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COUNTRYSIDE COUNCIL FOR WALES

THE STATUS OF THE SHRILL CARDER BEE
Bombus sylvarum ON THE GWENT LEVELS

P.M. PAVETT
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Bombus sylvarum (L.)

P.M. Pavett

Department of Biodiversity & Systematic Biology, Entomology Section, National Museums & Galleries of Wales, Cardiff.



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NATIONAL MUSEUMS & GALLERIES OF WALES

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AUTHOR: P.M. Pavett

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Gwent Wildlife Trust
Mike Edwards, UK Bumblebee Working Group

The Status of the shrill carder bee *Bombus sylvarum* (L.) on the Gwent Levels

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Project objectives

To determine the current status and distribution of the shrill carder bee on the Gwent Levels in order to promote sympathetic mowing and cutting regimes where appropriate, and to provide a framework for wider landscape management sympathetic to the conservation of this and other bumblebee species

Summary

The purpose of this survey was to investigate populations of the BAP species *Bombus sylvarum* on the Gwent Levels. *Bombus sylvarum* was found to be widespread on the Gwent Levels and in very large numbers. This area might contain the largest known populations in Britain. Populations at Dyffryn, Goldcliff wetland reserve, Peterstone and Redwick were particularly large, with workers recorded in excess of a hundred. Fifteen sites were visited on the Gwent Levels, only two of which failed to produce any records of *Bombus sylvarum*. Large areas of the Gwent Levels which were not investigated looked suitable for *Bombus sylvarum*. Creeping thistle *Cirsium arvense* is identified as an important forage plant on the Levels.

During the survey another UK BAP species, *Bombus humilis*, was also noted to be common and widespread on the Levels and records of this and the other seven bumblebee species recorded on the Levels are included in the report.

Crynodeb

Pwrpas yr arolwg hwn oedd ymchwilio i boblogaethau'r rhywogaeth BAP *Bombus sylvarum* ar Wastatiroedd Gwent. Cafwyd bod *Bombus sylvarum* yn gyffredin ar y Gwastatiroedd ac yn doreithiog iawn, sy'n golygu mai dyma lle mae'r boblogaeth fwyaf y gwyddom amdani ym Mhrydain yn fwy na thebyg. Roedd poblogaethau arbennig o fawr yn y Dyffryn, gwarchodfa corstir Allteurn, Llanbedr a Redwick, gyda'r gweithwyr yn cofnodi dros gant o sbesimenau. Ymwelwyd â phymtheg o safleoedd ar Wastatiroedd Gwent, ac ar ddau safle'n unig y methwyd â chofnodi unrhyw achosion o *Bombus sylvarum*. Roedd rhannau helaeth o Wastatiroedd Gwent na archwiliwyd i'w gweld yn addas ar gyfer *Bombus sylvarum*. Nodwyd bod yr ysgallen ymledol *Cirsium arvense* yn blanhigyn porthiant pwysig ar y Gwastatir.

Yn ystod yr arolwg, nodwyd bod rhywogaeth arall ar restr BAP y DU, sef *Bombus humilis*, yn gyffredin ar draws ardal helaeth o'r Gwastatiroedd, a chynhwysir cofnodion hwn a'r saith rhywogaeth arall o gacwn ar y Gwastatiroedd yn yr adroddiad.

Introduction

The Gwent Levels are an extensive area of reclaimed wetlands lying between the conurbations of Cardiff and Newport. The area is divided by a network of reens, much of it given over to agriculture and pasture. The site is also under pressure from the building of roads, housing and factory estates. Nevertheless, there are still large areas with an abundance of flowering plants and rough grasslands (see Appendix 1).

During the period 1998 to 2002 whilst undertaking survey work on the Levels, three records of the bumblebee *Bombus sylvarum* were noted. It was felt that the Gwent Levels could hold large populations of this bumblebee and that a baseline survey of the area would be desirable to ascertain the current status and distribution of *Bombus sylvarum* on the Levels. This report is based on survey work jointly funded by CCW and National Museums & Galleries of Wales.

During August *Bombus sylvarum* reaches its peak numbers with queens, workers and males being on the wing. The survey work was undertaken during August 2003 and all three castes were recorded but no nests were located. The weather during this period was perfect for aculeate survey work with prolonged warm, sunny periods and fifteen sites were visited on the Levels. The sites were selected to cover as much area of the Gwent Levels that was feasible during the survey, thus sites both coastal and inland, from the outskirts of Cardiff across to Newport were visited (see Appendix 2).

Bombus sylvarum (L.)

Bombus sylvarum was a fairly widespread and common bee around the middle of the last century, especially in southern England and lowland Wales. Post 1960 records for the bumblebee show a very marked decline in populations. The preferred habitats for *Bombus sylvarum* are large flower rich areas such as sand dune systems, well established grasslands and heathland. It would appear that present intense agricultural methods and fragmentation of habitats have had a very serious impact upon this bee. In Wales, it now only occurs on large tracts of flower rich countryside such as, Kenfig Burrows NNR, Margam Moors SSSI and Parc Slip Nature Reserve in Glamorgan, Castlemartin MoD and adjacent farmland in Pembrokeshire and the Gwent Levels in Gwent. Important nectar and pollen sources for this bumblebee include red bartsia *Odontites vernus*, red clover *Trifolium pratense*, bird's foot trefoil *Lotus corniculatus*, black knapweed *Centaurea nigra* and Viper's bugloss *Echium vulgare*. Most of these plants are found on the Gwent Levels and were in flower during the survey period. It was noted during the survey, however, that the most important forage plant was creeping thistle *Cirsium arvense* which was being utilised for pollen and also probably as a nectar source, males being noted visiting them.

Nests are constructed from grass and plant fibres at or just below ground level indicating an importance of areas of rough grasslands within the mosaic of flower rich areas. Each nest supports a relatively small colony of workers and a single queen, with workers on the wing from May to September.

The aim of the survey therefore was to determine the current status and distribution of the shrill carder bee on the Gwent Levels in order to promote sympathetic mowing and cutting regimes where appropriate, and to provide a framework for wider landscape management sympathetic to the conservation of this and other bumblebee species.

Methodology

Survey work was undertaken between June and September 2003, and searches were initially made in areas where there have been recent sightings. Subsequent searches were made more widely on the Levels, looking at suitable habitat along reens and road verges and flower-rich pastures and arable fields.

Sightings of shrill carder bees have been mapped. The number of bees seen were recorded, including the presence of queens, workers and males, and the habitat(s) described in terms of the extent of forage and sward richness (including photographs). Any flower species used as forage, either for nectar or pollen, by the shrill carder bee were noted but it was not discriminated as to whether the plants were visited for pollen, nectar or both..

