### **Butterflies and Moths**

There are 56 species of butterfly in Britain and Ireland,<sup>1</sup> and over 2,500 species of moth,<sup>2</sup> which together form the order lepidoptera (meaning scaly-winged). Moths are subdivided into macro-moths and micro-moths, and there are around 900 species of macro-moth.<sup>2</sup> Butterflies and moths share many similarities, and most beliefs about how to separate them are myths; for example, many moths fly in the daytime.

Lepidoptera abundance and species richness are a useful biodiversity indicator. Indeed, butterfly abundance is used as one of the UK Biodiversity Indicators.<sup>3</sup> This is because butterflies and moths are particularly sensitive to changes in land use and climate, and because so many other species are dependent on them, both as pollinators and as prey. Availability of caterpillars has been linked to breeding success in blue tits: chicks in urban areas were fed fewer caterpillars and experienced lower fledging success.<sup>4</sup>

Both butterflies and moths have undergone long term declines, and the abundance of larger moths has fallen by a third since 1968.<sup>5</sup> The UK butterfly indicators for habitat specialists and wider countryside have fallen by 45% and 25% respectively since the mid 1970s.<sup>6</sup> Of those species where a long-term trend could be calculated, 41% of moths<sup>5</sup> and 57% of butterflies<sup>6</sup> have declined in abundance. Causes of decline are complex and interactive, and include changes in land use, pollution and artificial lighting.<sup>5</sup> Climate change is causing many lepidoptera to move northwards, although this movement is limited by habitat availability. Most worryingly, species already in decline are those least likely to be able to move northwards or recover from extreme climatic events.<sup>6</sup>

Lepidoptera are probably the best recorded group of invertebrates. Nationally, butterflies are recorded casually and through the UK Butterfly Monitoring Scheme (UKBMS), which has been running since 1976 and now covers over 3,000 locations across the UK.<sup>7</sup> In 2009 Butterfly Conservation added the Wider Countryside Butterfly Survey (WCBS) to UKBMS, using randomly selected 1km squares (based on the Breeding Bird Survey (BBS) model), as many of the UKBMS transects are biased towards sites with good butterfly populations and/or rare species. In fact, many BBS surveyors now also survey their squares for butterflies as well as birds. There were 829 WCBS squares in 2019, but more are needed to achieve good coverage. Wales is a high priory area where more squares are needed.<sup>8</sup> The general recording scheme for butterflies is Butterflies for the New Millenium (BNM). This includes historic and current records, including a five-year cycle of recording butterfly distributions across the UK.

Moths are recorded through the Rothampsted light traps, a network of 80 traps across the UK (part of the Insect Survey) that has been collecting data since 1964 to provide one of the most comprehensive long-term insect datasets in the world.<sup>9</sup> A more recent addition to national moth data is the National Moth Recording Scheme (NMRS), started in 2007. This is an ongoing collation of current sightings and historic records, like BNM, rather than a standardised survey.

The County List for VC35 (Gwent) stands at 50 butterflies, 589 macro-moths and 855 micro-moths.<sup>10</sup> The Monmouthshire Moth and Butterfly Group (MMBG) was founded in 1999 (originally as the Newport Moth Recording Group) and is still active<sup>11</sup>; it publishes a regular newsletter, *The Silurian*. Recording is highest in Monmouthshire, but Newport also has a high number of records, especially

considering its size and large areas of urban habitat. Recording is lower in the north and west of Gwent, possibly due to the difficulties of recording in the uplands.

Unitary authority	Butterfly records	Species	Macro-moth records	Species
Gwent	55,148	50	223,016	589
Blaenau Gwent	3,025	32	10,332	384
Caerphilly (VC35 only)	6,945	33	30,575	485
Monmouthshire	28,169	49	108,396	579
Newport	10,974	37	61,169	490
Torfaen	7,394	41	510,743	405

Records distribution by local authority (to Dec 2020)<sup>12</sup>

Within the study area, there are 36 UKBMS locations, with datasets varying from 1 to 10 years, 14 (39%) of which reported in 2018, the most recent available year. At UKBMS sites within the study area, 47 species of butterfly and moth have been recorded; records range from over 600 records of Speckled Wood (*Pararge aegeria*) to single records of Pale Clouded Yellow (*Colias hyale*), Scarlet Tiger (*Callimorpha dominula*), Shaded Broad-Bar (*Scotopteryx chenpodiata*), and Silver-Ground Carpet (*Xanthorhoe montanata*).<sup>13</sup>

UK BMS locations within the study area, size relative to number of years of data (1 to 10 years)<sup>13</sup>



