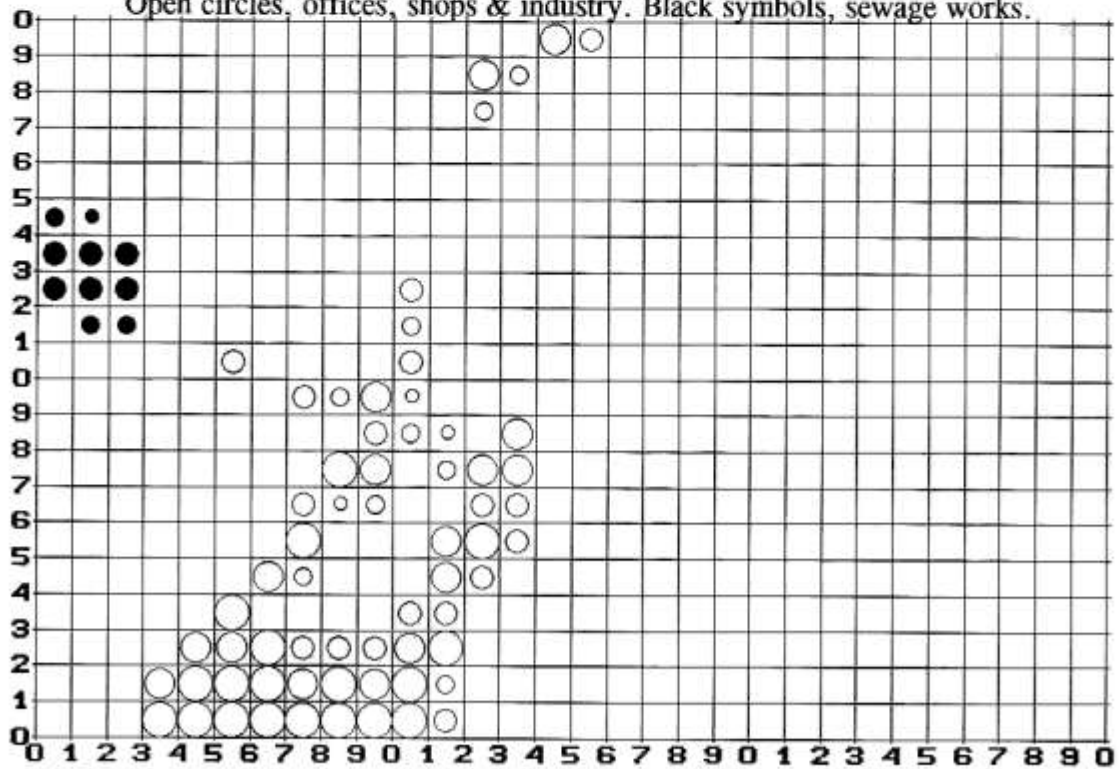


Fig.123. URBAN COVER - OFFICES, SHOPS AND INDUSTRIAL AREAS

Open circles, offices, shops & industry. Black symbols, sewage works.



ENVIRONMENTS - 3 X 2 KM ZONE
 For explanation of symbols see page 101

Fig.124. URBAN COVER - MAIN ROADS

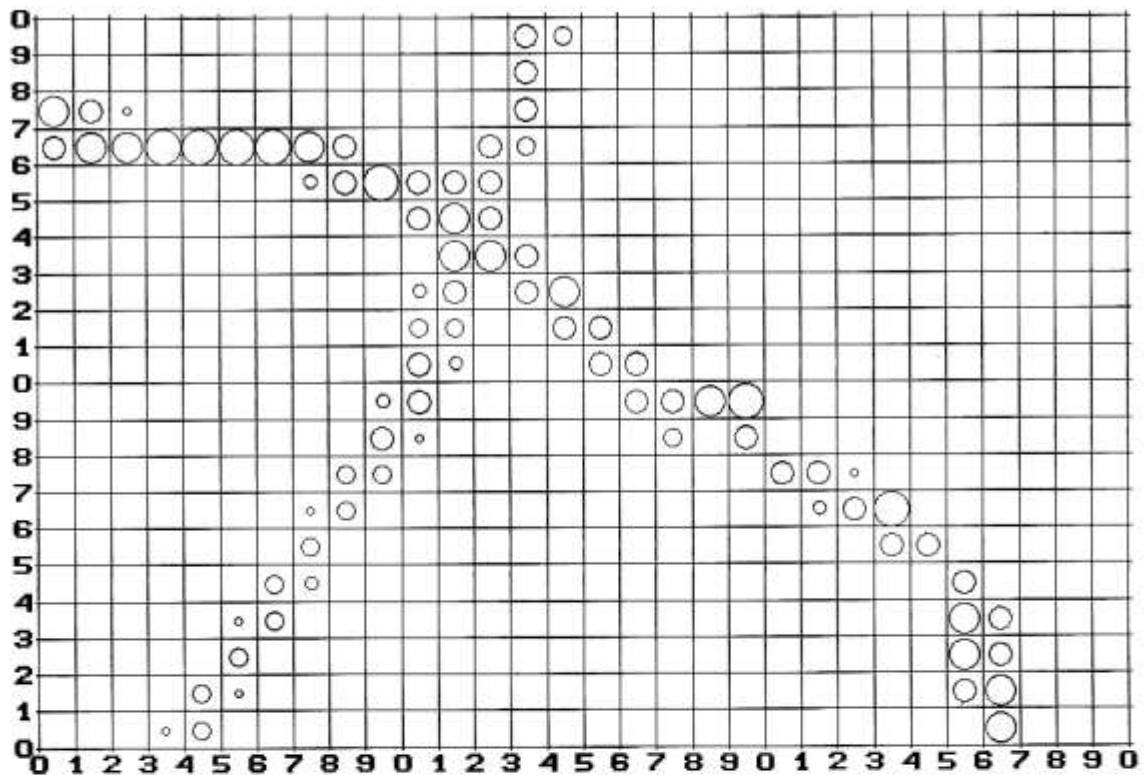
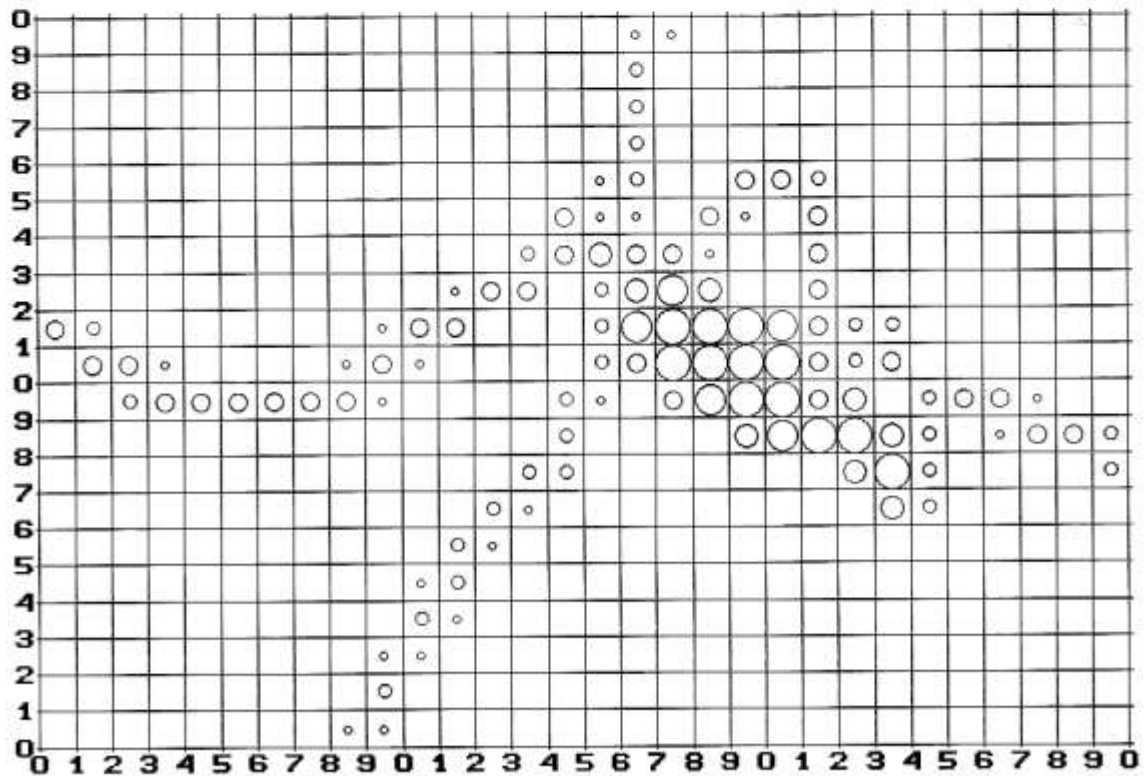
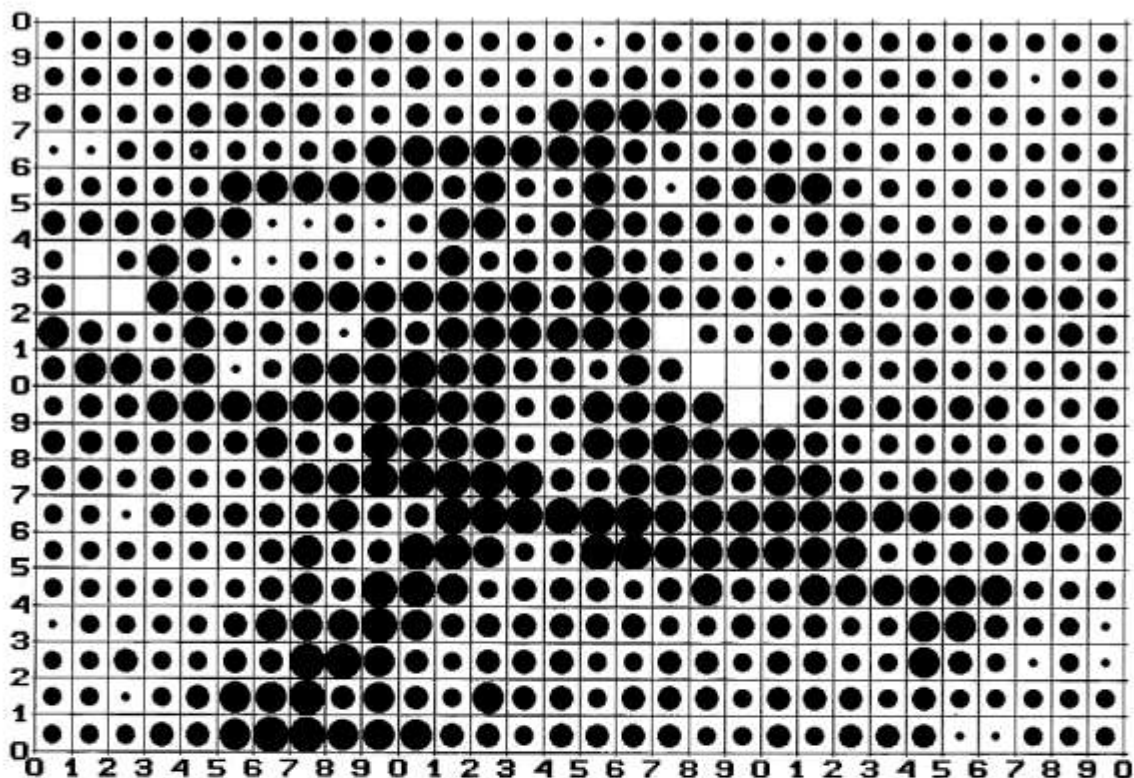


Fig.125. WATER - LAKES, RIVER AND CANAL



RECORDING COVERAGE - 3 X 2 KM ZONE

Fig.126. RECORDING COVERAGE 1994-7, DURING BUTTERFLY SEASON

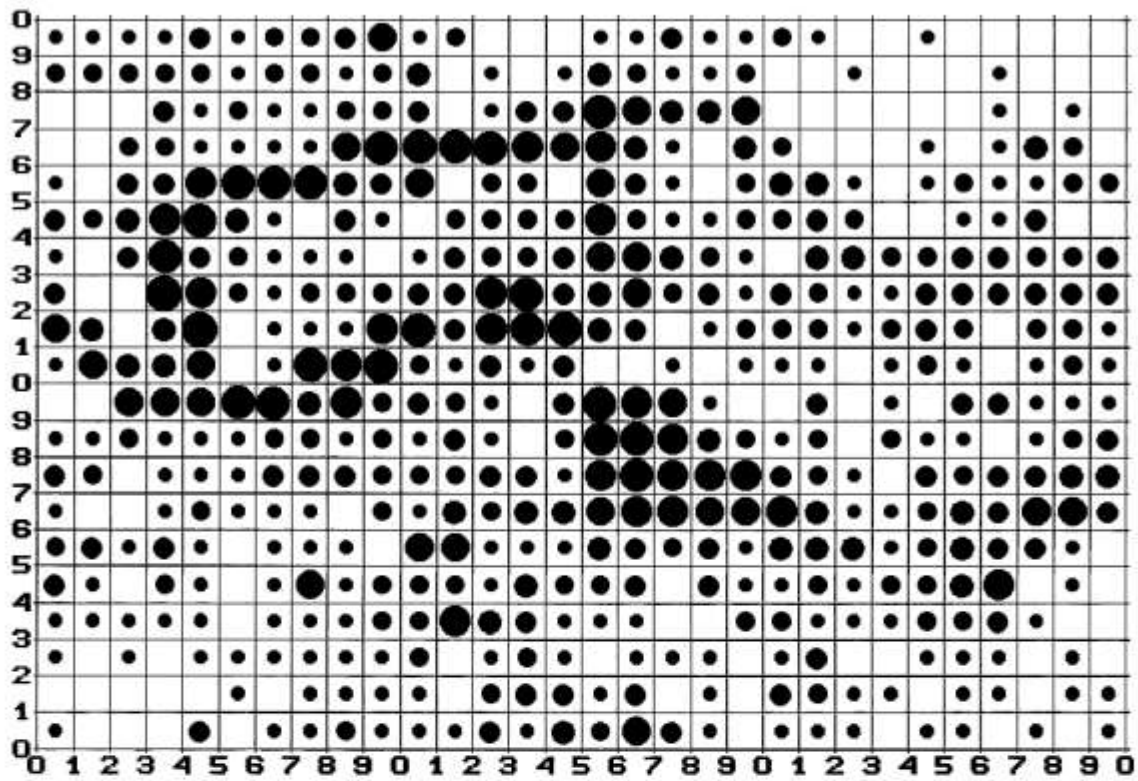


The symbols in the above figure represent the number of visits to each square during the four "butterfly seasons", thus:

	not visited - see page 6
•	1 visit
●	2-9 visits
●	10-29 visits
●	30-99 visits
●	100+ visits

BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE

Fig.127. RECORDS FOR ALL SPECIES IN 3 X 2 KM ZONE



NUMBERS OF SPECIES RECORDED IN EACH 100 M SQUARE

1	2	2	2	6	2	4	3	6	9	2	3	0	0	0	1	2	5	1	2	4	1	0	0	2	0	0	0	0	0
3	3	3	3	4	2	3	4	2	3	8	0	2	0	1	7	4	1	2	4	0	0	1	0	0	0	1	0	0	0
0	0	0	6	2	3	1	2	3	4	6	0	1	6	6	15	9	8	8	9	0	0	0	0	0	0	1	0	2	0
0	0	4	3	2	1	1	2	9	16	13	13	16	11	9	11	7	2	0	7	3	0	0	0	1	0	2	7	4	0
1	0	6	6	11	13	14	13	8	5	9	0	4	4	0	9	5	1	0	4	7	8	2	0	2	4	2	2	4	3
5	3	7	11	15	8	2	0	5	1	0	3	4	4	4	11	4	2	2	3	3	5	3	0	0	1	1	6	0	0
2	0	5	13	5	3	1	1	1	0	1	6	4	4	6	9	9	8	4	1	0	7	8	3	3	5	6	3	3	6
6	0	0	18	11	4	2	4	4	3	5	5	12	15	5	8	10	4	6	2	6	4	1	2	6	6	5	6	6	6
9	7	0	8	17	0	1	1	1	12	15	5	11	13	13	8	5	0	1	3	4	3	1	4	5	4	0	4	4	2
2	10	8	8	10	0	1	13	11	15	3	1	6	1	5	0	0	2	0	2	1	2	0	2	3	2	0	1	4	1
0	0	9	9	10	14	15	7	11	3	6	3	1	0	6	15	11	11	1	0	0	5	0	1	0	6	5	2	2	1
2	1	4	2	1	1	4	3	2	3	2	5	2	0	3	13	13	12	8	3	2	3	0	3	1	1	0	2	3	5
5	3	0	1	1	1	5	5	5	4	4	4	5	5	2	11	13	12	12	11	6	4	1	0	5	3	6	5	7	8
2	0	0	1	3	0	2	2	0	3	1	8	3	7	8	9	12	12	9	9	12	8	2	2	3	7	6	9	10	5
4	5	1	5	1	0	2	1	2	0	10	10	1	1	2	8	6	4	5	2	7	8	7	2	3	7	6	6	1	0
6	1	0	4	1	0	1	10	2	3	4	4	1	7	4	4	5	0	6	2	2	3	2	3	4	8	11	0	2	0
2	2	1	2	1	0	1	2	1	3	4	11	7	6	2	1	1	0	0	3	3	1	1	1	3	4	6	1	0	0
1	0	2	0	1	1	2	2	2	2	3	0	1	4	1	0	1	2	1	0	2	5	0	0	2	1	2	0	2	0
0	0	0	0	0	1	0	1	1	1	1	0	4	6	6	2	5	0	1	0	5	3	1	1	0	2	1	0	1	1
1	0	0	0	5	0	1	1	3	1	1	2	5	1	8	4	9	5	1	0	2	1	1	0	2	1	0	1	0	2

BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.128. *Thymelicus sylvestris*

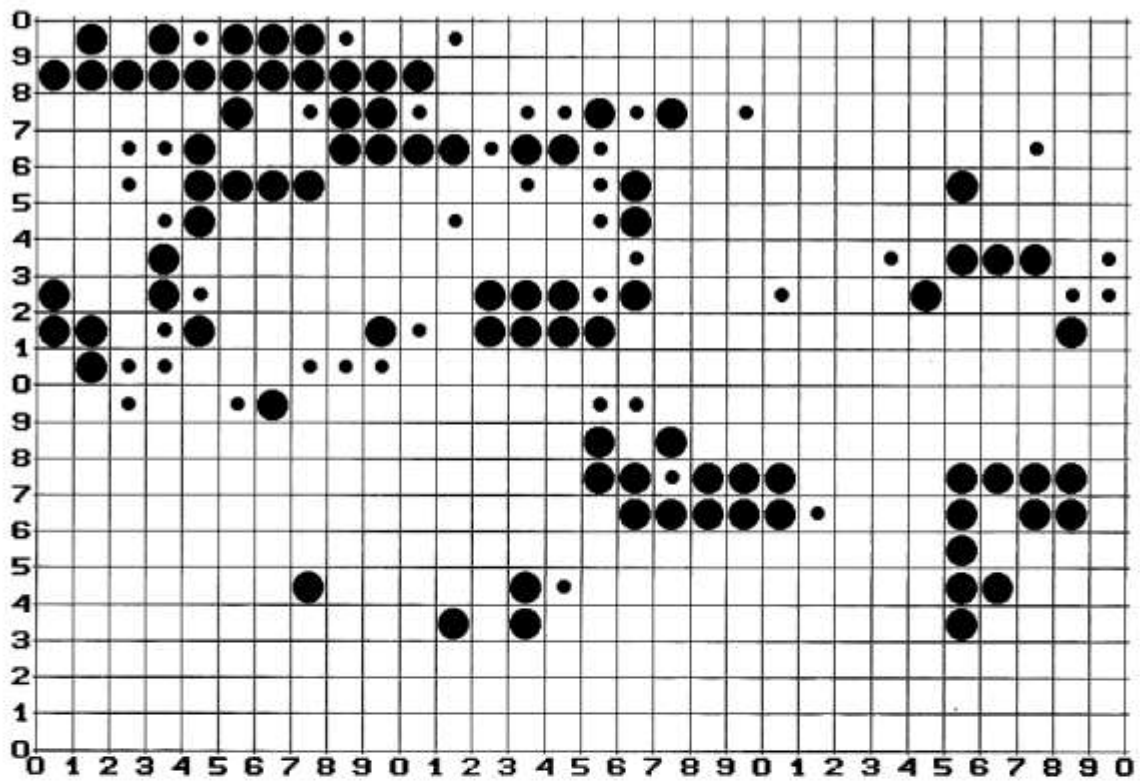
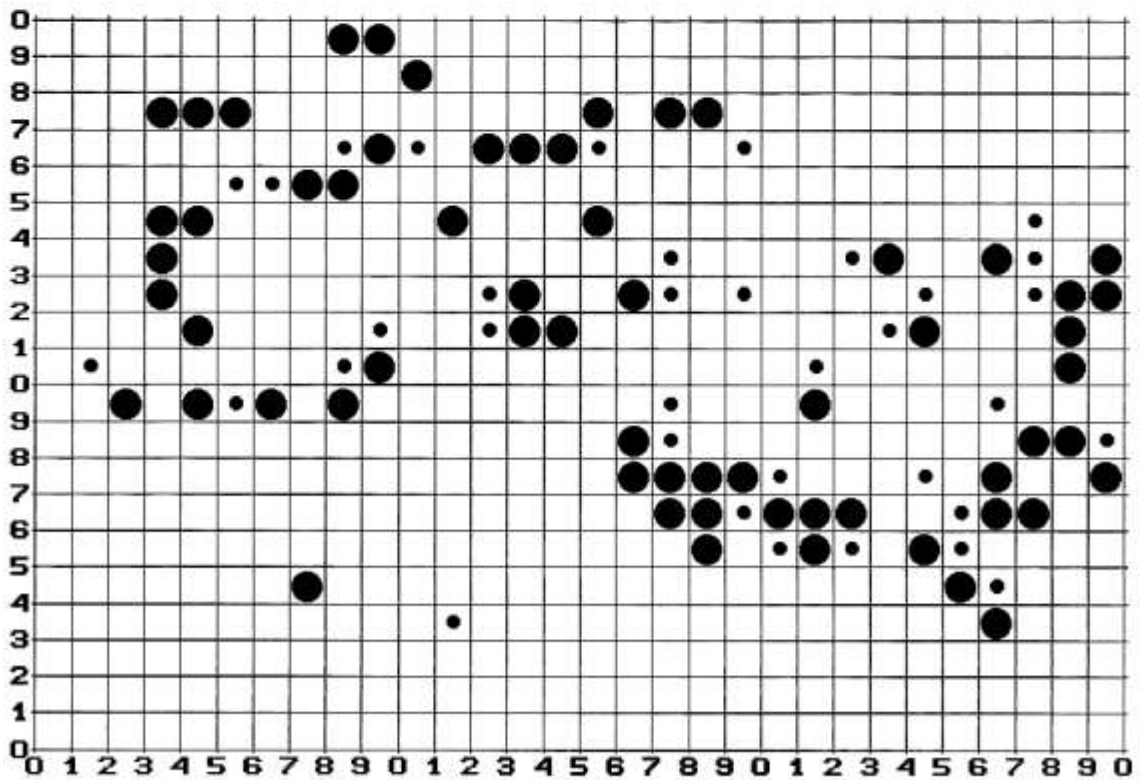


Fig.129. *Ochlodes venata*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
 Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.130. *Colias croceus*

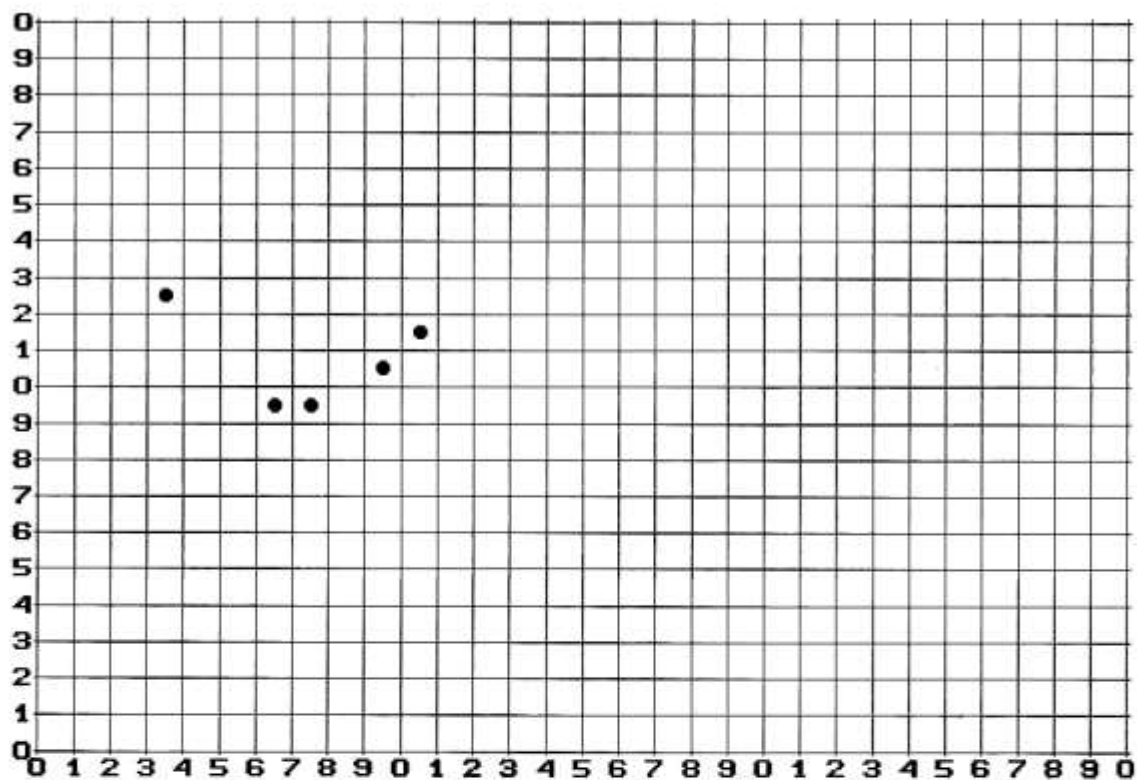
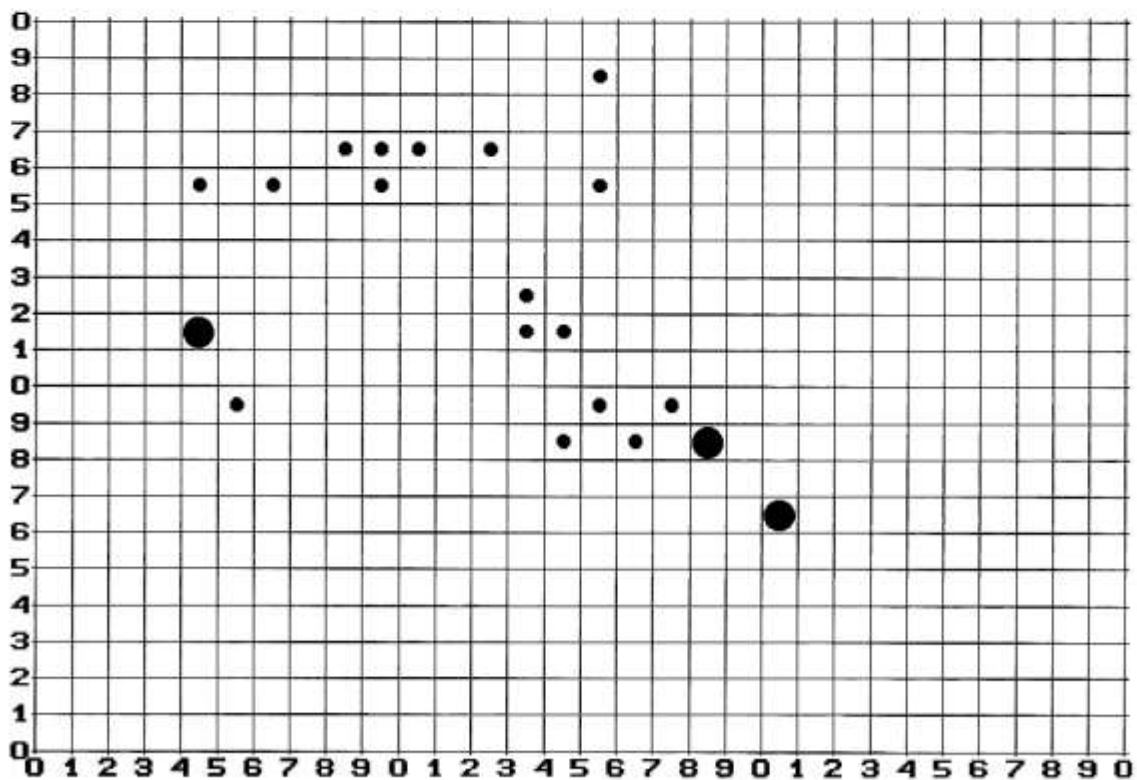


Fig.131. *Gonepteryx rhamni*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.132. *Pieris brassicae*

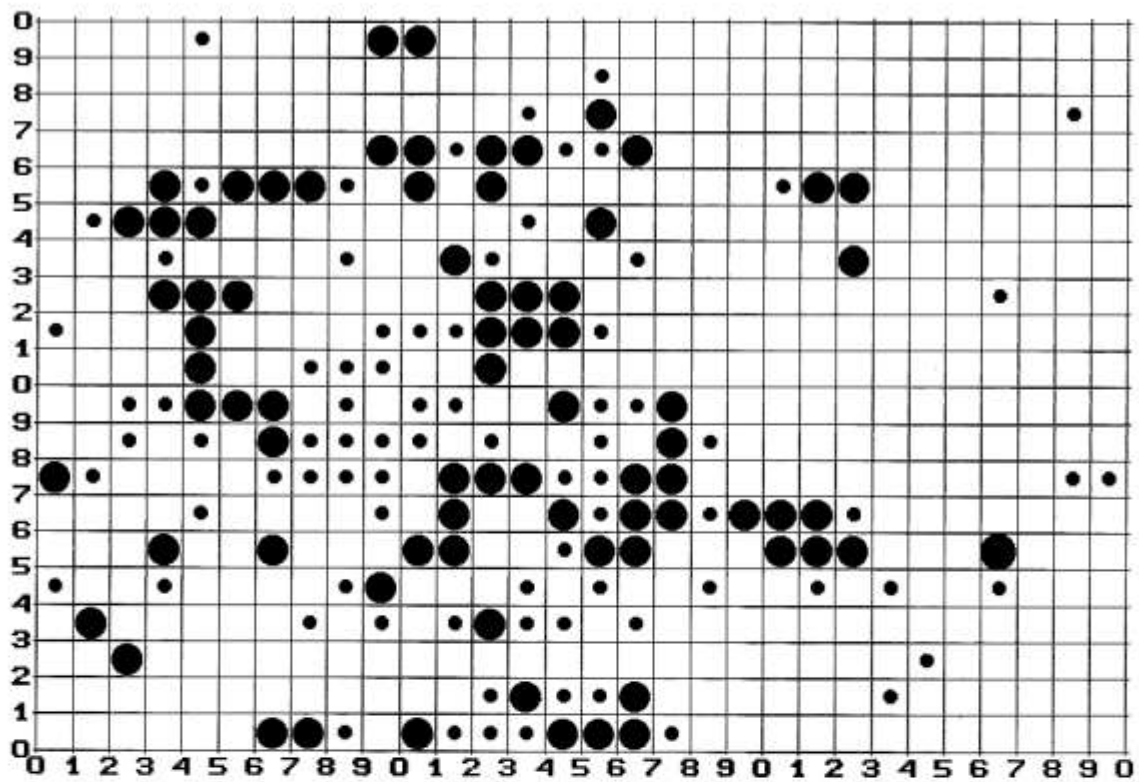
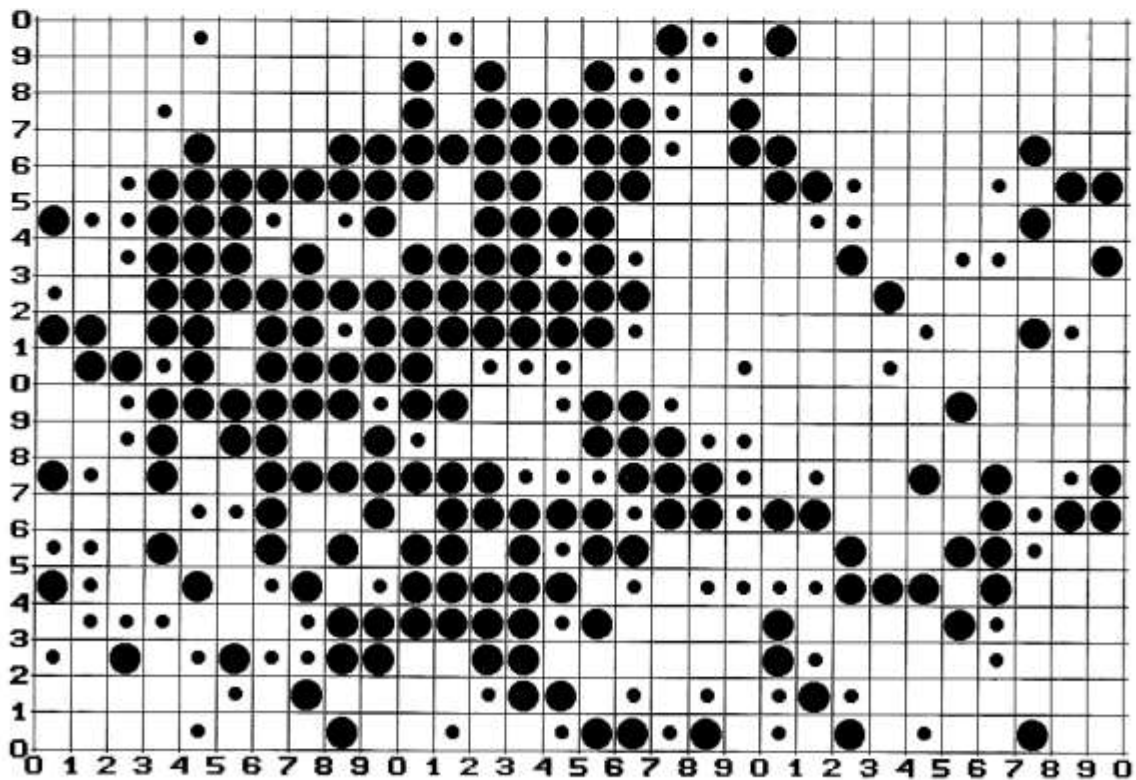


