Ariennir gan
Lywodraeth Cymru
Funded by
Welsh Government

Greater Gwent
STATE OF NATURE

100 STORIES OF OUR WILDLIFE

Compiled by:

Technical Ecology

Supported by:

SEWBReC
SOUTH EAST WALES BIODIVERSITY RECORDS CENTRE
CANOLFAN GOFNODION BIOAMRYWIAETH DE DDWYRAIN CYMRU

On behalf of:

A Resilient Greater Gwent

Cyfoeth Naturiol Cymru
Natural Resources Wales

Cyngor Bwrdeistref Sirol
Blaenau Gwent
County Borough Council

THE wildlife TRUSTS
YMDDIRIEDOLAETH natur GWENT

CAERPHILLY COUNTY BOROUGH COUNCIL
CYNGOR BWRDEISTREF SIROL CAERFFILI

monmouthshire sir fynwy

NEWPORT CITY COUNCIL
CYNGOR DINAS CASNEWYDD

TORFAEN COUNTY BOROUGH
BWRDEISTREF SIROL TORFAEN

This project has being funded by Welsh Governments Enabling of Natural Resources and Well-being Grant through the ‘A Resilient Greater Gwent’ work programme. The programme runs until summer 2022 and is working towards a South East Wales where nature is in recovery and sustainable communities value their landscapes and wildlife and get involved for their own health and well-being.

Caiff y prosiect ei gyllido drwy Grant Galluogi Adnoddau Naturiol a Llesiant Llywodraeth Cymru drwy raglen gwaith 'Gwent Fwyaf Gydnerth'. Mae'r rhaglen yn parhau tan haf 2022 ac mae'n gweithio i sicrhau De Ddwyrain Cymru lle mae adferiad mewn natur a chymunedau cynaliadwy yn gwerthfawrogi eu tirluniau a bywyd gwyllt ac yn cymryd rhan ar gyfer eu hiechyd a'u llesiant eu hunain.

We are very grateful to the following people and groups for their assistance in producing this report:

Nicholas Aebishcher, Martin Anthoney, Lucy Arnold-Matthews, Mark Barber, Ailidh Barnes, Gillian Barter, Gemma Bodé, Sam Bosanquet, Gethin Bowes, Philip Briggs, Neil Calbrade, Bex Cartwright, Kay Celtel, Colin Cheeseman, Richard Clarke, Eleanor Colver, Derek Crawley, Stuart Craxford, Rob Curtis, Clare Dinham, Kevin Dupé, Rachel Edwards, Rob Evans, Helen Fairbank, Teresa Frost, Heather Garrett, Andrew Gott, Paul Greest, Liz Hancocks, David Hepper, Maggie Iles, Andy Karran, Jerry Lewis, Amy Ludford, Emily Marnham, Caroline Matthews, Mark McLoughlin, Ian Middlebrook, Nadine Morgan, Andy Musgrove, David Noble, Liam Olds, Sali Palmer, Sarah Perkins, Steve Preddy, Sophia Ratcliffe, Adam Rowe, Andrea Rowe, David Slade, Kate Stinchcombe, Jane Taverner, Fen Turner, Steph Tyler, Emily Walsh, Robert Ward, Lowri Watkins, Ian White, Karen Wilkinson, Steve Williams, Julian Woodman, Goldcliff Ringing Group, Gwent Ornithological Society, Monmouthshire Bat Group, Monmouthshire Meadows Group, Monmouthshire Moth and Butterfly Group

We are grateful to the following organisations for curating and providing data, and giving permission to use National Biodiversity Network (NBN) Atlas data:

Amphibian and Reptile Conservation (ARC), Bat Conservation Trust (BCT), Biodiversity Information Service for Powys & Brecon Beacons National Park (BIS), Botancial Society of Britain and Ireland (BSBI), British Dragonfly Society (BDS), British Trust for Ornithology (BTO), Butterfly Conservation, Centre for Ecology and Hydrology (CEH), Cofnod - North Wales Environmental Information Service, Game & Wildlife Conservation Trust (GWCT), Gloucester Centre for Environmental Records (GCER), Herefordshire Biological Records Centre (HBRC), Joint Nature Conservation Committee (JNCC), Natural England (NE), Natural Resources Wales (NRW), NBN Atlas, People's Trust for Endangered Species (PTES), Plantlife, Project Splatter, Royal Society for the Protection of Birds (RSPB), South East Wales Biodiversity Records Centre (SEWBReC), The Biological Records Centre (BRC), The Mammal Society, Welsh Government.

Front Cover: Common Toad, Common Clubtail, Reed Warbler, Common Lizard and Hedgehog. All images by Andy Karran. Cover design by Jacqui Whitehouse.

Images: Kindly provided by Martin Anthoney, Sam Bosanquet, Hugh Clark (Bat Conservation Trust), Pete Hadfield, Pete Hill, Alistair Hotchkiss, Andy Karran, Allard Martinius, Steve Wadley, Lowri Watkins, Gary Welsby and Terry Whittaker (2020 Vision).

This report should be cited as: Jones S M, Karran A, Bosanquet S, Barter G, Garrett H and Hancocks L. 2021. Greater Gwent State of Nature. Produced by the Resilient Greater Gwent Partnership.

This report is dedicated to all those who collect, verify and curate biological data; those who go out hunting obscure species in inhospitable places and inclement weathers, those who sift and sort through barely legible field notes, and those who champion detail and accuracy; without you, we would know nothing.

Contents

Foreword

In 2013, a collaboration of 25 nature conservation and research organisations produced the first UK State of Nature.[1] Described as a 'health check of nature', it compiled quantitative data on over 3,000 species, across eight broad habitat types, to give the first authoritative assessment of the biodiversity of the UK and UK overseas territories.

The picture was sobering and alarming. More species were declining than increasing. Habitat loss was widespread, and those habitats that remained were degraded. More than one in ten species assessed using Red List criteria were thought to be under threat of extinction in the UK.

Amazingly, the authors were positive. The scope and quality of the State of Nature data was testament to the power of collaborative working, as well as the dedication of thousands of conservation professionals and volunteers. They hoped that by highlighting nature's disappearance, greater efforts would be made to save it.

Subsequent State of Nature reports in 2016 and 2019 show that little has changed. Of the species assessed in 2019, 15% were threatened with extinction, and the UK will not meet most of its 2020 Aichi targets for biodiversity recovery.[2] However, the collective response for nature is growing: there are massive increases in areas designated for protecting nature, air pollution continues to decrease, and conservation volunteering is at an all-time high.

Our knowledge and understanding of nature are also increasing. The number of species assessed in the State of Nature has grown from just over 3,000 to over 8,400. Equally, the number of people and organisations involved in the State of Nature, and wildlife recording in general, is higher than ever.

Several efforts have also been made to distil this wealth of biodiversity data down to regional and local levels in order to guide conservation efforts on the ground. Given that funding for nature conservation is always limited, it is vital that any action is prioritised and targeted to give maximum results, and that we monitor the effectiveness of our actions.

This is just one of such efforts.

Aims

This report aims to describe what is known about the status and trends of a selection of species within Greater Gwent, and the threats affecting them. Species are both a component and product of our ecosystems, so looking at what is happening to individual species can indicate what is happening within the wider environment. The species included are a wide selection from different groups and different habitats, chosen with the aim of providing a snapshot that represents much of the biodiversity that is to be found within this diverse region.

A secondary aim of this report is to examine the availability of biological data at the regional level; to demonstrate what can be shown with the wealth of data that has already been collected; and to highlight where there are knowledge gaps or data issues. This report, therefore, is as much a 'State of data' analysis, as a State of Nature.

It is hoped that this report will be used by conservation practitioners, policy makers and recorders for:

- planning conservation projects, in terms of location, focus or activity
- providing a baseline to assess the effectiveness of conservation work
- demonstrating the need for policy change and action
- targeting recording to fill evidence gaps
- awareness raising and education.

Finally, this report uses biological data to show broad, regional-scale species status and trends. Recorders and practitioners are encouraged to explore further and find ways that existing biological data can support their work, as well as generating and sharing new data.

Ecosystem resilience

Ecosystem resilience has been defined in Wales as 'the capacity of ecosystems to deal with disturbances, either by resisting them, recovering from them, or adapting to them, while retaining their ability to deliver services and benefits now and in the future'.[3]

Resilience is difficult to directly assess because ecosystems are complex and dynamic, the responses to disturbances vary greatly in scale and duration, and many of the underlying mechanisms are not understood. This can be overcome by using four ecosystem attributes of diversity, extent, condition and connectivity and their emergent properties as proxies for resilience (see figure 1).

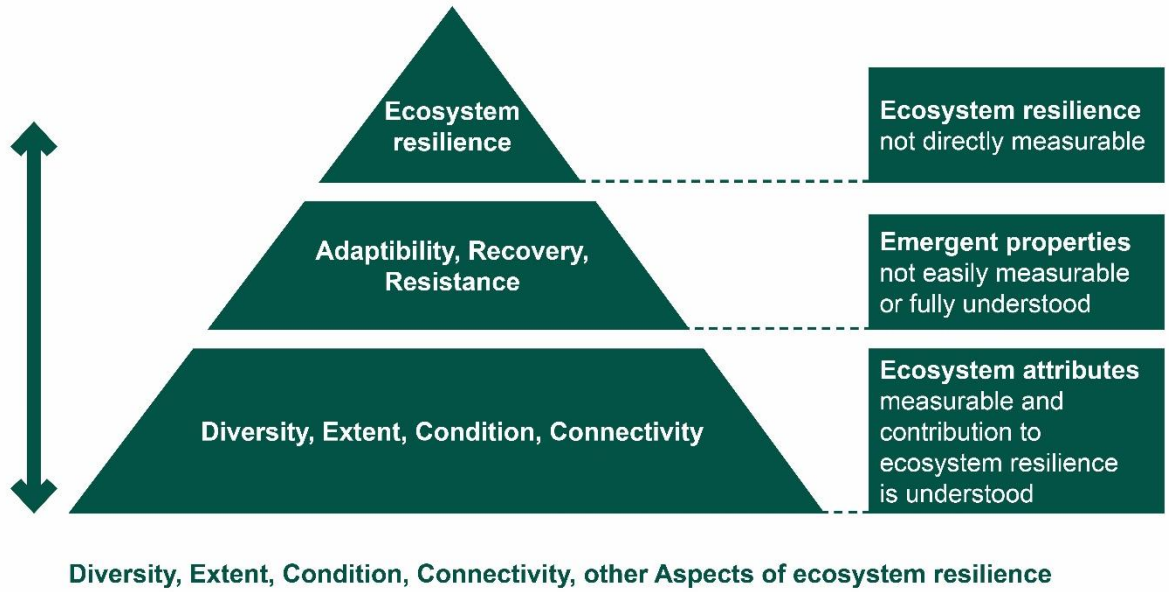


Figure 1: DECCA framework showing the relationship between the attributes and the emergent properties of resilience.

Diversity matters at every level and scale, from genetics to species, and from habitats to landscapes. The size of an ecosystem (**extent**) will affect its capacity to adapt, recover or resist disturbance. Fewer species can survive in a smaller patch, and the demography of species is altered when habitat is lost, leading to species loss and ecosystem decay. The **condition** of habitats is affected by multiple and complex pressures that affect the resilience of ecological communities and their capacity to resist, persist or recover. **Connectivity** refers to the links between and within habitats and for any given species; connectivity is related to the relative distance that species can move to feed, breed and complete lifecycles that may need different environments. Connectivity is a major driver for spatial variation which affects diversity and the abundance of living organisms. The ability to adapt, resist or recover from pressures or demands on the ecosystem is an emergent property of the four attributes.

Ecosystem resilience is core to the new, integrated approach to the environment, which is based on the flow from ecosystems, through ecosystem services and benefits, to well-being. Sustainable Management of Natural Resources (SMNR) is the means by which the Welsh environment is managed to achieve this flow, and resilience is the property of ecosystems that allows the flow to persist in the face of impacts and change.

Assessment of Ecosystem Resilience in Wales: The Natural Resources Wales (NRW) State of Natural Resources Report 2020 (SoNaRR) found that resilience is low to moderate across all ecosystems in Wales.[4] The main pressures and demands bearing down on the quality of ecosystem resilience and services are:

- habitat loss and deterioration
- climate change
- pollution
- invasive non-native species, pests and diseases
- over-exploitation.

Actions to build ecosystem resilience and aid species recovery: The speed and success of nature recovery and species climate-change adaptation will mainly depend on actions that maintain or enhance all four attributes of resilience (Figure 1). The Welsh Government National Natural Resources Policy recommends the maintenance and restoration of Resilient Ecological Networks ats a landscape-scale approach to building ecosystem resilience.[5] Effective Resilient Ecological Networks are defined as connected landscape features that:

- have networks of habitat in good ecological condition that link protected sites and other biodiversity hotspots across the wider landscape
- enable the movement of species across landscapes to fulfil their life cycle or respond to climate change
- provide important ecosystem services and maximum benefit for well-being.

Networks of integrated habitats create permeable landscapes that support species with different range capacity and niche requirements for each stage of their lifecycle. In general, effective habitat management and creation will sustain larger populations of species. However, for certain species, specific management measures within the network may be necessary to improve species populations. For example, mobile species can often require a combination of elements within a landscape to survive.

Assessment of ecosystem resilience in Gwent: The SoNaRR 2020 assessed ecosystem resilience at a national level. No analysis has been made at a regional level, but many of the species and habitats recorded across Wales are found in Gwent, along with the same five key pressures that will be impacting on ecosystem resilience across the region.

Species form the building blocks of ecosystems. Species distribution and abundance are strongly linked to aspects of ecosystem resilience and will respond to the five key pressures. Thus, the species featured within this report can be used as indicators of change within ecosystems.

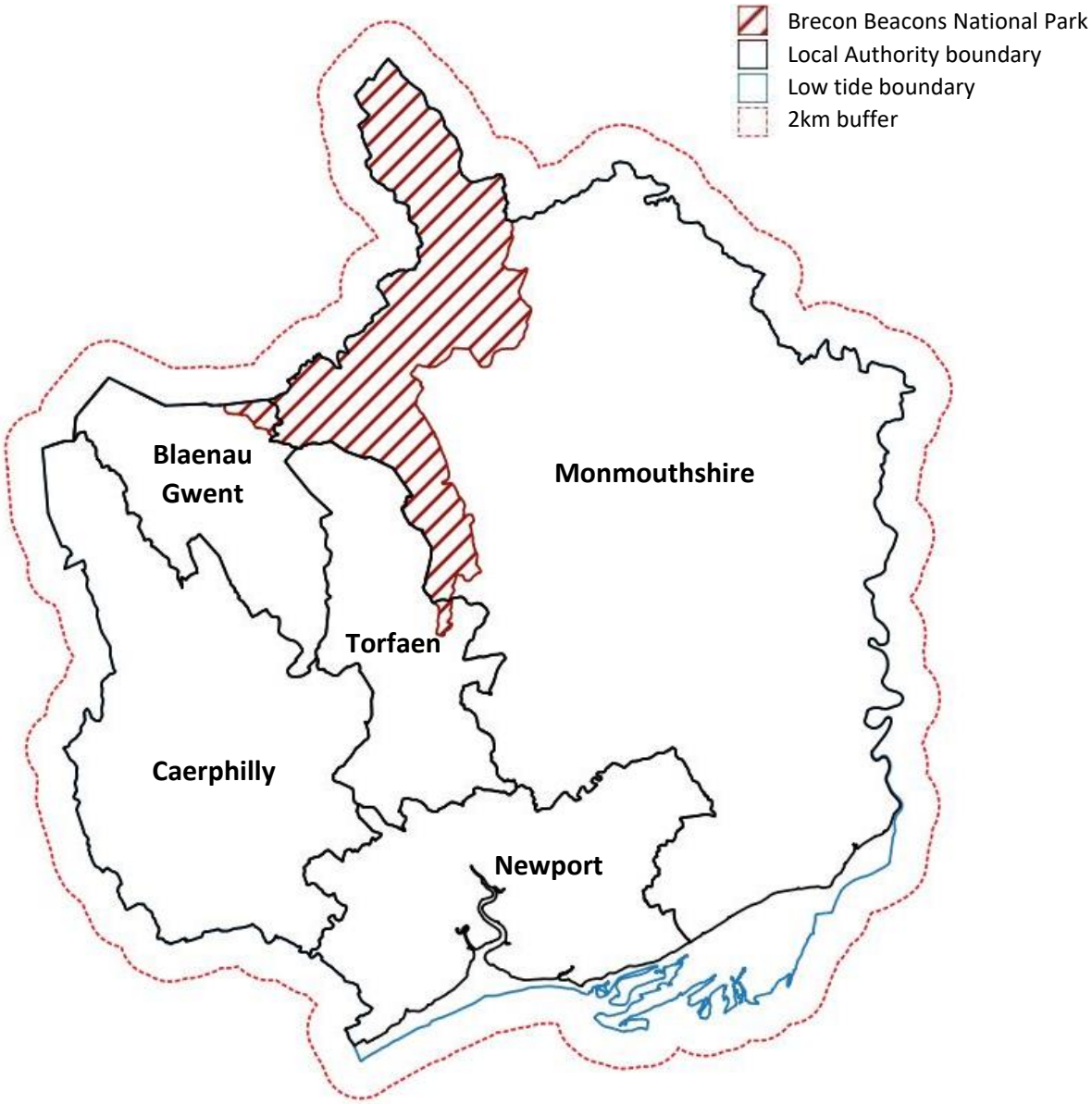
Using this report

In this report, 'Greater Gwent' is used to refer to the area covering all five local authorities, to the low tide mark; 'Gwent' is used to refer to the old unitary authority boundary and vice county 35; and 'the study area' is used to refer to Greater Gwent, plus a 2km buffer zone.

Throughout the report, the same background map is used. This shows local authority boundaries, low tide mark, the part of the Brecon Beacons National Park within Greater Gwent, and a 2km buffer.

The map is often divided into 1 km grid squares (monads). Only grid squares that fall entirely within the study area are included in the mapping and analysis, giving 1916 monads.

The Greater Gwent background map



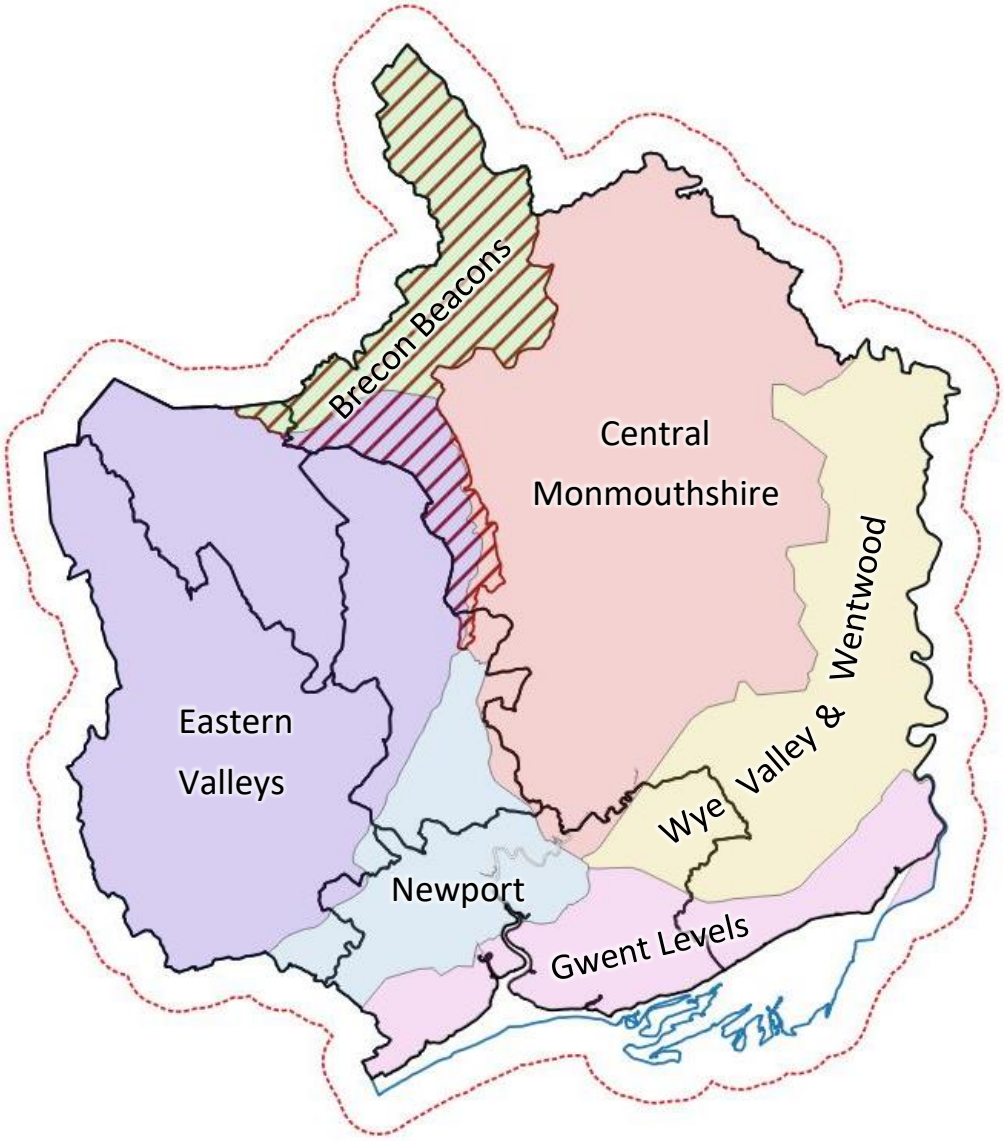
About Greater Gwent

Greater Gwent is an area of South East Wales comprising of the local authorities of Blaenau Gwent, Caerphilly, Monmouthshire, Newport and Torfaen. The counties are very different in both landscape and social demographics; the boundary corresponds to that of the old unitary authority of Gwent, and the historic county of Monmouthshire (Watsonian vice-county 35), expanded to include the whole of Caerphilly borough. It is also the area covered by the South East Wales Area Statement.[6]

This diversity of character across a relatively small area of 1,616 square km (to low tide mark) means that Greater Gwent holds a wealth of both natural and cultural heritage, from the historic castles along the English border to the east, to the cradle of the Industrial Revolution, the Blaenavon World Heritage Site, in the west. Greater Gwent is home to 591,100 people.[7]

For the South East Wales Area Statement, key stakeholders co-produced a series of Landscape Profiles (2019). For this purpose, the terrestrial area was divided into six distinct characteristic landscapes (see map below): the woodlands of the Wye Valley and Wentwood; farmland of central Monmouthshire; the urban area of Newport; the Gwent Levels; the Eastern Valleys; and the Brecon Beacons and Black Mountains. These Landscape Profiles consider the resilience of the eight UK broad habitats, as defined by the National Ecosystem Assessment and used in SoNaRR, and how they interact at a landscape scale. Although the Landscape Profile approach is a spatial one, it is underpinned by the Ecosystem Approach Principles, as set by the Convention on Biological Diversity (CBD). Each individual Landscape Profile, which can be made available upon request, supports a collective common evidence base on which to begin reaching a consensus for collaborative nature recovery action.