## Forester Adscita statices (Linnaeus, 1758)

#### Protection: None

**Conservation status:** UKBAP Priority Species, Wales Section 7 Priority Species

### Data availability: Poor (39 records)

**Context:** The Forester, confusingly, is not particularly associated with woodlands. Its name comes from the moth's green colour, similar to the 'Lincoln Green' traditionally worn by foresters. This day-flying moth is mostly found on grassland, as well as woodland rides and clearings, where the larval foodplant is Common



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Sorrel (*Rumex acetosa*) or Sheep's Sorrel (*R. acetosella*).<sup>14</sup> The Forester was added to the UK BAP Priority Species list in 2007 due to marked declines across the UK. More research is needed to understand Forester ecology and establish the current UK distribution.<sup>15</sup>

**Outlook:** What is happening to Forester populations is unclear, both within Greater Gwent and at the UK level. It has to be assumed that the trend that led to their allocation as a priority species is continuing. New information may come from the new National Moth Recording Scheme,<sup>16</sup> launched in 2007.

**Greater Gwent range:** There are only a few, very thinly scattered records for Forester across Greater Gwent. Almost a quarter of the records come from Flatwood Meadow LNR, which seems to be subject to dedicated surveys by an individual recorder. Caerwent also appears to have an established, albeit less well recorded, population. Although Flatwood Meadow is known for its lepidoptera,<sup>17</sup> there are many other examples of this type of grassland (species-rich hay meadow) across Greater Gwent, suggesting that this species may be under-recorded. It is suggested that the Forester is sensitive to sward height, and moves between local sites accordingly, making them difficult to record.<sup>18</sup>



**Population trends:** There is not sufficient data to determine a regional trend for the Forester.

**Protection:** 26% of records come from protected sites, with scattered records from SINCs such as Greenmeadow Farm in Blaenau Gwent and Ty-Sign Meadows in Caerphilly. The Flatwood Meadow records do not appear within the LNR boundary due to centring of records.





# White-Spotted Sable Anania funebris (Ström, 1768)

### Protection: None

Conservation status: Red Data Book (RDB) Nationally Scarce,<sup>19</sup> UKBAP Priority Species, Wales Section 7 List

### Data availability: Poor (11 records)

**Context:** The White-Spotted Sable is a day-flying moth found in woodland glades and rough grassland, particularly on limestone. It is reliant on Goldenrod (Solidago sp.) and occasionally Dyers Greenweed (Genista *tinctoria*).<sup>19</sup> The White-Spotted Sable has an extremely



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limited and localised distribution across the UK, restricted to parts of southeast England, Morecambe Bay, Herefordshire and Gloucestershire, and around the coast of Wales. There are very few records for the UK overall: just 257 records in the NBN Atlas.<sup>20</sup>

Outlook: It is difficult to determine trends for scarce species, although it is thought that the White-Spotted Sable is possibly declining, due to increased shading in woodland leading to reduced availability of their foodplants.<sup>19</sup> Generally, the local populations of species with low abundance and limited distribution are more vulnerable to extinction.<sup>21</sup>

If the species remains in Greater Gwent, it may already be too late to maintain the population. Interventions to support the White-Spotted Sable could include woodland and grassland management to encourage the foodplants, as well as increased survey efforts.

Greater Gwent range: The White-Spotted Sable has been never been common in Greater Gwent, and has only been found at a few sites: Lasgarn Woods, Victoria Slopes, Penllywn Grasslands, Wentwood, Slade Wood and near Tintern. Most of these sites are just single records. This is one of the few species where there are more historic (pre-1970) records than recent ones. The most records (three) are from the area around Penllwyn Grasslands, where there was a persistent colony until the mid 1990s. It is thought that increasing development around the site led to the loss of the population. The most recent SEWBReC record, in 1998, is from Lasgarn Woods, but there are more records from Aberbargoed Grasslands (2013 and 2014) not yet on the SEWBReC database.<sup>18</sup> However, there have been no recent records.

Density of White-Spotted Sable records (maximum 3 records/km<sup>2</sup>) G White-Spotted Sable records by decade 

**Population trends:** There is not enough data to determine a local trend for White-Spotted Sable.

**Protection:** 30% of records come from protected sites, with records from SINCs at Lasgarn Woods and Victoria Terrace. It is likely that three further records are from from Penllywn Grasslands SSSI but fall outside the boundary due to centring of records.