Results

The shrill carder bee was recorded from 13 of the 15 sites visited on the Gwent Levels (see Site Data Sheets), from Cardiff to Magor. Populations at Coedkernew, Howardian LNR, Magor Marsh, Newton Road, "saltmarsh" and Trowbridge appear to be small with only a handful of workers seen. Larger numbers were recorded at Hendre Lake, near Rhymney and the Trowbridge area, and exceptional populations were found at Peterstone, Goldcliff wetland reserve, Dyffryn and Redwick, where workers numbered in the low 100s.

Adults were recorded foraging on a wide range of plants (bird's-foot trefoil, bramble, cotton thistle, fleabane, greater willowherb, hedge mustard, hedge woundwort, Himalayan balsam, knapweed, marsh woundwort, purple loosestrife, red bartsia, smooth hawk's-beard, teasel, tufted vetch, water mint, white clover and woody nightshade) although creeping thistle was the most frequently visited. It is not known whether these were being visited for pollen and/or nectar.

The brown-banded carder bee *Bombus humilis* was also widespread and was recorded from all 13 sites where shrill carder bee was seen.

List of *Bombus* (Apidae) species recorded during survey

Bombus lucorum (L.)
Bombus terrestris (L.)
Bombus lapidarius (L.)
Bombus pratorum (L.)
Bombus hortorum (L.)
Bombus humilis Illiger

Bombus pascuorum (Scopoli)
Bombus sylvarum (L.)
Bombus campestris (Panzer)

List of plants recorded as being visited by bumblebees during survey

Birds-foot trefoil	<i>Lotus corniculatus</i> Linnaeus
Bramble	<i>Rubus fruticosus</i> Linnaeus
Common ragwort	<i>Senecio jacobaea</i> Linnaeus
Cotton thistle	<i>Onopordon acanthium</i> Linnaeus
Creeping thistle	<i>Cirsium arvense</i> (Linnaeus) Scop.,
Fleabane	<i>Pulicaria dysenterica</i> (Linnaeus) Bernh.,
Greater willowherb	<i>Epilobium hirsutum</i> Linnaeus
Hedge mustard	<i>Sisymbrium officinale</i> (Linnaeus) Scop.,
Hedge bindweed	<i>Calystegia sepium</i> (Linnaeus) R. Br.,
Hedge woundwort	<i>Stachys sylvatica</i> Linnaeus
Himalayan balsam	<i>Impatiens glandulifera</i> Royle
Knapweed	<i>Centaurea nigra</i> Linnaeus
Marsh woundwort	<i>Stachys palustris</i> Linnaeus
Meadowsweet	<i>Filipendula ulmaria</i> (Linnaeus) Maxim.,
Purple loosestrife	<i>Lythrum salicaria</i> Linnaeus
Red bartsia	<i>Odontites vernus</i> (Bellardi) Dumort.,
Red clover	<i>Trifolium pratense</i> Linnaeus
Smooth hawk's-beard	<i>Crepis capillaris</i> (Linnaeus) Wallr.,
Smooth sow-thistle	<i>Sonchus oleraceus</i> Linnaeus
Teasel	<i>Dipsacus fullonum</i> Linnaeus
Tufted vetch	<i>Vicia cracca</i> Linnaeus
Water mint	<i>Mentha aquatica</i> Linnaeus
White clover	<i>Trifolium repens</i> Linnaeus
Woody nightshade	<i>Solanum dulcamara</i> Linnaeus

Sites visited on the Gwent Levels during the survey

(listed in order of date visited)

Newton Road (soil extraction site)

Date - 5.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2378; 2478. (see Appendix 2 Site 6)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle, bramble
<i>Bombus terrestris</i>	Creeping thistle
<i>Bombus lapidarius</i>	Creeping thistle, bramble
<i>Bombus humilis</i>	Creeping thistle
<i>Bombus pascuorum</i>	Creeping thistle, bramble
<i>Bombus sylvarum</i>	Creeping thistle, red bartsia

Notes

Obviously a soil extraction site is continually changing but there are large areas which, having been bulldozed in previous years, have a rich and varied ruderal plant community. The emergent vegetation along the reens is also rich. Only five workers of *Bombus sylvarum* were noted at this site, but it has been recorded at the site in previous years.

Magor Marsh NNR

Date - 6.viii.2003

Weather – Warm and sunny

Grid Reference - ST.4286 (see Appendix 2 Site 15)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle
<i>Bombus terrestris</i>	Bramble
<i>Bombus lapidarius</i>	Teasel, Greater willowherb
<i>Bombus pratorum</i>	Bramble
<i>Bombus humilis</i>	Creeping thistle, Teasel, Birds-foot trefoil
<i>Bombus pascuorum</i>	Creeping thistle, Teasel, Greater willowherb
<i>Bombus sylvarum</i>	Creeping thistle

Notes

Most of the reserve was unsuitable for bumblebees in general, and for *Bombus sylvarum* in particular. Large areas of the reserve were very poor in flowering plants with the exception of the borders of the fen areas where *Bombus lucorum*, *terrestris*, *lapidarius*, *pratorum*, *humilis*, and *pascuorum* were fairly frequent visiting the flowers mentioned above.

Bombus sylvarum was only to be found in one small field where *Cirsium arvense* was fairly frequent. Five workers were recorded along with *B. lucorum* and *B. humilis* visiting the flowers of *Cirsium*.

Peterstone

Date - 7.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2579; 2679; 2680; 2780. (see Appendix 2 Site 7)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle, bramble, Himalayan balsam, cotton thistle
<i>Bombus terrestris</i>	Creeping thistle, fleabane
<i>Bombus lapidarius</i>	Creeping thistle, bramble, ragwort, knapweed, hedge mustard Cotton thistle
<i>Bombus pratorum</i>	Bramble, hedge mustard, knapweed
<i>Bombus hortorum</i>	Teasel, Himalayan balsam
<i>Bombus humilis</i>	Creeping thistle, bramble, Himalayan balsam, knapweed
<i>Bombus pascuorum</i>	Creeping thistle, bramble, teasel, white clover
<i>Bombus sylvarum</i>	Creeping thistle, bramble, teasel, greater willowherb, Himalayan balsam, cotton thistle

Notes

This area had the highest density of *B. sylvarum*. During a two hour period well in excess of a hundred workers were sighted. Two queens were encountered but no nests were observed. The preferred plant to visit was the creeping thistle. On a visit a fortnight later the creeping thistle had gone to seed and only a handful of *B. sylvarum* workers were observed.