Landscape profiles within Greater Gwent



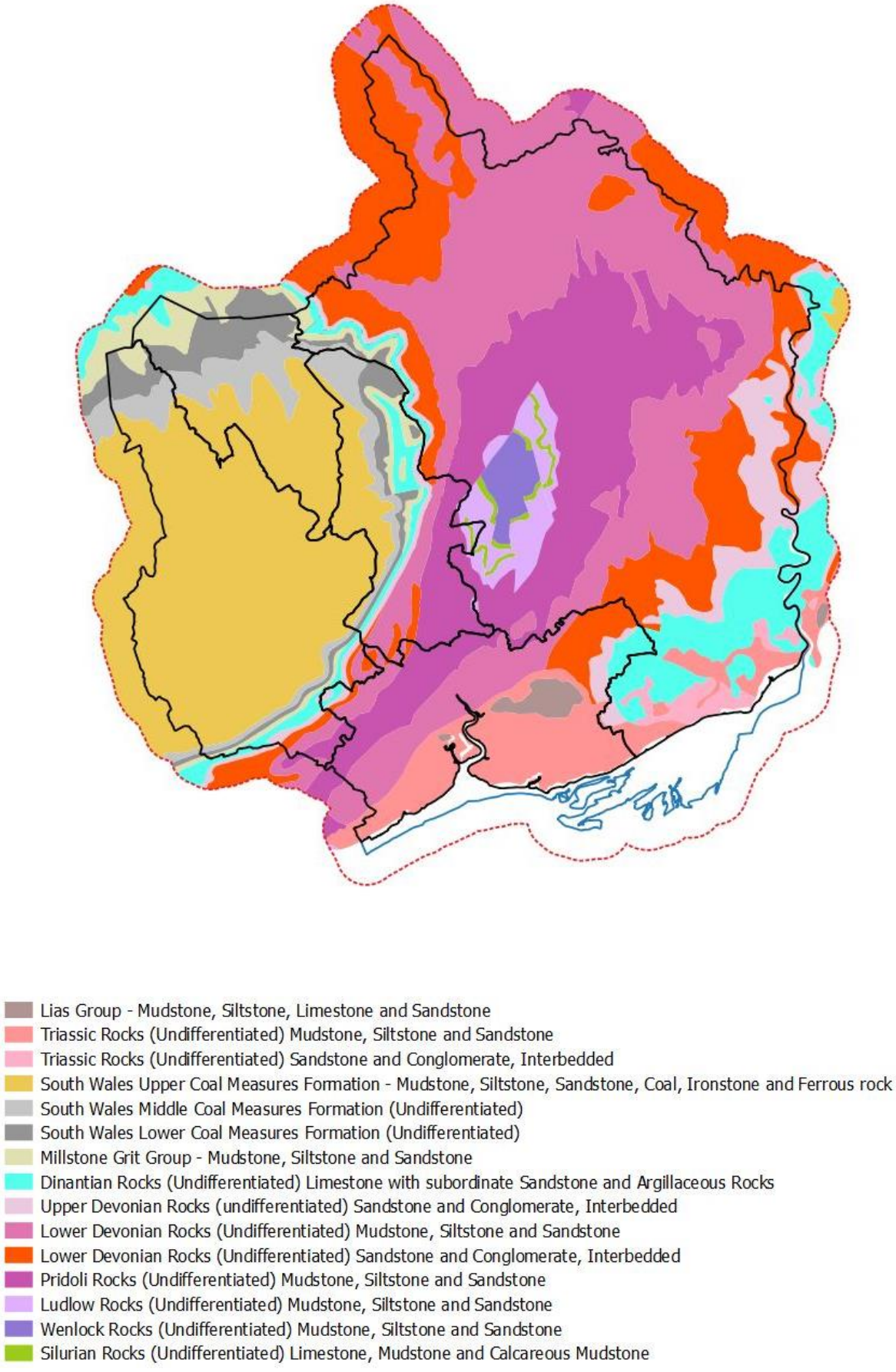
Geology and soils

Much of the diversity of landscapes and habitats across Greater Gwent is due to the underlying geology and soils. Most of Monmouthshire is underlain by the Old Red Sandstone rocks, with the older Usk Inlier in the centre. Parts of the Old Red Sandstone series, known as the Brownstones formation, form the Black Mountains, Sugarloaf, and Trellech Ridge.

In the south of the region, a band of limestone extends from the east, and is then overlain by younger sandstone rocks, which border the Severn Estuary. The differing colours of the rocks give many place names, such as Goldcliff and Black Rock.

To the west of the region, the younger South Wales Coal Measures dominate, surrounded by a band of limestone outcrop. Together, these provided the coal, iron and lime that fuelled the Industrial Revolution – a legacy that shapes the landscape seen today.

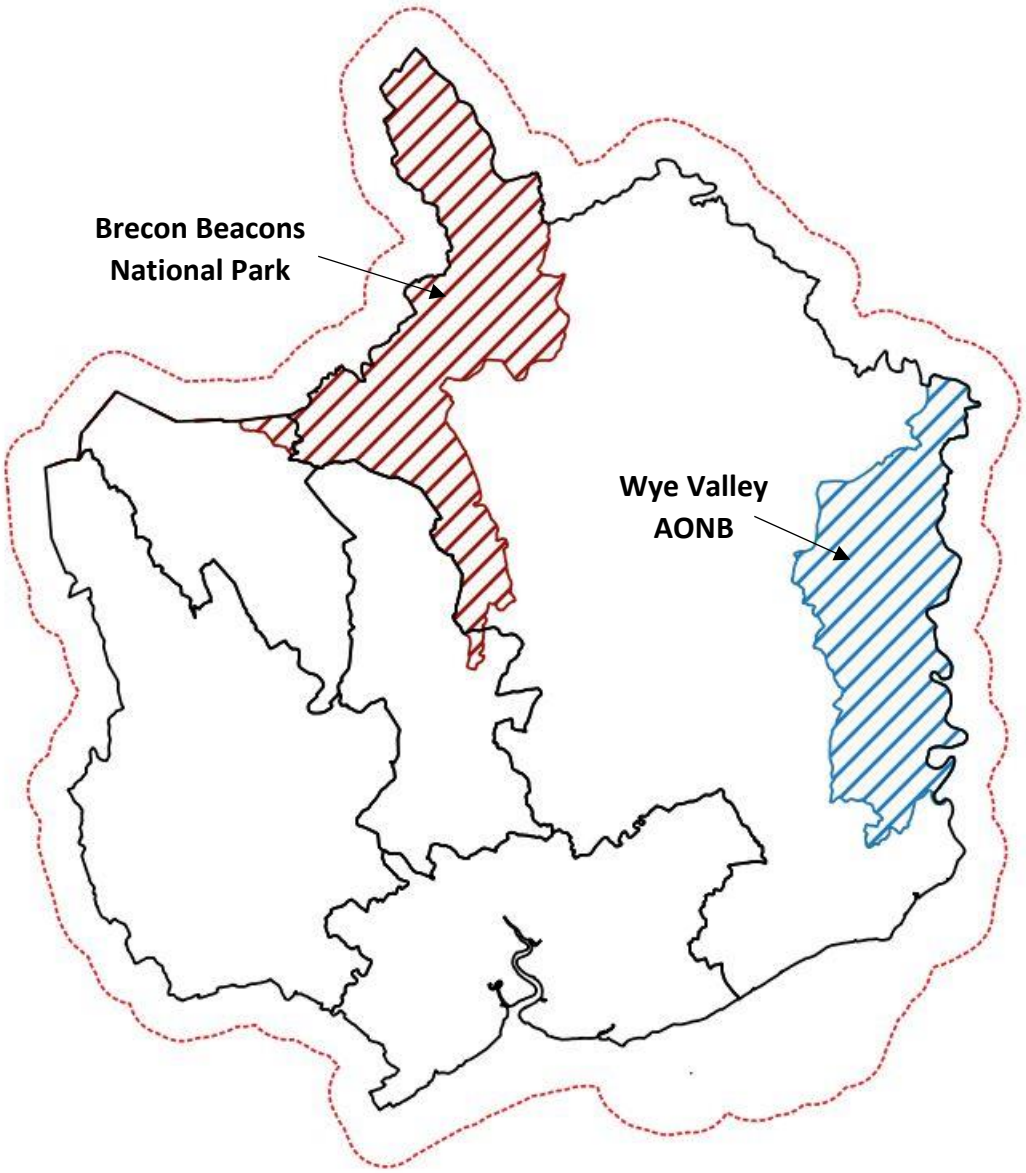
Bedrock geology of Greater Gwent[8]



Protected areas

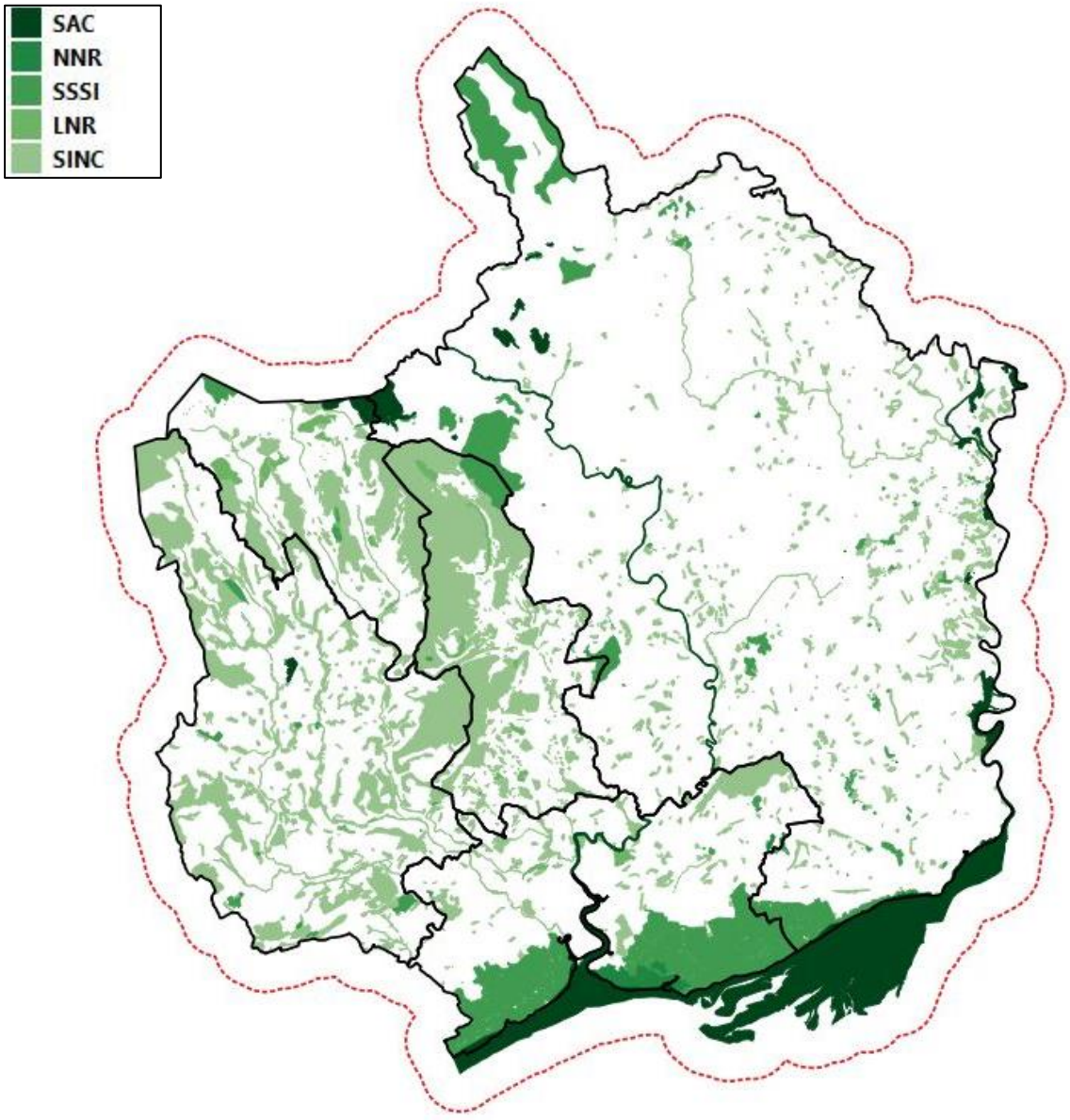
Greater Gwent contains two protected landscapes. Part of the Brecon Beacons National Park, totalling 153km^2 falls within Monmouthshire, Torfaen and Blaenau Gwent, and extends north and west into Powys and beyond. The Wye Valley Area of Outstanding Natural Beauty (AONB) has 117km^2 within Monmouthshire, running along the English border and extending into Gloucestershire and Herefordshire.

Protected landscapes within Greater Gwent[9]

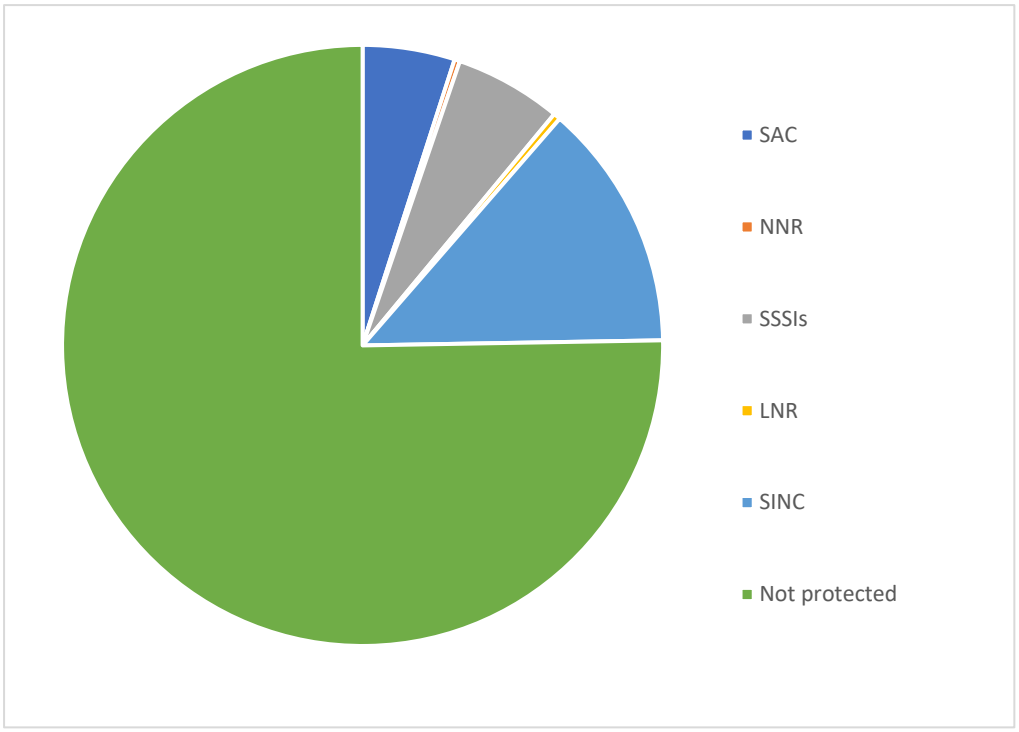


A quarter (25%) of Greater Gwent is protected for biodiversity reasons, with 13 Special Areas of Conservation (SACs). One of these, the Severn Estuary, is also a Special Protected Area (SPA) and Ramsar Site. There are also 5 National Nature Reserves, 94 Sites of Special Scientific Interest (SSSIs), 25 Local Nature Reserves (LNRs), and over 1,600 Sites of Importance for Nature Conservation (SINCs).

Protected areas by highest level of designation[9]



Percentage of land with nature conservation designation in Greater Gwent



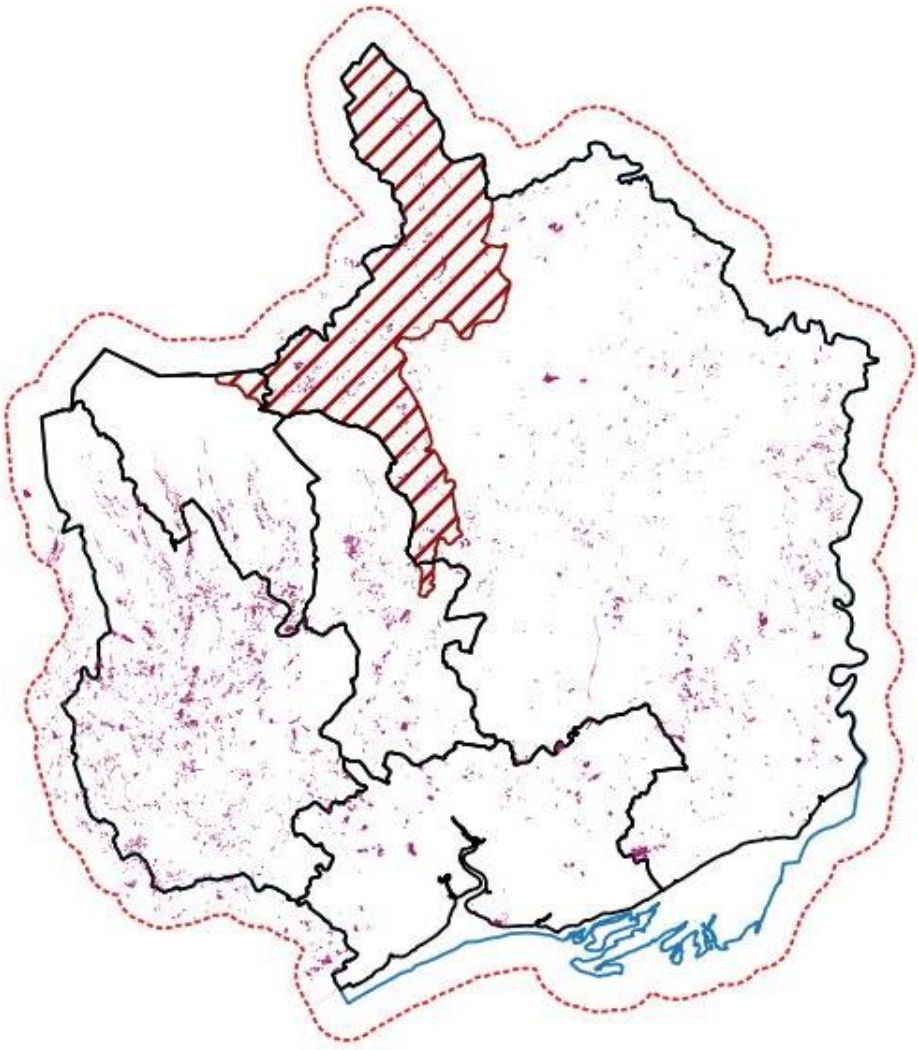
Terrestrial ecosystems in Greater Gwent

Grassland ecosystems

Greater Gwent is considered a stronghold for the UK's few remaining species-rich grasslands, which have suffered drastic declines. Fortunately, many are now protected, such as the Aberbargoed Grasslands Special Are of Conservation (SAC) and National Nature Reserve (NNR), and Sites of Special Scientific Interest (SSSI) grasslands at Pentwyn, Brockwells Meadows and Penllywn. Management is crucial for species-rich grassland, as lack of management can be as damaging as over-grazing or fertiliser applications.

Species associated with species-rich grassland included in this report include Marsh Fritillary Butterfly, Grassland Waxcaps, Greater Butterfly Orchid, Greenwinged Orchid, Small Blue, Shrill Carder Bee, Brown Banded Carder Bee and Pollinators.

Lowland Grasslands (below 300m(asl)) in the study area in 1997[10]



Farmland ecosystems

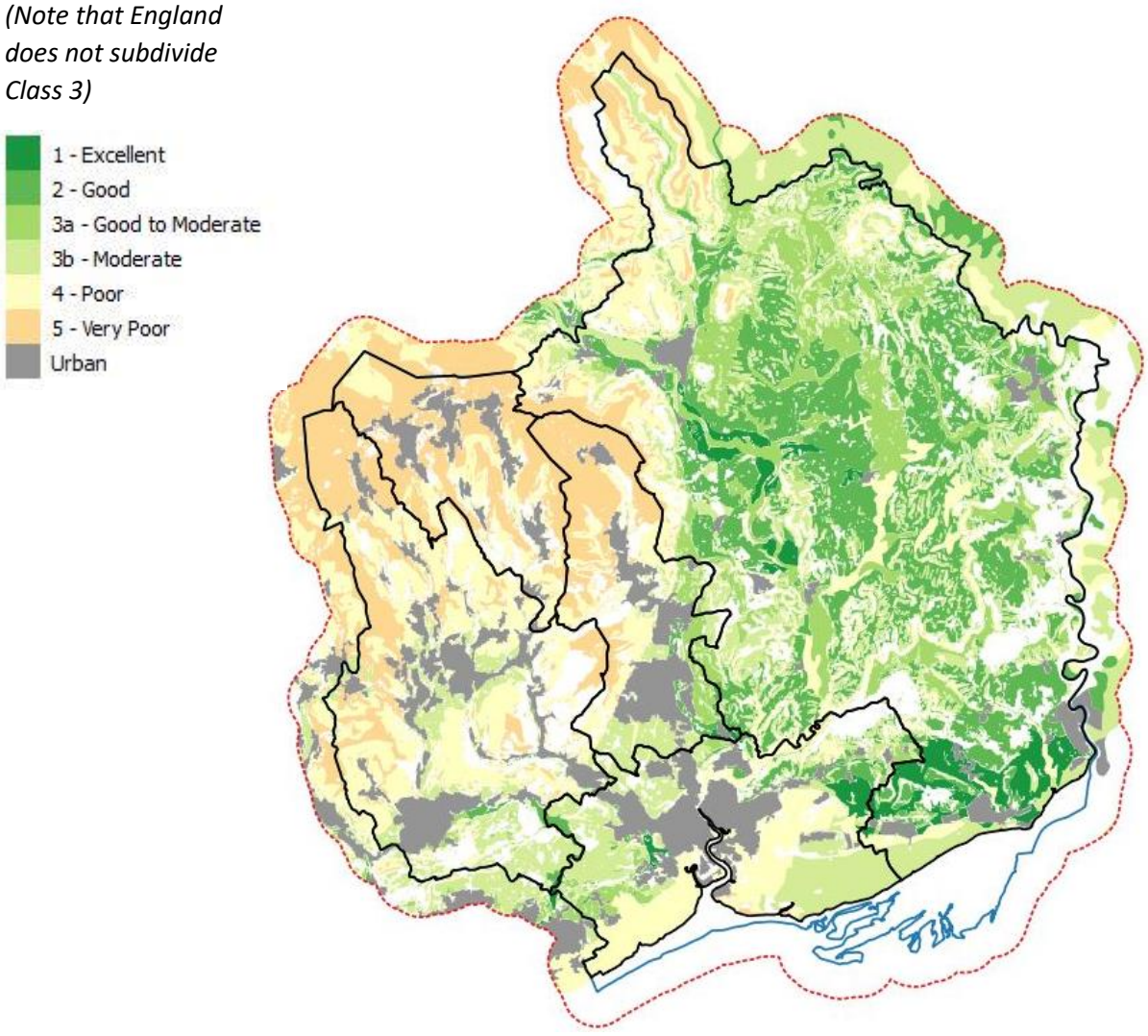
Farming shapes much of the landscape of Greater Gwent. The Agricultural Land Classification (ALC) assesses land based on criteria for climate, soil and situation to determine the highest quality agricultural land. Higher quality land is more valuable and is protected through the planning process. Only 7% of the land in Wales falls within the 'best and most versatile' agricultural land, grades 1 to 3a.[11]

Farmland ecosystems are hugely important for food production, but the drive for increasing yields has led to the loss of many species associated with the traditional farmed landscape. In quantifying the impact of drivers of change, the 2016 State of Nature report concluded that the intensification of agriculture had caused the largest long-term negative impact on wildlife.[12] Farming, while supporting wildlife, is promoted through the Glastir agri-environment scheme, but uptake in Greater Gwent is below the Welsh average, with less than 10% of farms (12% of farmed area)[13] participating.