Fig.133. *Pieris rapae*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.134. *Pieris napi*

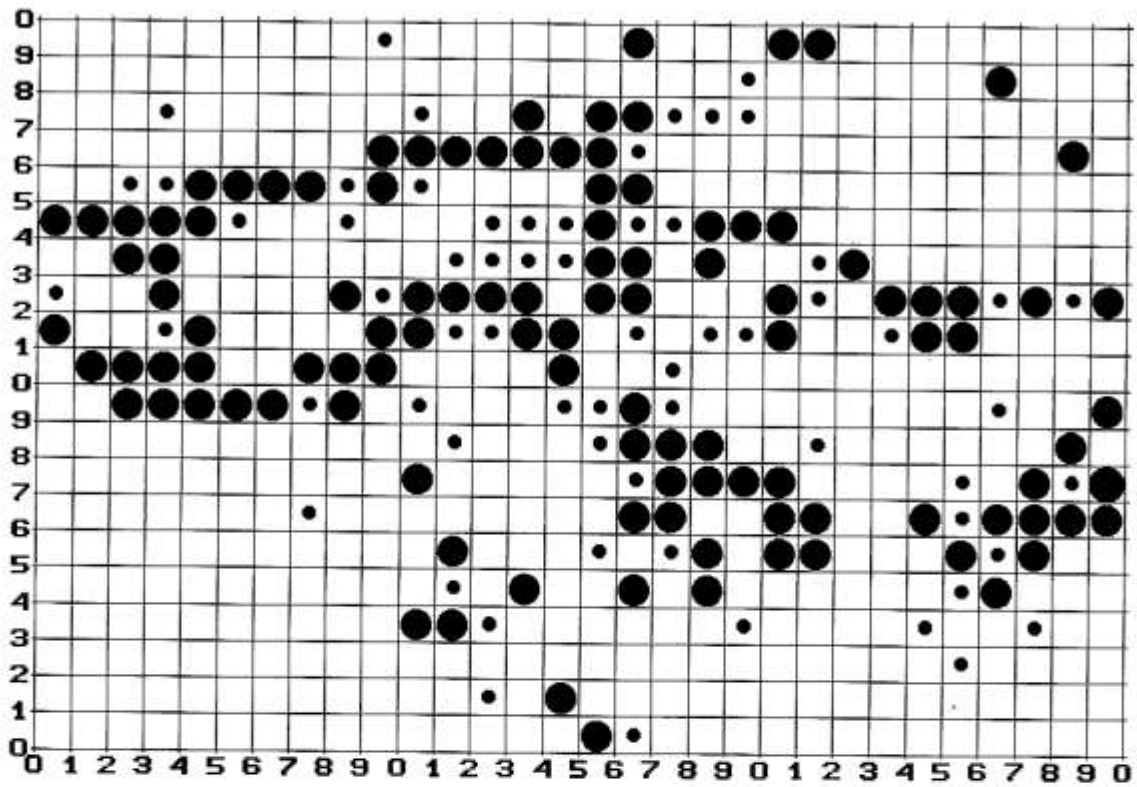
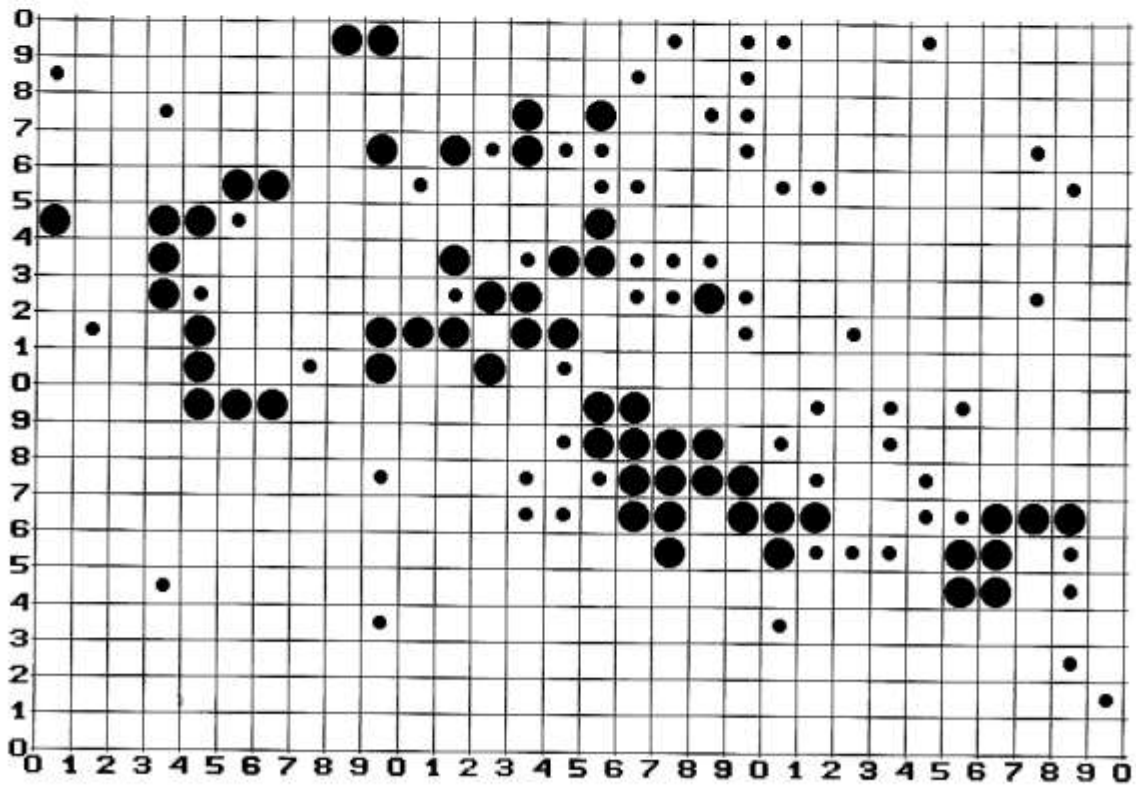


Fig.135. *Anthocharis cardamines*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
 Small symbols, single sightings, Full-size symbols, multiple sightings.
 Open circle, single larval record in 1992 (see page 27).

Fig.136. *Lycaena phlaeas*

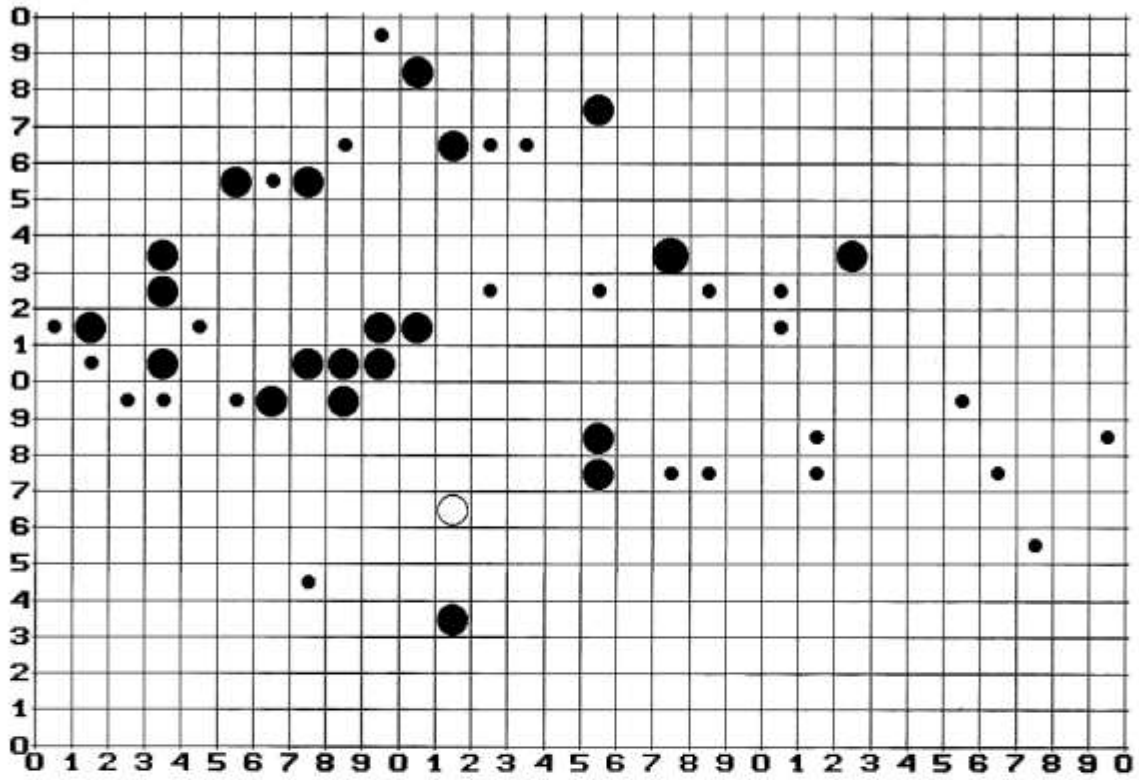
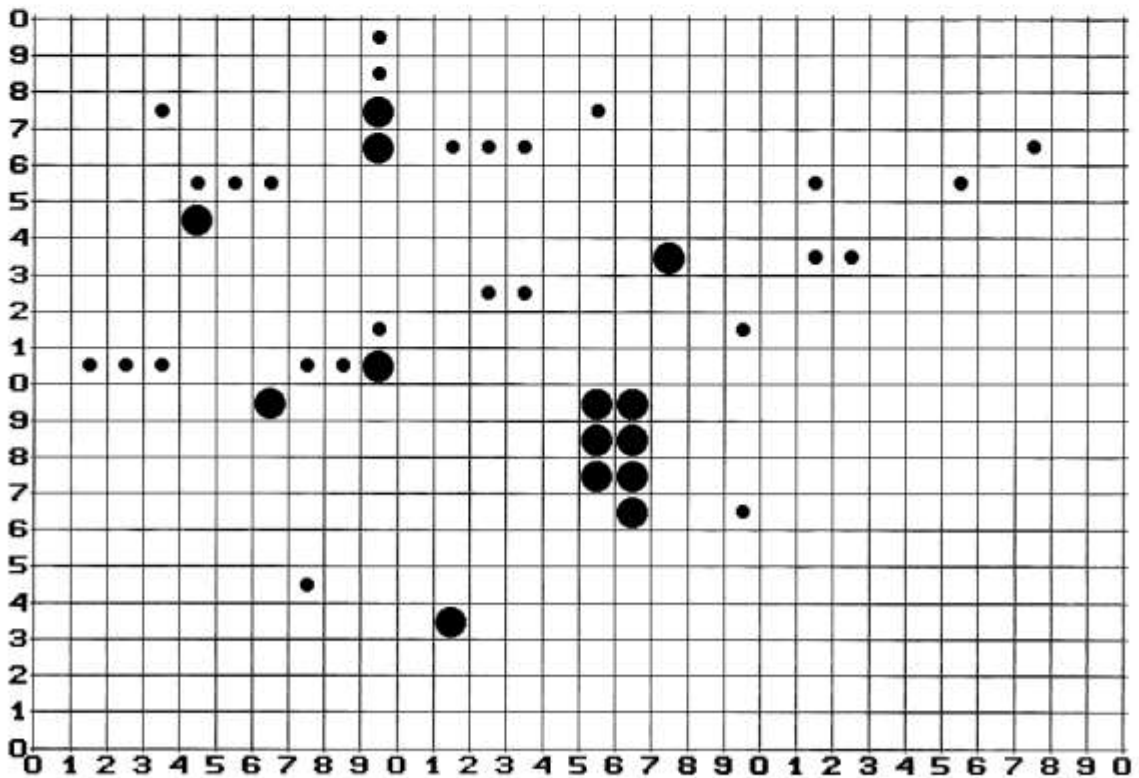


Fig.137. *Polyommatus icarus*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.138. *Celastrina argiolus*