Saltmarsh

Date - 8.viii.2003

Weather – Warm and sunny

Grid Reference - ST.3482; 3483; 3582; 3583. (see Appendix 2 Site 13)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle, cotton thistle
<i>Bombus lapidarius</i>	Creeping thistle, cotton thistle
<i>Bombus humilis</i>	Creeping thistle, cotton thistle
<i>Bombus pascuorum</i>	Creeping thistle, cotton thistle
<i>Bombus sylvarum</i>	Creeping thistle, cotton thistle

Notes

Cirsium arvense was abundant within the fields marked above and all the *Bombus* species recorded were predominantly visiting the flowers of this plant with few visiting the cotton thistle. Workers of *B. sylvarum* were not particularly common with only around ten being

observed. It is probable that these workers were moving into the fields from the wetland reserve where the bee was very common.

Wetland Reserve – Goldcliff

Date - 8.viii.2003

Weather – Warm and Sunny

Grid Reference – ST.3282; 3382; 3482. (see Appendix 2 Site 12)

Species occurring at the site

<i>Bombus lucorum</i>	Teasel
<i>Bombus terrestris</i>	Teasel, ragwort
<i>Bombus lapidarius</i>	Ragwort, knapweed
<i>Bombus hortorum</i>	Teasel
<i>Bombus humilis</i>	Knapweed, birds-foot trefoil
<i>Bombus pascuorum</i>	Creeping thistle, ragwort, knapweed
<i>Bombus sylvarum</i>	Creeping thistle, cotton thistle, birds-foot trefoil, teasel, knapweed, tufted vetch, red clover, ragwort
<i>Bombus campestris</i>	Teasel

Notes

Bumblebees were very common around the edges of the reserve, including along the coastal footpath. *Bombus sylvarum* occurred very commonly with between two and three hundred being seen during a period of three to four hours. Males were noted and a single queen. Again creeping thistle was the preferred plant to visit, though a range of other flowering plants were noted as being visited.

Dyffryn

Date - 11.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2984; 3084. (see Appendix 2 Site 10)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle, knapweed
<i>Bombus terrestris</i>	Hedge mustard
<i>Bombus lapidarius</i>	Smooth hawk's-beard, knapweed, tufted vetch
<i>Bombus pratorum</i>	Greater willowherb, tufted vetch
<i>Bombus hortorum</i>	Himalayan balsam,
<i>Bombus humilis</i>	Creeping thistle, Himalayan balsam, marsh woundwort, hedge woundwort, smooth hawk's-beard, tufted vetch
<i>Bombus pascuorum</i>	Bramble, Himalayan balsam, tufted vetch
<i>Bombus sylvarum</i>	Creeping thistle, knapweed, marsh woundwort, hedge woundwort, hedge mustard, Himalayan balsam, smooth hawk's-beard, tufted vetch

Notes

Bombus sylvarum occurred commonly in a number of fields near Dyffryn high school. Around two hundred workers were noted with males in attendance and two queens. Where creeping thistle was present this was the plant most frequently visited. Another plant that this species appears to be partial to is marsh woundwort. A stretch of reën (ST304845) surrounded by grassy fields had good growths of this plant and *B. sylvarum* was attracted to the flowers of this plant in large numbers. No other flowering plants were present and the fields were unsuitable for bumblebees, *B. sylvarum* obviously being attracted from other areas to visit this plant. A six-foot length of reën had fifty or sixty workers visiting marsh woundwort, an exceptional site when compared to the numbers of *Bombus sylvarum* encountered in other surveys in recent years.

nr. Rhymney

Date - 12.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2279; 2379. (see Appendix 2 Site 2)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle, smooth hawk's-beard
<i>Bombus lapidarius</i>	Creeping thistle, smooth hawk's-beard, hedge mustard, knapweed
<i>Bombus humilis</i>	Creeping thistle, smooth hawk's-beard, knapweed
<i>Bombus pascuorum</i>	Creeping thistle, smooth hawk's-beard, knapweed
<i>Bombus sylvarum</i>	Creeping thistle, smooth hawk's-beard, smooth sow-thistle, knapweed, hedge mustard

Notes

These unexceptional fields abounded with bumblebees. *Bombus sylvarum* was noted in good numbers, with around fifty to sixty workers seen during a period of just over an hour. Workers predominated but males were also seen. The creeping thistle at this site had nearly all gone to seed and most *B. sylvarum* were found on smooth hawk's-beard, as indeed, were all the *Bombus* recorded above.

Hendre Lake, St. Mellons

Date - 12.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2480. (see Appendix 2 Site 5)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle, knapweed
<i>Bombus terrestris</i>	Meadowsweet
<i>Bombus lapidarius</i>	knapweed

<i>Bombus humilis</i>	Creeping thistle, tufted vetch, water mint, birds-foot trefoil, hedge bindweed
<i>Bombus pascuorum</i>	Creeping thistle, hedge woundwort, tufted vetch
<i>Bombus sylvarum</i>	Creeping thistle, hedge woundwort, white clover, red bartsia, woody nightshade, tufted vetch, birds-foot trefoil, greater willowherb, water mint, knapweed

Notes

Around a hundred *Bombus sylvarum* were seen at the site. Workers and males were recorded in all the fields around Hendre Lake. Indeed, *B. sylvarum* was recorded in the car park before even leaving the car when workers were seen visiting tufted vetch. At this locality the favoured flowers to visit were those of red bartsia.

Trowbridge (footpath)

Date - 12.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2379. (see Appendix 2 Site 3)

Species occurring at the site

<i>Bombus lucorum</i>	Fleabane
<i>Bombus lapidarius</i>	Fleabane
<i>Bombus pratorum</i>	Fleabane
<i>Bombus humilis</i>	Creeping thistle, cotton thistle
<i>Bombus pascuorum</i>	Purple loosestrife
<i>Bombus sylvarum</i>	Creeping thistle, fleabane, greater willowherb, purple loosestrife

Notes

Flower rich road margins and footpaths through factory sites were visited. Around 20+ workers of *Bombus sylvarum* were noted foraging on a variety of flowering plants.

Trowbridge area

Date - 12.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2378; 2379; 2478; 2479. (see Appendix 2 Site 4)

Species occurring at the site

<i>Bombus lucorum</i>	Creeping thistle
<i>Bombus lapidarius</i>	Creeping thistle, knapweed
<i>Bombus humilis</i>	Creeping thistle, tufted vetch
<i>Bombus pascuorum</i>	Creeping thistle, knapweed
<i>Bombus sylvarum</i>	Creeping thistle, knapweed, tufted vetch

Notes

Around 30+ workers and males were recorded at this area.

Llandeenny

Date - 13.viii.2003

Weather - warm and sunny

Grid Reference - ST.3986; 4085; 4086. (see Appendix 2 Site 11)

Species occurring at the site

Bombus lapidarius Ragwort

Notes

One of only two areas visited where *B. sylvarum* was not found, indeed, only one species of *Bombus* was recorded, and then only males. There were large areas of creeping thistles but all had gone to seed. Earlier in the year *B. sylvarum* could well be found in this area when more plants are in flower.