Species in this report associated with farmland include Harvest Mouse, several bat species, arable vascular plants and bryophytes, Lapwing, Tree Sparrow, and Barn Owl.

Agricultural Land Classification of the study area in 2017–18[14,15]

(Note that England does not subdivide Class 3)



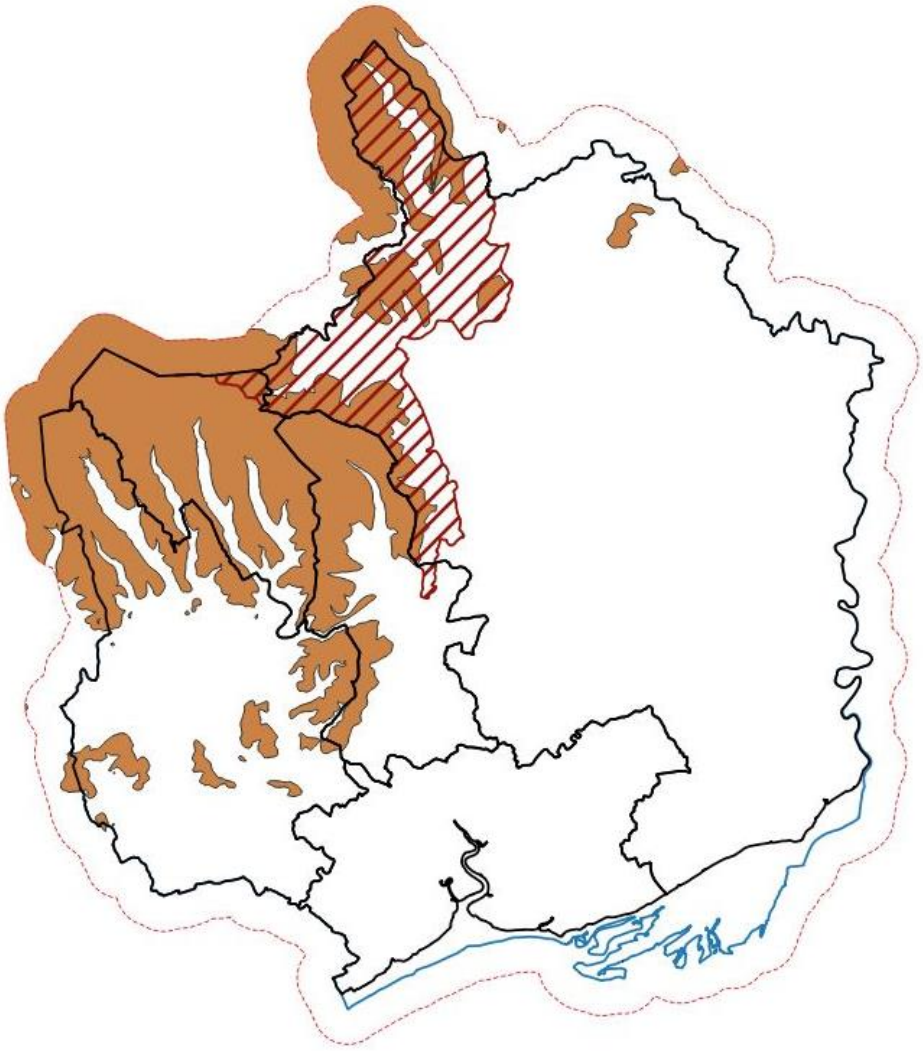
Upland ecosystems

A large area of Greater Gwent is classified as upland. Generally, this is land at an altitude above 300m(asl), although in reality there is a gradient from lowland to upland character. In Wales, this upland fringe is called ffridd, and can be an important habitat. In Greater Gwent, the uplands are a complex mosaic of heathland, acidic grassland, bracken, blanket bog and flushes, with areas of woodland and scrub. Uplands are valuable ecosystems, particularly as the underlying peat deposits can provide significant carbon storage.

Upland ecosystems in Greater Gwent are threatened by many issues, including lack of appropriate grazing, lack of connectivity between areas of higher biodiversity, historic drainage of wetlands, and landscape crime such as off-roading, fly tipping and arson.[16]

Species in this report associated with uplands include Ring Ouzel, Red Grouse, Hen Harrier, Brown Hare, the Silurian moth, Small Pearl-Bordered Fritillary and Scarce Blue-Tailed damselfly.

Area of study area above 300m(asl)[17]



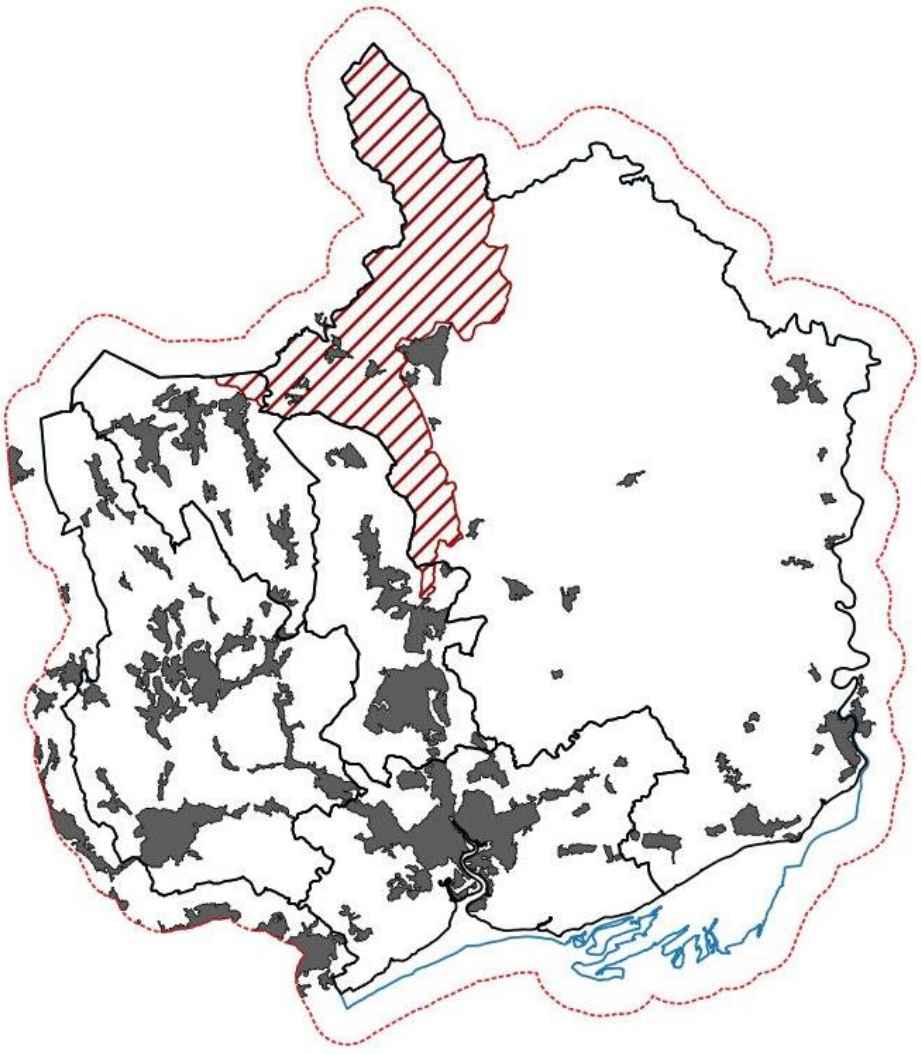
Urban and post-industrial ecosystems

Urban areas can support a surprising biodiversity, and people value the wildlife on their doorstep very highly. Access to green spaces is hugely important for health and well-being, and green infrastructure provides valuable ecosystem services such as shading, air quality and drainage, as well as recreation and amenity. Despite this importance, urban greenspaces suffer from development pressures, high disturbance, and fragmentation.

In Greater Gwent, post-industrial land includes coal spoil tips – large areas of the uplands that form distinctive features, hosting a unique wildlife community. Coal spoil forms a mosaic of bare ground with grass and heath, which is particularly important for invertebrates, lichens and bryophytes.

Species in this report associated with urban and post-industrial land include House Sparrow, Peregrine, Hedgehog, Sandstone Roof Tile mosses, coal spoil invertebrates group, Grayling and Grizzled Skipper. Japanese Knotweed is also relevant.

Built up areas within the study area in 2011[18]

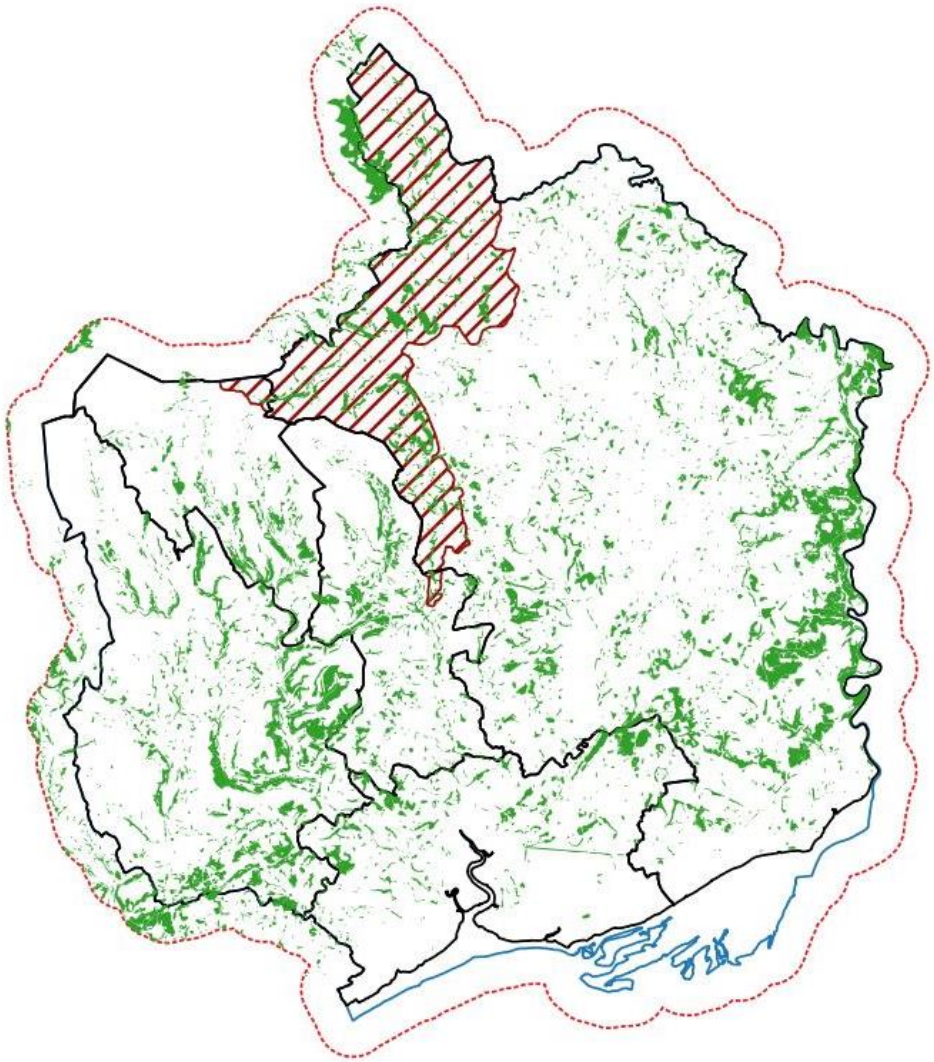


Woodland ecosystems

Woodlands are found across Greater Gwent, with important woodlands designated as SACs along the Wye Valley, at Cwm Clydach, Coed y Cerrig and the Sugarloaf. Greater Gwent has around 20,000ha of woodland.[14] Woodlands across the UK have declined historically and are slowing recovering, but much of the younger woodlands are commercial plantations of limited wildlife value.[2] Woodland ecosystems are threatened by lack of management, disturbance, pollution and disease.[2]

Species in this report associated with woodland include Dormouse, Pine Marten, bat species, Beech and Oak fungi, Hawfinch, Pied Flycatcher, Marsh Tit, Willow Tit, Wood White, and Spreading Bellflower. Ash Dieback is also included.

Woodland cover within the study area in 2018[19]



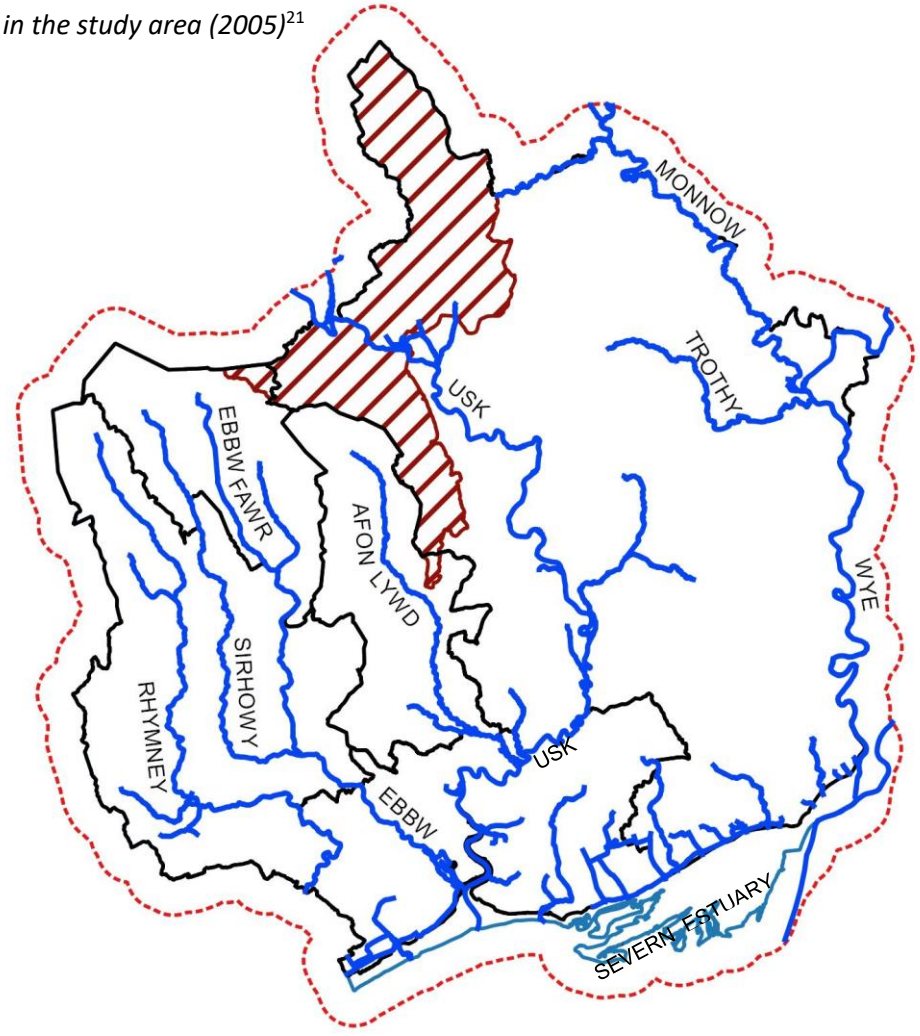
Freshwater and wetland ecosystems

There are just under 500km of main rivers (not including the Severn Estuary) within Greater Gwent. The Monmouthshire & Brecon Canal within Greater Gwent measures 38.1km, with the Crumlin arm adding another 11.6km. Both the Usk and Wye rivers are designated as SACs for their habitat quality and importance for migratory fish and Otter. Rivers are regularly monitored through the Water Framework Directive. Most of the rivers in Greater Gwent are failing to achieve overall Good Status.[20] Reasons for failing to achieve Good Status are similar across all three areas: pollution, physical modification, invasive non-native species and poor habitat quality.

Greater Gwent also has a rich resource of ponds, lakes and wetlands, such as Llandegfedd Reservoir and Nedern Brook Wetlands SSSIs. The Gwent Levels, an extensive historic landscape of fields and drainage ditches, stretches across Newport and Monmouthshire (see map on coastal section). The Gwent Levels are protected as SSSIs for the invertebrate interest within the drainage ditches.

Species associated with freshwater and wetlands included in this report include Otter, Water Vole, Common Toad, Great Crested Newt, migratory fish, European Eel, Dipper, Snipe, Cetti's Warbler, Bittern, Reed Warbler, all odonata, and invertebrates of the Gwent Levels. Invasive species Giant Hogweed, Himalayan Balsam, Japanese Knotweed and Signal Crayfish are also relevant.

Main rivers in the study area (2005)[21]



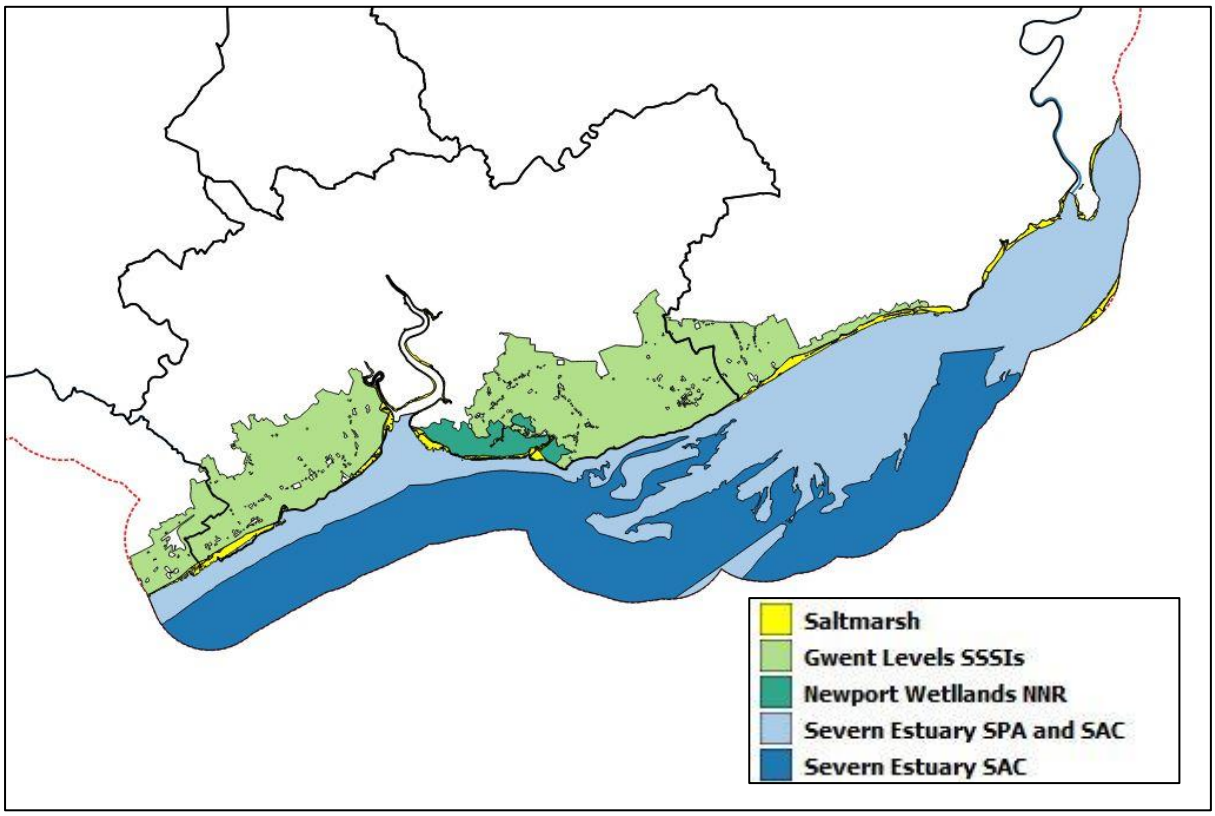
Coastal ecosystems

Greater Gwent has an unusual coastline. The transition from terrestrial to marine is very abrupt in places because much of the Levels were claimed from the sea and are now protected by a sea wall. Greater Gwent is bounded by the Severn Estuary, a SPA, SAC and Ramsar site. The Severn has the second highest tidal range in the world at over 12m and is one of only six estuaries in Britain to accommodate over 100,000 waders at peak times. It supports internationally important populations of Bewick's Swan, Curlew, Dunlin, Redshank, Gadwall, and European White-Fronted Goose. It is also a key migratory route for Salmon, Sea Trout, River and Sea Lamprey, and Twaite and Allis Shad.[22]

Important habitats along the coastline include mudflats, which provide internationally important wader feeding grounds, saltmarsh, which forms a narrow band along parts of the coast, and the saline lagoons at Newport Wetlands NNR.

Species associated with the coast included in this report include Dunlin, Redshank, Black-Tailed Godwit, Little Egret, migratory fish, and European Eel. The flora along the sea wall is important for Shrill Carder Bee, Small Blue and other pollinators.

Coastal habitats and protected areas within the study area (2016)[23]



The 100 Species Stories

The species were chosen through consultation with local conservation bodies, local authorities, Local Nature Partnerships and species experts. Species were chosen based on their local conservation interest, particularly those species that could indicate changes in ecosystems.

The 100 stories of our wildlife are comprised of:

- 15 mammals, and 1 group of mammals (bats)
- 36 birds
- 6 reptiles and amphibians
- 2 fish
- 17 invertebrates, and 4 groups of invertebrates
- 3 groups of fungi
- 3 plants, and 1 group of plants
- 2 bryophytes, and 5 groups of lichens and bryophytes
- 5 invasive species and plant diseases (3 plants, 1 fungus, and 1 invertebrate)

Because of the groupings, these 100 stories represent over 500 species. However, it should be noted that this is a small fraction of the 25,000 species that have been recorded in Gwent and Glamorgan.[24]

Each story shows what information we have for that species or species group, and what is happening to them over time. Some are success stories of population growth, range increase, or the eradication of a harmful species. But many are the opposite, and for some, the story is that there is not enough information to know what is happening.

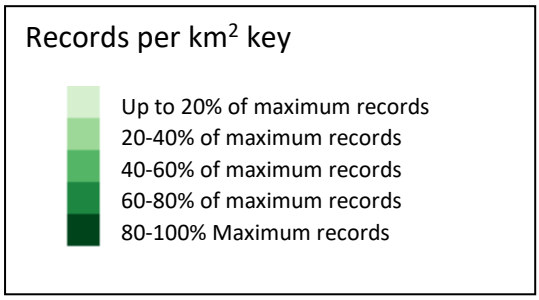
There is likely to be bias in the selection of species towards rare and declining species, as they are of more interest to conservationists, but it is still sobering to consider at least 42 of the 100 stories are thought to be tales of decline. Of the Mammals, one is Critically Endangered, one Endangered, and four are Vulnerable at the Wales level, according to International Union for Conservation of Nature (IUCN) criteria. Of the birds, 14 are Red listed at the Wales level.

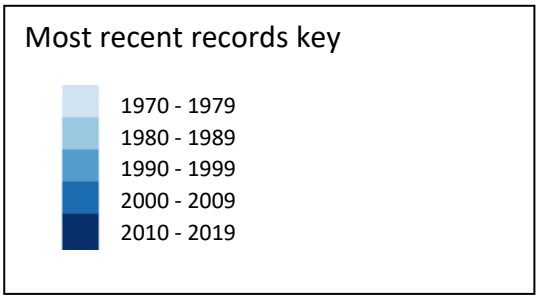
Each species or species group has its own descriptive section with maps showing distribution and dates of records. The sections are grouped taxonomically, with references at the end of each group.