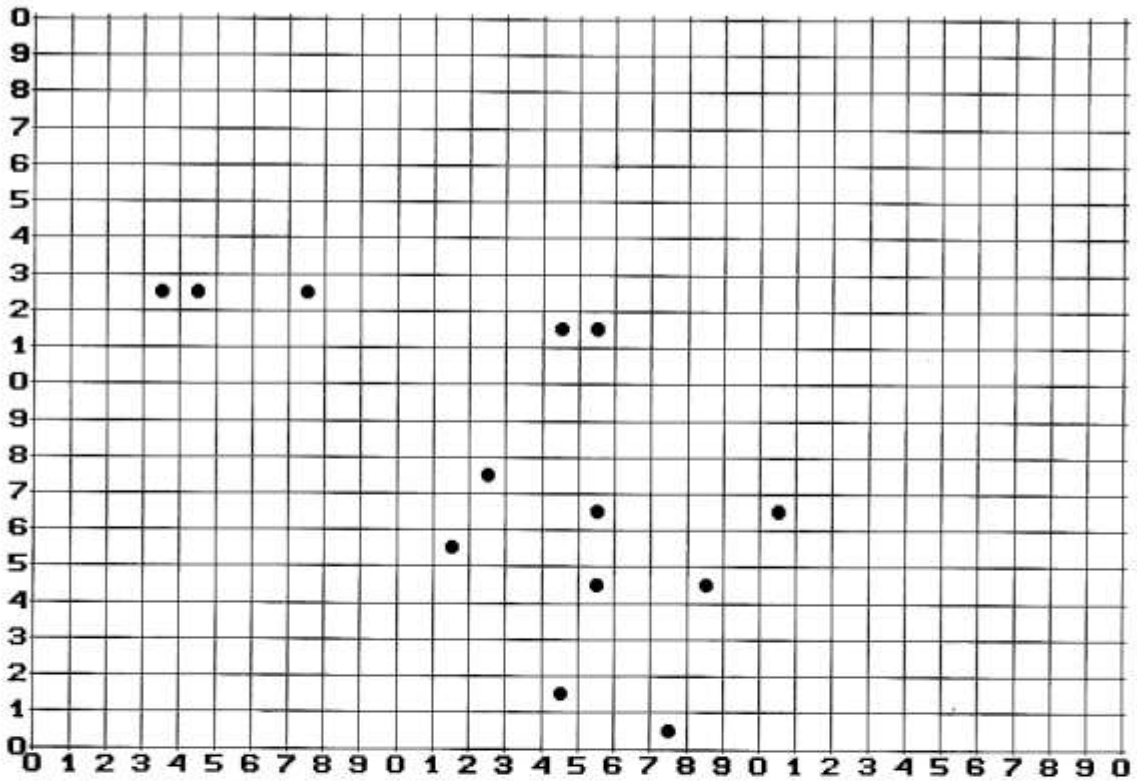
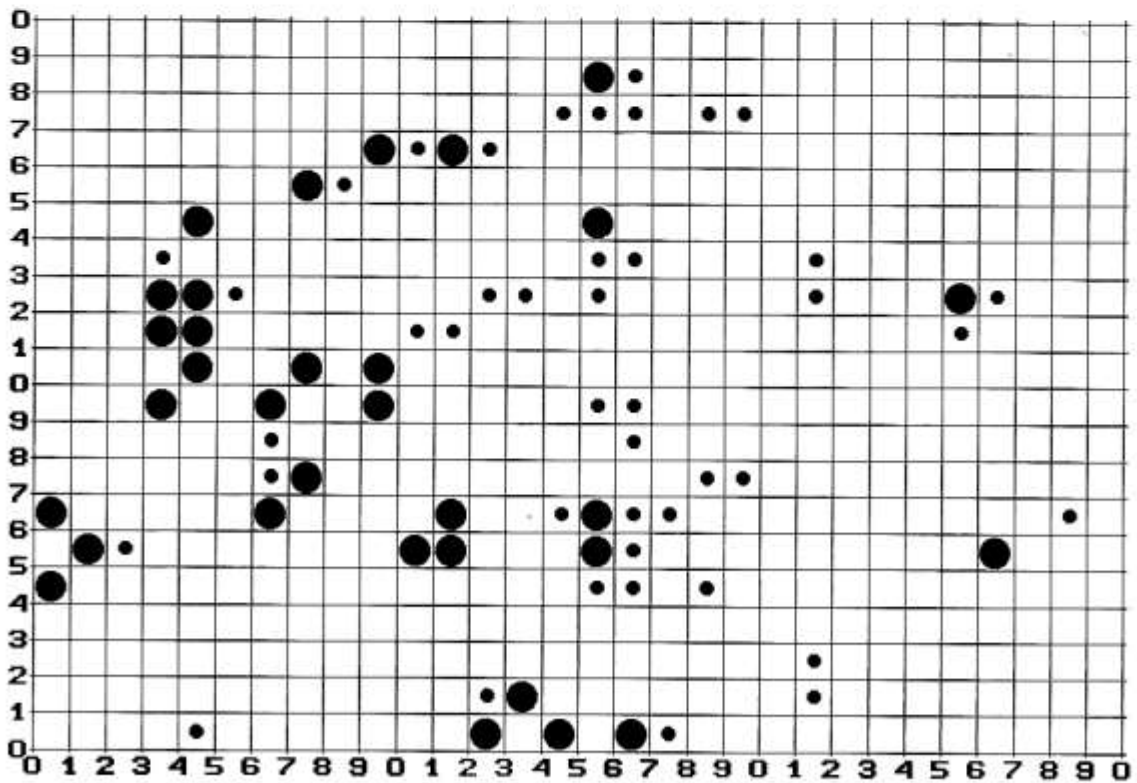


Fig.139. *Vanessa atalanta*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.140. *Vanessa cardui*

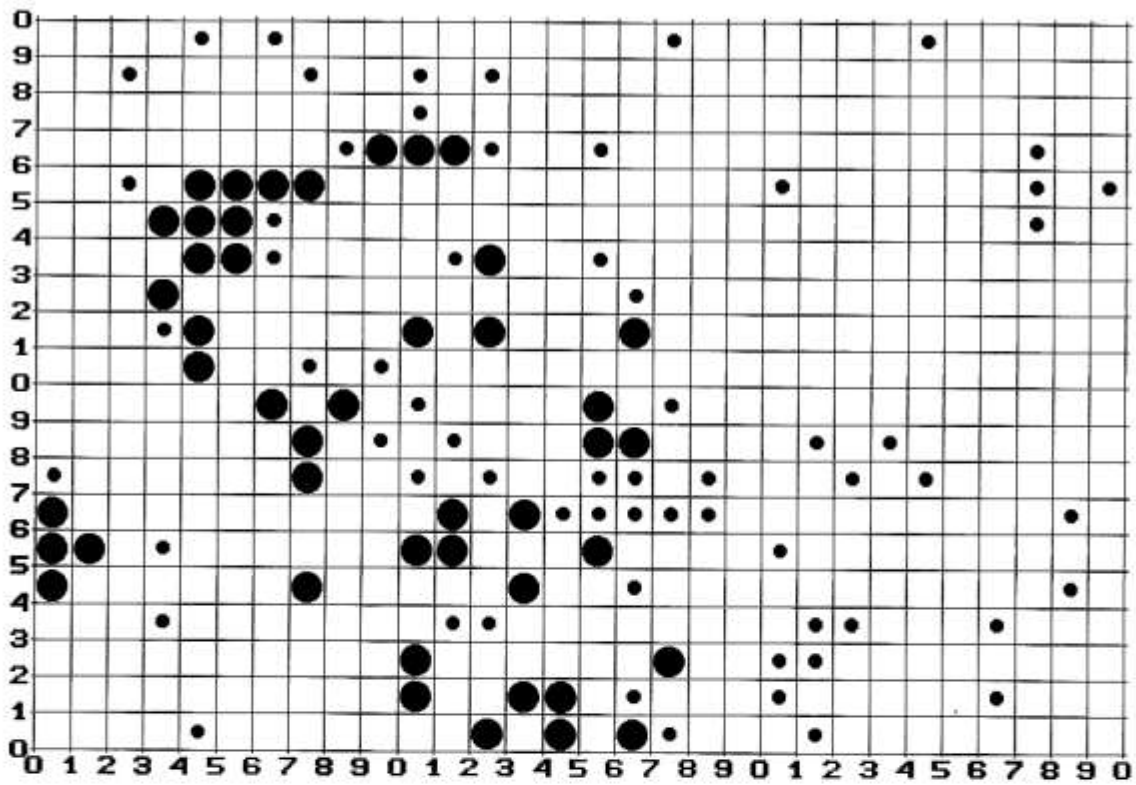
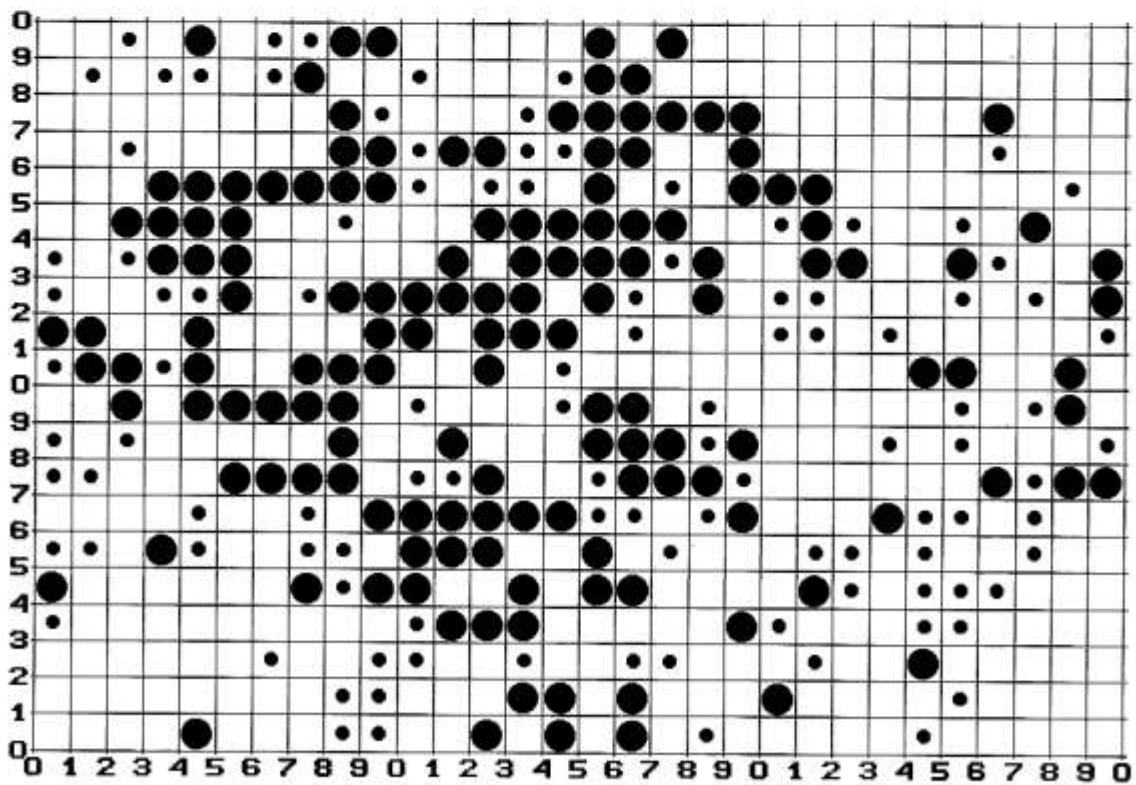


Fig.141. *Aglais urticae*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.142. *Inachis io*

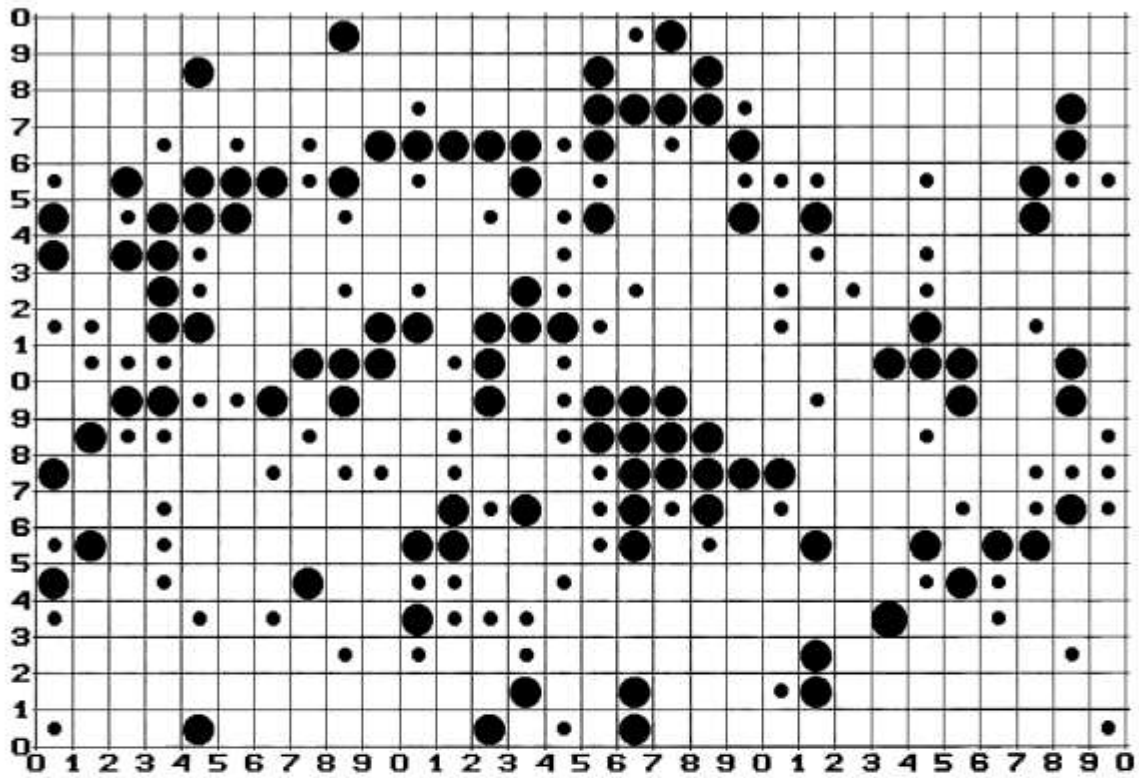
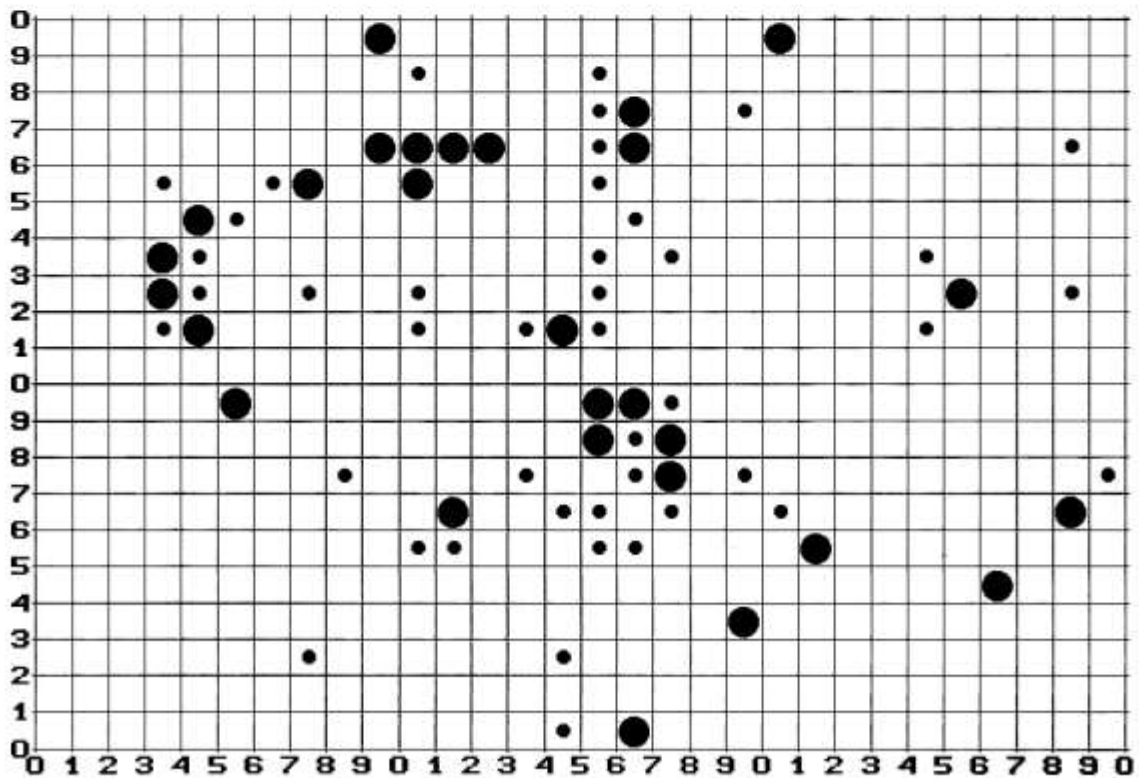


Fig.143. *Polygonia c-album*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.144. *Pararge aegeria*