White-Spotted Sable records from protected sites

# Small Pearl-Bordered Fritillary *Boloria selene* (Denis & Schiffermüller, 1775)

### Protection: None

**Conservation Status:** NEAR THREATENED (UK),<sup>22</sup> UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Moderate (489 records)

**Context:** The Small Pearl-Bordered Fritillary has undergone a severe long-term decline. It has lost 76% of its range and 58% of its abundance since 1976<sup>6</sup> and is close to being classified as Vulnerable.<sup>22</sup> Small



Pearl-Bordered Fritillaries are found in a range of habitats, including grassland and moorland flushes, and mosaic habitats of grassland, bracken and scrub.<sup>23</sup> They are sensitive to changes in management, as both lack of management and overgrazing will cause the loss of their foodplants, Common Dog-Violet (*Viola riviniana*) and Marsh Violet (*V. palustris*).<sup>24</sup>

**Outlook:** Small Pearl-Bordered Fritillary declines have been more severe in England, meaning that Wales, together with Scotland and the west of England, is now a stronghold for the species. However, we do not have a reliable trend for the Welsh population. On a positive note, the Small Pearl-Bordered Fritillary has been shown to respond well to landscape-scale conservation, such as improvements to site management, site restoration and planting of the larval foodplants.<sup>24</sup> Although the status of the Greater Gwent population is not clear, its presence on sites already managed for biodiversity is reassuring.

**Greater Gwent range:** Small Pearl-Bordered Fritillaries are found mostly in the north and west of Greater Gwent, on upland fringe (ffridd) and grassland sites. Hotspots for records occur at Silent Valley and Blackrock, which are both UKBMS sites, as well as Aberbargoed Grasslands and Blaenserchan.

Although there is a scattering of records along the English border, these are mostly historic, with almost all recent records coming from Blaenau Gwent, Caerphilly and Torfaen. This indicates a retreat from lowland sites to higher altitudes: most recent Small Pearl-Bordered Fritillary records are above 300m. It is suggested that this could be climatic, as most of the lowland sites remain in good condition.<sup>18</sup>

Density of Small Pearl-Bordered Fritillary records, (maximum 87 records/km<sup>2</sup>) Small Pearl-Bordered Fritillary records by decade 4 

**Population trends:** Small Pearl-Bordered Fritillaries have been recorded at two UKBMS locations within Greater Gwent: Black Rock and Silent Valley.<sup>13</sup> Peak counts for each year are shown below, but the recording period is not long enough to determine a trend, nor are the two sites representative of the whole of Greater Gwent. At best, this shows the year-to-year variability typical of many butterflies and moths, as climatic conditions influence population dynamics.

Collated indices from UKBMS are available for Small Pearl-Bordered Fritillary for the UK and Wales.<sup>25</sup> These are a relative measure of the population abundance. Note that the Welsh dataset is only based on an average of 11.3 sites returning data each year (UK average 106.9), so is unlikely to be statistically reliable.



Peak counts for Small Pearl-Bordered Fritillary at Silent Valley and Black Rock<sup>13</sup>

Collated indices for Small Pearl-Bordered Fritillary for the UK and Wales<sup>25</sup>



**Protection:** Just over 75% of records come from protected sites, with high numbers of records from the Aberbargoed Grassland SAC, Silent Valley SSSI/LNR, as well as Cwmllwydrew Meadows LNR and SINCs such as Blaenserchan and Garn yr Erw.



Small Pearl-Bordered Fritillary records from protected sites

# Small Blue Cupido minimus (Fuessly, 1775)

### Protection: None

**Conservation status:** NEAR THREATENED (UK),<sup>22</sup> UKBAP Priority Species, Wales Section 7 Priority Species.

### Data availability: Poor (16 records)

**Context:** The UK's smallest resident butterfly, the Small Blue, is found on chalk and coastal grasslands, mainly in the south of England. Its sole foodplant is the Kidney Vetch (*Anthyllis vulneraria*), and it sometimes forms a symbiotic relationship with ants.<sup>26</sup> The Small Blue has lost 44% of its range since 1976, and 27% in abundance in the period 2005 to 2014.<sup>6</sup> In Wales, its distribution is largely limited to the southern coast.



**Outlook:** Currently the UK population is predicted to remain in decline, although the species is responsive to conservation efforts, such as site management and Kidney Vetch planting, and can quickly colonise new sites.<sup>27</sup> The Pollinating the Levels project<sup>28</sup> (part of the Living Levels scheme) on the Gwent Levels could potentially be beneficial for Small Blue.

**Greater Gwent range:** There are very few records for Small Blue across the study area. It is likely that most are erroneous or dispersing individuals rather than indicative of any resident population, especially as some do not correspond to the typical habitat. The foodplant, Kidney Vetch, is also rare within the study area. The recent records along the coastline seem the most likely to be accurate but, given the large recorder effort on the Gwent Levels, the fact that there are so few records indicates that the species may not be breeding in Greater Gwent.