Interpreting the species stories

In each section, there are two maps giving the density of available records from 1970 to 2019 for the species and the decade of most recent record within each grid square. The maps should be viewed together, as this will indicate locations for current populations, that is, areas where there are high numbers of recent records. Note that records are placed within the centre of their grid reference, which can lead to inaccuracy and false hotspots where a number of low-resolution records are together. This is highlighted in the text when it occurs.

The same keys are used throughout, where the maximum number of records per square km is stated for each species:





For each species there is also text describing:

- **Status –**any legal protection and conservation status.
- **Data availability** – a subjective judgement of how much data is available and how accurately it represents the range and population of the species, together with the number of records within the study area.
- **Context –** brief description of the species ecology, with any known national trends and conservation issues.
- **Outlook** – predictions for the species with regard to current and future pressures.
- **Greater Gwent range** – current range and historic changes in range within Greater Gwent.
- **Population trends** – where possible, data is used from national recording schemes to generate population trends at the regional level (where this is not possible, national trends are referred to).
- **Protected Sites** – numbers of records from protected sites within Greater Gwent (records are only counted once, under their highest level of designation).

Where the section is about a group of species such as rare arable plants or coal spoil invertebrates, this will include a species list (where practical). The same maps and text headings are used, with the addition of a map of species richness.

It is important to note that numbers and locations of records may not accurately reflect species abundance and distribution, depending on levels of recording and mobility of species. See State of Greater Gwent Data for more information about data quality and bias.

For detailed technical methodology, see Appendix 1.

Biodiversity recording in Greater Gwent

Recording wildlife has a long history in Gwent. During the surge of scientific interest in the Victorian era, the first president of the Cardiff Naturalist Society in 1867 was William Adams, a surveyor who had worked all over Greater Gwent, particularly in Ebbw Vale and Tredegar.[25] Despite being based outside of the area, the society regularly conducted field trips to Gwent sites; in 1873 this meant a visit to Tintern, including a carriage ride to Wyndcliffe, which was 'a most agreeable and enjoyable day'.[26] The society still exists, and recently celebrated its 150th anniversary.

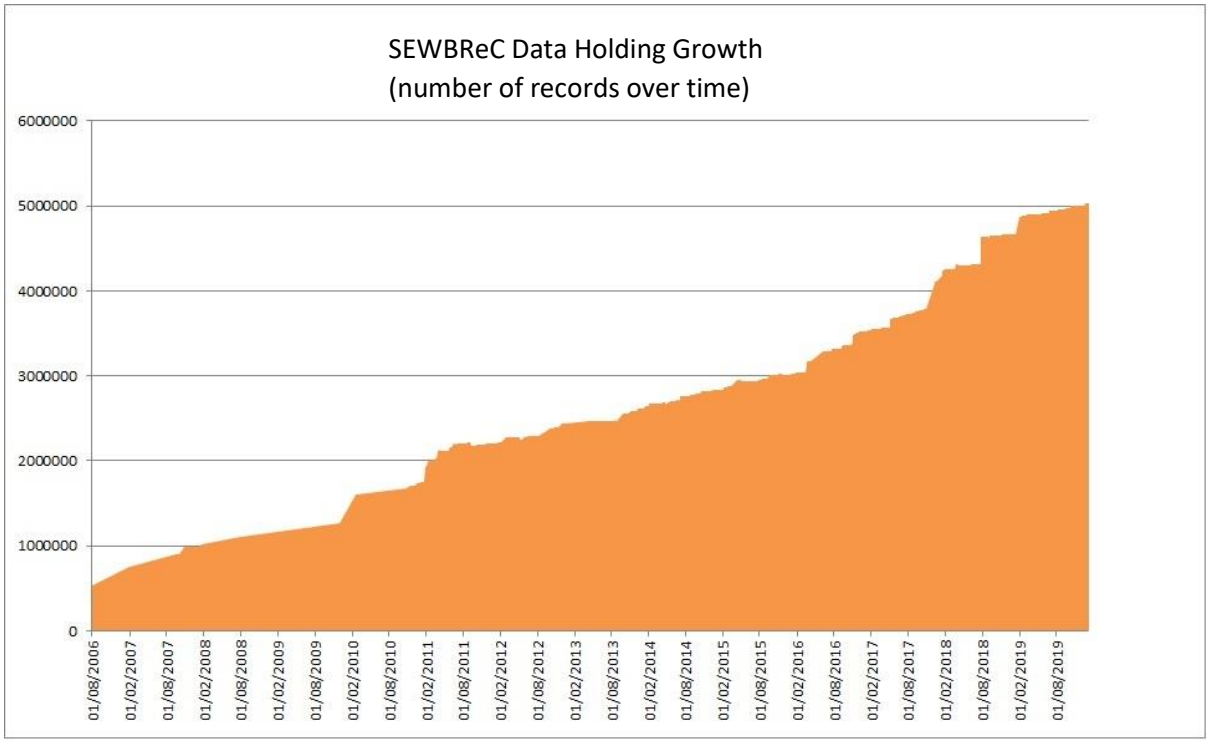
Progress towards national systems of wildlife recording was halted by the First and Second World Wars, but the following decades saw the establishment of the Brecon Beacons National Park in 1957, the founding of the Gwent Ornithological Society in 1961, and Gwent Wildlife Trust purchasing its first nature reserve, Magor Marsh, in 1963. At a UK level, this coincided with the publication of the first Botanical Society of Britain and Ireland (BSBI) Atlas in 1962 (using an amazing 1.5million records, which were sorted mechanically), which led the establishment of the Biological Records Centre (BRC) in 1964.[27]

It was only in the 1980s that concerns were raised about biological recording; the concept of a network of local records centres had been suggested in the 1970s by the BRC, but only one had been established. Subsequently, NGOs, museums, local recording groups and national schemes all began setting up their own systems for collating, verifying and distributing data, with no common standards or co-ordination. By the 1990s, over 2,000 different UK organisations were collecting and storing biological records.[28] At the same time, demand for high quality biological information was growing as a result of the 1992 Rio Convention on Biodiversity and planning policy placing greater emphasis on taking local habitats and species and their conservation into account when making strategic plans and planning decisions.

The response to this situation in Greater Gwent was the establishment of the South East Wales Biodiversity Records Centre (SEWBReC) in 2003. It was the second Local Environmental Record Centre (LERC) in Wales, after the Biodiversity Information Service covering Powys and the Brecon Beacons National Park. By the end of 2007, Wales had complete LERC coverage. The Association of Local Environmental Records Centres (ALERC) was formed in 2009, and the UK now has complete coverage. The LERCs aim to collate and disseminate local biological data, working on improving data consistency and supporting local recording.

State of Greater Gwent data

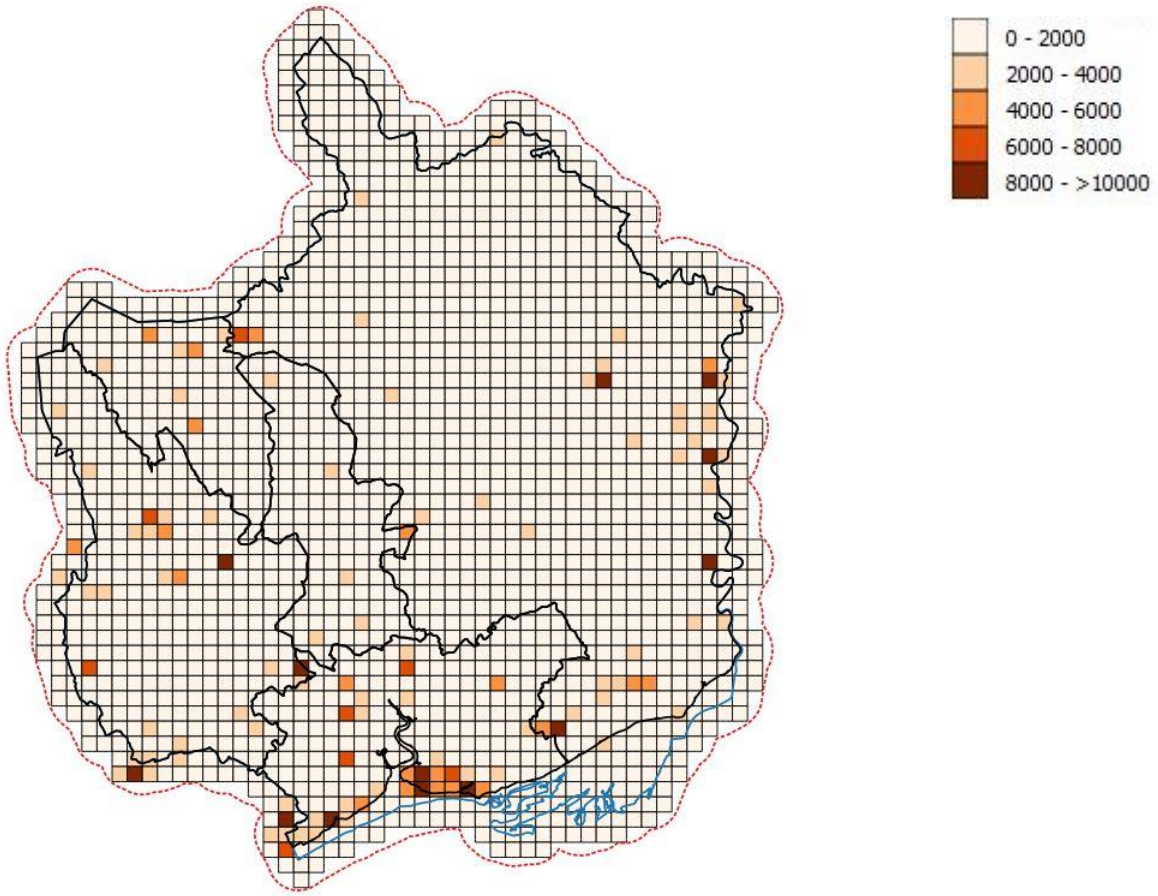
This report utilises almost 120,000 records to provide information for over 500 species. This represents a phenomenal level of recording, curating and provision, which would not have been possible just 20 years ago. This volume of biological data, through local and national records centres, and from national recording schemes, has not been available until recently. This growth is demonstrated by the SEWBReC holdings, which have grown to just over 5 million records within 20 years (includes Gwent and Glamorgan records).



However, this data is not evenly spread temporally, spatially or taxonomically. Although significant efforts have been made to digitise older records, such as the Mary Gillham Archive Project,[29] the majority of species in the report have very few records prior to the 1990s. This means that increased recording effort can mask trends in population and range.

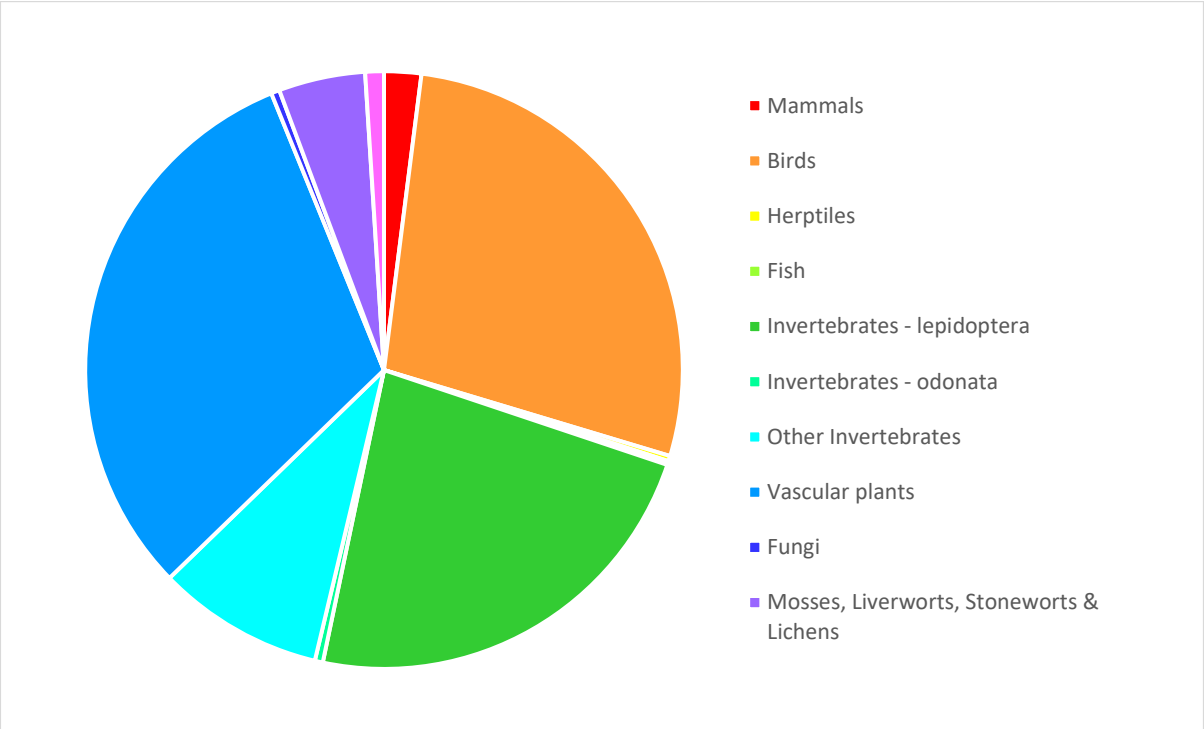
Spatial bias of records is highly skewed towards protected sites and other wildlife-rich areas, such as Peterstone Wentlooge, Newport Wetlands and Pentwyn Grasslands. Discounting grid squares within the Severn Estuary, 11% of the terrestrial squares across Greater Gwent have fewer than 100 records within 50 years, while the average number of records is 787 per monad. Most of these poorly recorded grid squares occur in upland or rural areas, such as central Monmouthshire and the Torfaen borders.

Density of records (1970–2019) within Greater Gwent



Taxonomic bias within Greater Gwent is towards birds, lepidoptera and plants, meaning ranges and trends calculated for those species is more likely to be accurate (subject to the spatial bias). Herptiles, fungi and invertebrates other than lepidoptera are particularly, underrepresented. In fact, there are almost 100 bird records for every reptile or amphibian record.

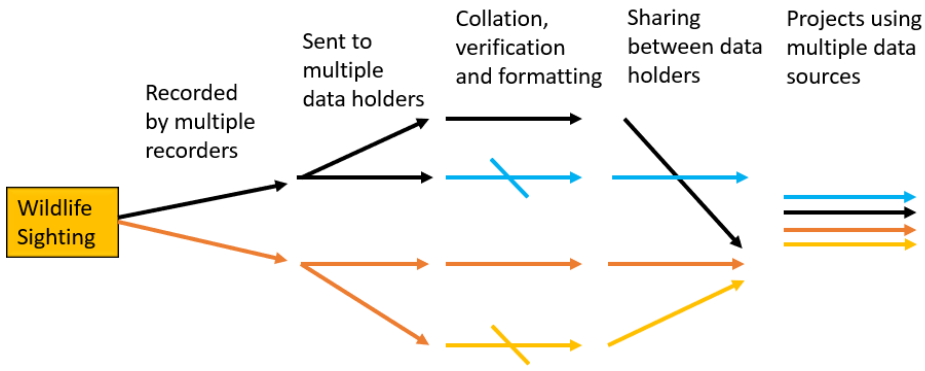
Greater Gwent Records (1970–2019) by species group



Data quality and reliability also varied considerably. Duplication of records within and between different datasets was a significant issue. The figure below shows how record duplication can occur at multiple stages from recorder to data user. The differing record formats from the three LERCs and NBN Atlas meant that duplicates could not be identified and removed by automated processes. Within datasets, some duplication could be removed but not all duplication could be detected or easily removed. Species where duplication seemed to be a particular issue included Otter and Shrill Carder Bee. Improving data pathways is a current priority for SEWBreC.

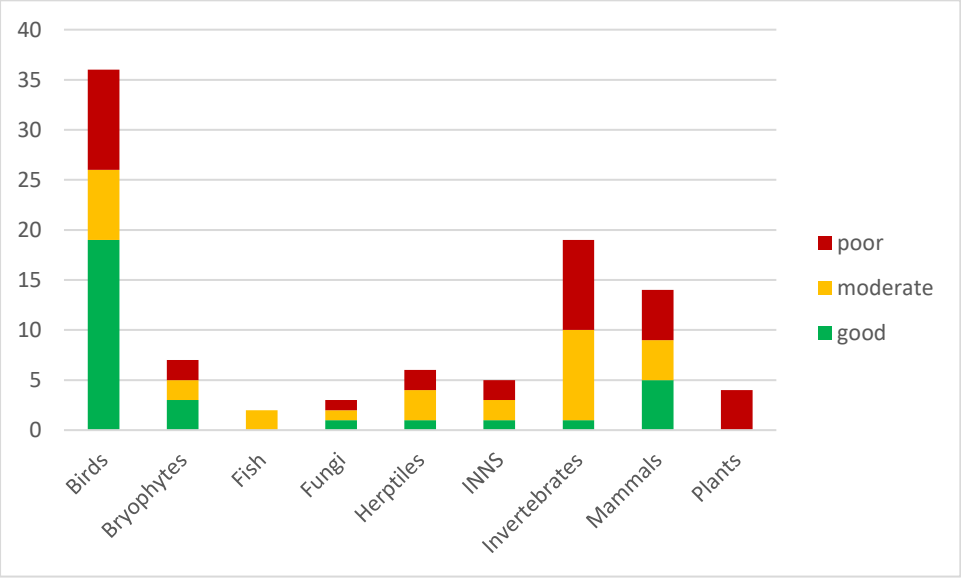
There were also some datasets where information was not reaching LERCs or the NBN Atlas, from local recorders, recording groups, recording schemes or from statutory agencies (termed data disconnects). This was particularly the case for Ash Dieback, fish and bats.

Potential duplication pathways



Each of the Greater Gwent species or species groups was given a subjective assessment of data quality, based on factors such as number, date and distribution of records, as well as local knowledge. Data classified as 'Good' quality means that the data was likely to give a more accurate representation of the species status. Data for 31 species or species groups was classified as Good, 30 as Moderate and 35 as Poor. Four were not classified due to variation in data quality across species groups, or lack of records altogether. Birds had the most reliable data, but this was not equal across all species. All plants had Poor data, but this was probably influenced by the choice of species included in the report, as they are all rare species with few records.

Subjective data quality



Reliable population trend data at the regional level was only available for birds and two mammals (Lesser Horseshoe Bat and Otter). This broadly reflects the UK, where structured sampling data is available for birds, bats, butterflies and plants.[30] If participation in national recording schemes was increased, trends could theoretically be calculated for a further 6 of the mammals/mammal groups,

all 6 herptiles and the 11 Lepidoptera. As a rough guide, producing a reliable regional trend requires around 40 data collection points, evenly distributed through the area.

Attention must also be drawn to the lack of information regarding conservation action. Any details of local conservation work within the species sections relied heavily on the knowledge of local experts, which is often limited to 'working memory' of about 10 years. Although some organisations and groups have archived their newsletters, many have not, so information about former projects or schemes has often been a matter of chance. The national Biodiversity Action Reporting System, which aimed to catalogue and map such action, failed due to limited uptake, and was closed and archived in 2016. This lack of available information means that knowledge and understanding gained from previous actions is less likely to be used.

References

1. Burns F, Eaton MA, Gregory RD, Al Fulaij N, August TA, Biggs J, Bladwell S, Brereton T, Brooks DR, Clubbe C, Dawson J, Dunn E, Edwards B, Falk SJ, Gent T, Gibbons DW, Gurney M, Haysom KA, Henshaw S, Hodgetts NG, Isaac NJB, McLaughlin M, Musgrove AJ, Noble DG, O'Mahony E, Pacheco M, Roy DB, Sears J, Shardlow M, Stringer C, Taylor A, Thompson P, Walker KJ, Walton P, Willing MJ, Wilson J and Wynde R. 2013. State of Nature Report. The State of Nature partnership.
2. Hayhow DB, Eaton MA, Stanbury AJ, Burns F, Kirby WB, Bailey N, Beckmann B, Bedford J, Boersch-Supan PH, Coomber F, Dennis EB, Dolman SJ, Dunn E, Hall J, Harrower C, Hatfield JH, Hawley J, Haysom K, Hughes J, Johns DG, Mathews F, McQuatters-Gollop A, Noble DG, Outhwaite CL, Pearce-Higgins JW, Pescott OL, Powney GD and Symes N. 2019. The State of Nature 2019. The State of Nature partnership.
3. Natural Resources Wales. 2016. State of Natural Resources Report (SoNaRR): Assessment of the Sustainable Management of Natural Resources. Technical Report. Natural Resources Wales.
4. Natural Resources Wales. 2020. State of Natural Resources Report (SoNaRR): Assessment of the Achievement of SMNR Aim 2: Ecosystems are Resilient to Expected and Unforeseen Change. Natural Resources Wales.
5. Welsh Government. 2017. Natural Resources Policy. Welsh Government: https://gov.wales/natural-resources-policy
6. Natural Resources Wales. Introduction to South East Wales Area Statement: https://naturalresources.wales/about-us/area-statements/south-east-wales-area-statement/introduction-to-south-east-area-statement/
7. Local authority population estimates 2018. Office for National Statistics. ONS Crown Copyright Reserved (from Nomis on 5 January 2020).
8. British Geological Survey. 2020. BGS Geology 625K Bedrock dataset. Contains British Geological Survey materials © UKRI (2020).
9. Contains multiple data sources, please see Appendix 2: Data sources for more information.
10. Data from Terrestrial Phase 1 Habitat Survey 1997. Showing acid, neutral, calcareous and marshy grassland below 300m Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.
11. Agricultural land classification: predictive map: https://gov.wales/agricultural-land-classification-predictive-map (accessed 10/07/2021).
12. Hayhow DB, Burns F, Eaton MA, Al Fulaij N, August TA, Babey L, Bacon L, Bingham C, Boswell J, Boughey KL, Brereton T, Brookman E, Brooks DR, Bullock DJ, Burke O, Collis M, Corbet L, Cornish N, De Massimi S, Densham J, Dunn E, Elliott S, Gent T, Godber J, Hamilton S, Havery S, Hawkins S, Henney J, Holmes K, Hutchinson N, Isaac NJB, Johns D, Macadam CR, Mathews F, Nicolet P, Noble DG, Outhwaite CL, Powney GD, Richardson P, Roy DB, Sims D, Smart S, Stevenson K, Stroud RA, Walker KJ, Webb JR, Webb TJ, Wynde R and Gregory RD. 2016. State of Nature 2016. The State of Nature partnership.
13. Welsh Government. 2019. Number and area of farms in Greater Gwent participating in Glastir in 2019. Response to FOI request. Rural Payments Wales, Welsh Government. Compared to total farmed area from Statistics for Wales & Welsh Government (2019) Agricultural Small Area

Statistics (2002–2018). Welsh Government: https://gov.wales/agricultural-small-area-statistics-2002–2018 (accessed 27/12/19).