Redwick

Date - 13.viii.2003

Weather - Warm and sunny

Grid Reference - ST.3982; 3983. (see Appendix 2 Site 14)

Species occurring at the site

<i>Bombus lucorum</i>	Bramble, ragwort
<i>Bombus terrestris</i>	Fleabane
<i>Bombus lapidarius</i>	Bramble, ragwort
<i>Bombus hortorum</i>	Teasel
<i>Bombus humilis</i>	Tufted vetch, birds-foot trefoil
<i>Bombus pascuorum</i>	Birds-foot trefoil, teasel, ragwort, tufted vetch
<i>Bombus sylvarum</i>	Birds-foot trefoil, fleabane, tufted vetch
<i>Bombus campestris</i>	Teasel
<i>Bombus sylvarum</i>	Fleabane, Birds-foot Trefoil, Creeping thistle

Notes

Bumblebees in general were very numerous at this site and between two and three hundred *Bombus sylvarum* workers and males were recorded, again creeping thistle being the primary forage plant.

Coedkernew

Date - 14.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2783; 2883. (see Appendix 2 Site 8)

Species occurring at the site

<i>Bombus lucorum</i>	Fleabane, Purple loosestrife
<i>Bombus lapidarius</i>	Creeping thistle, knapweed
<i>Bombus humilis</i>	Creeping thistle, cotton thistle, knapweed, tufted vetch
<i>Bombus pascuorum</i>	Cotton thistle, birds-foot trefoil, purple loosestrife, marsh woundwort, tufted vetch
<i>Bombus sylvarum</i>	Creeping thistle, cotton thistle, purple loosestrife, marsh woundwort, fleabane, knapweed, tufted vetch

Notes

An area where new roads had been laid and ponds dug. The areas where the ground had been scraped was very rich in flowering plants and also along the reens and field margins in this area. Around 20 *Bombus sylvarum* workers were recorded for the site.

Roadway from Coedkernew to the B4239

Date - 14.viii.2003

Weather – Warm and sunny

Grid Reference - ST.2782; 2783; 2881; 2182. (see Appendix 2 Site 9)

Species occurring at the site

<i>Bombus lucorum</i>	Bramble
<i>Bombus lapidarius</i>	Bramble
<i>Bombus pratorum</i>	Bramble
<i>Bombus pascuorum</i>	Bramble

Notes

Fields were visited along this stretch of roadway but none were suitable for Bumblebees in general and *Bombus sylvarum* in particular. Most had no flowering plants, except along the road outside of the fields, and were cattle and horse grazed with short turf like grass.

Howardian LNR

Date – 15.viii.2003

Weather – Warm and Sunny

Grid Reference – ST 207788

Species occurring at the site

<i>Bombus lapidarius</i>	Knapweed
<i>Bombus humilis</i>	Tufted vetch, knapweed
<i>Bombus pascuorum</i>	Tufted vetch

Bombus sylvarum Tufted vetch, knapweed

Notes

Although not strictly on the Gwent Levels it was felt that it would be useful to visit a flower rich site away from the main populations of *Bombus sylvarum* on the Levels. Howardian is a small flower rich site surrounded by industry and roads and it was pleasing therefore to record three workers of *Bombus sylvarum* and more commonly *B. humilis* at this site. I am unsure whether Howardian can maintain populations of *Bombus sylvarum* or whether workers from the Levels travel to forage at the site.

Discussion

During August 2003 survey work was undertaken on the Gwent Levels to investigate the extent of the populations of *Bombus sylvarum*. Fifteen sites covering areas both coastal and inland areas were visited and *Bombus sylvarum* is reported from thirteen of these sites. Number of bees sighted ranged from three to two to three hundred. It is established that the Gwent Levels hold important populations of this declining Bumblebee and it has been shown to be widespread and locally common in the area. The bumblebee occurred in areas that were flower rich and whilst a range of flowering plants were noted as being visited *Cirsium arvense* was noted as an important forage plant for pollen and probably nectar during the summer months. There are many areas on the Gwent Levels that are similar to those visited during the survey and it is certain that many of these will hold populations of *Bombus sylvarum*.

Whilst the Gwent Levels is a large area, which seems to be a pre-requisite for this species, it must be borne in mind that the area is under intense pressure from the building of factories, homes and roads. Too much fragmentation of the area may well have serious repercussions for this bumblebee. Another threat to this bumblebee is the wholesale mowing of fields, verges and reens and the spraying or topping of thistles.

Recommendations

With such large and easily accessible populations of this bumblebee it will be worth highlighting the area for any future ecological studies made on this bee. It would also be useful to further investigate the extent of the populations and distribution of the bee on the levels taking in the Caldicot Levels. Surveys during late spring would also be beneficial at the sites already visited to ascertain which plants are being visited for pollen and nectar during this period of the season.

Acknowledgements

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APPENDIX 1 : Photographs of selected sites

Howardian LNR (Site 1)



Howardian LNR (Site 1)



Rhymney (Site 2)



Rhymney (Site 2)



Peterstone (Site 7)



Duffryn (Site 10)



APPENDIX 2

Areas visited on the Gwent Levels

Green colour shaded on maps- indicates area with *B. sylvarum*

Yellow colour shaded on maps – indicates area visited but no *B. sylvarum* seen

Map 1

Site 1 Howardian LNR; 15.viii.2003; Grid Reference – ST 207788

Map 2

Site 2 nr. Rhymney; 12.viii.2003; Grid Reference - ST.2279; 2379.

Site 3 Trowbridge area; 12.viii.2003; Grid Reference - ST.2379.

Site 4 Trowbridge area; 12.viii.2003; Grid Reference - ST.2378; 2379; 2478; 2479.

Site 5 Hendre Lake, St. Mellons ;12.viii.2003; Grid Reference - ST.2480.

Site 6 Newton Road (soil extraction site); 5.viii.2003; Grid Reference - ST.2378; 2478.

Map 3

Site 7 Peterstone;. 7.viii.2003; Grid Reference - ST.2579; 2679; 2680; 2780.

Map 4

Site 8 Coedkernew;. 14.viii.2003 Grid Reference - ST.2783; 2883.

Site 9 Roadway from Coedkernew to the B4239; 14.viii.2003; Grid Reference - ST.2782; 2783; 2881; 2182.

Map 5

Site 10 Dyffryn. Date - 11.viii.2003; Grid Reference - ST.2984; 3084.

Map 6

Site 11 Llandeenny;13.viii.2003; Grid Reference - ST.3986; 4085; 4086.

Map 7

Site 12 Wetland Reserve – Goldcliff; 8.viii.2003 Grid Reference – ST.3282; 3382; 3482.

Site 13 Saltmarsh; 8.viii.2003; Grid Reference - ST.3482; 3483; 3582; 3583.