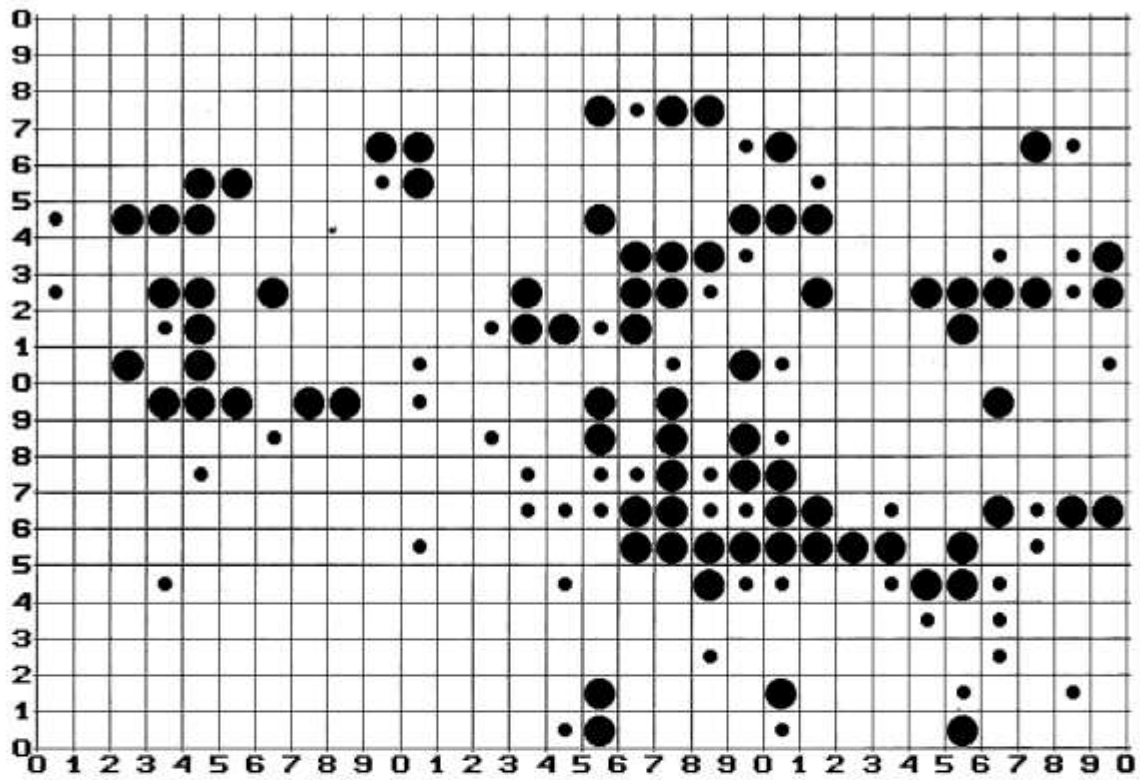
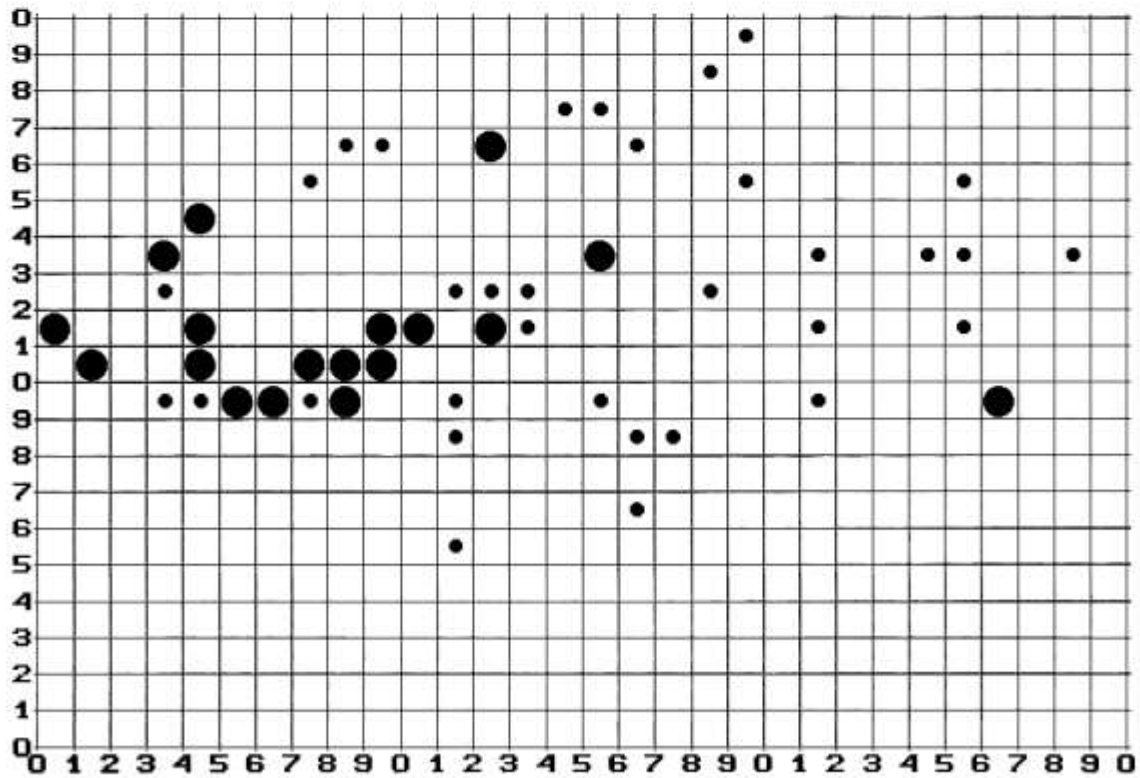


Fig.145. *Lasiommata megera*



BUTTERFLY DISTRIBUTIONS, 1992-1997 - 3 X 2 KM ZONE
Small symbols, single sightings. Full-size symbols, multiple sightings.

Fig.146. *Pyronia tithonus*

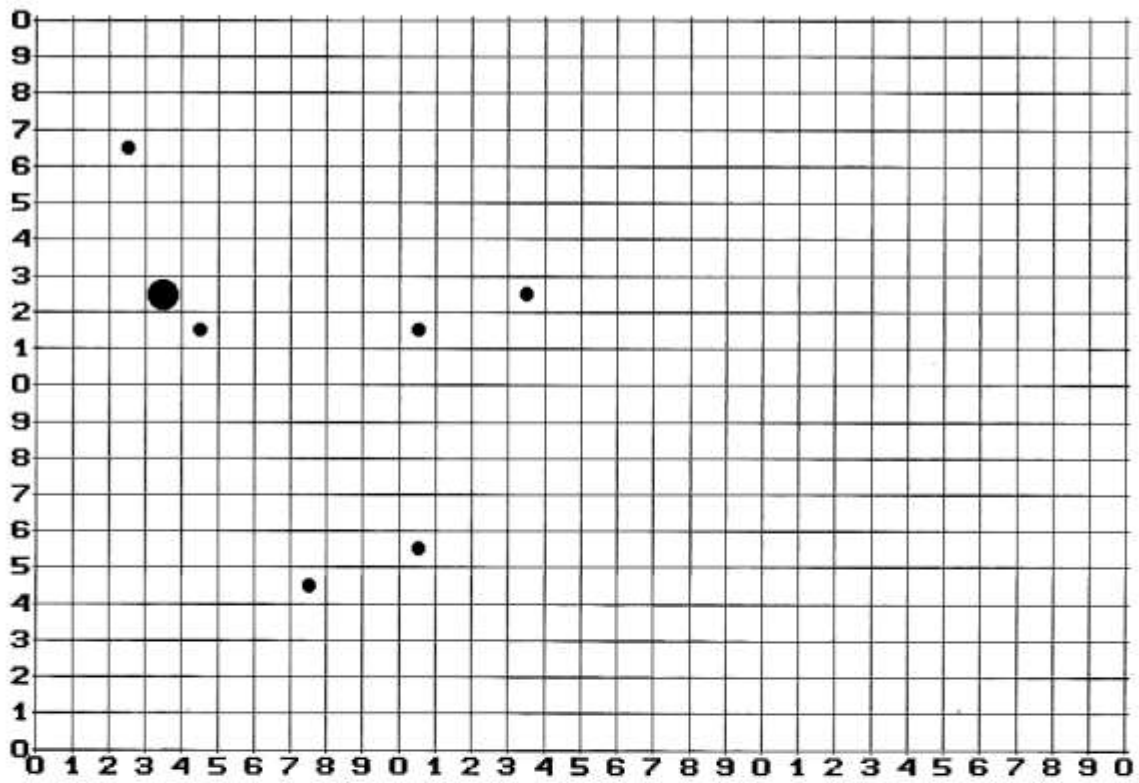
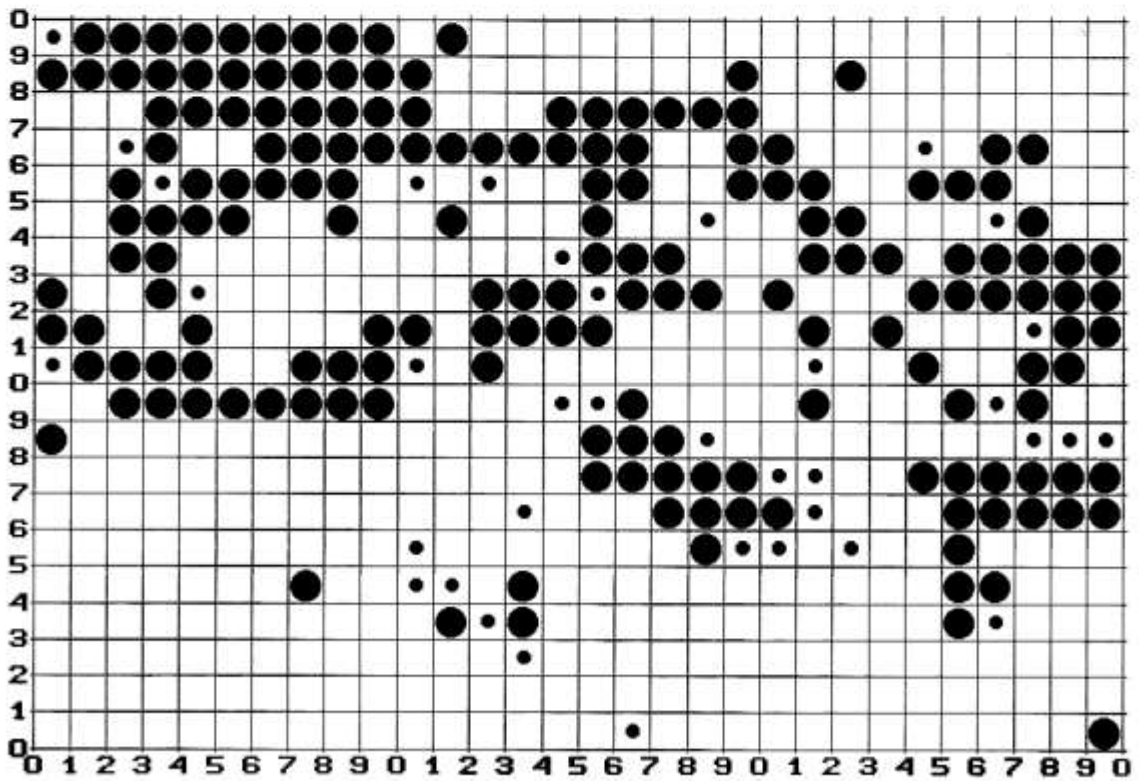


Fig.147. *Maniola jurtina*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.148. GRASSLAND, hostplant-habitat for Hesperiids and Satyrines

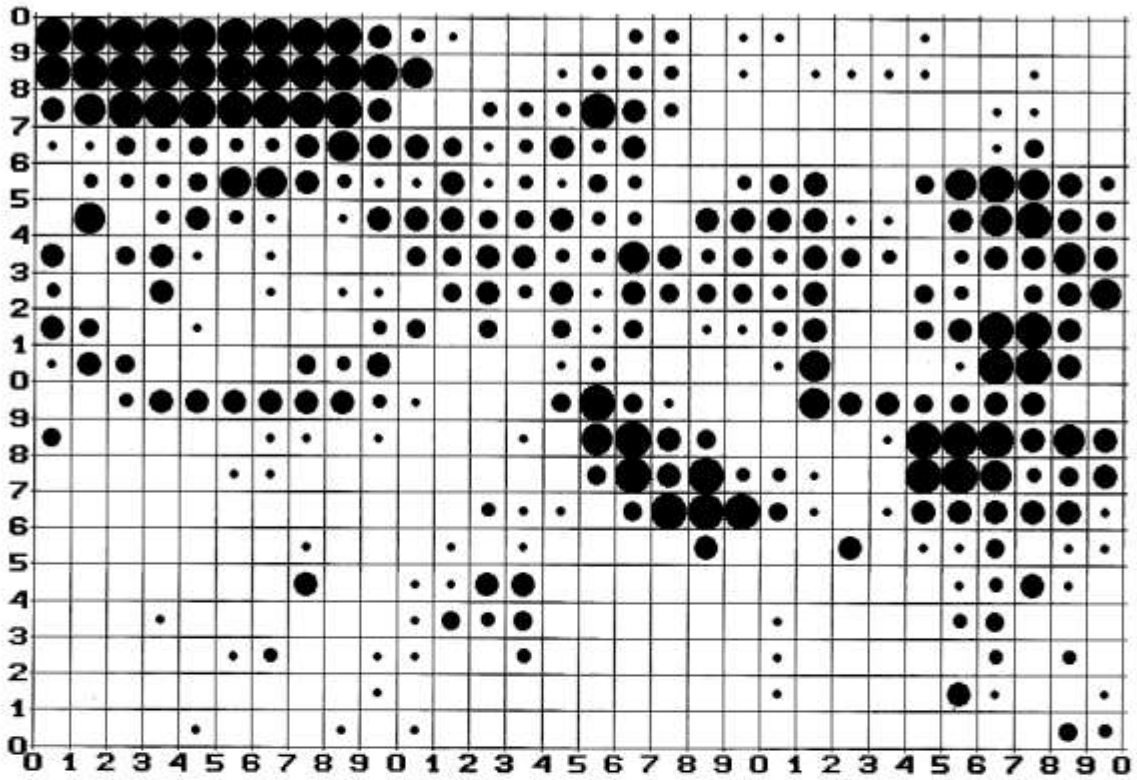
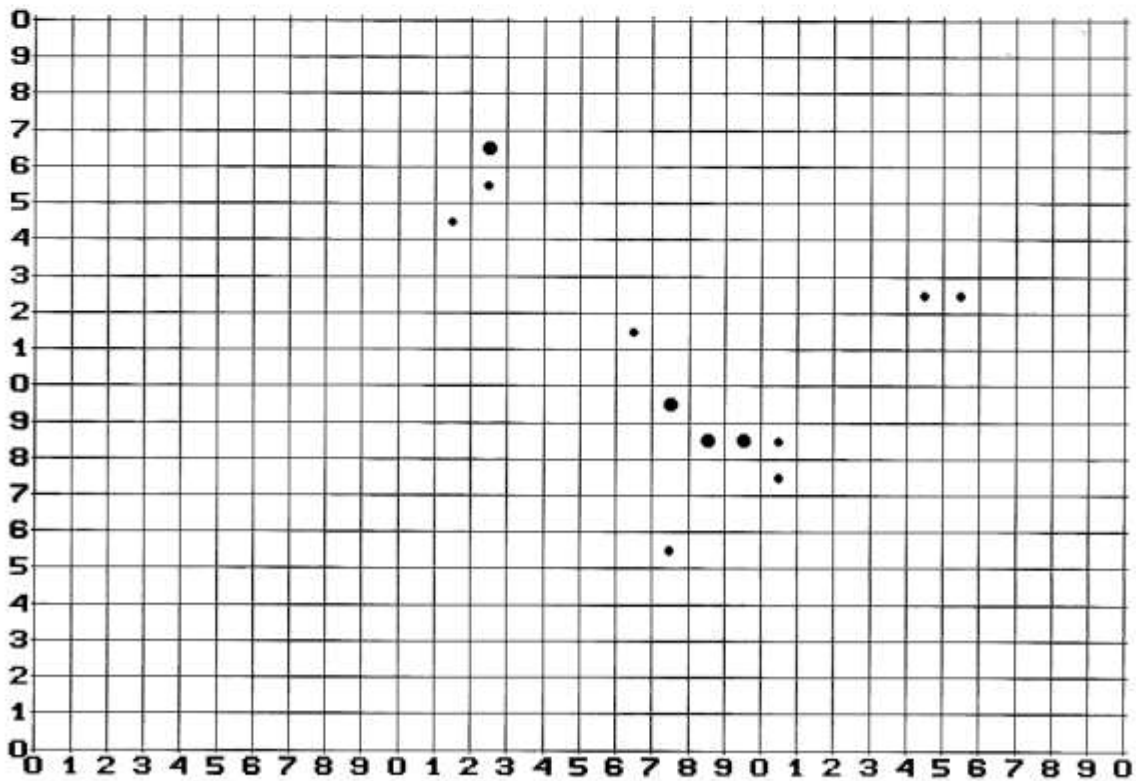


Fig.149. ALDER BUCKTHORN, hostplant-habitat for *G.rhamni*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.150. CULTIVATED CRUCIFERS, hostplant-habitat for *P.brassicae* & *P.rapae*