14. Welsh Government. 2017. Post 1988 Agricultural Land Classification (Wales) Surveys © Crown copyright. Mapping derived from soils data © Cranfield University (NSRI) and for the Controller of HMSO 2021 © Crown copyright 2020, the Met Office. Contains OS data © Crown copyright and database right 2020. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved.
15. Natural England Open Data (2018) Provisional Agricultural Land Classification (ALC)(England) © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right (2021).
16. TACP. 2015. Natural Resources Management Plan for South-east Wales Uplands. Torfaen County Borough Council.
17. Data from OS Terrain 50. Contains OS data © Crown copyright and database right 2021.
18. Built-up Areas (Wales) dataset. Office of National Statistics. © Crown Copyright and database right 2021. Ordnance Survey 100021874.
19. National Forest Inventory Woodland Wales 2018 dataset. Broadleaf, Conifer and Mixed woodland. Contains information supplied by the Forestry Commission. © Crown copyright and database right 2019 Ordnance Survey (100021242).
20. Natural Resources Wales. 2021. Water Watch Wales. River Waterbodies Interim Assessment 2018. Water Watch Wales: https://waterwatchwales.naturalresourceswales.gov.uk/en (accessed 14/03/2021).
21. Main Rivers dataset. 2005. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.
22. Taylor B. (ed.). 2011. State of the Severn Estuary. The Severn Estuary Partnership, Cardiff
23. Saltmarsh extents dataset (2009–2016). Contains Natural Resources Wales information © Natural Resources Wales and database right and Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves (NNR) and Special Sites of Scientific Interest (SSSI) datasets Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.
24. SEWBReC records holdings at the end of 2019, pers comm.
25. Cardiff Naturalists' Society History 150th Anniversary: https://www.cardiffnaturalists.org.uk/htmfiles/150th-11.htm
26. ‘A most agreeable and enjoyable day’: The Cardiff Naturalists Society’s Field Trip to Tintern Abbey, June 1873. Glamorgan Archives: https://glamarchives.wordpress.com/2017/10/12/
27. A Time Before BRC. Biological Records Centre: https://www.brc.ac.uk/time-brc
28. Burnet J, Copp C and Harding P. 1995. Biological Recording in the United Kingdom – Present Practice and Future Development. Co-ordinating Commission for Biological Recording.
29. Mary Gillham Archive Project: https://www.marygillhamarchiveproject.com/
30. Border, J. Gillings, S., Newson, S.E., Logie, M., August, T., Robinson, R.A. & Pocock, M.J.O. 2019. The JNCC Terrestrial Biodiversity Surveillance Schemes: An Assessment of Coverage. JNCC Report No. 646, JNCC, Peterborough, ISSN 0963–8091.

Terrestrial mammals

The recent Red List for Wales's mammals reports that 1 in 3 of the 39 native or formerly native mammals in Wales are threatened with extinction, with 51% in need of urgent action.[1] There are 17 mammal species on the Section 7 list of Priority Species for Wales, all of which, except the Red Squirrel, are found in Greater Gwent.

Mammals occupy a great variety of ecological niches, from predators such as the Otter and Pine Marten, and grazers and browsers such as deer, to important prey species such as voles and mice. They are found in a large variety of habitats including woodland, grassland, upland and wetlands. The use of mammals as an indicator of ecosystem health varies according to the species and ease of recording. For example, Otter spraints have often been used as indicators of water quality and fish populations, as Otter spraint is easily identified with little risk to disturbing the animal.

The variety of mammal species, their ecology and visibility means that mammal recording is equally varied. Some, such as Dormouse, Water Vole and Otter, have their own recording schemes, with coverage discussed in each individual section. Others, particularly small mammals, are less well recorded and only covered by casual recording, or overall surveys such as the Living with Mammals survey (PTES)[2] and the Breeding Bird Survey (BTO)[3] which added a mammal section in 1995.

In this section there are 11 mammals, ranging from the widespread, such as Badger and Otter, to the rarely recorded Harvest Mouse and Water Shrew. There are notable success stories, namely the return of the Otter to many watercourses, and the successful reintroduction of Water Vole to the Gwent Levels. The current situation regarding the return of Beavers to Wales is also summarised.

Note that bats are included in a separate section.

Eurasian Badger *Meles meles* (Linnaeus, 1758)

Andy Karran

Protection: Protection of Badgers Act (1992) [4]

Conservation status: LEAST CONCERN (UK),[5] LEAST CONCERN (Wales) [5]

Data availability: Medium (857 records)

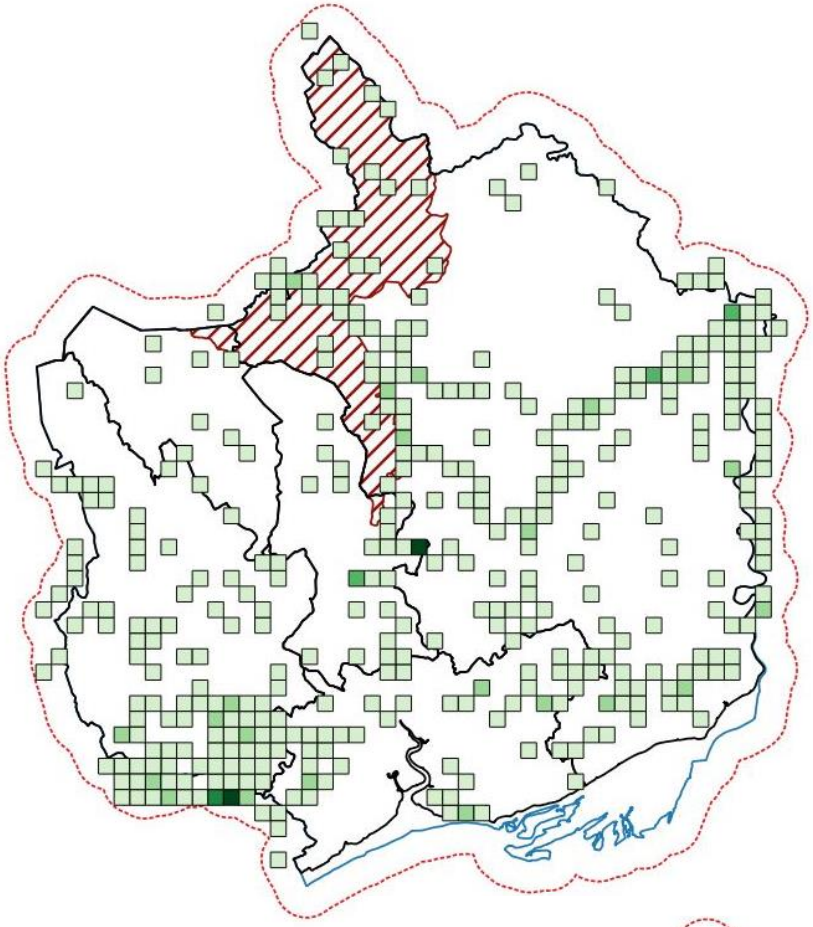
Context: Badgers are included within this report because of their association with bovine tuberculosis (bTB), with Gwent being an area of high bTB incidence.[6] Historically, Badgers have been persecuted by gamekeepers, farmers or for bloodsports, and the population has recovered from a low point at the beginning of the twentieth century.[7] The current UK population is thought to be stable or increasing,[5] although there is some uncertainty due to differing survey methodologies.

Current threats include conflict with development, road casualties and legal culls. There are still numerous reported incidents of Badger persecution,[8] but these are unlikely to be significant in terms of the overall population. Road casualties and bTB are discussed in more detail within this chapter.

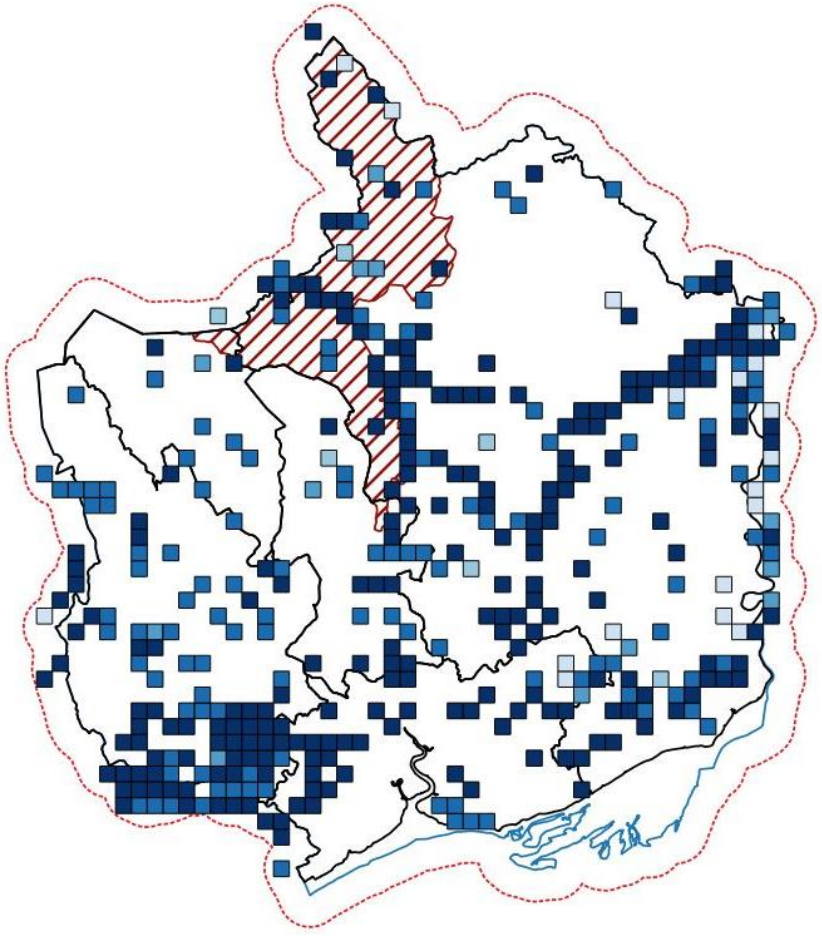
Outlook: The national population and range for Badgers is predicted to remain stable, with the exception of English cull zones.[5] Road deaths are a potential cause for concern, as is the loss of setts through development, habitat changes and fragmentation of territorities.[7] Research is ongoing regarding the impact of climate change.

Greater Gwent range: Badger records are concentrated along main roads and settlements, with an unusual concentration around Caerphilly. Whether this is due to high numbers of urban Badgers or increased recorder effort is unclear – although there is an increasing trend in urban Badgers nationally.[5] There is also a skew due to low resolution records causing a false hotpot on the Torfaen/Monmouthshire border.

Density of Badger records (maximum density 16 records/km^2)



Badger records by latest record/km^2

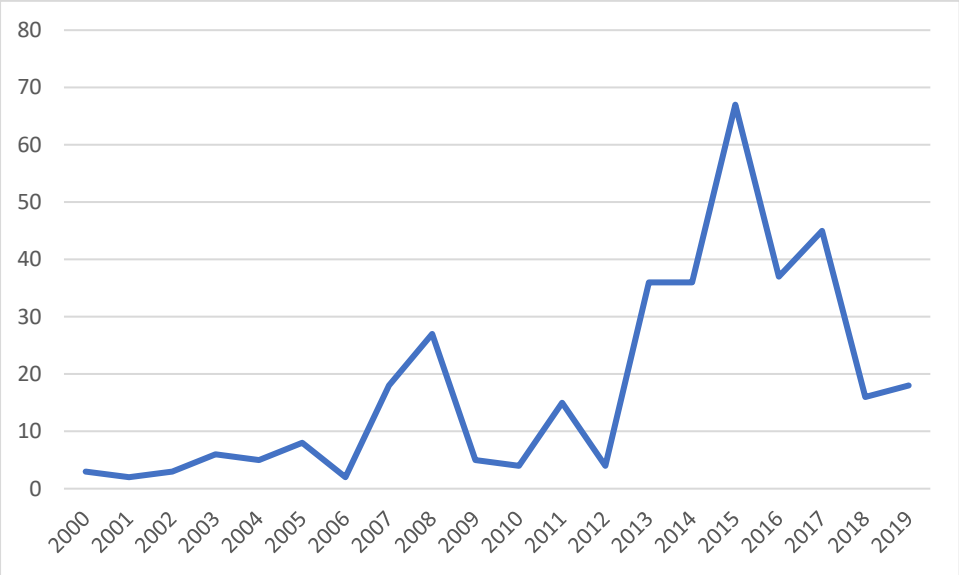


Trends: There is not enough data to give any population trends for Gwent. At a national level, Badger populations are thought to be stable or increasing.[5]

Road casualties: The impact of road deaths on Badger populations is unclear: using data collated in the 1980s, Clark et al.[9] estimated that 50,000 Badgers were killed on roads per annum. Although Harris et al.[7] conclude that this level of mortality does not have an impact on the overall population, creation of new roads and increases in traffic levels since these studies may now be cause for concern. In addition, recent work[10] suggests that Badgers are sensitive to changes in climate, with weather patterns affecting breeding and foraging activity.

Almost half (42%) of the SEWBReC Badger records are of road mortalities (GERC and HBRC records are not used, as they do not include recorder comments), and there are additional 110 road mortality records from Project Splatter. Annual road casualty records since 2000 are shown below. Further work would be needed to analyse whether this pattern is due to increased recorder effort, increased road traffic, or other factors, such as climate, having impacts on Badger movements.

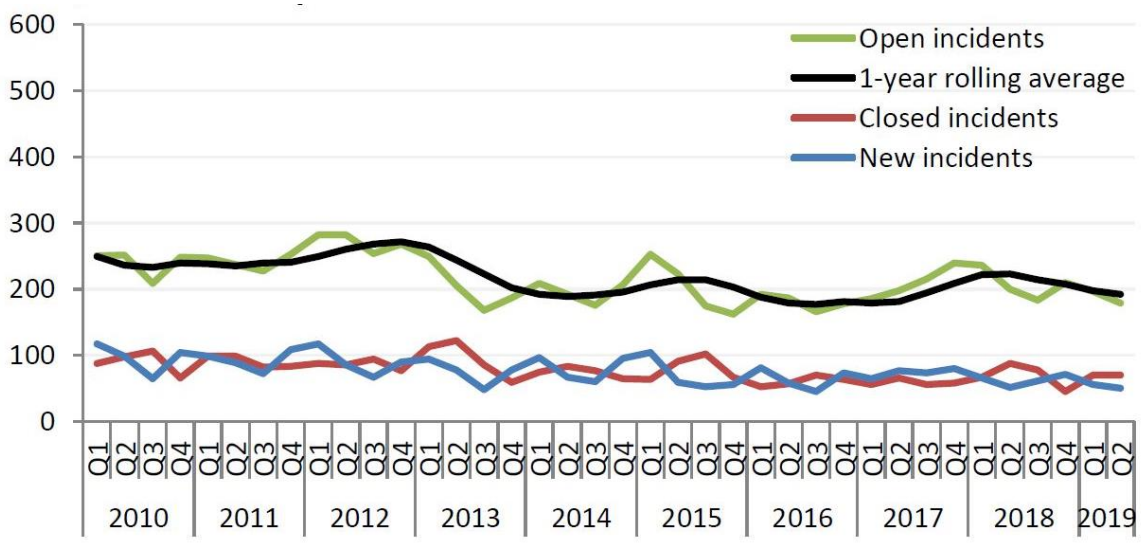
Badger road mortality records per annum (SEWBReC and Project Splatter) from within the study area. Note that Project Splatter records are included from 2013 onwards.



Bovine Tuberculosis (bTB): Badgers are known carriers of bTB and can transmit the disease to cattle, and vice versa. The movement of the disease with Badger populations and the rates and mechanisms of transmission are poorly understood,[11] although transmission within species occurs at higher rates than between species.[12]

Gwent is part of the Welsh Government High bTB Incidence Area (East), which includes Gwent and most of Powys.[6] The latest statistics[13] show that bTB incidents in the area are falling, albeit gradually, although bTB remains more prevalent in the area than the Wales average.

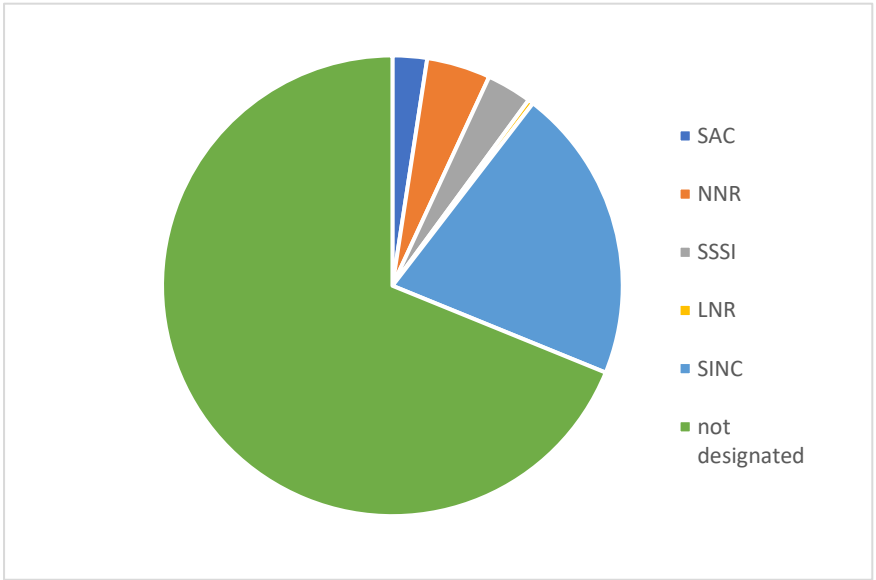
New, closed and open incidents of bTB in High TB Area (East)[13]



Currently, Welsh Government Policy is to continue to monitor the incidence of bTB in Badgers,[14] and a programme for collection and analysis of dead Badgers is in place.[15] A grant covering up to 50% of the costs of Badger vaccination was offered in 2019.[16]

Protection: Only 31% of records are from protected sites. There is a recording bias with regard to Badgers, as many of the records come from road casualties (see below) or potential development sites, which are not protected. As they are not a species of particular conservation concern, there are very few dedicated surveys for Badgers. There is also possible reluctance on the part of some recorders to share locations of Badgers, especially setts, due to persecution.

Badger records from protected sites



European Beaver *Castor fiber* (Linnaeus, 1758)

Allard Martinius

Protection:[3] Annex 3 of the Bern Convention in Europe, Habitats Regulations (1994) Scotland only

Conservation status: UK BAP (Biodiveristy Action Plan) Priority Species, Environment (Wales) Act Section 7 Species. Red List:[5] ENDANGERED (UK), not applicable (Wales)

Data availability: Poor (no records)

Context: The European Beaver is included here due to the work of the Welsh Beaver Project, which is currently investigating the feasibility of reintroducing the Beaver to Wales. Beavers were hunted to extinction in the UK in the sixteenth century, and only around 1,200 animals remained in Europe by the start of the twentieth century. As a result of reintroductions and natural recolonisation, Beavers have returned to much of their former range across mainland Europe. Much of the enthusiasm for restoring Beavers to the UK stems from their role as 'ecosystem engineers': Beavers manipulate their habitat, slowing water flow and increasing biodiversity.[17]

UK reintroductions: In the UK, Beavers were successfully reintroduced to Knapdale, Scotland in 2009 and granted European Protected Species status in Scotland in the same year. The Knapdale population had grown to around 430 animals in 2017.[18] A second Scottish population has become established from escaped or unlicensed release on the River Tay, and was estimated at approximately 433 animals in 2017–18.[19]

In England, an escaped or unlicensed release resulted in a breeding population on the River Otter in Devon. In 2015, the Devon Wildlife Trust were granted a five-year licence to study the existing population and reintroduce additional animals. The population is now estimated to be at least seven breeding pairs.[20] Additional releases of Beavers into enclosed sites have taken place in Kent, Devon, Cornwall,[6] Yorkshire[21] and Gloucestershire,[22] with further releases proposed in Dorset,[23] Somerset and Surrey.[26]

In Wales, the Welsh Beaver Reintroduction Project conducted a feasibility study[25] that concluded: 'Beaver reintroduction to Wales is ecologically feasible, with re-establishment and the management of impacts being possible at a relatively low financial cost. Beavers offer substantial benefits in terms of ecosystem services and biodiversity conservation, while there are social benefits in terms of stimulation of tourism as well as educational and recreational opportunities.' In March 2021, the first two Beavers (an adult male and its offspring) were released under licence to the Cors Dyfi Nature Reserve in Powys, with further individuals from the same family unit expected to follow soon after.

There are recent records[26] of Beaver field signs on the River Dyfi not associated with the controlled release, but it is not known where the animal or animals are from, nor how many there are.

Greater Gwent status: The Welsh Beaver Reintroduction Project has identified six catchments in Wales where Beavers could be reintroduced, but none are within Gwent. The Wye and Severn catchments were eliminated from the habitat surveys at an early stage due to the potential added complications of cross-border licensing and legislation.[27] At present, the nearest known Beavers are a pair within an enclosure in the Forest of Dean.