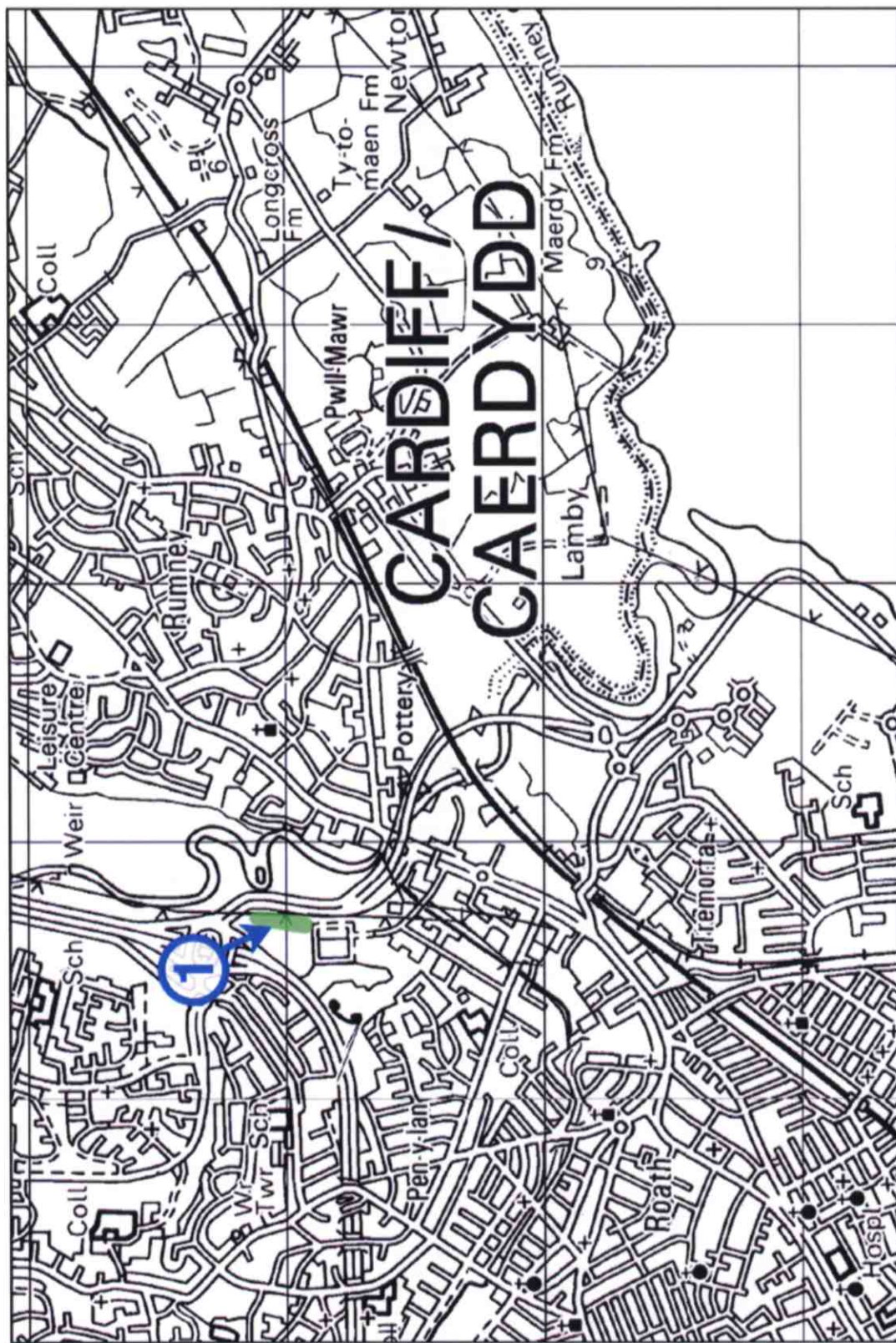
Map 8

Site 14 Redwick; 13.viii.2003; Grid Reference - ST.3982; 3983.

Map 9

Site 15 Magor Marsh NNR; 6.viii.2003; Grid Reference - ST.4286

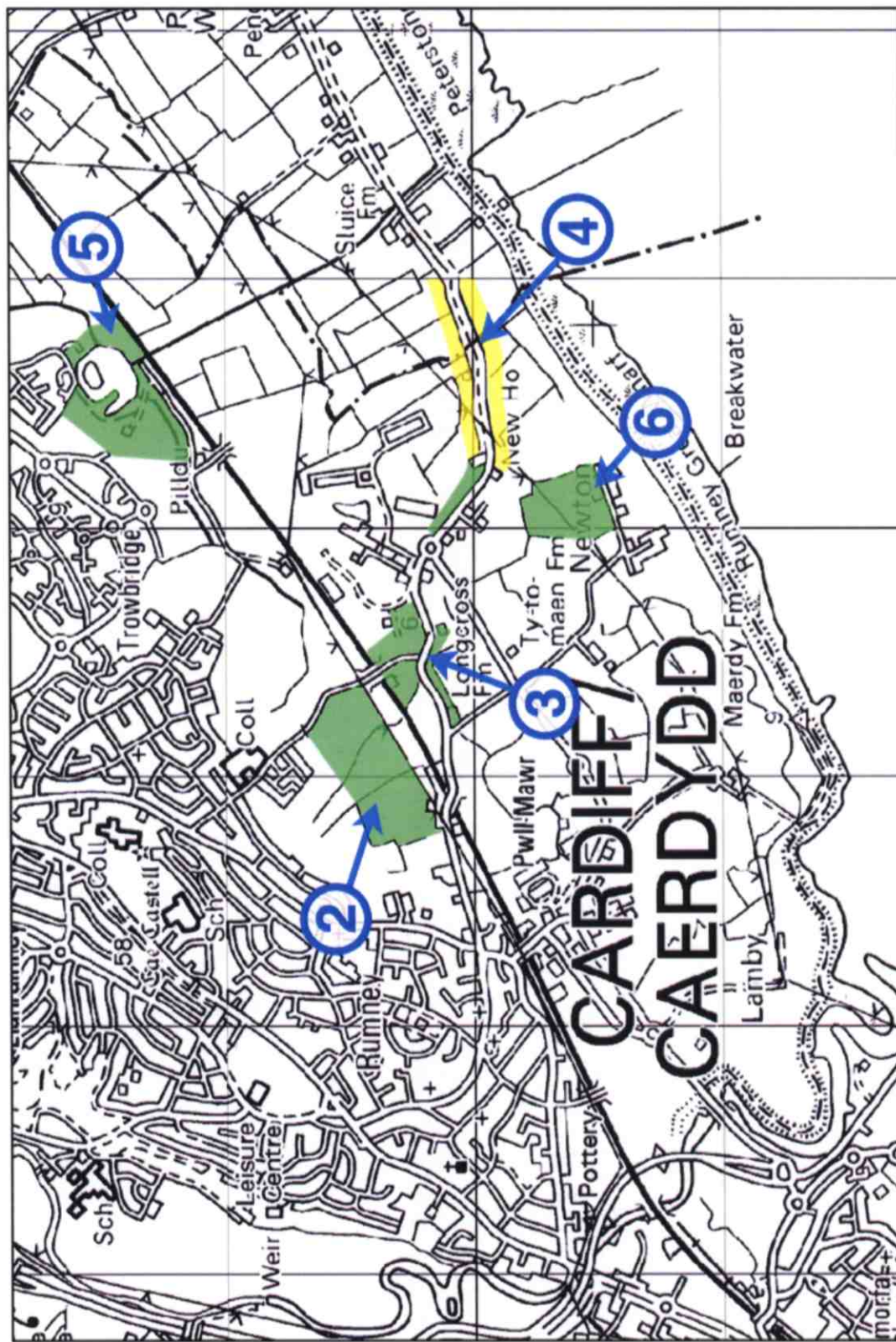
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Gwent Levels