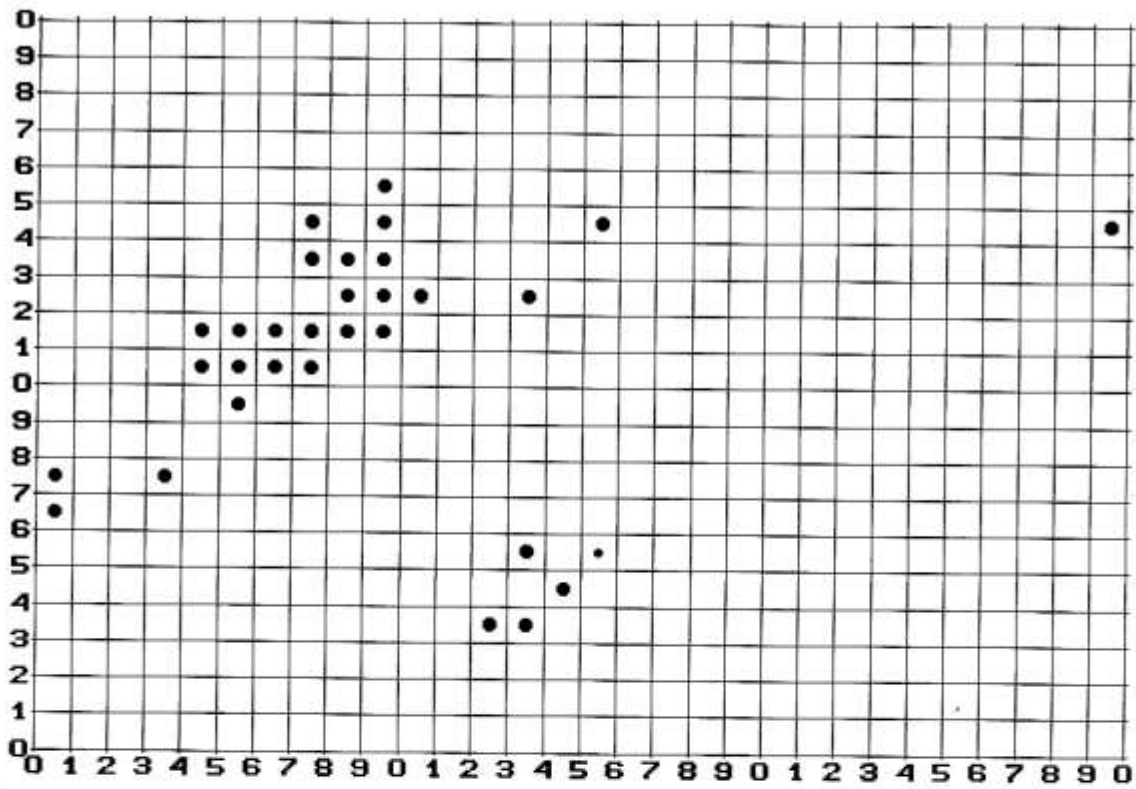
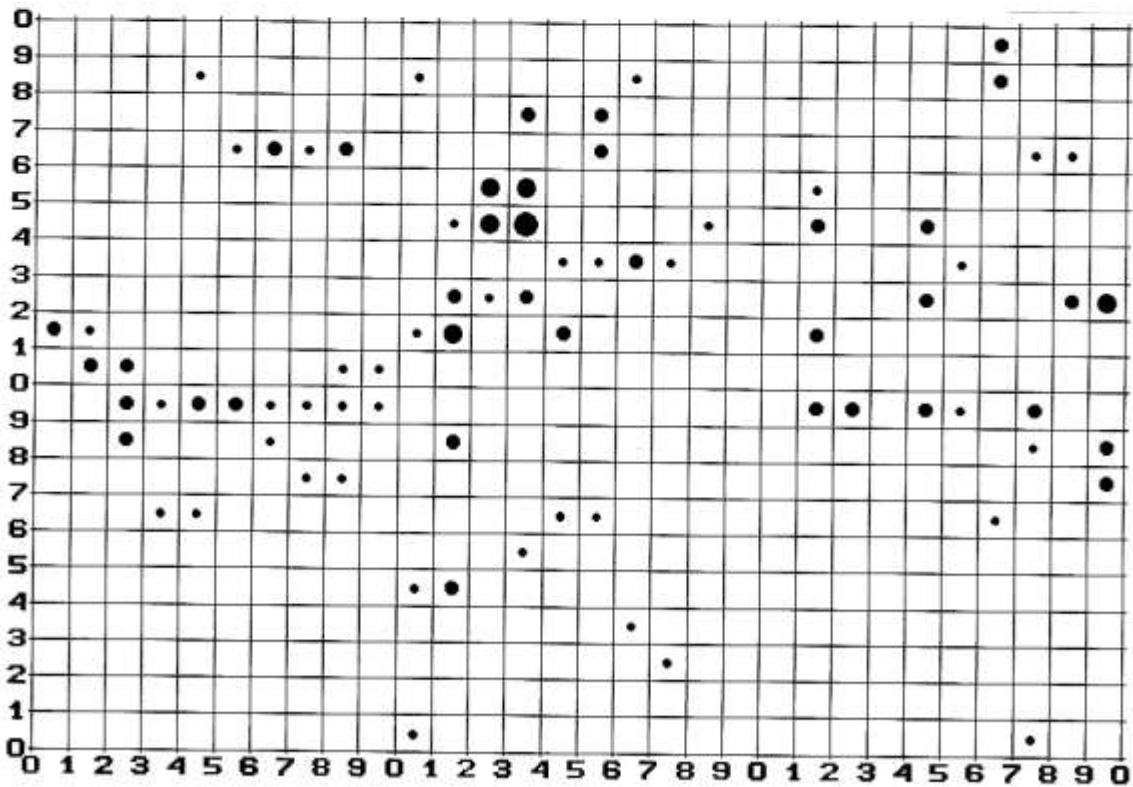


Fig.151. WILD CRUCIFERS, hostplant-habitat for *P.brassicae*, *P.rapae*, *P.napi*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.152. CUCKOO FLOWER, hostplant-habitat for *P.napi* & *A.cardamines*

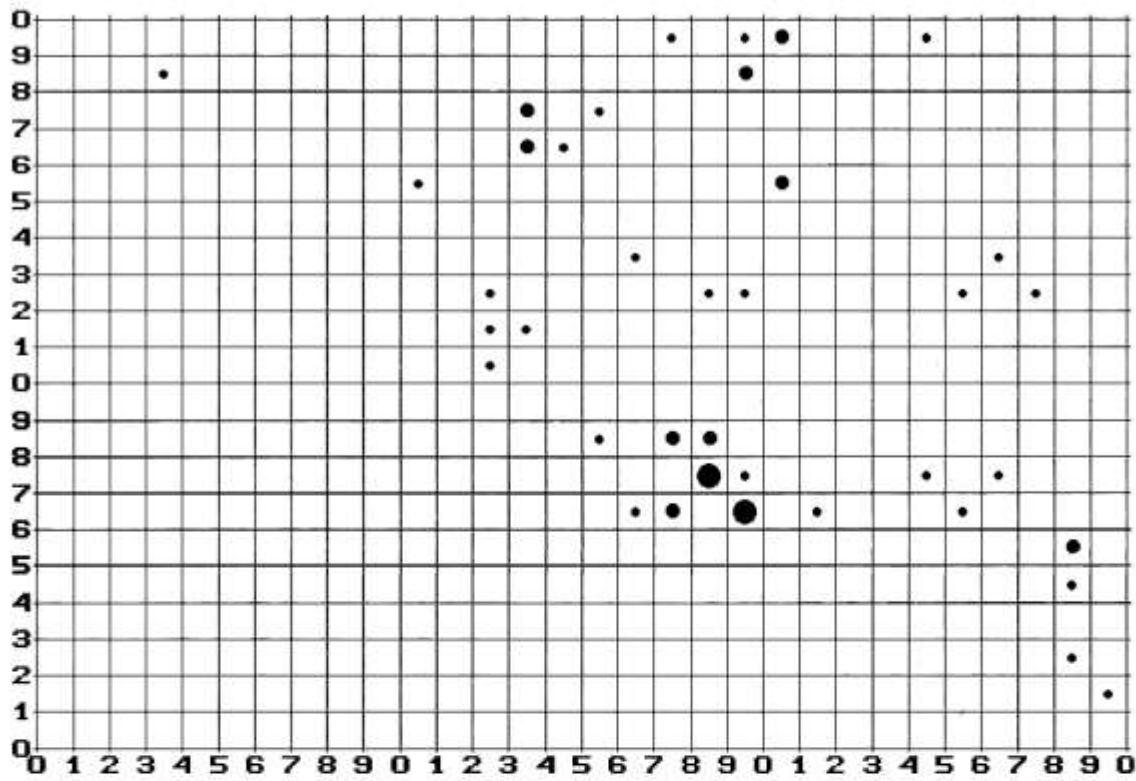
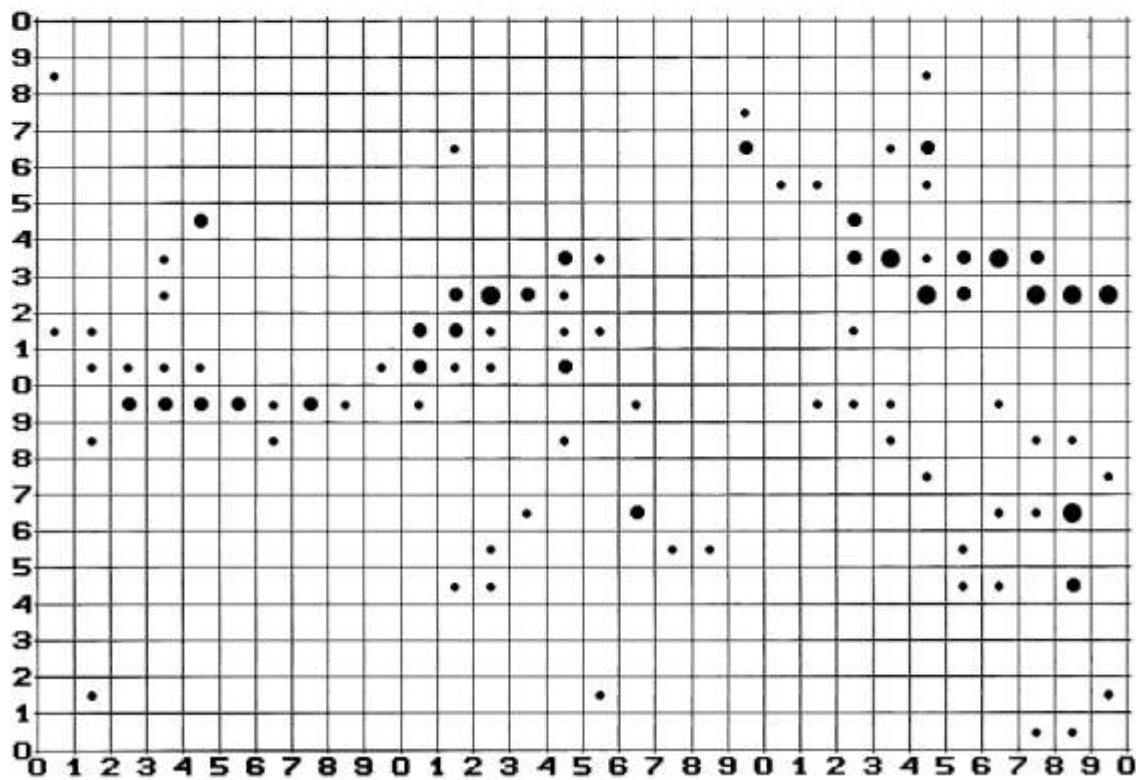


Fig.153. GARLIC MUSTARD, hostplant-habitat for *P.napi* & *A.cardamines*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.154. HONESTY & SWEET ROCKET, alternative hostplants for *A.cardamines*

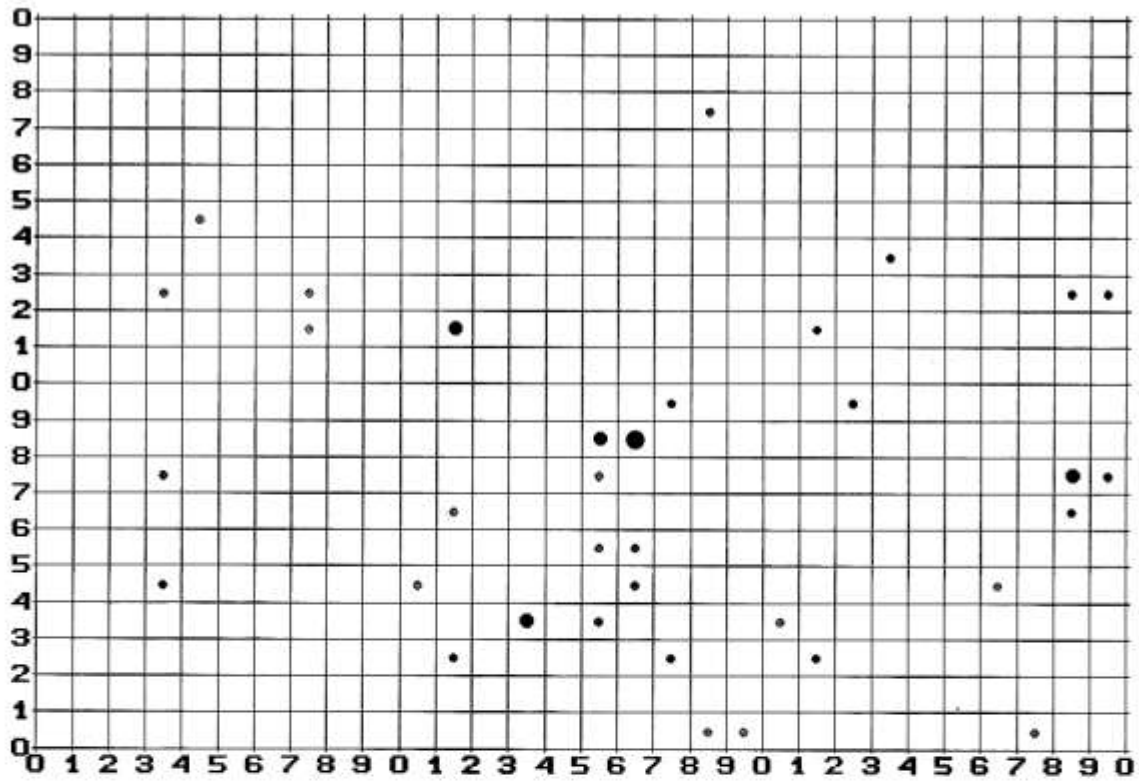
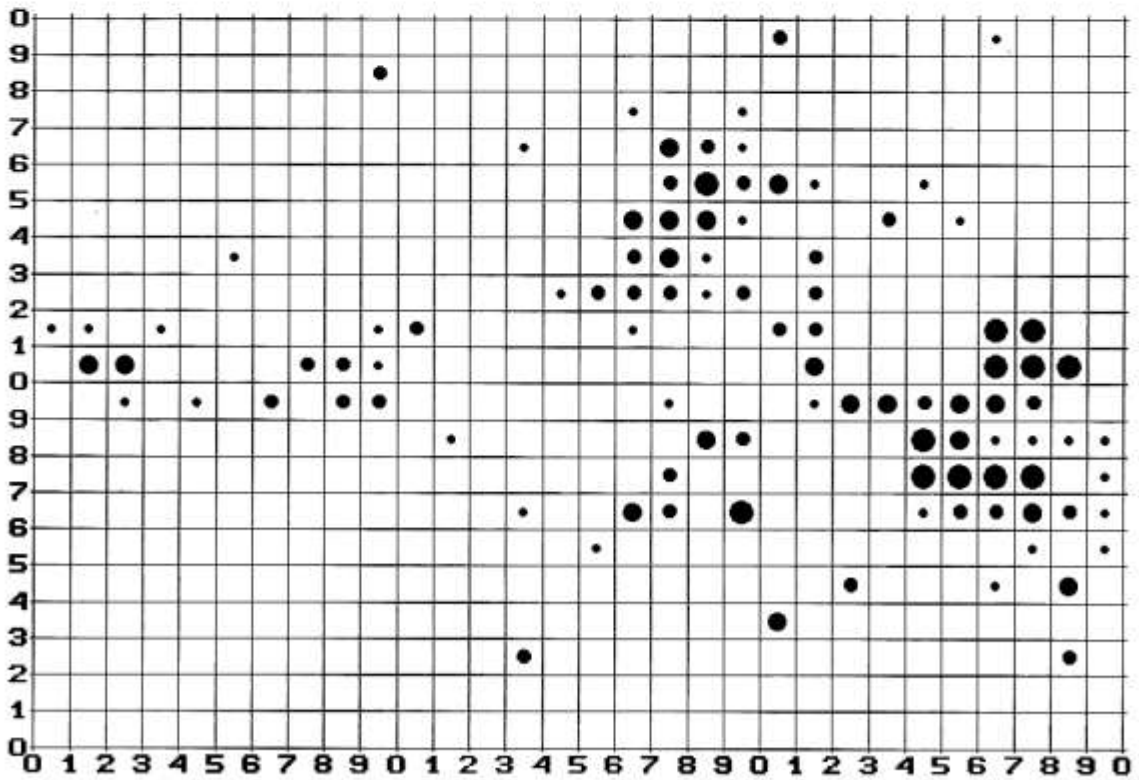