**Population trends:** The Small Blue has not been recorded at any UKBMS sites within the study area. The UK collated index is shown below; the Small Blue has not been recorded from enough sites in Wales to produce an index.



UKBMS collated index for Small Blue, across the UK<sup>25</sup>

**Protection:** Just over 37% of records come from protected sites, with records from the Severn Estuary SAC, Newport Wetlands NNR and the Gwent Levels SSSIs. The Severn Estuary records are most likely due to centring of records along the sea wall. Most of the recent records come from protected sites along the coast.



Small Blue records from protected sites

### Silurian Eriopygodes imbecilla (Fabricius, 1974)

### Protection: None

**Conservation status:** VULNERABLE (Red Data Book category 2),<sup>29</sup> Wales Section 7 Species

### Data availability: Moderate (266 records)

**Context:** The Silurian was first discovered in Wales in 1972 by Dr Neil Horton, who named it after the Silures tribe that occupied the area around 2,000 years ago. It was a further 33 years before the larvae were found, confirming breeding in the area.<sup>30</sup> A second



population was discovered on Hatterall Ridge in 2005, providing the first English records for the species.<sup>31</sup> To date, there are four known populations, three of which are in the study area.<sup>32</sup>

Little is known about Silurian ecology. So far, populations have been found at high altitude, at least 450m above sea level, with larvae feeding on bilberry, and sometimes heath bedstraw.<sup>32</sup> The presence of deep moss is thought to be important.<sup>31</sup> Females very rarely come to light, and males can travel several kilometres from breeding grounds, making breeding areas difficult to locate.<sup>32</sup> Recording efforts are also hampered by access issues, and the fact that adults usually fly very late at night (between 1 and 3am), although males can sometimes be found nectaring during the day.<sup>33</sup> Larvae are also nocturnal, meaning that Silurian surveys are only for the most dedicated recorders.

**Outlook:** Currently the UK population is limited to Greater Gwent and the Herefordshire border. The size of the population and any trend is unknown, although Butterfly Conservation and the Monmouthshire Moth and Butterfly Group (MMBG) are monitoring the known populations. It is thought that the Silurian could be vulnerable to heather burning and wildfires, and this is particularly a concern for the Blorenge population.<sup>32</sup> A further unknown is how well the species might respond to conservation efforts, and how readily it colonises (or recolonises) new areas.<sup>32</sup>

**Greater Gwent range:** The Silurian is found in the uplands of Blaenau Gwent, Torfaen and Monmouthshire. The recording hotspot is at Coity Mountain/ Blaentillery, where the species was first discovered, with separate populations at Hatterall Ridge on the Herefordshire border, and on the Blorenge. The fourth population lies just outside the study area at Darren Lwyd.<sup>32</sup> All of the populations have recent records within the latest decade.

Butterfly Conservation and MMBG have surveyed other likely sites with similar altitude and habitat conditions, both within the study area and to the north, but so far have not found any more populations.<sup>32</sup>



**Protection:** Nearly all (96%) of the Silurian records come from protected sites: the Hatterall Ridge and Blorenge populations are within the Black Mountains and Blorenge SSSIs, and the Coity Mountain population is within the large Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC. The small number of records from outside of these sites are mostly outlying records, likely to be errors or transient individuals.





# Dingy Skipper Erynnis tages (Linnaeus, 1758)

### Protection: None

Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species, Red List: VULNERABLE<sup>22</sup>

### Data availability: Moderate (580 records)

Context: The Dingy Skipper is a small, mottled brown butterfly, found in a wide range of habitats, such as heathland, woodland edges and brownfield sites. Its main foodplant is Common Bird's-Foot Trefoil, but a sparse sward, often with bare patches of ground and varied vegetation heights are also needed.<sup>34</sup>



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Dingy Skippers have suffered dramatic declines of over 60% since the 1970s, although there are recent signs of population and range growth from 2005 to 2014.<sup>6</sup> Recovery is likely to be slow, as Dingy Skippers generally occur in small colonies of up to 50 individuals and have poor dispersal, which limits their ability to colonise new sites.<sup>34</sup>

**Outlook:** At the UK level, there are signs that Dingy Skipper populations could be recovering, but they remain threatened by development, particularly of brownfield sites, and inappropriate management. It is not possible to determine a trend for Dingy Skipper in Greater Gwent, but the isolated remaining Monmouthshire populations are likely to be the most vulnerable. Anthoney<sup>35</sup> reports that Dingy Skippers were spreading across the post-industrial sites in the Valleys and around Caerwent but were vulnerable as natural succession led to the loss of their foodplant, and that the eastern meadow sites were 'rapidly diminishing'.