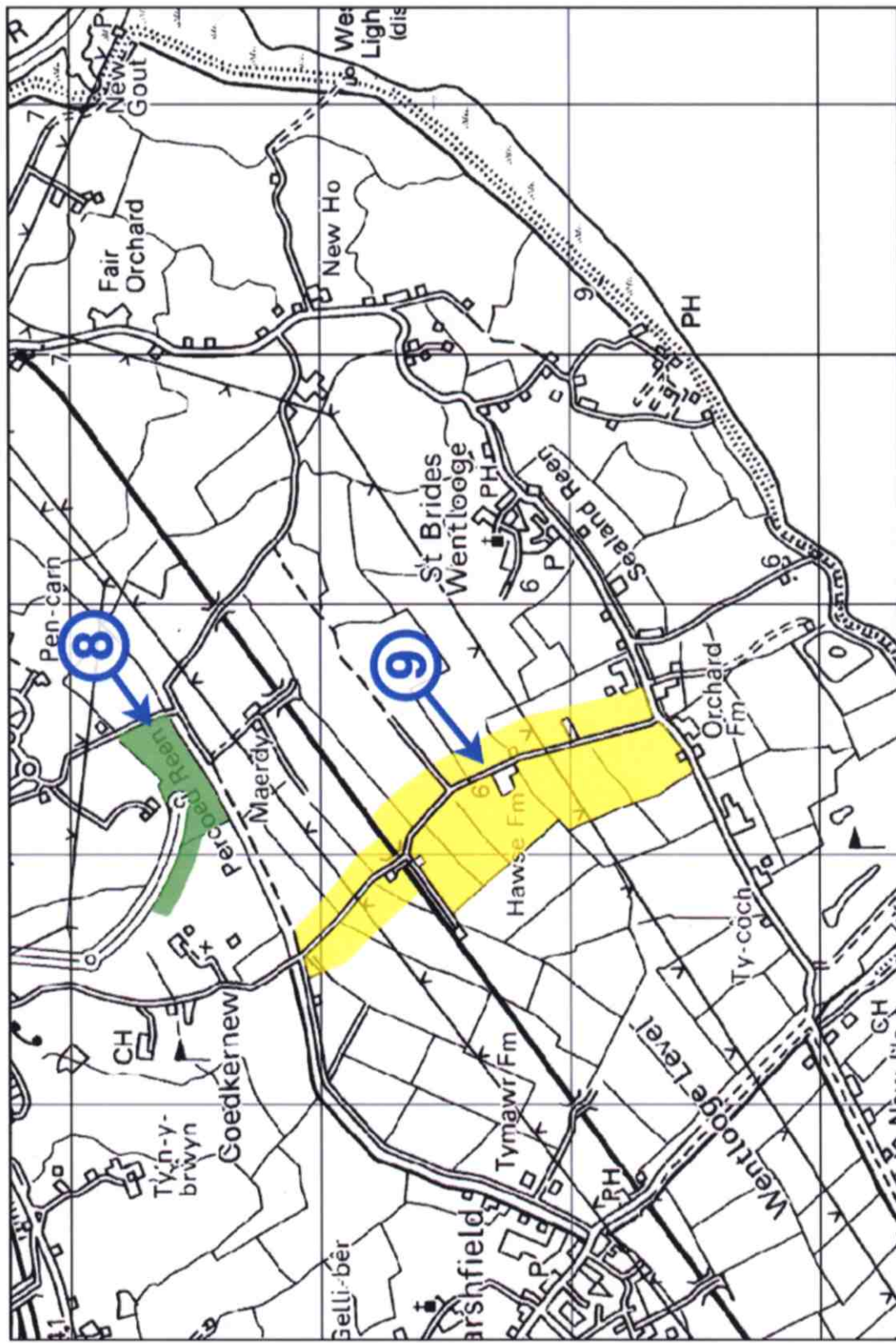


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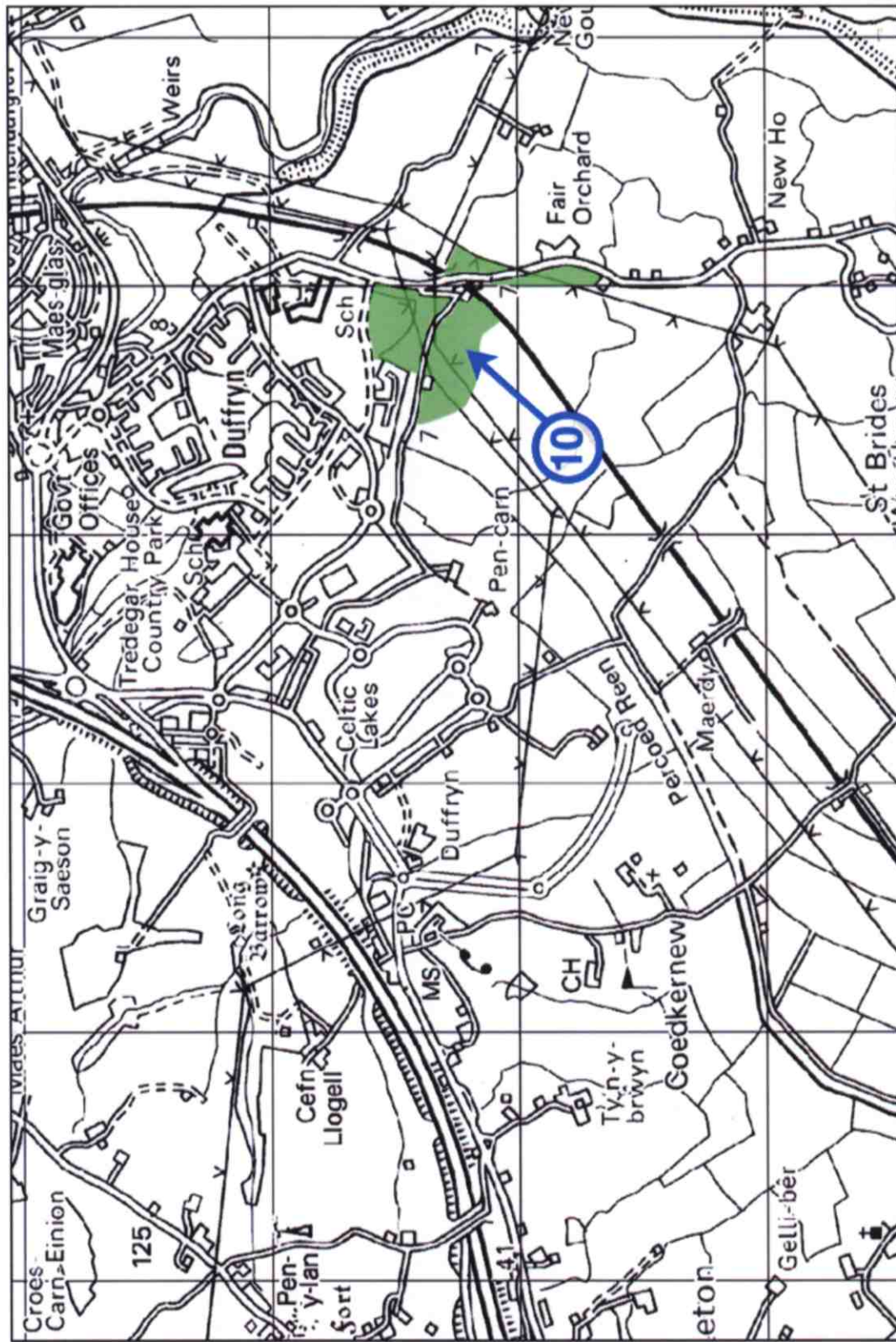


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Gwent Levels, Duffryn