Outlook: Beaver population and range is predicted to increase at the UK level.[5] In Wales, the Beaver continues to have an ambiguous legal status, and further work would be needed into site selection and detailed reintroduction proposals before licensed releases could take place.[25]

Brown Hare *Lepus europaeus* (Pallas, 1778)

Andy Karran

Protection: Hunting Act (2004)

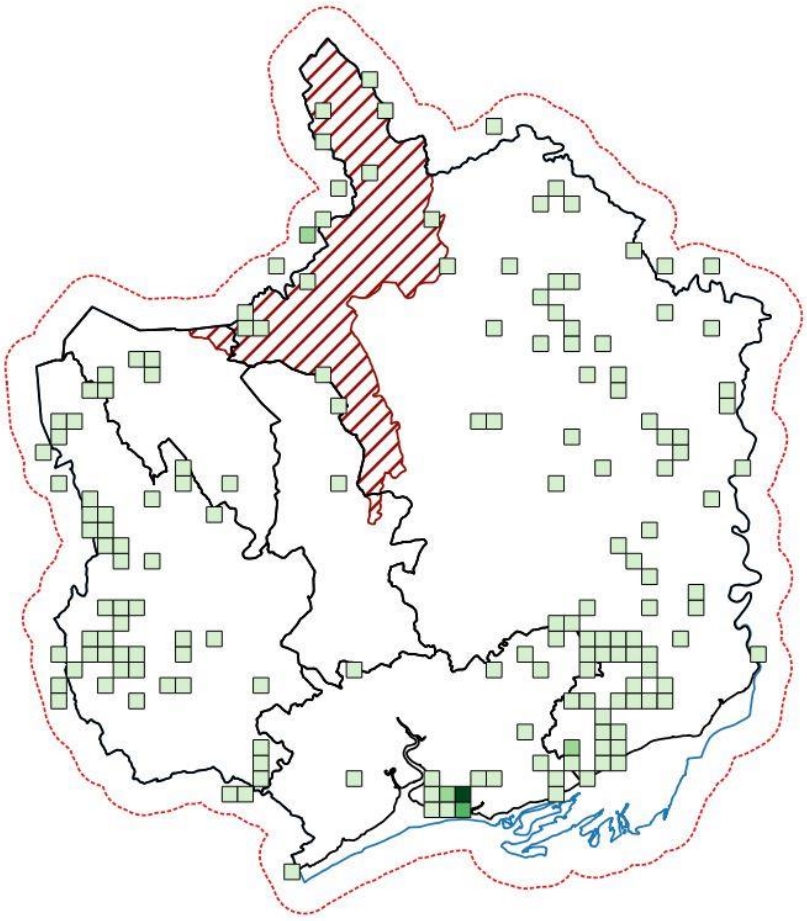
Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species. Red List:[4] n/a (UK), n/a (Wales)

Data availability: Moderate (294 records)

Context: Brown Hares are thought to have been introduced to Britain in Roman times and were once a common sight on farmland. They were among the first species to be added to the UK Biodiversity Action Plan (UKBAP Priority list), following estimates that the population had declined by around 75% since the second World War.[27] The reasons for the decline are not fully understood, although it is thought to be linked to changes in farming practices, including the use of larger fields, machinery and agrichemicals, and changes in crops. Increasing numbers of predators, particularly foxes, may also be a factor.[7]

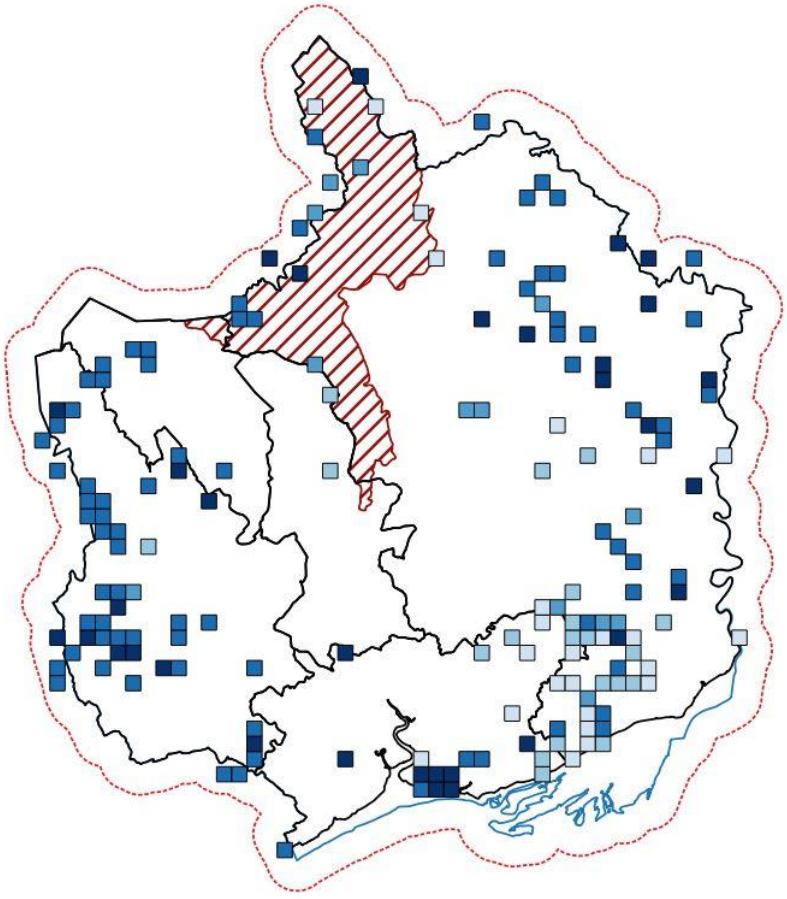
Outlook: Currently the UK population is predicted to remain stable, although there are negative pressures from changes in agricultural practices, pest control and climate change.[4] There is some evidence that agri-environment schemes can have a positive impact,[31] but this was not seen across all farms.

Greater Gwent range: Brown hares are found across Greater Gwent, with distribution broadly corresponding to arable habitats in Monmouthshire, Newport and the west of Caerphilly. Greater Gwent is considered to be on the edge of the optimal habitat for brown hares because of the prevalence of livestock farming:[27] Brown hares are found on pastoral farms but have lower adult survival rates.[28] There are high numbers of recent records from Newport Wetlands, most likely due to recording efforts, whereas the Monmouth/Newport border has few recent records, despite having many historic records.



Density of Brown Hare records (maximum 25 records/km^2)

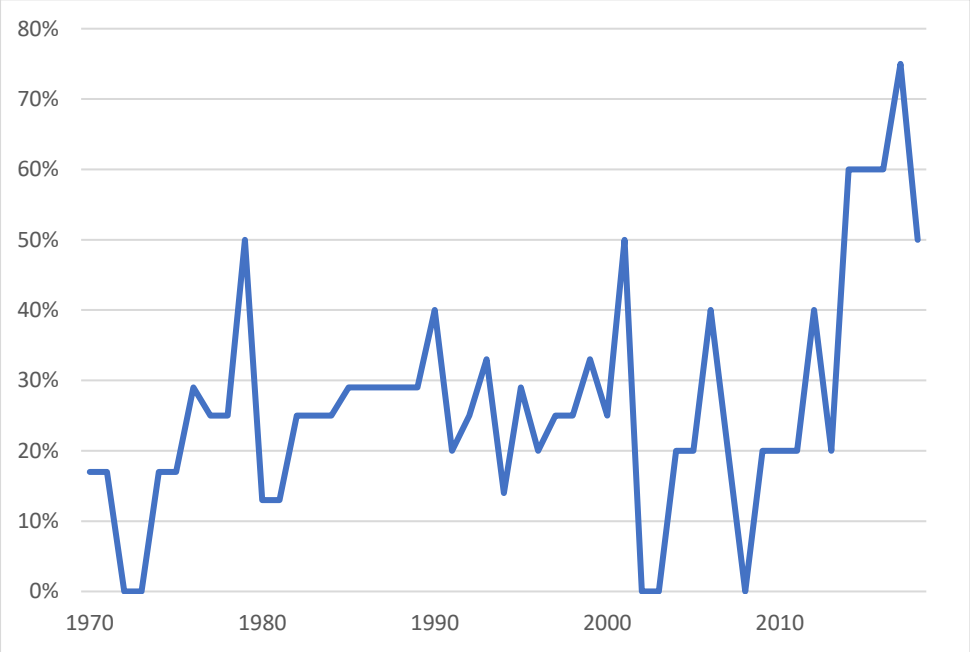
Brown Hare records by decade



Trends: As Brown Hare is a game species, data from the National Gamebag Census of the Game and Wildlife Conservation Trust (GWCT) can be used to measure trends. Nineteen sites across the study area provide data to GWCT, but not all sites report every year; the average number of annual returns since 1970 is 5.8 sites.[29] This provisional trend is based on the percentage of sites reporting the presence of Brown Hare, as bag figures are largely absent from 1993 onwards.

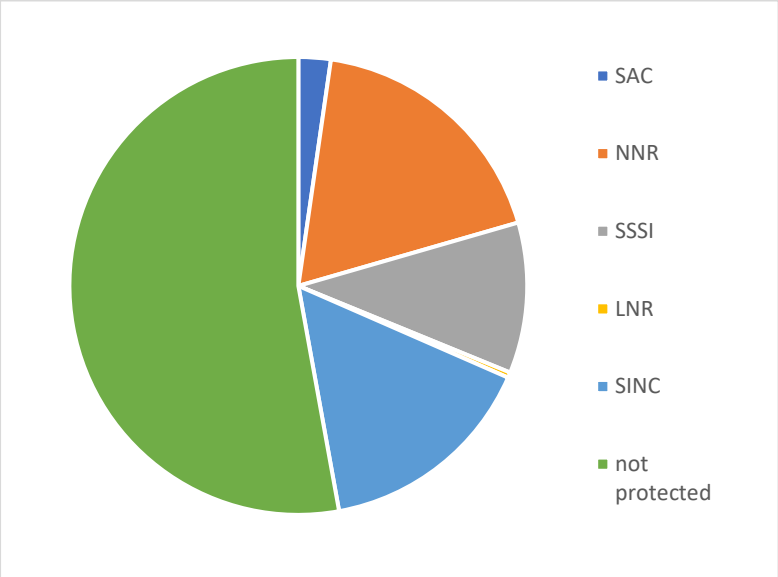
National Gamebag Census returns for the study area show a recent increase in the percentage of sites reporting the presence of Brown Hare, although this is based on a small number of returns. This is reflected in the national returns, where bag density (animals killed per km^2) shows a long-term decline but a recent increase, thought to be related to the introduction of set aside and agri-environment schemes.[30]

Percentage of sites within the study area reporting the presence of Brown Hare, from the National Gamebag Census[29,26]



Protection: Just under half (47%) of records come from protected sites, with high numbers of records from Newport Wetlands NNR. Note that Brown Hare is a game species and can be an agricultural pest. Brown hares are protected during their breeding season on unenclosed land.

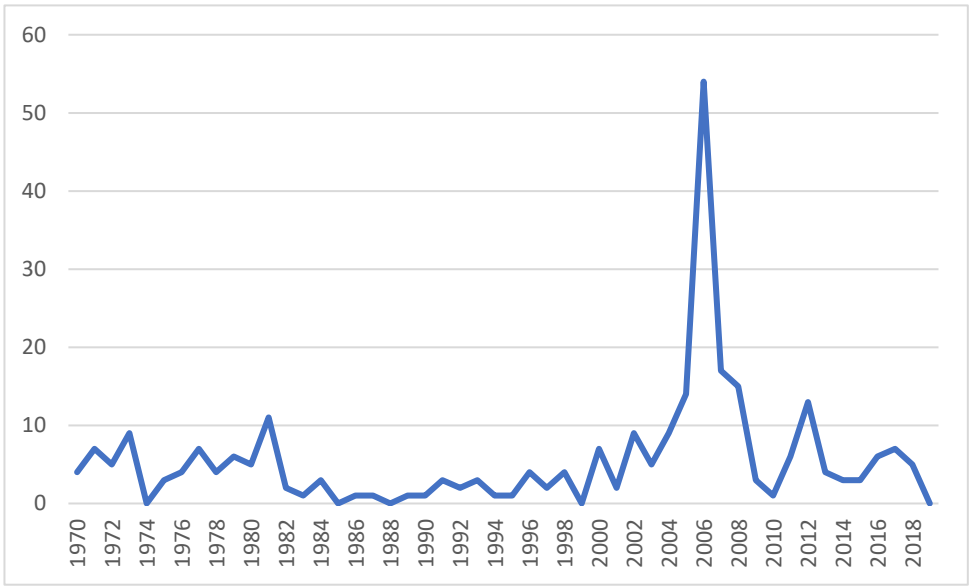
Brown Hare records from protected sites



Brown Hare and Lapwing Survey: In 2006, Gwent Wildlife Trust led an awareness-raising campaign encouraging members of the public to submit Brown Hare records. Fifty-four records were submitted in 2006; prior to this, the average number of records per year was just 3.7, so this represented a 15-fold increase. Records were received from every local authority except Torfaen. Thirty of the records used specially printed survey cards, which showed the species and provided a form for the record, although other records may also have been a result of the increased awareness of the species.

This demonstrates that public awareness programmes can be effective in generating new records and indicates that Brown Hare may be generally under-recorded across Greater Gwent.

Annual numbers of SEWBReC records for Brown Hare; showing the impact of the GWT Brown Hare and Lapwing Survey in 2006



Dormouse *Muscardinus avellanarius* (Linnaeus, 1758)

Lowri Watkins

Protection: Conservation of Habitats and Species Regulations – Schedule 2 (2017). Wildlife and Countryside Act – Schedule 5 (1981, as amended)

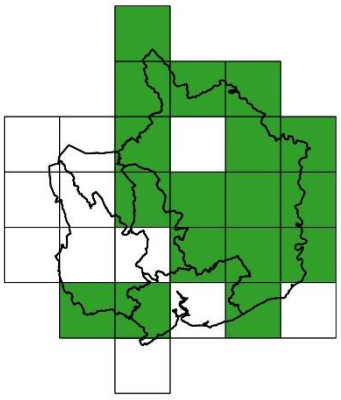
Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[5] VULNERABLE (UK and Wales)

Data availability: Good (2,044 records)

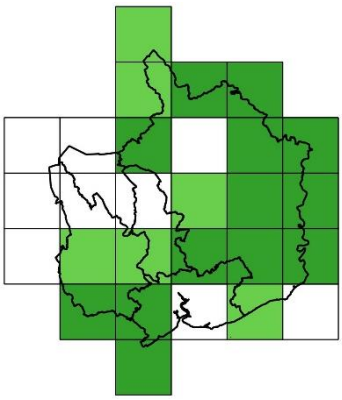
Context: Across the UK, the decline in Dormouse numbers is well documented. It is thought that their range has reduced by half since 1885, and since consistent monitoring began in the mid-1990s, numbers are estimated to have fallen by 55%.[32] Conservation efforts include legislative protection, publication of best practice guidance,[33] raising public awareness (particularly through the Great Nut Hunt), and establishment of the National Dormouse Monitoring Programme (NDMP), as well as site level management by a range of organisations.

Outlook: Matthews et al.[5] predict that although Dormouse range is likely to remain stable, population and habitat are likely to decline. Drivers of change are fragmentation and reduction in woodland species diversity. Climate change is also likely to affect Dormouse populations,[5,32] although the net effect is uncertain, as type of woodland is a factor.

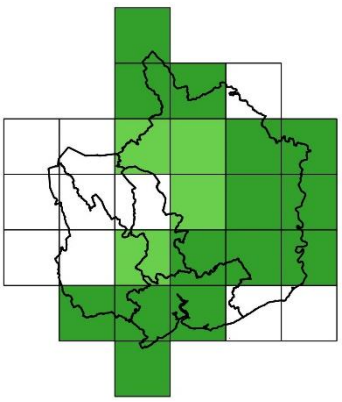
Greater Gwent range: In the 1990s several surveys were carried out to determine the distribution of Dormice in Wales. The Vincent Wildlife Trust[34] combined the results of these to produce a map of 10km squares with recorded field signs, 17 of which are partially or completely within Greater Gwent. Changes in range at this broad scale are shown below.



10km squares with field signs, derived from Jermyn Messenger and Birks (2001)[31]



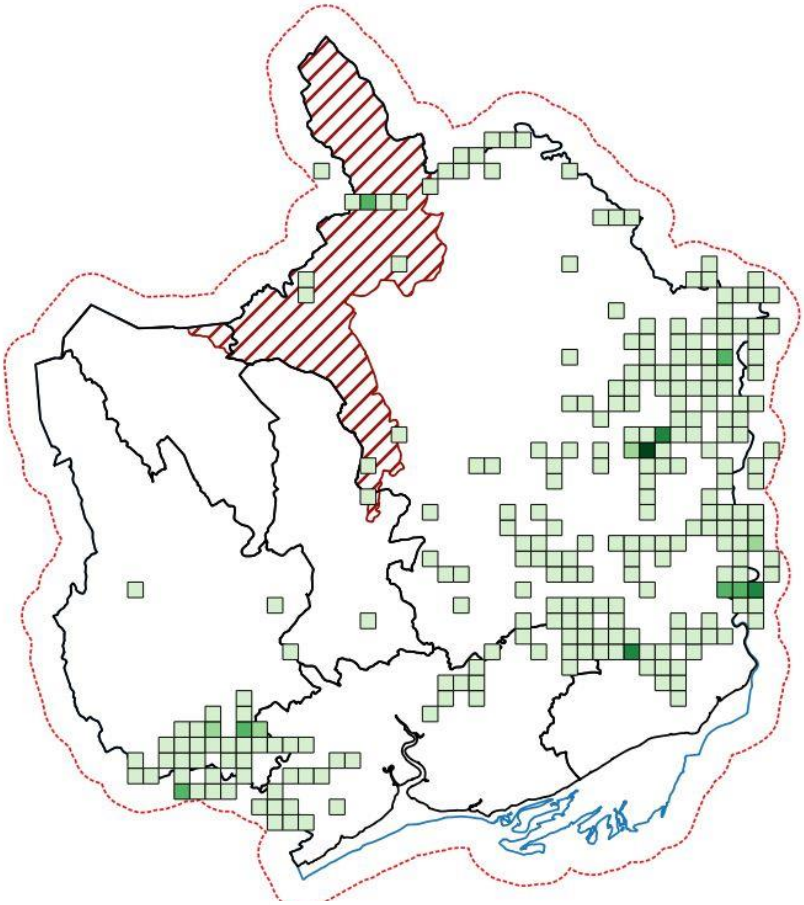
10km squares with records from 2000-2009. Squares with <5 records are lighter green.



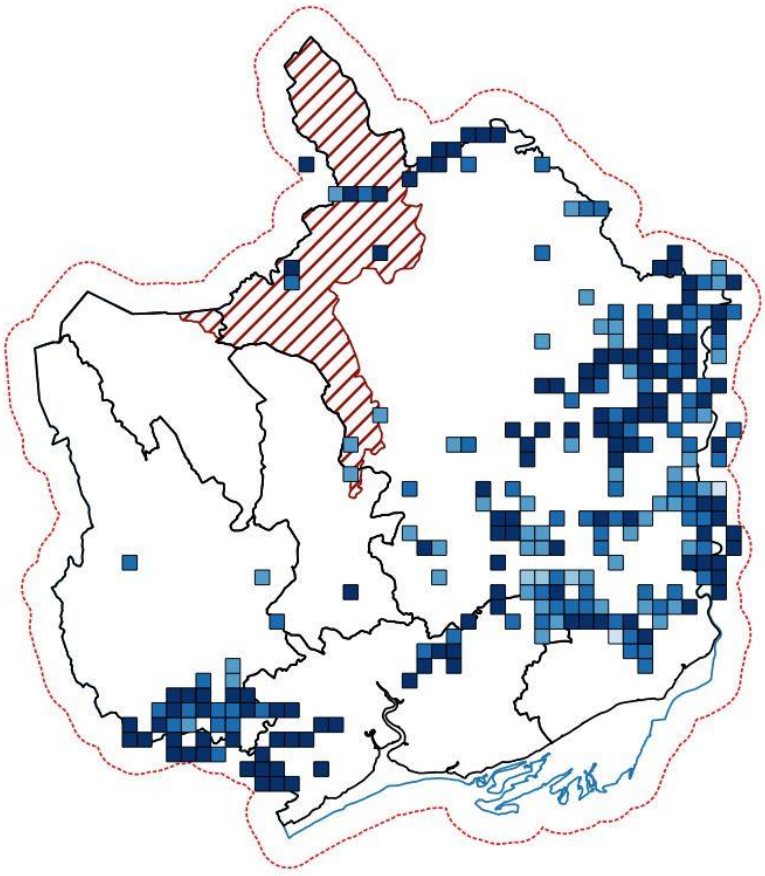
10km squares with records from 2010-2019. Squares with <5 records are lighter green.

At a higher resolution scale, Dormouse distribution is more fragmented. Records are concentrated in central and eastern Monmouthshire, and the south of Caerphilly, extending into Newport. There is a band of records across the northern border between Monmouthshire and Herefordshire, corresponding to records along the A465 (see Habitat Patterns below). Hotspots for records occur at Croes Robert Wood, Caerwent, Graig Wood, Coed Cefn Pwll-du, Harpers Grove and Wyndcliff (corresponding to NDMP locations).

It would also appear that considerable range contraction has also taken place, only half of the grid squares where Dormouse has been recorded have records from the latest decade. Whilst this may in part be due to reduced recording, or concentration of recording towards monitoring key populations, it is still cause for concern.



Density of Dormouse records, (maximum 138 records/km^2)

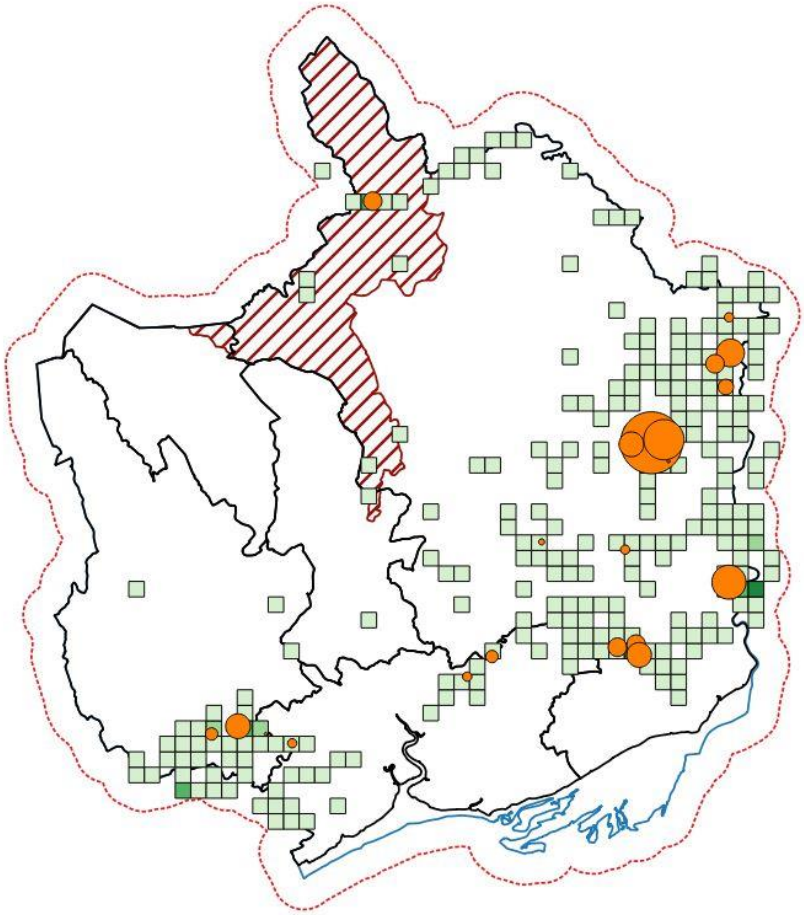


Dormouse records by decade of most recent record

Habitat patterns: The best conditions for Dormice are likely to be 'found in extensive, ancient semi-natural woodland'.[33] In Greater Gwent, 55% of records occur within Ancient Semi-Natural Woodland, Plantation on Ancient Woodland, Restored Ancient Woodland or Ancient Woodland of Unknown Category. Fragmentation of woodland habitat is thought to be a major factor affecting Dormouse distribution,[35] and 69% of Greater Gwent records occur within the Woodland Core Network[36] – the area of greatest woodland connectivity.

Outside of these traditional Dormouse habitats, there are noticeable concentrations of Dormouse records along major roads, notably the M4, A40, A449 and A465 in Monmouthshire and Newport. While this is also a reflection of survey effort, this phenomenon has been noted elsewhere, with evidence suggesting that Dormouse density in roadside verges could be two to three times higher than in the wider landscape.[37]

Population trends: The National Dormouse Monitoring Programme (NDMP) consists of monthly Dormouse nest box counts, with the maximum spring adult count (May or June) per 50 boxes used as an indicator of pre-breeding population size. There are 21 sites across Gwent registered with the NDMP,[38] shown below. However, only eight of these have a continuous data set of more than five years, with four of the poorly monitored sites consistently returning a spring count of zero.