Greater Gwent range: Dingy Skippers are found across the upland areas of Greater Gwent, with isolated populations in the south and west of Monmouthshire. There are no records from Newport and central Monmouthshire, even though there are likely to be suitable habitats, such as urban brownfield sites.

High numbers of records are from Blackrock (a UKBMS site), Aberbargoed Grasslands SAC/NNR, as well as Blaenserchan, Caerwent and Cymynyscoy Quarry. Most sites have recent records, with the exception of the sites in the west of Monmouthshire, which only have historic records.



**Population trends:** Dingy Skippers are not covered very well by UKBMS within the study area, having only been recorded at four UKBMS sites, two of which are in England.<sup>13</sup> Numbers recorded at Blackrock appear to be positive, with a maximum count of 15 individuals in 2017, but there is not enough data to produce a local trend.<sup>13</sup> The UKBMS trend is presented below, based on an average of 213 UK sites and 15 Welsh sites returning data each year.



UKBMS collated indices for Dingy Skipper in the UK and Wales<sup>25</sup>

**Protection:** Just under 61% of records come from protected sites, with high numbers of records from Aberbargoed Grassland SAC & NNR, Silent Valley SSSI/LNR, and Cymynyscoy Quarry LNR/SINC, as well as scattered records across the upland SINCs in the west of Gwent. Note that high numbers of SAC records also come from Blackrock, as this falls within the Usk Bat SAC.



Dingy Skipper records from protected sites

### Marsh Fritillary Euphydryas aurunia (Rottemburg, 1775)

**Protection:** Conservation of Habitats and Species Regulations (2017, as amended), Wildlife & Countryside Act (1981, as amended) Schedule 5

**Conservation status:** VULNERABLE (UK),<sup>22</sup> UKBAP Priority Species, Wales Section 7 Priority Species.

Data availability: Moderate (257 records)

**Context:** Marsh Fritillaries are found in marshy grassland habitats, where they feed on Devil's-Bit Scabious (*Succisa pratensis*). Their populations are highly volatile and function as meta-populations,



requiring extensive habitat networks to support them.<sup>36</sup> The population has undergone significant declines of 79% between 1976 and 2014,<sup>6</sup> and they are now only found in the western part of the UK. They were listed as a Species of Community Interest in the European Habitats Directive (Annex II, 1992), meaning that Special Areas of Conservation (SACs) can be designated to promote their conservation. There are 26 Marsh Fritillary SACs (where Marsh Fritillary is the primary reason for designation) in the UK, 9 of which are in Wales.<sup>37</sup>

**Outlook:** The short-term UK trend (2005–2014) for Marsh Fritillary was a decline in both occurrence (22%) and abundance (64%).<sup>6</sup> Although the latest UK Article 17 report states that the range and population are in Favourable condition, habitat, future prospects and overall assessment were Unfavourable.<sup>38</sup> In Wales, the population has shown a long term decline<sup>39</sup> (see below), with most SACs and SSSIs that support the species in Unfavourable condition.<sup>40</sup>

Within Greater Gwent, a recent assessment of the landscape at Aberbargoed Grasslands SAC showed a dramatic decline in habitat condition and extent between 2004 and 2017 and that the populations were considered to be 'under immediate threat of extinction'.<sup>40</sup>

The species is closely monitored across Wales, and new sites are still being found,<sup>39</sup> showing that the species can colonise new sites with suitable habitat in favourable conditions. They have been reintroduced to sites in England, and there is a planned reintroduction to Llantrisant Common in Wales.<sup>41</sup> It is clear that a site-based approach is not enough to halt the decline of the species; schemes working at landscape scale and engaging with landowners and agri-environment schemes have been successful in England and Scotland.<sup>42</sup>

**Greater Gwent range:** The Marsh Fritillary is found in central Caerphilly, centred around the Aberbargoed Grasslands SAC/NNR. This is the most easterly population in Wales. There are two other populations – at Penllwyn Grasslands SSSI and Penalltau – and some stray outliers. Note that some records have counts as high as 407 adults or over 1,000 larval webs, so number of records does not necessarily reflect abundance.

Penllwyn Grasslands has not had records of Marsh Fritillary since 1999, although nine adults were found at a site to the south of the SSSI in 2010. Penalltau has not had any records since 2001.