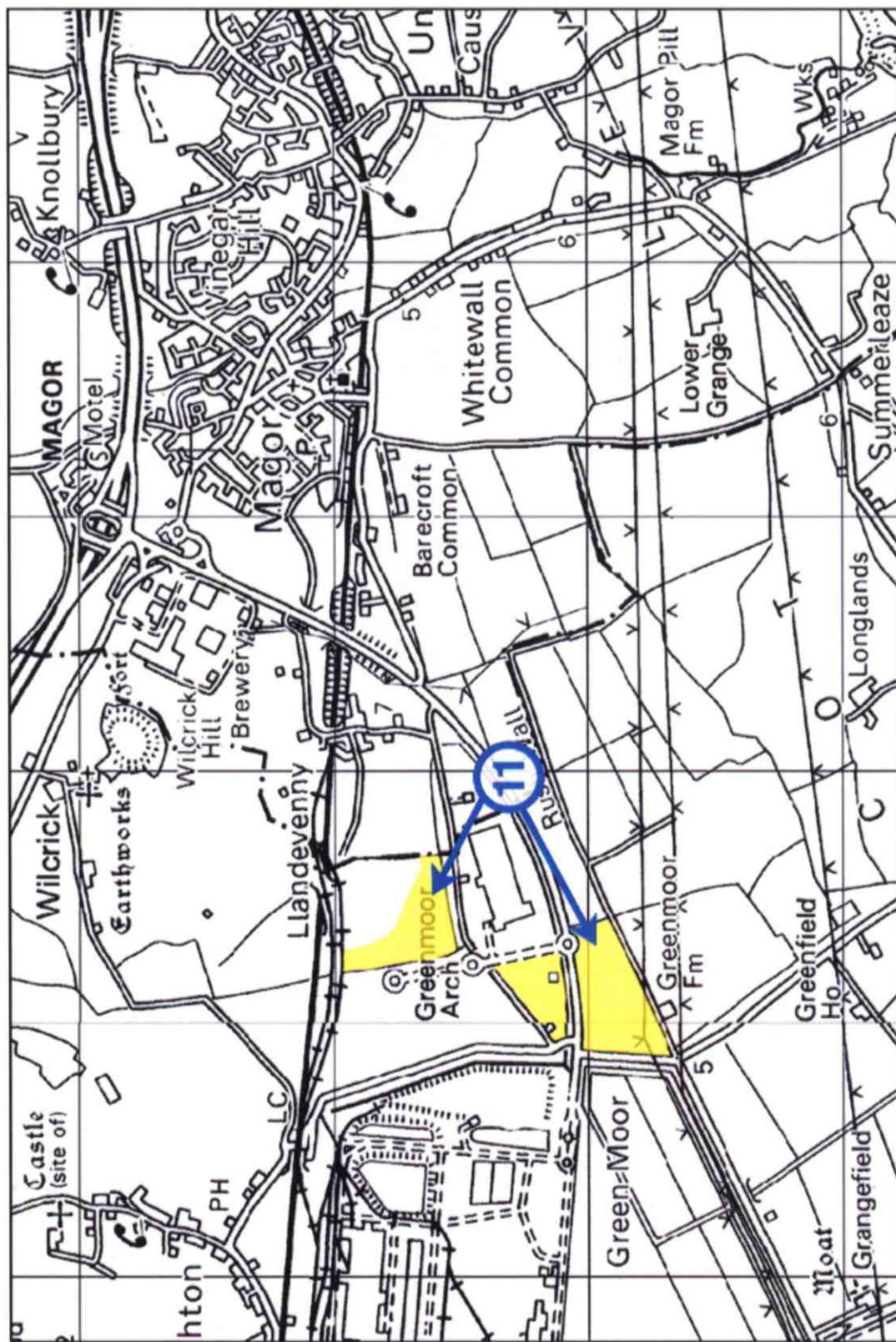
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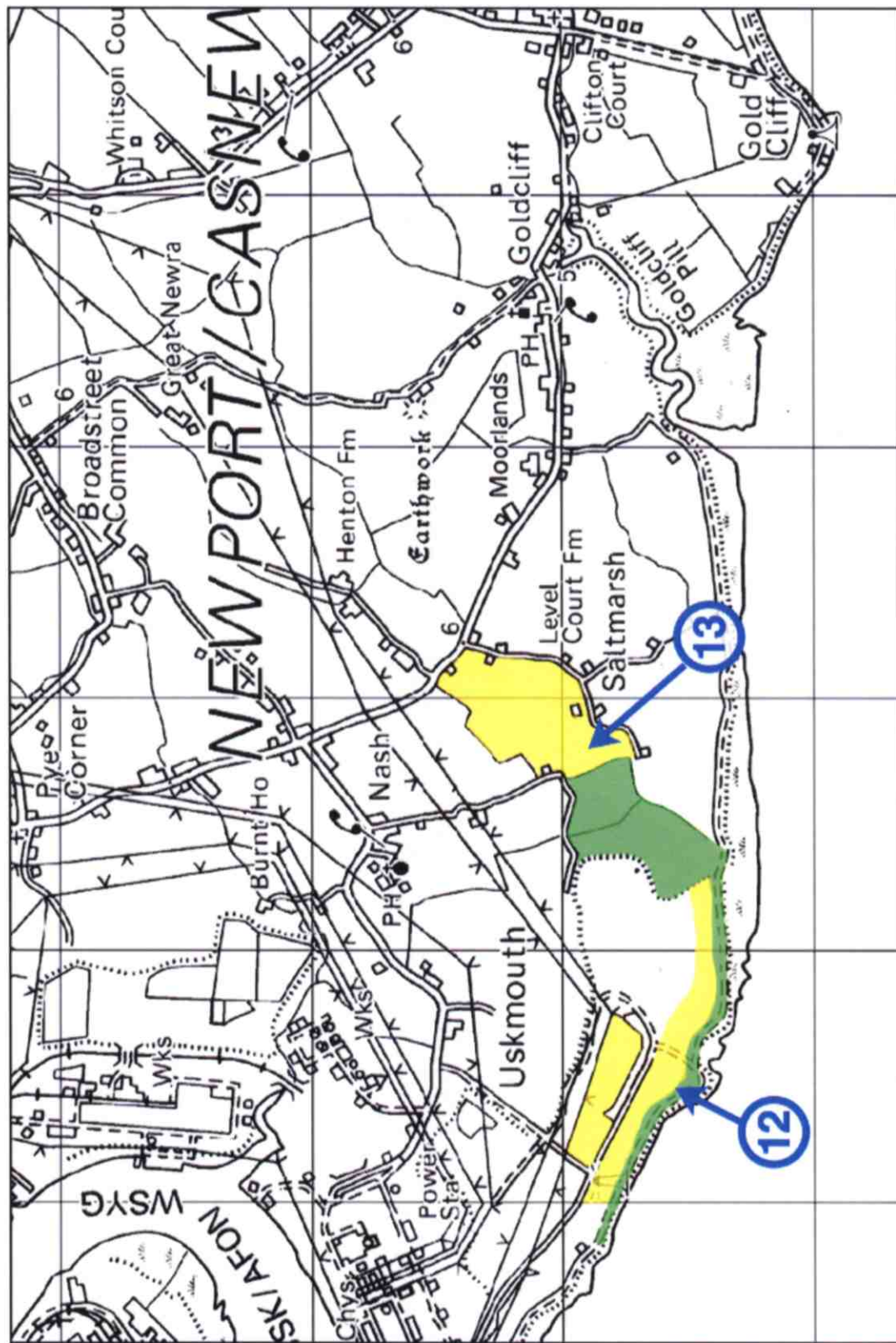
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Gwent Levels