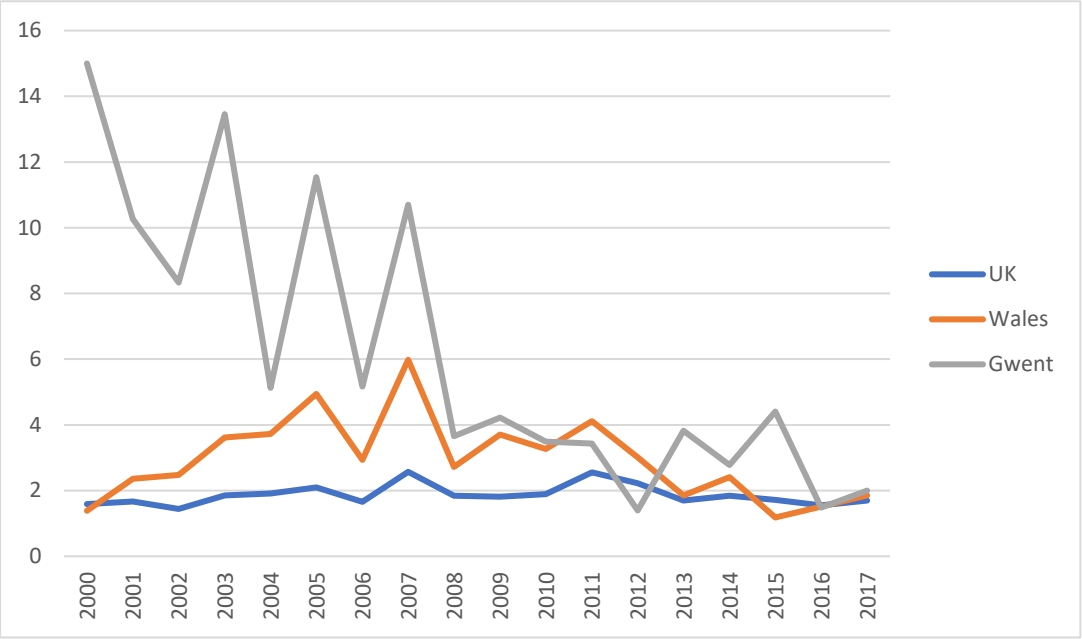


Approximate locations of NDMP sites, with density of Dormouse records. Size of point indicates number of spring returns.

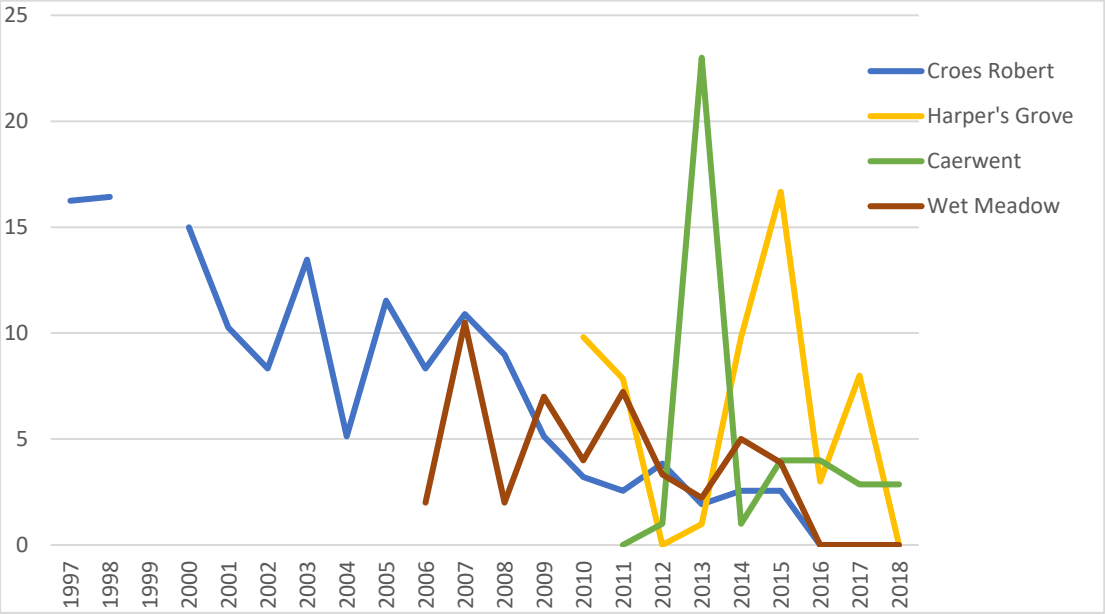
Using the average maximum counts from these eight sites gives a trend for Dormouse populations in Gwent, shown below with the UK and Welsh average. However, the dataset is so small, and skewed by early highs followed by declines at Croes Robert and Wet Meadow Woods (adjacent sites in Monmouthshire), that there is no certainty around these trends. The Gwent average is often well above Welsh and UK averages.

This is illustrated by individual returns from four NDMP sites: Croes Robert Woods, Wet Meadow Woods, Caerwent and Harpers Grove. This shows the high variability between years, as Dormouse populations are very sensitive to weather conditions,[32] as well as variability between different sites. It is also possible that low numbers of boxes could be amplifying this high variation.

Mean maximum spring count of adult Dormice per 50 boxes[38,39]

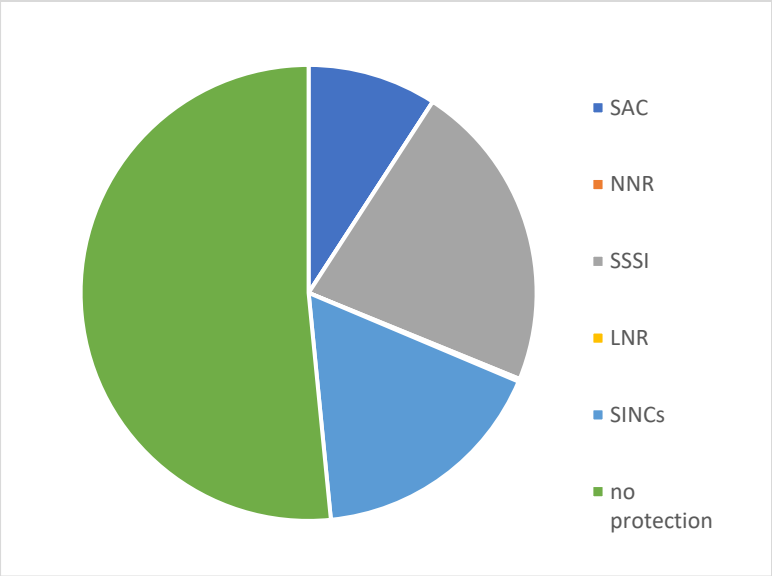


Maximum spring count of adult Dormice per 50 boxes at 4 sites in Gwent[38,35]



Protection: Although individual Dormice and their breeding and resting places are protected by law, most (52%) Dormouse records within Greater Gwent have been found outside of protected areas. SAC records come from the Wye Valley Woodlands SAC, most notably at Wyndcliff, and SSSI records from Croes Robert Wood, Gaer Wood, Coombe Valley Woods and Ruperra Woodlands. SINC (Site of Importance for Nature Conservation) records are from numerous sites throughout Monmouthshire, Newport and Caerphilly – as all Ancient Woodlands are designated as SINCs. Note however, that this does not take centred records or Dormouse mobility into account, and it may be that many more records are associated with or close to protected sites.

Dormouse records from protected sites



Harvest Mouse *Micromys minutus* (Pallas, 1771)

Andy Karran

Protection: none

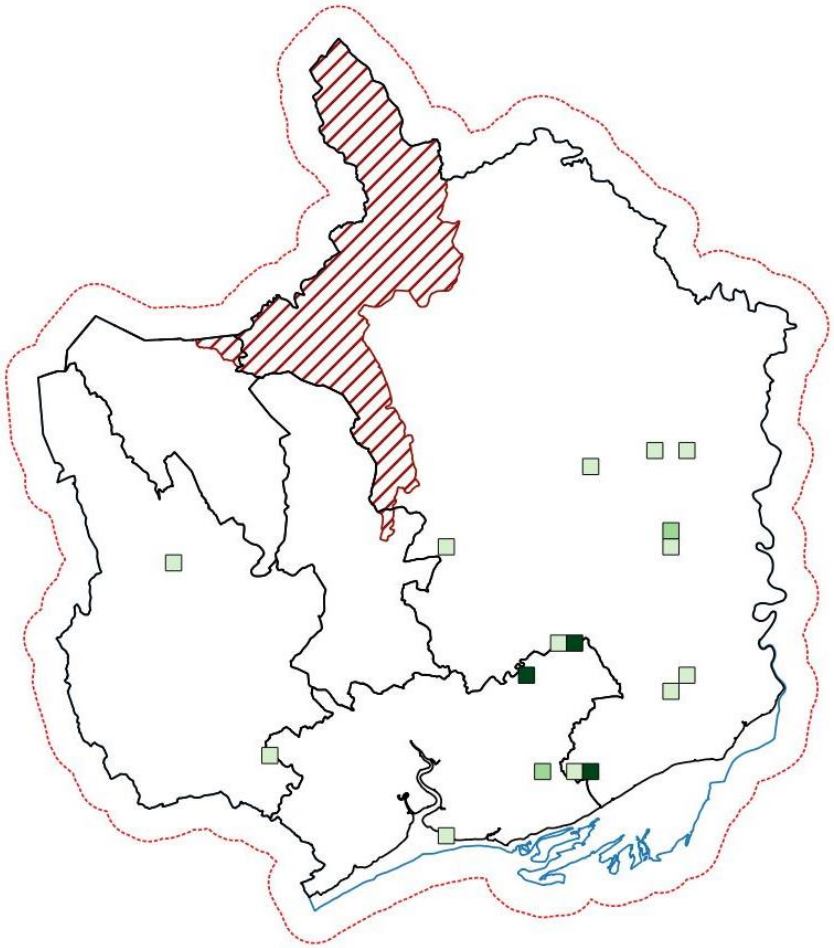
Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[5] NEAR THREATENED(UK), VULNERABLE (Wales)

Data availability: Poor (45 records)

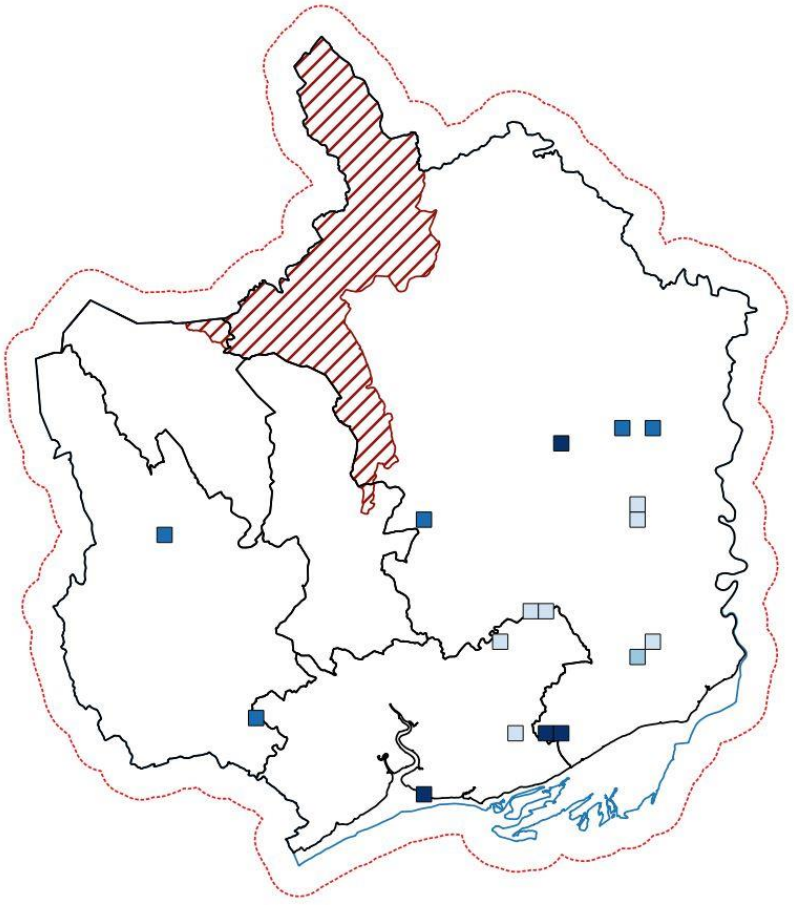
Context: The Harvest Mouse is Britain's smallest rodent and can be found in a range of tall grass habitats, from traditional cereal crops and hay meadows to reedbeds, grassy verges and hedgerows. Populations are difficult to estimate because of the variable success of the different survey methods,[40] uneven distribution of local populations[41] and large seasonal fluctuations.[5] Surveys carried out by the Mammal Society found that 71% of sites that had Field Mouse signs in 1979 had no signs when revisited in the 1990s, and that habitat had been entirely lost in about half of these sites,[42] leading to their allocation as a BAP Priority Species. In Wales, there are very few records: just 139 records for the whole of Wales in 2013.[43]

Outlook: Although there is not enough data to show a historic trend, the outlook for the Harvest Mouse is a predicted population decline, due to changes in agricultural practices and climate change.[5] There is an urgent need for more data to get a better understanding of habitat use and population dynamics, as well as improve survey techniques.

Greater Gwent range: Harvest Mouse records are mostly in the south of the Greater Gwent; Harvest Mice are not found in the uplands. Hotspots occur at Magor Marsh, where there have been regular Harvest Mouse surveys (although it is possible that some of these are duplicates), and around Wentwood, where there is a cluster of records dating from the 1970s. Records are from a range of habitats, including reedbeds and road verges. The majority are records of single nests, although one survey at Magor found seven nests.



Density of Harvest Mouse records, (maximum 9 records/km^2)

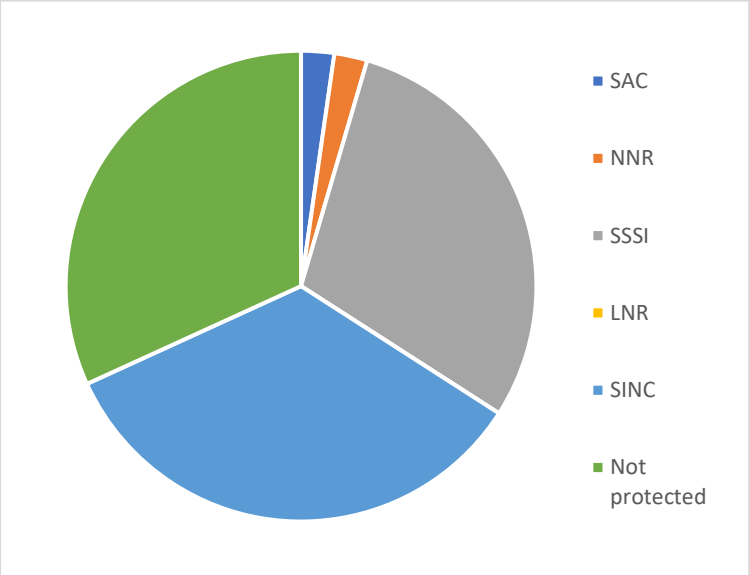


Harvest Mouse records by decade

Trends: There are not enough records to establish a population trend for Harvest Mouse in Greater Gwent. There is not enough data to establish population trends for Britain[5] or Wales.[44] It is probable that populations have been affected by changes in agricultural practices, but the scale and distribution of such impacts is unknown.[5]

Protection: Over two thirds (68%) of records come from protected sites, with most of the more recent records coming from managed nature reserves, where there is more likely to be consistently managed, higher quality habitat and more recording effort, with dedicated surveys in some places.

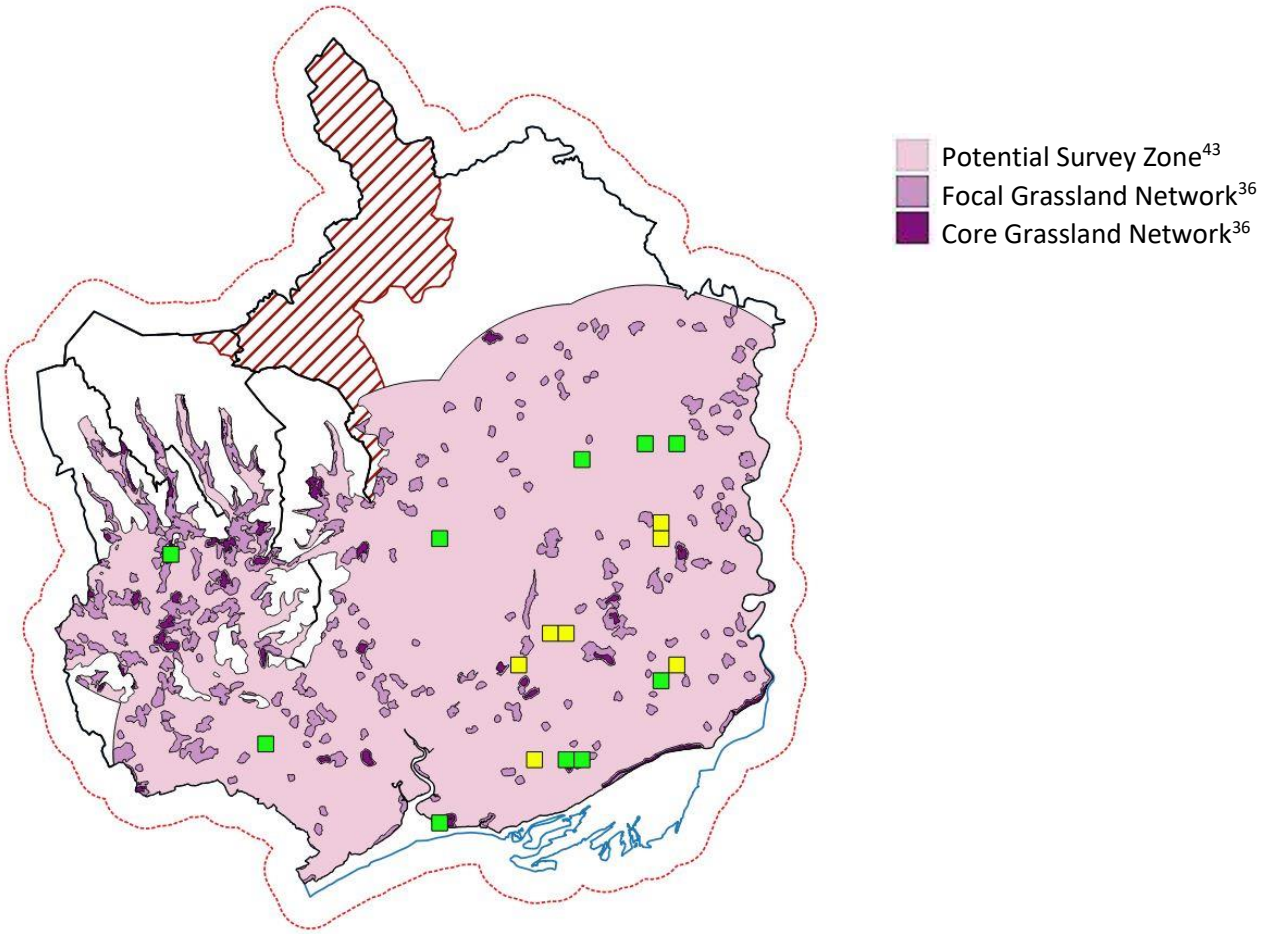
Harvest Mouse records from protected sites



Future surveys: Surveys for Harvest Mice have varying degrees of success.[40,41] Searching for nests is the least time consuming, and has given results at Magor Marsh; but trapping, particularly with Longworth traps has been more successful in other locations.[45] Some studies have more success positioning the trap on the ground,[46] others in the stalk zone.[44] There has also been recent work using bait cups in the stalk zone for camera trapping[47] or collection of faeces for DNA testing.[48] It may be possible that some of these techniques could detect Harvest Mice in new areas.

Tapping (2013)[43] has tried to indicate likely places to find Harvest Mice in Wales, based on recent records and suitable habitat within the Lowland Grassland habitat network. Patches within the Grassland habitat network were ranked according to the area of suitable habitat within them, to give areas where Harvest Mice might be found. However, there are several issues with this work, namely the age of the Phase 1 survey that it is based on and the fact that some Harvest Mouse habitats, such as road verges, were not mapped in the original Phase 1 survey.

The map below shows the boundary of the potential survey zone described by Tapping, with the Core and Focal Grassland habitat networks identified by the Countryside Council for Wales.[36] Recent records (post 1980) are shown in green, with historic records in yellow.



West European Hedgehog *Erinaceus europaeus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended) Schedule 6

Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[5] VULNERABLE (UK), VULNERABLE (Wales)

Data availability: Good (1,824 records)

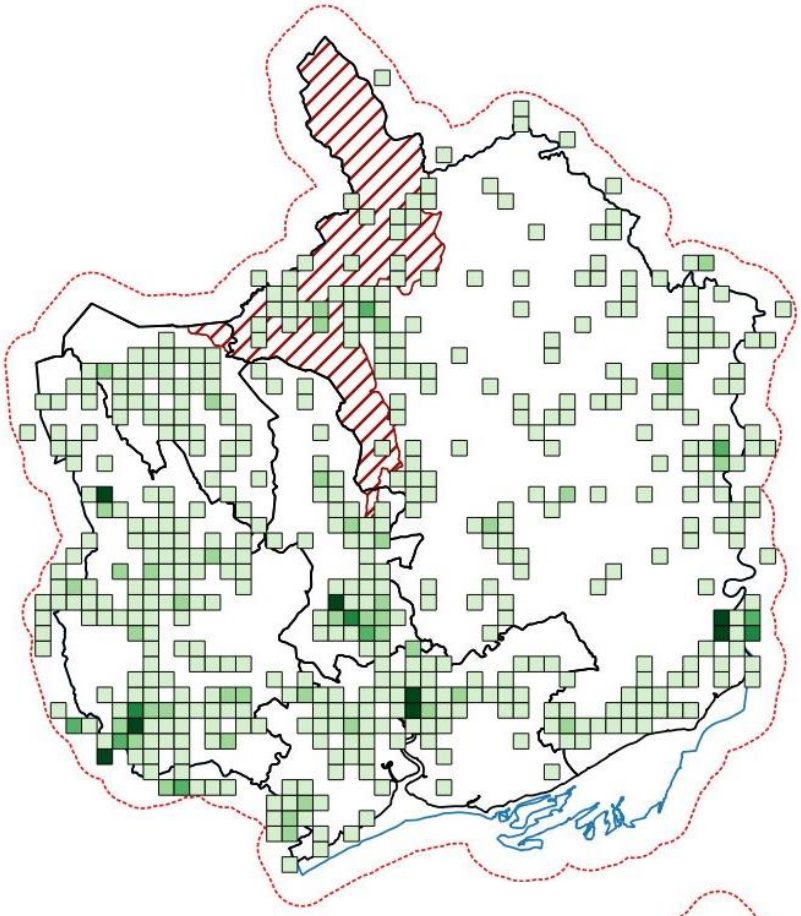
Context: Hedgehogs were added to the UK BAP Priority Species list in 2007, following survey results showing ongoing decline.[49] Current estimates suggest that the population has declined by as much as 73% since 1995,[4] although there is some uncertainty due to differences in survey methodologies. Declines are attributed to several factors including agricultural changes, road casualties, predation by Badgers, and habitat loss and fragmentation. Differences between rural and urban surveys suggest that, for urban Hedgehogs, the decline has recently slowed, and the population may now be increasing; the trend for rural populations is less clear: a recent survey[50] found Hedgehogs at only 22% of rural sample sites.