Fig.155. SORREL, hostplant-habitat for *L.phlaeas*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.156 CLOVER, hostplant-habitat for *C.croceus* and *P. icarus*

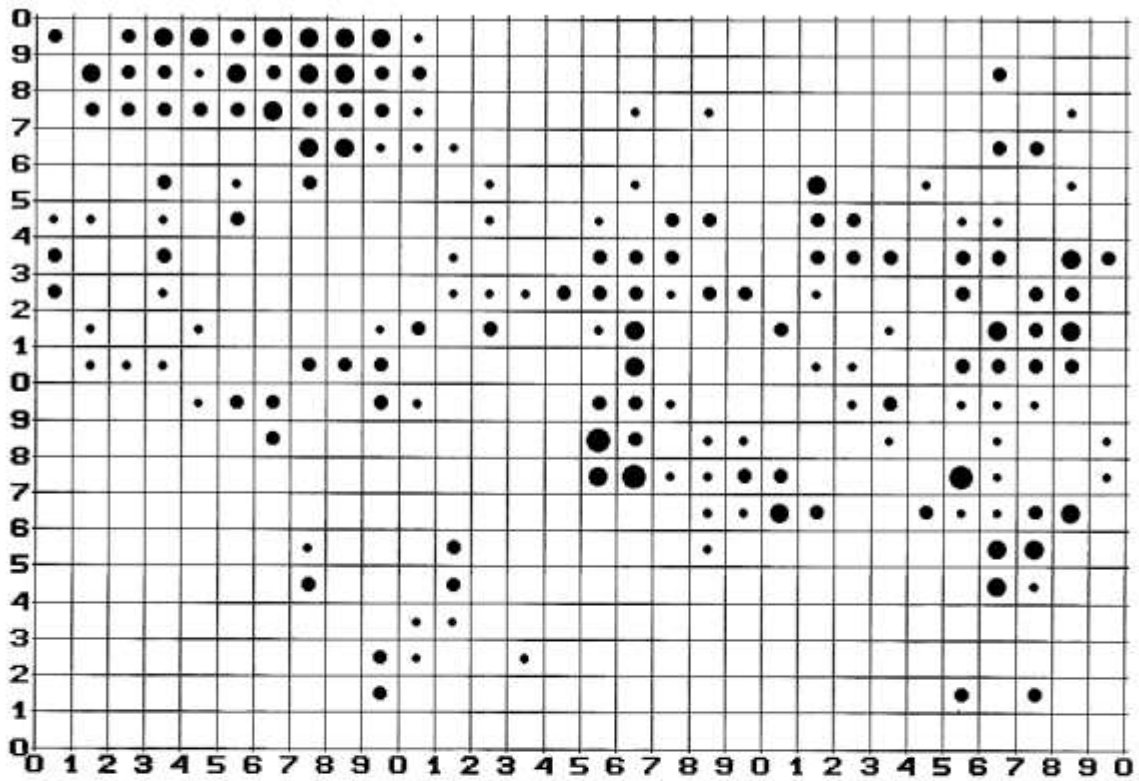
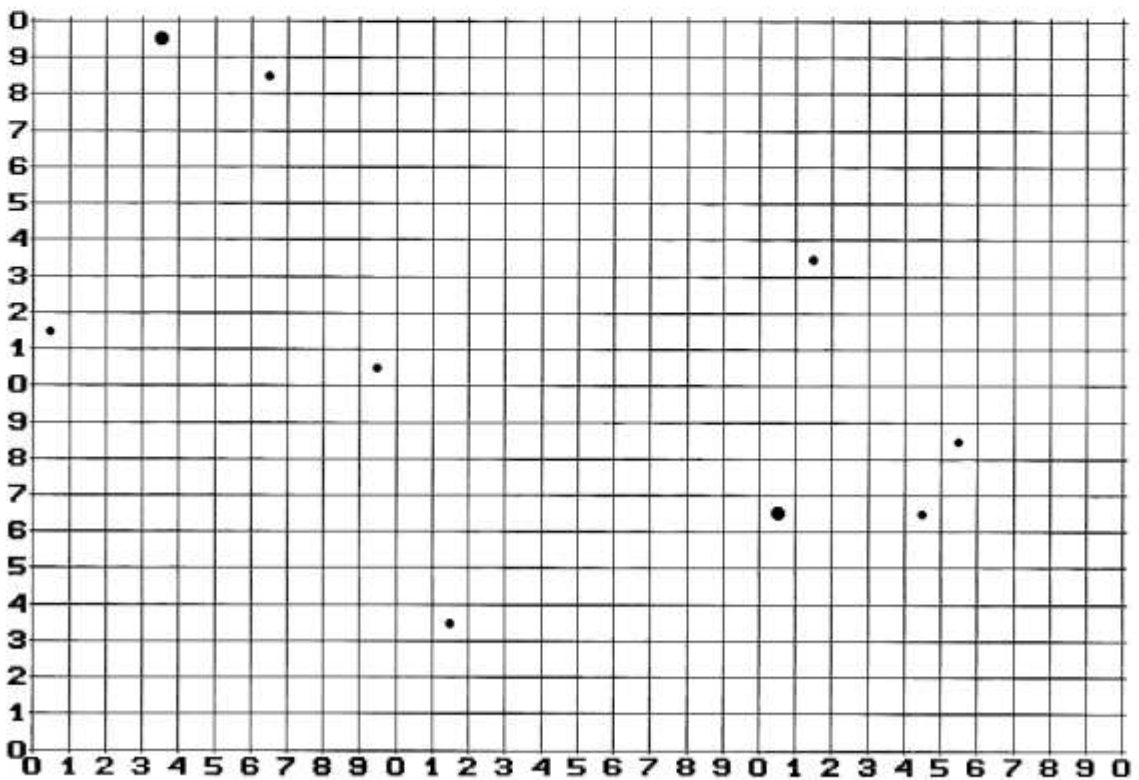


Fig.157. BIRD'S-FOOT TREFOIL, hostplant-habitat for *P. icarus*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.158. HOLLY, hostplant-habitat for *C. argiolus*

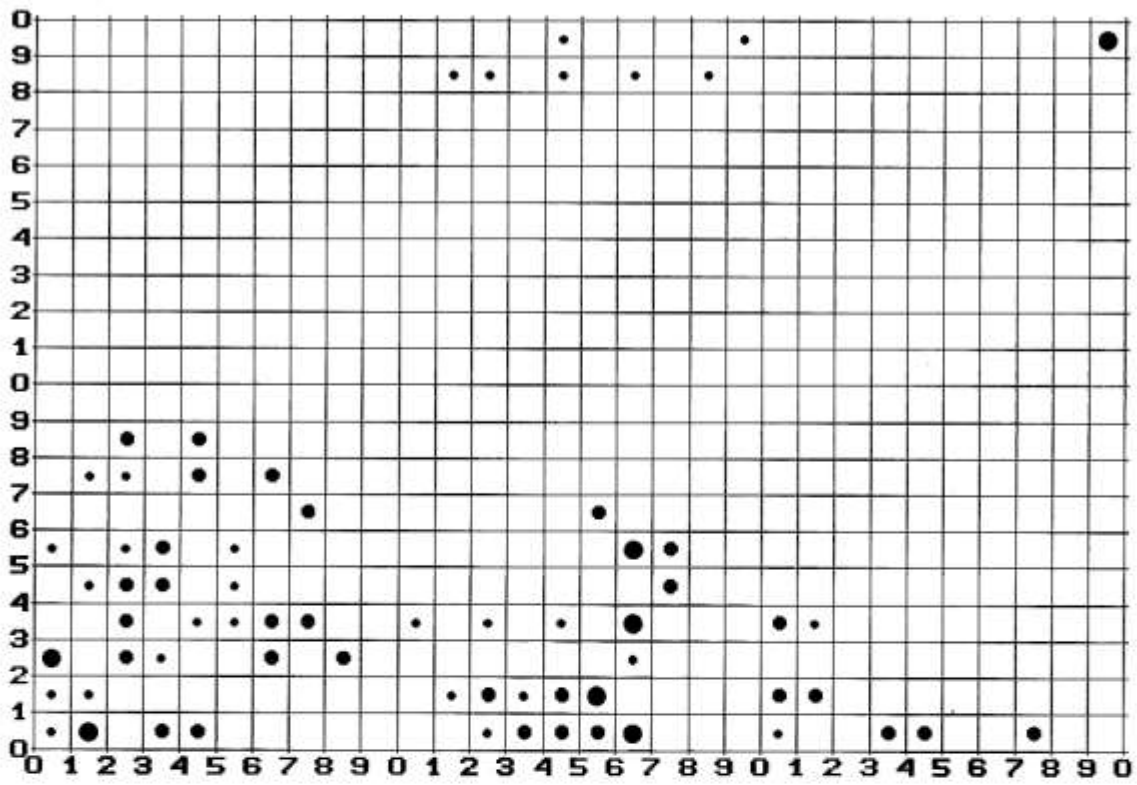
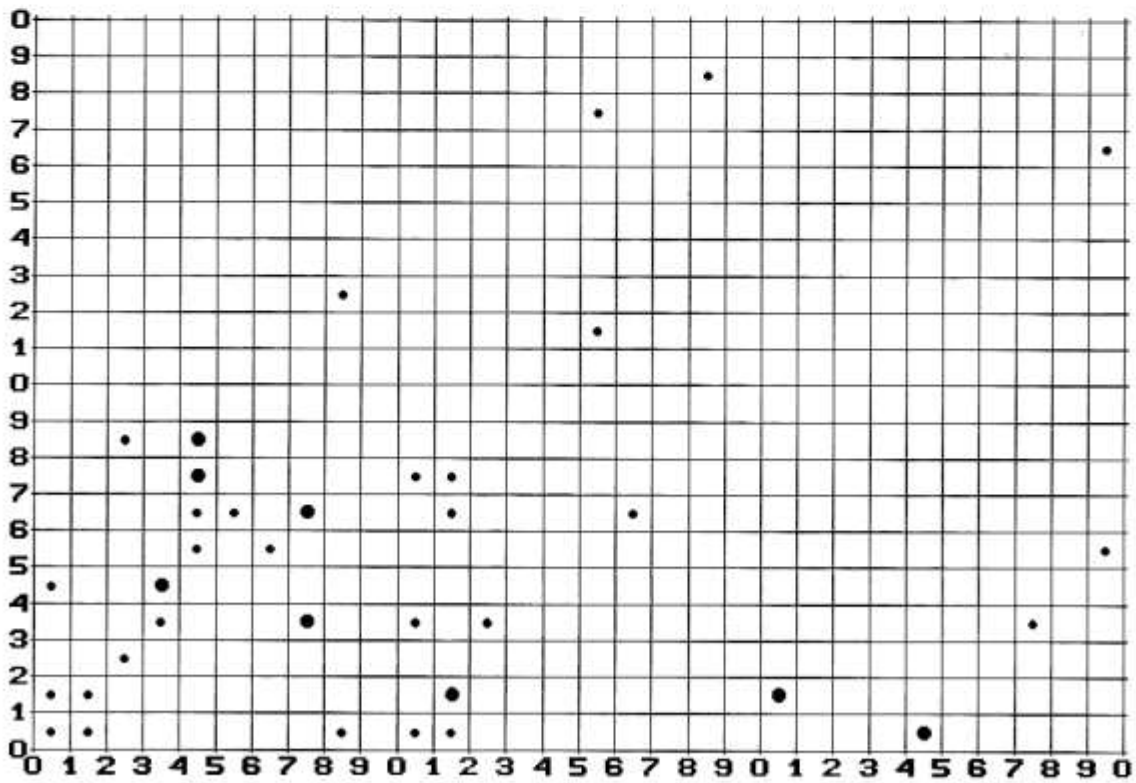


Fig.159. IVY, hostplant-habitat for *C. argiolus*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
 Symbol sizes, same as for Environments - see page 101

Fig.160. NETTLE, hostplant-habitat for *V.atalanta*, *A.urticae*, *I.io*, *P.c-album*