**Population trends:** Marsh Fritillary is monitored by larval web counts rather than counts of adults. There is no UKBMS transect at Aberbargoed, but larval web counts are carried out as a part of the SAC monitoring and the Wales Marsh Fritillary Surveillance Programme.<sup>39</sup> The population at Aberbargoed follows the characteristic 'boom & bust' pattern of Marsh Fritillary, but there is a trend of slow decline. Favourable condition for the site is defined as achieving 100 webs per ha suitable habitat, for at least one in every six years, but this is based on a generic target, rather than site-specific information.<sup>43</sup> Note that the 2020 count was limited due to coronavirus restrictions, so may not be representative.

The combined larval web counts for Wales (based on 23 core Welsh populations) follow a similar pattern, with a slight recovery from 2009 to 2014, but show an overall decline of 43% in 25 years.<sup>39</sup> The UK and Welsh trends derived from UKBMS transects follow a similar pattern.<sup>21</sup>





Larval web trend for Wales 1993–2018 showing TRIM and TrendSpotter outputs<sup>39</sup>

**Protection:** Just over half (53%) of records come from protected sites, with most protected site records from the Aberbargoed Grasslands SAC/NNR. Other protected sites include Pentllwyn Grasslands SSSI and SINCs at Coed Penallta and Waun Rydd. Note that some records will fall outside the protected sites due to record centring, but many are in areas around the main sites, showing the need for management of the habitat network in the surrounding area. The site of the population at Penalltau is not protected.



Marsh Fritillary records from protected sites

### Grayling Hipparchia semele (Linnaeus, 1758)

### Protection: None

**Conservation status:** UK BAP Priority Species, Environment (Wales) Act Section 7 Species

Red List: VULNERABLE<sup>22</sup>

Data availability: Moderate (335 records)

**Context:** A highly cryptic species, Graylings are found in open habitats with bare ground, such as coastal areas, lowland heath, and brownfield sites such as quarries. In Greater Gwent, they are often found on



coal spoil sites. Their main foodplants are grasses, including Sheep's Fescue, Red Fescue, Bristle Bent and Early Hair-Grass,<sup>45</sup> and they often use large rocks for shelter and for warming in the sun.<sup>46</sup> They have undergone a significant population decline of 30–49% from 1995 to 2010,<sup>22</sup> with a decrease in the area of occurrence of 62% from 1976 to 2014.<sup>6</sup> The reasons for decline are not fully understood, although changes in land use are a possible factor.<sup>47</sup>

**Outlook:** At the UK level, it is difficult to predict a future trend for the Grayling. In Greater Gwent, the increased focus on coal spoil habitats through the work of Buglife and the Colliery Spoil Biodiversity Initiative is likely to benefit the Grayling, although more work is needed to monitor populations and ensure appropriate management and protection of such sites. Grayling habitats are vulnerable to natural succession, causing shading and loss of bare ground. Post-industrial sites are also often seen as development opportunities: the Grayling colony at Markham Tips was lost when coal tips were reconfigured in the 1990s.<sup>46</sup>

**Greater Gwent range:** Graylings are mostly found in the north-west of Greater Gwent, with concentrations of records in the uplands, associated with coal spoil sites. Greater Gwent is unlike most of the UK, where the population is distributed along the coast. This is likely due to the nature of the coast in Greater Gwent, which does not offer the bare ground and rock preferred by the species. By contrast, the brownfield spoil habitats offer the desired combination of bare ground and sparse grasses.

Recording hotspots occur at Silent Valley SSSI, The British and Blaenserchan in Torfaen, and the tips just north of Aberbargoed Grasslands, with lower numbers of records across the north of Torfaen, the Clydach Gorge and around Rhymney. Other sites include Parc Bryn Bach, Varteg, Wyllie, Ochrwyth, Ebbw Vale Garden City and Trefil. Many grid squares have recent records, with most historic records being outliers to the south and east. This could be attributed to the increasing awareness of the importance of coal spoil for biodiversity.

Density of Grayling records (maximum 20 records/km<sup>2</sup>)



**Population trends:** UKBMS has records for Grayling at four sites: Clytha, Silent Valley, Blackrock Quarry and Central Valley (Ebbw Vale), but these do not have enough data to produce a regional trend. Only Silent Valley has more than two years of data, with peak counts of five in 2014 and 2015, and three in 2016 to 2018.<sup>13</sup> The UKBMS trends for Wales and the UK show a decline, based on an average of 128 UK sites and 13 Welsh sites returning annual data.



Collated indices for Grayling for the UK and Wales<sup>21</sup>

**Protection:** Just over 64% of records come from protected sites, with high numbers of records from Silent Valley SSSI/LNR and the Blorenge SSSI, as well as scattered records from LNRs such as Tirpentwys and Garn Lakes. Most SINC records come from Cefn Gelligaer and the area around Garn Lakes, with scattered records from other upland and post-industrial sites across Torfaen, Blaenau Gwent and northern Caerphilly.