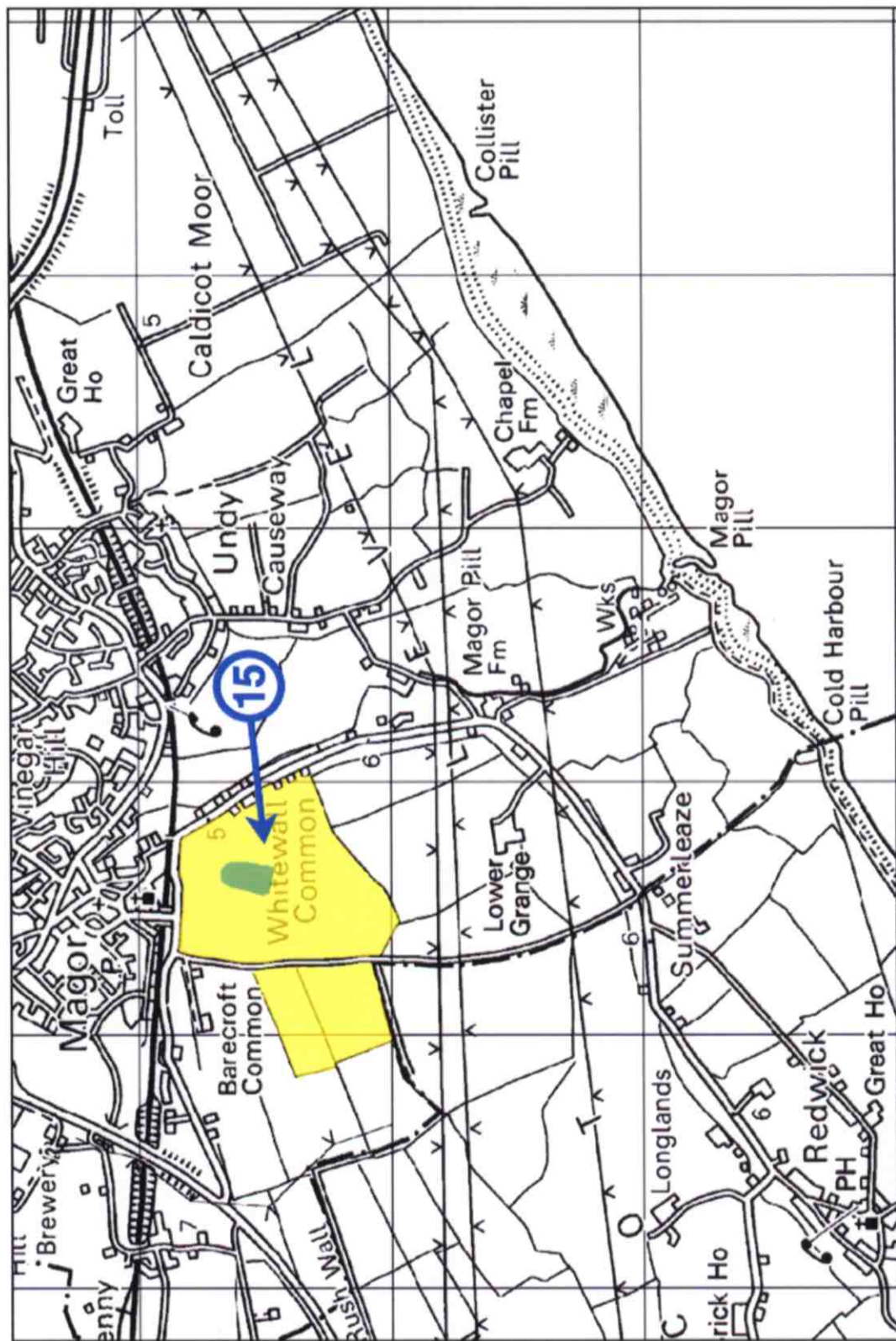
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