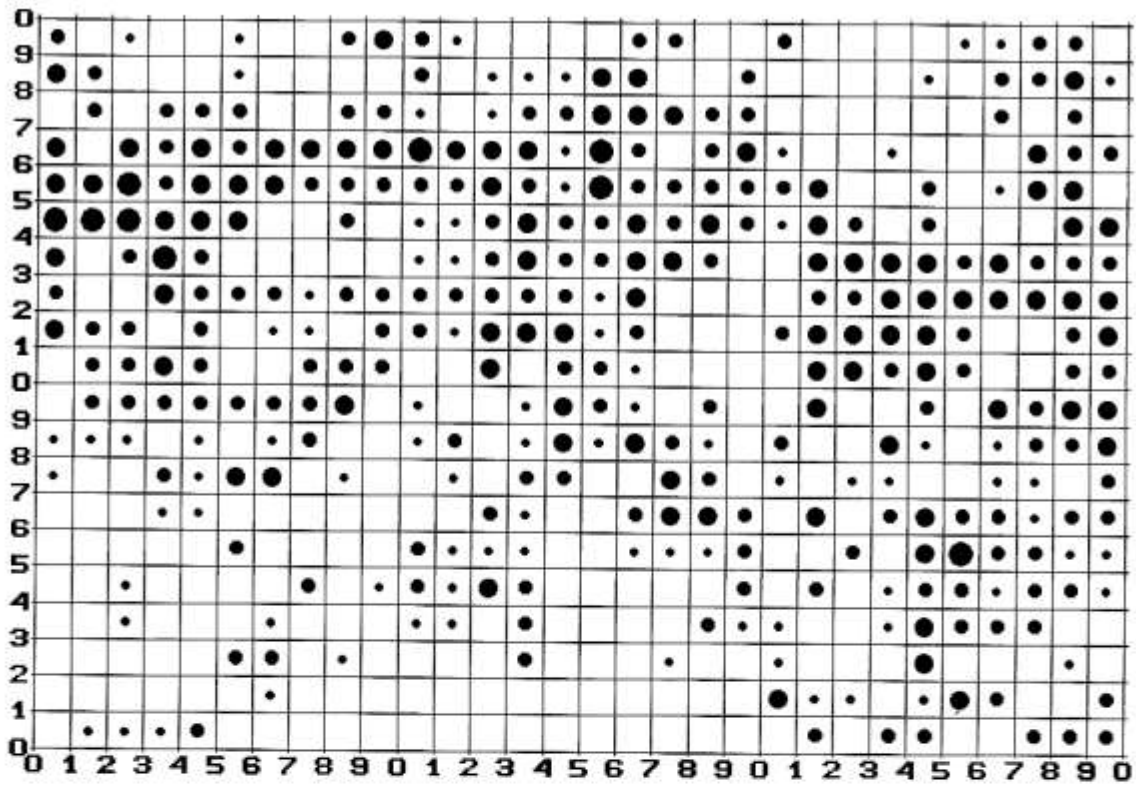
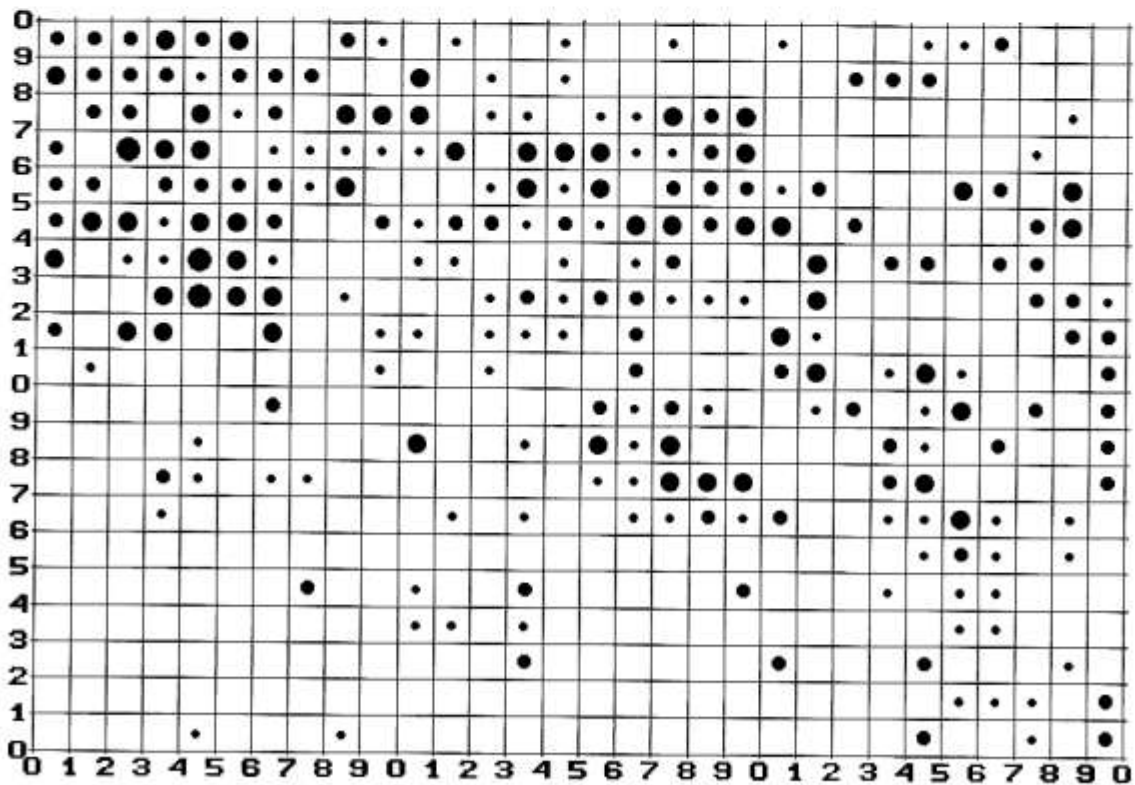
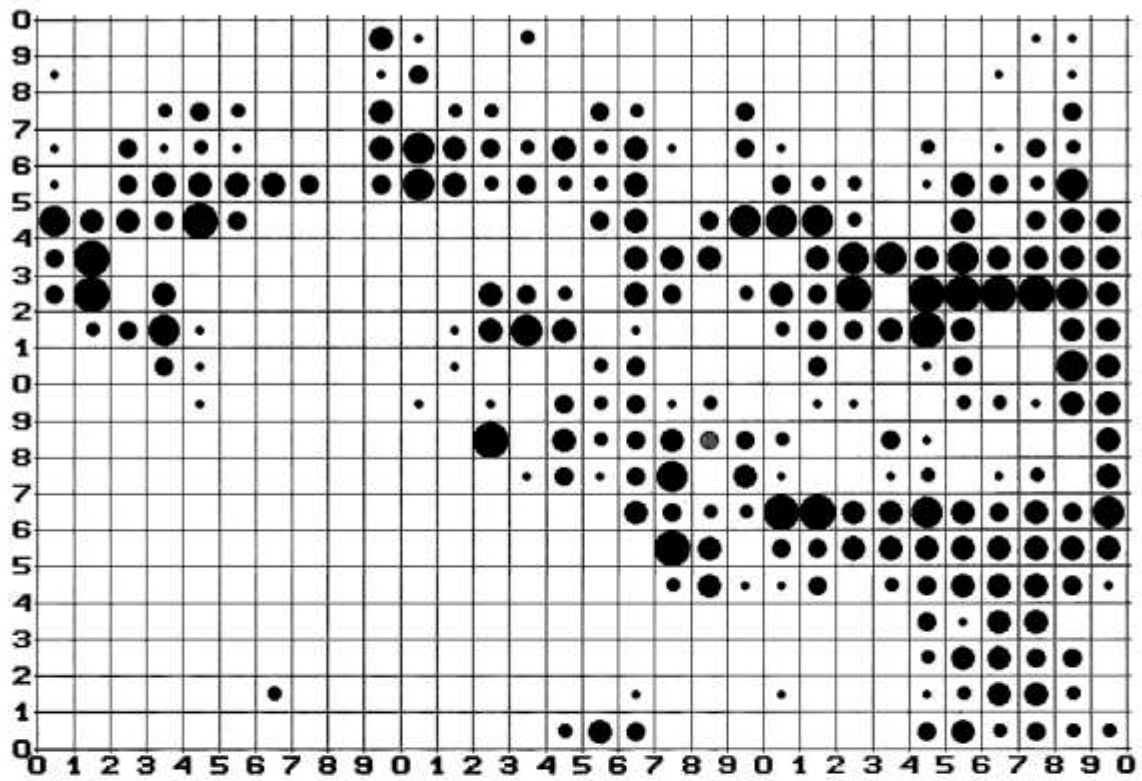


Fig.161. THISTLE, hostplant-habitat for *V.cardui*



HOSTPLANT-HABITATS, 3 X 2 KM ZONE
Symbol sizes, same as for Environments - see page 101

Fig.162. WOODLAND WITH GRASS, hostplant-habitat for *P.aegeria*



MAIN NECTAR SOURCES, 1996-1997 - 3 X 2 KM ZONE

Fig.163. THISTLE

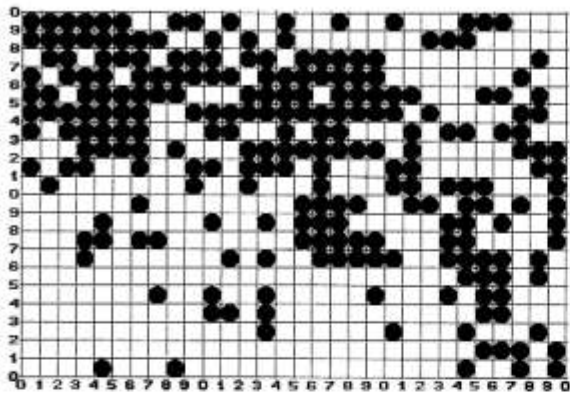


Fig.164. BUDDLEIA

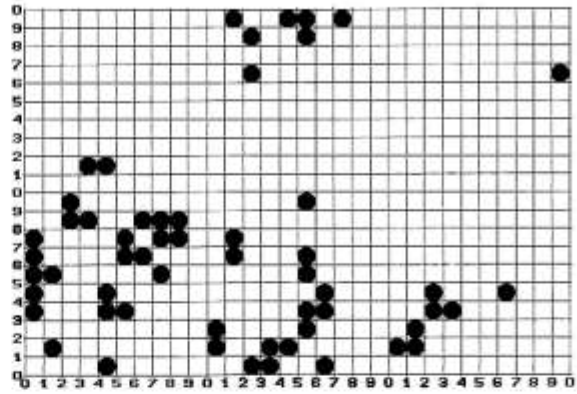


Fig.165. RAGWORT

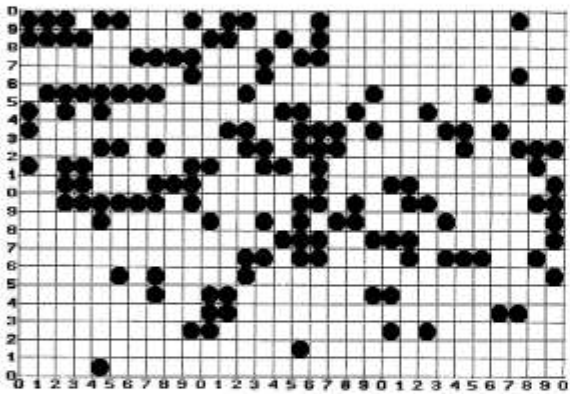


Fig.166. BRAMBLE

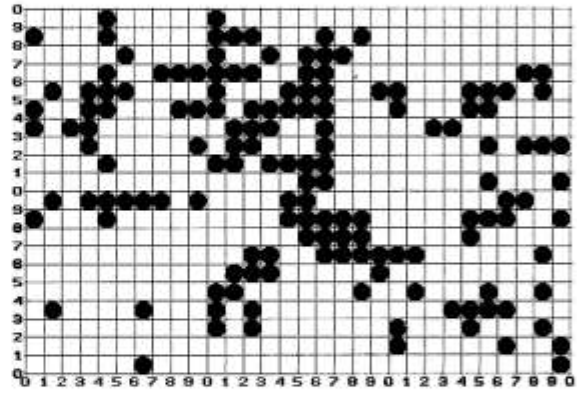


Fig.167. MICHAELMAS DAISY

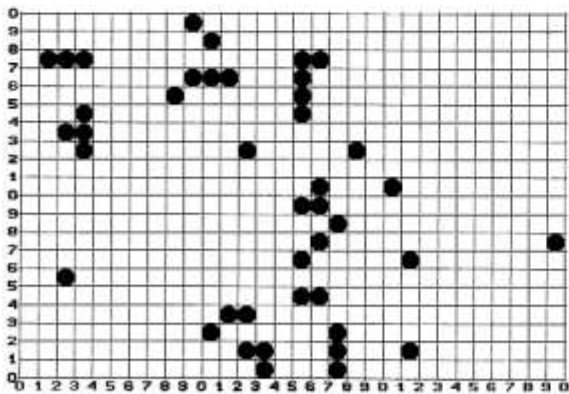


Fig.168. DANDELION

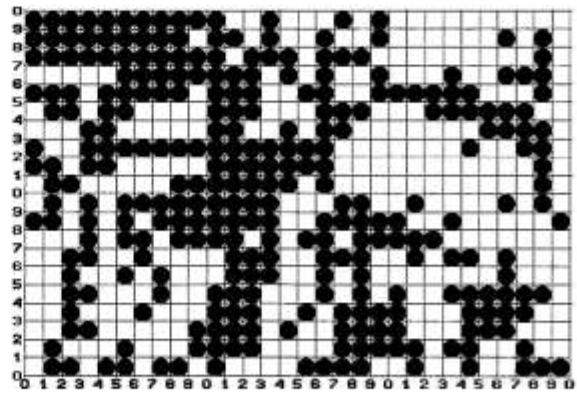


Fig.169. *Zygaena lonicerae*

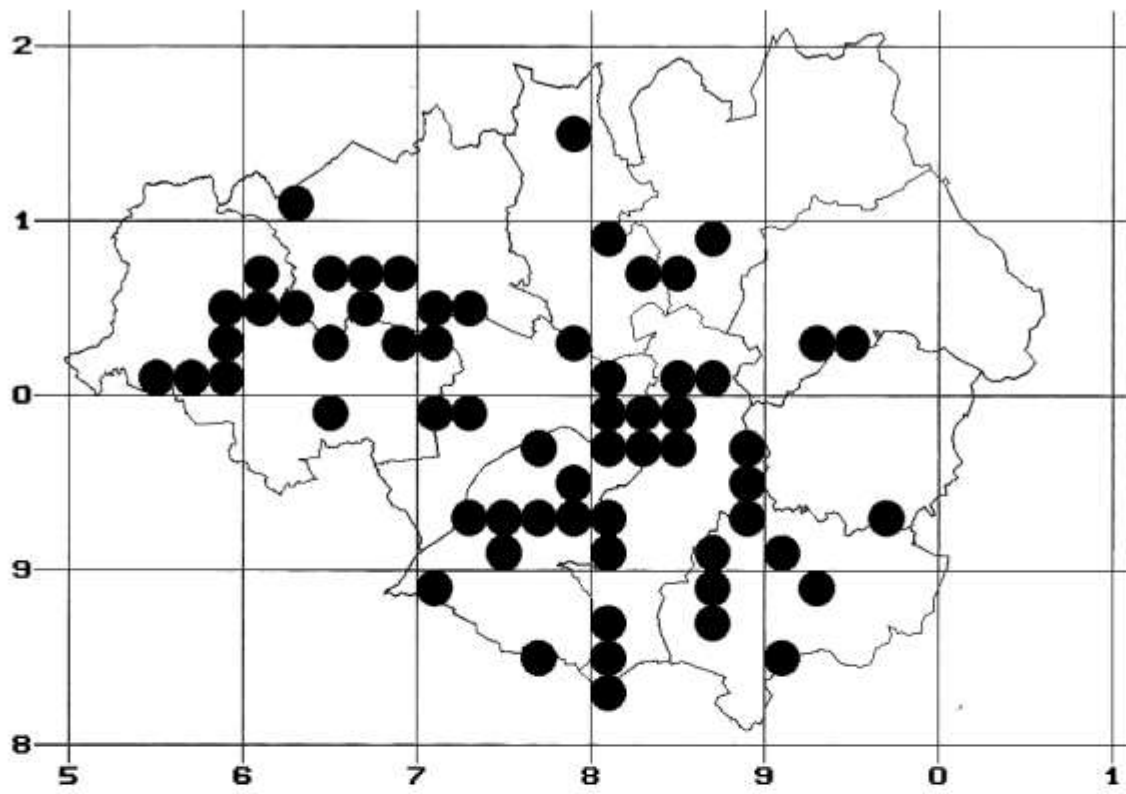
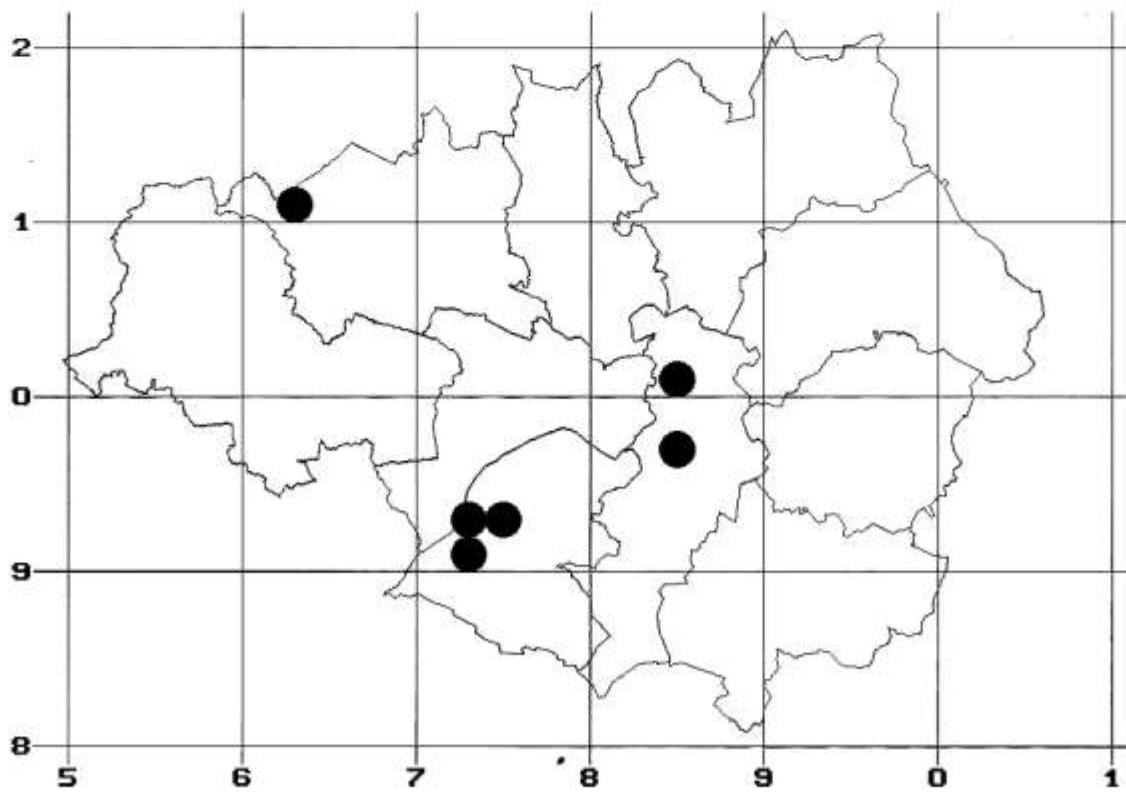


Fig.170. *Zygaena filipendulae*







ENVIRONMENT AGENCY

Much has been written in recent years about the decline of butterflies in Britain as a result of habitat loss. Whilst not denying the extent of this problem, this booklet aims to present a more optimistic picture by showing how twenty-four species of butterflies can and do thrive in the urban, suburban and rural environments which make up Greater Manchester, and many of these species range through the whole area virtually to the city centre.

The author Peter Hardy is an amateur entomologist who was born and bred in the Manchester area. He has travelled worldwide studying and photographing butterflies, and has published several scientific papers. For this, his first book, he has chosen the butterflies of his "home" patch as the subject of a detailed study of how they interact with the pressures and changes of civilisation in and around a large city, and the ecological requirements (hostplant-habitats and nectar sources) which they require.

The book will be of interest to naturalists, conservationists and indeed everyone with a love for the living things with which we share the environment.

PGL Enterprises, 10 Dudley Road, Sale, Cheshire, M33 7BB

ISBN 0-9532374-0-0