Grayling records from protected sites

### Wood White Leptidea sinapis (Linnaeus, 1758)

**Protection:** Wildlife & Countryside Act (as amended) Schedule 5

**Conservation status:** ENDANGERED<sup>22</sup> (UK) UK BAP Priority Species, Environment (Wales) Act Section 7 Species.

Data availability: Poor (115 records)

**Context:** The Wood White is a dainty butterfly found in woodland rides and clearings, as well as hedgerows and scrub mosaic. The larval foodplants are legumes, including Meadow Vetchling (*Lathyrus pratensis*) and



Birds-Foot Trefoil (*Lotus corniculatus*).<sup>48</sup> Wood Whites have undergone declines of almost 90% since the 1970s,<sup>6</sup> making them one of the UK's most threatened butterfly species. Distribution is now limited to central and southern England, and a small part of Ireland.<sup>48</sup>

**Outlook:** The UK Wood White population is still declining; both area of occurrence and abundance fell during the period 2005 to 2014.<sup>6</sup> Targeted habitat management is taking place in England, and the species was reintroduced to four sites across the West Midlands in 2016.<sup>49</sup> West Midlands Butterfly Conservation reports a stable population, with overall range contraction and some range expansion in Shropshire.<sup>50</sup>

**Greater Gwent range:** Greater Gwent is at the very edge of the Wood White range. Most records come from Herefordshire, in the Doward area. There is a UKBMS site at Lord's Wood in Herefordshire, which has a high number of records. Away from this population, other records are likely to be windblown individuals or possible misidentifications. There are very few confirmed records for Greater Gwent, despite there being suitable habitat.

The lack of recent records – most records date from the 1990s or earlier – and apparent contraction in range is concerning. The Lord's Wood UKBMS site stopped recording in 2011. Only five grid squares have records from the most recent decade, and only two of these are within the main area of population in the north-east. More positively, there are some recent records from 2018 and 2019 for Highmeadow Woods just inside the Welsh border, not yet with SEWBReC.<sup>18</sup>

Density of Wood White records, (maximum 33 records/km<sup>2</sup>)



**Population trends:** Peak counts from the UKBMS transect at Lords Wood show a stable population, or even a possible increase. However, this dataset should be treated with caution due to the relatively short timeframe and the lack of records from 2011 onwards.<sup>13</sup> The UK population trends show severe, ongoing declines in both abundance and range,<sup>6</sup> also shown by UKBMS collated index (UK only, from an average of 36 sites).<sup>25</sup>



Peak Counts of Wood White from UKBMS transect at Lords Wood<sup>13</sup>

UKBMS collated indices for Wood White in the UK<sup>25</sup>



**Protection:** Half of the Greater Gwent records for Wood Whites come from protected sites, with records from the Wye Valley Woodlands SAC and a SINC near Penallt. The SSSI record is a stray from the Gwent Levels.

Protected sites within Greater Gwent are less relevant for the Wood White, as the population centre appears to be within Herefordshire. Parts of the English range are protected by the English parts of the Wye Valley Woodlands SAC and Lady Park Wood NNR, but the UKBMS site at Lords Wood appears to be outside of these protected areas. Note that information on non-statutory protected sites within England was not available.



Wood White records from protected sites

### White Admiral Limenitis camilla (Linnaeus, 1764)

### Protection: None

Conservation status: VULNERABLE<sup>22</sup> (UK) UK BAP Priority Species, Environment (Wales) Act Section 7 Species.

### Data availability: Poor (131 records)

Context: A striking woodland butterfly, the White Admiral is found in mature woodland with sunny glades. The larval foodplant is Honeysuckle (Lonicera periclymenum). The species is widespread across south and east England, and has spread rapidly since



the 1920s, after an earlier range contraction.<sup>51</sup> However, populations have declined sharply since the mid-1990s, for unknown reasons: latest UKBMS results indicate a decrease of 44% in abundance between 2005 and 2014.<sup>6</sup>

**Outlook:** The UK population is predicted to continue to decline. Although climate change might lead to the expectation that the White Admiral would expand its range northwards, it is now thought that the response to climate change is more complicated than previously thought. The White Admiral is now predicted to decrease in abundance as a result of climate change.<sup>6</sup>

In Greater Gwent, it seems that White Admirals are capable of extending their range in good years they were first found in vc35 in the 1950s, and remained at just one site in the Angiddy Valley for many years.<sup>18</sup> The species has since spread to 11 different sites. However, some of its key woodland habitats are undergoing felling in order to control Phytopthera and other tree diseases. This is of serious concern, as felling will also cause the loss of honeysuckle.

Greater Gwent range: White Admirals are found across the east and south of Greater Gwent, corresponding to the edge of their UK range. Records are generally from woodland sites, particularly the Wye Valley Woodlands, with recording hotspots at Slade Wood, (thought to be the most westerly site in Wales<sup>18</sup>) and woodland in the Angiddy Valley. The Wye Valley woods to the north and west of Monmouth, and Bishops Barnets Wood at the Southern end of the wye valley also seem to support a populations, although lower numbers of records.

Some sites do not have recent records; Hendre Wood (the northwest cluster) hasn't had a record since 2006. Only one UKBMS transect at Lords Wood in Herefordshire has recorded White Admirals but there are no records since 2007.<sup>13</sup>



**Population trends:** There is not enough data to produce a regional trend for the White Admiral. UK trends indicate a long term (1976–2014) decline of 25% in range and 59% in abundance.<sup>6</sup> The short-term (2005–2014) decline is 14% in range and 45% in abundance.<sup>6</sup> The UKBMS trends for the UK shows this decline, based on an average of 133 sites returning annual data.



UKBMS collated indices for the White Admiral for the UK<sup>21</sup>

**Protection:** Less than 10% of White Admiral records come from protected sites, possibly due to the butterfly often being found at edges of woodland, leading to records falling just outside protected sites. The SAC record is from Wye Valley Woodlands SAC, and the SINCs records from three SINCs: Bishops Barnets Wood, Lower Hale Wood and Buckle Wood & Glyn Wood (both in the Angiddy Vally area). Slade Wood, which seems to support the most westerly and healthiest population, is not protected at all.





# Grizzled Skipper Pyrgus malvae (Linnaeus, 1758)

#### Protection: None

**Conservation status:** VULNERABLE,<sup>22</sup> UKBAP Priority Species, Wales Section 7 Priority Species

### Data availability: Moderate (335 records)

**Context:** The Grizzled Skipper is a spring butterfly found in woodland rides and clearings, species-rich chalk grassland and post-industrial sites. It is one of the first small butterflies to emerge, sometimes as early as March.<sup>52</sup> The larval foodplants are from the Rosaceae family, mainly Agrimony (*Agrimonia*)



*eupatoria*), Creeping Cinquefoil (*Potentilla reptans*) and Wild Strawberry (*Fragaria vesca*).<sup>52</sup> The Grizzled Skipper was added to the UKBAP list in 2007 as a result of significant declines:<sup>22</sup> over half of their area of occurrence has been lost since 1976, although the short-term trend is weakly positive.<sup>6</sup>

**Outlook:** Grizzled Skippers are often found on Brownfield sites, meaning that they are often threatened by development. Small and isolated populations are also more vulnerable to extinction.<sup>53</sup>

The Grizzled Skipper was expected to expand its range northwards in response to climate change; however, recent studies have found that populations in the north and west have actually declined more than those in the south and east.<sup>54</sup> Climate change is therefore not compensating for the long-term decline, which is most likely due to habitat deterioration. Increased habitat availability, connectivity and quality is urgently needed to reverse Grizzled Skipper declines.

**Greater Gwent range:** Greater Gwent is at the edge of the UK range for the Grizzled Skipper, which is concentrated in the south and east of England. The Welsh population is mostly restricted to the south, with isolated populations in the north-east.<sup>52</sup>

In Greater Gwent, records are mostly clustered around Caerwent and Llanmelin Hillfort, strongly corresponding to the limestone band through the area. There are a few scattered records along the English border, often in old limestone quarries. Most squares have recent records.



**Population trends:** There is not enough data to determine a population trend for Greater Gwent. The Grizzled Skipper has not been recorded in any UKBMS transects within the study area. The UK long term (1976–2014) population trend is a decline of 53% in range and 37% in abundance. The short-term (2005–2014) trend points to an increase of 7% in range and no change in abundance.<sup>6</sup> The UKBMS collated index for the UK shows this decline, based on an average of 163 sites returning annual data.



UKBMS collated indices for the Grizzled Skipper for the UK<sup>21</sup>

**Protection:** Just under 15% of records come from protected sites. The SAC and SSSI records are from the Gwent Levels (a centred record is in the Severn Estuary SAC). Most SINC records come from Llanmelin Hill Fort and Rich's Brake Woodland, both within the core area for Grizzled Skipper around Caerwent. The remaining records on SINCs are outlier records in Torfaen, at Lasgarn Woods and Blaensychan Valley.



Grizzled Skipper records from protected sites

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