Hedgehogs are often welcomed into urban gardens, and it seems that urban habitats are increasingly important for the overall population. Densities of Hedgehogs in urban areas can be as much as nine times higher than in rural areas,[51] thought to be due to the increased availability of anthropogenic food, shelter opportunities and reduced predation. It is even suggested that Hedgehogs will make their way to villages in the countryside.[52] Hedgehog Street, an online hub promoting Hedgehog-friendly gardens and improving Hedgehog connectivity, was launched in 2011 by the Peoples Trust for Endangered Species and the British Hedgehog Preservation Society. To date, 90 Hedgehog holes have been created and mapped within the study area.[53]

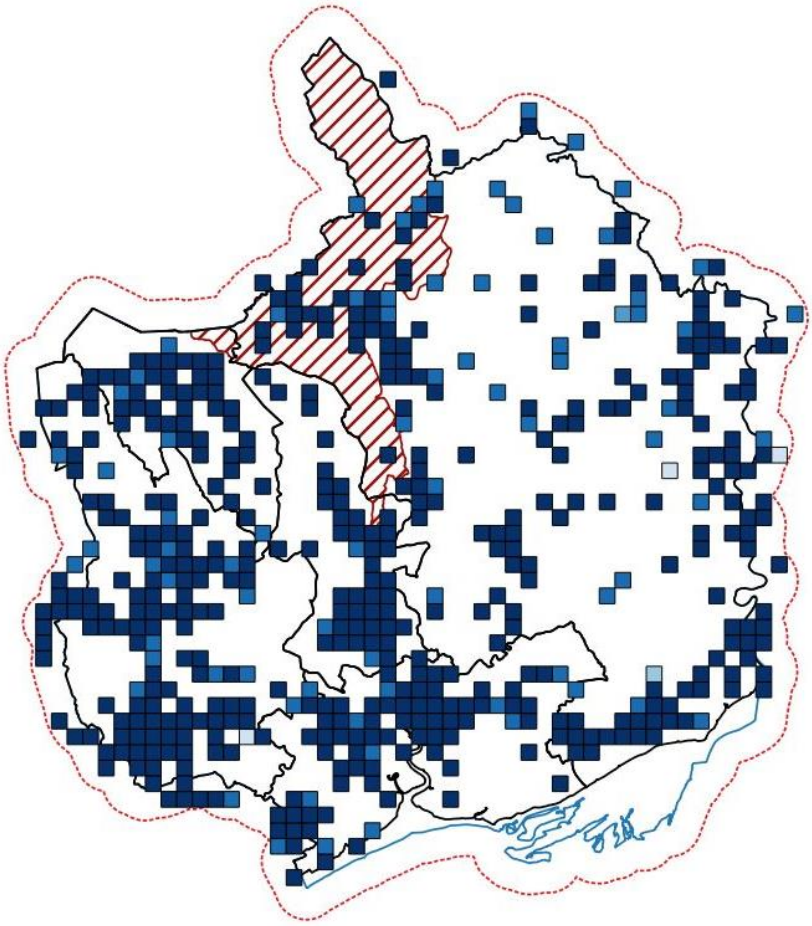
Outlook: The predicted outlook for Hedgehogs is for continued decline[5] due to a decrease in habitat area and quality. The impact of climate change on Hedgehog populations is not fully understood, but it is thought that warmer wetter winters may have a detrimental impact by affecting hibernation.[57] It appears that urban habitats will be increasingly important for Hedgehogs.

Greater Gwent range: Hedgehog records are widely spread across Greater Gwent, with slightly higher concentrations of records in urban areas. This is a result of recorder bias, but it may also be a reflection of the higher density of Hedgehogs in urban and suburban areas. There are a few hotspots in Chepstow (187 records), Cwmbran (87 records) and Deri (30 records). These are likely to be a combination of centred records, duplications and concentrated recorder effort. The map below is set as if 25 is the maximum record count, in order to show some variation in the lower densities.

Density of Hedgehog records (max density ≥25)



Hedgehog records by date

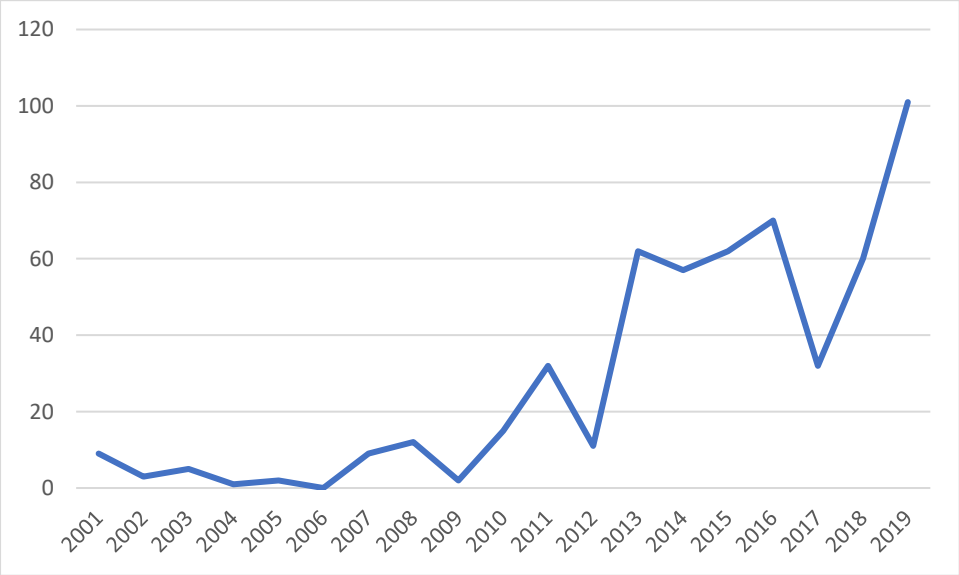


Trends: UK trends are derived from several surveys, including the Mammals on Roads survey, Big Garden Birdwatch, Breeding Bird Survey, Living with Mammals and Hogwatch. All surveys are showing a decline in occurrence and abundance over varying time periods within the last 25 years.[54] Combining the results of these surveys was beyond the scope of this report, and it is likely that there are not enough survey points within the study area to provide a robust trend.

Recorded Hedgehog road casualties within the study area have increased over the last 20 years, but this is likely to be a result of increased public awareness and recording effort. Project Splatter records are included from 2013 onwards.

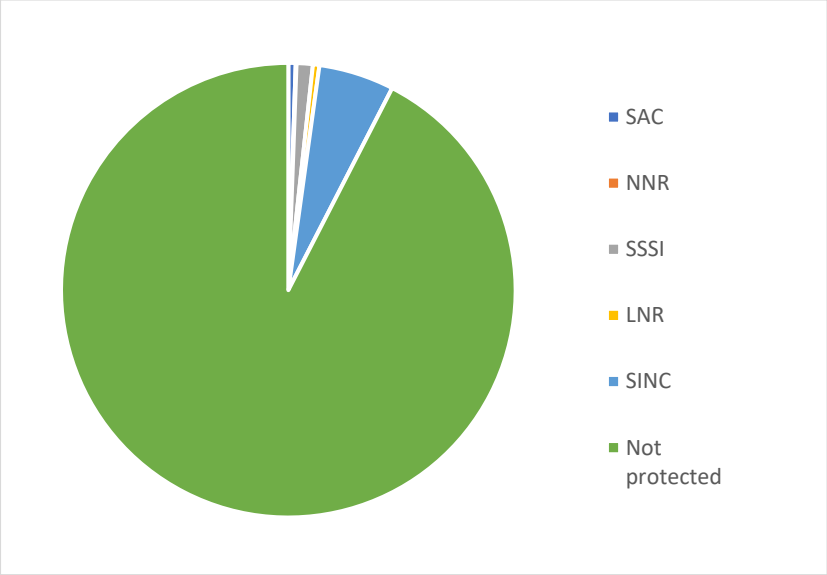
It is also important to note that most of the road casualty records come from within the urban area and urban fringe: 46% of road casualty records fall within the urban and suburban area as defined by LCM 2015, and this rises to 69% and 81% with a buffer of 100m and 250m respectively. This correlates with work carried out by Wright et al. (2020)[55] showing that areas with moderate (peak at 50%) urban cover and high grassland cover had a high probability of Hedgehog road mortalities.

Annual Hedgehog road casualties within the study area from 2001 onwards



Protection: Very few records of Hedgehogs (7%) are from protected sites; this correlate to the fact that most records are from within urban and suburban areas and roads that are less likely to be protected. Additionally, most reserves are unlikely to be surveying or monitoring any resident Hedgehog populations. However, it should be noted that areas of grassland and other green spaces within urban areas but outside of gardens can provide important Hedgehog habitat[52] and be important connectivity routes.[5]

Hedgehog records from protected sites



European Otter *Lutra lutra* (Linnaeus, 1758)

Andy Karran

Protection:[4] The Conservation of Habitats and Species Regulations – Schedule 2 (2017). Wildlife and Countryside Act - Schedule 5 (1981, as amended)

Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[5] LEAST CONCERN (UK), VULNERABLE (Wales)

Data availability: Good (1,004 records)

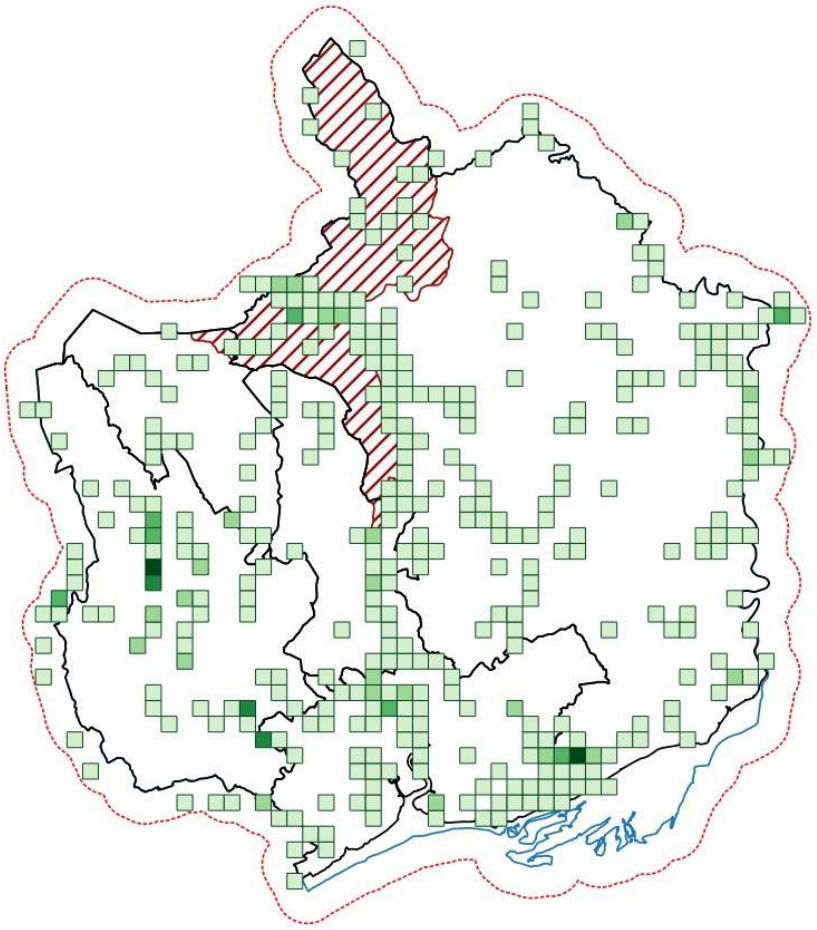
Context: The European Otter suffered severe declines in the middle of the nineteenth century as a result of pollution affecting fish stocks. At the time of the first Otter survey in Wales, in 1977–78, signs of Otters were only found at 20% of survey sites; by 2010, Otter field signs were found at 90% of survey sites.[58] This impressive recovery is attributed to its strong legal protection and improvements in water quality, and Otters have now returned to most of their former UK range.[5] Gwent has a well-established Otter population, with Otters being a primary designation feature for both the Usk and Wye Special Areas of Conservation.[59]

It should be noted that, although there is a high number of Otter records, there are many duplicate records, as several organisations collect Otter records, which are then shared with SEWBReC. Although efforts have been made to remove duplicates, it is possible that some have been missed.

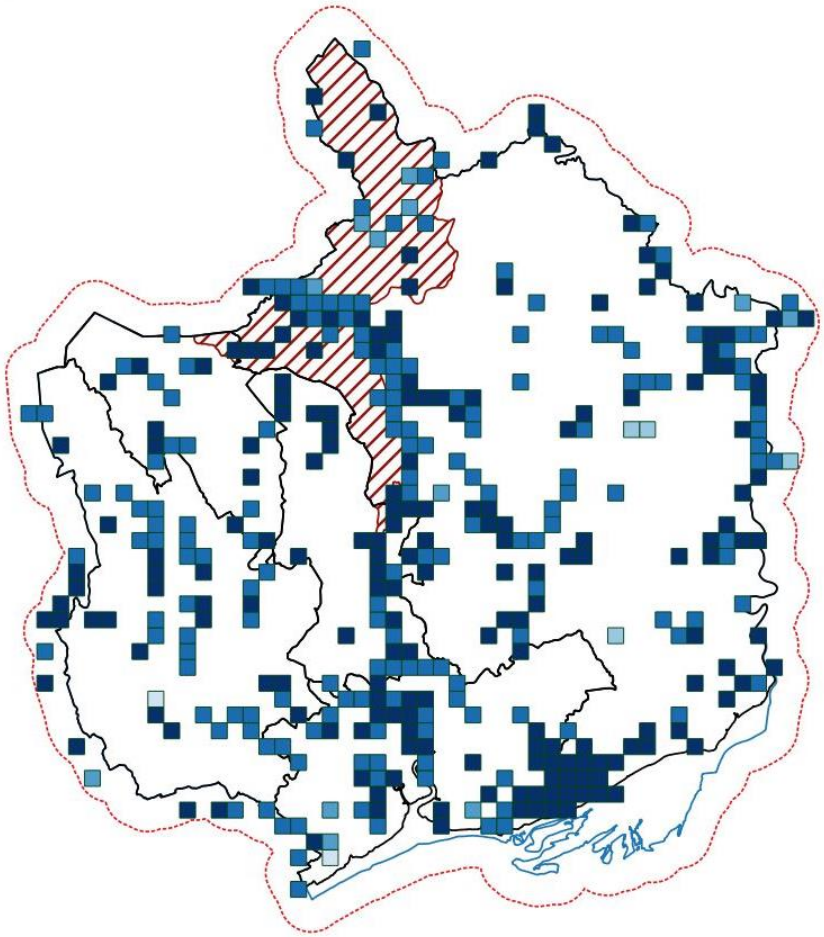
Outlook: At the UK level, the Otter population is predicted to continue to increase and expand its range.[5] The Otter population is thought to be at carrying capacity in a few places, including the Wye Valley, and it is expected that recolonisation will be complete, and cover the whole of Great Britain by 2030.[80]

Greater Gwent range: Otters are evenly distributed across the whole of Gwent, and are concentrated along main rivers, particularly the Usk and Wye, and the Monmouthshire & Brecon Canal. High numbers of records are found at Magor Marsh and Bargoed Country Park, but this is likely to be a result of increased recorder effort at these locations.

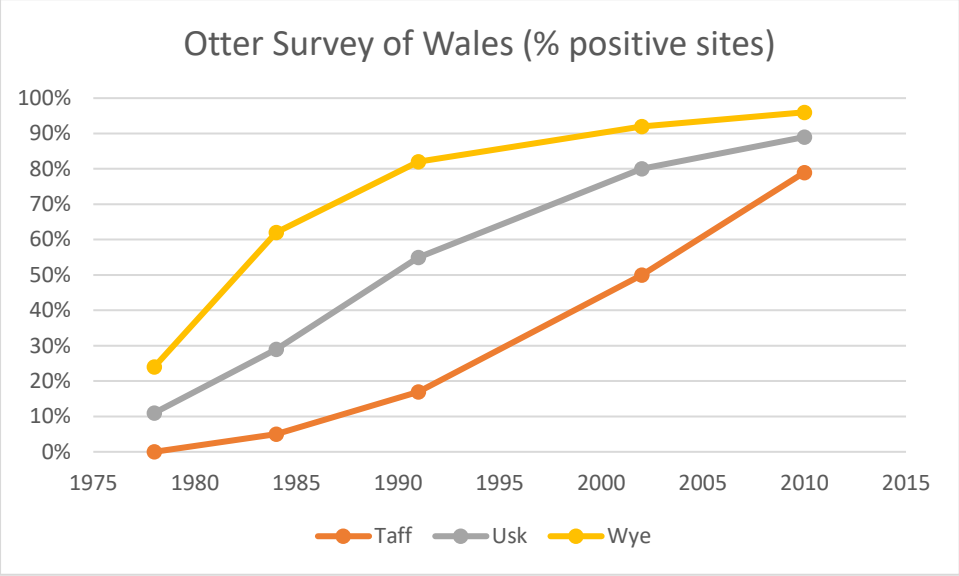
Density of Otter records (Maximum density 21 records/km²)



Otter records by latest record/km²



Trends: Regular national surveys for Otters have been conducted in Wales since 1977, so there is a good dataset showing a steady increase in range. Greater Gwent is covered by three study catchments: the Wye, Usk and Taff, although all three extend beyond Greater Gwent. Results from the Otter Survey of Wales[58] for each catchment are shown below:

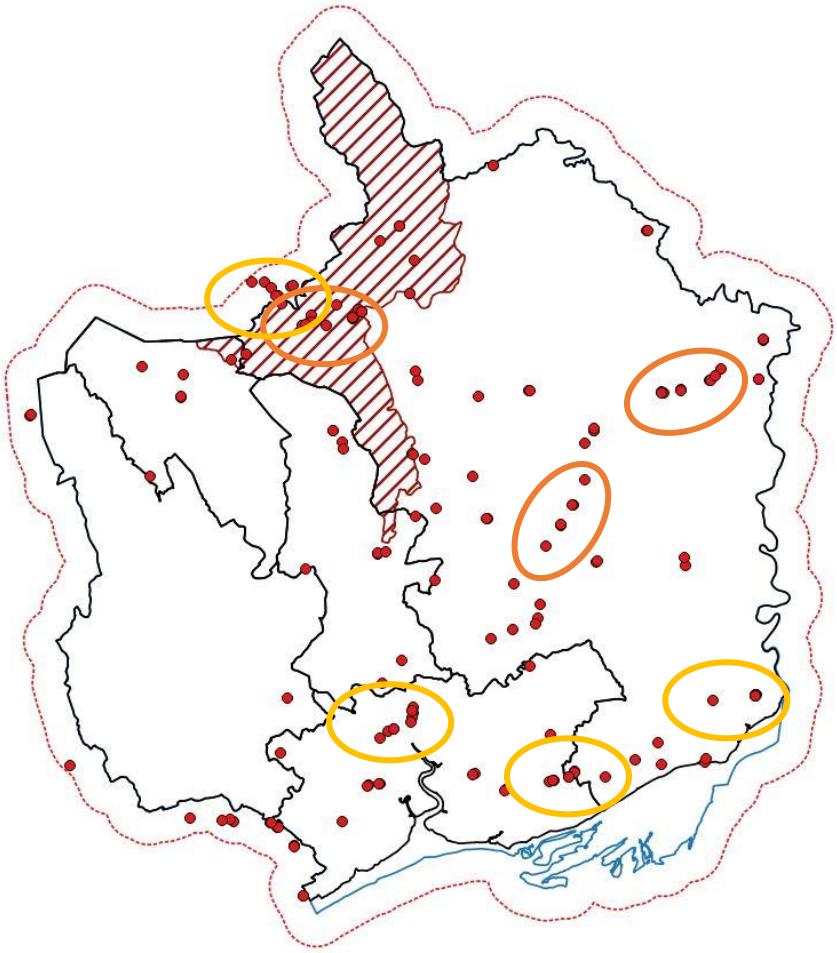


Using sample points from all three catchments that fall within the Greater Gwent gives an occupancy of 87.5% in 2010. Negative sites in Greater Gwent occurred on tributaries of the Afon Lwyd and Rhymney, as well as the western Gwent Levels. Rather than being areas where Otters are absent, it is suggested that these sites are used more sporadically by Otters, so are less likely to be positive for Otter field signs.[58]

Road Casualties: There has been an increase in numbers of recorded Otter road casualties across the UK since the mid-1980s,[60] although this is possibly the result of increased awareness and reporting. It is not clear whether road casualties are having a significant impact on Otter populations – it is suggested that the severity of impact may vary between UK regions.[60] There are, however, clear implications in terms of animal welfare, especially when females with cubs are killed, and the impact of roads is listed as a high-level concern in UK Habitats Directive reporting.[61]

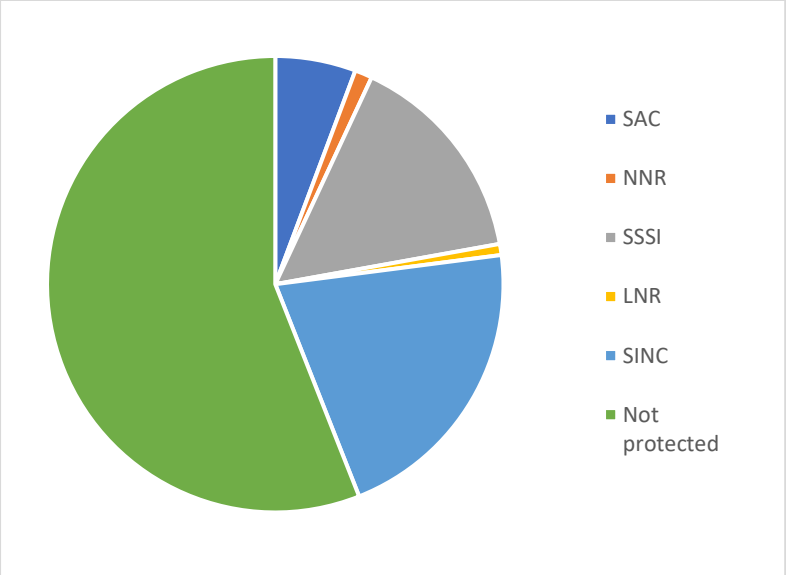
Cardiff University Otter Project (CUOP) was started in 1992 to collect Otters for post-mortem examination.[62] While post-mortem analysis is used in a wide range of research projects, such as toxicology and genetics studies, the locations of road casualties can be used to indicate hotspots and guide mitigation measures. In 2012, CUOP produced a series of reports identifying areas of multiple mortalities and priorities for mitigation.[63,64] SEWBReC records and Project Splatter records contain 156 road casualty records; records from GCER, HBRC and NBN are not specific.

The map below shows locations of Otter road casualty records, together with multiple mortality areas identified by Wilkinson and Chadwick (2012)[63,64] as Medium (orange) and Low (yellow) priorities for mitigation.



Protection: In Greater Gwent, 44% of records occur on protected sites, with the majority from Sites of Special Scientific Interest and Sites of Importance for Nature Conservation. This does not reflect the full protection of Otter habitat: designations of rivers tend to be narrow and often limited to the high-water mark or a fixed distance from it, or even represented by lines instead of area, so records do not always fall within the protected sites even though the site may be used regularly by Otters. Where Otter commuting or laying up habitat is some distance away from the watercourse, this is also unlikely to be within a protected site. However, all Otter breeding and resting sites are protected through the Conservation of Habitats and Species Regulations, regardless of whether they fall within a protected site.

Otter records found on protected sites within Greater Gwent



Pine Marten *Martes martes* (Linnaeus, 1758)

Protection:[4] Habitats Regulations – Schedule 2 (2010). Wildlife and Countryside Act - Schedule 5 (1981, as amended)

Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[5] LEAST CONCERN (UK), CRITICALLY ENDANGERED (Wales)

Data availability: Poor (14 records)

Terry Whittaker (2020 Vision)

Context: Pine Martens were widespread until the nineteenth century, when persecution by gamekeepers led to their extinction across England and most of Wales. Recovery of the Scottish population began in the middle of the twentieth century, but it was estimated that less than 50 remained in Wales in the 1990s.[65]

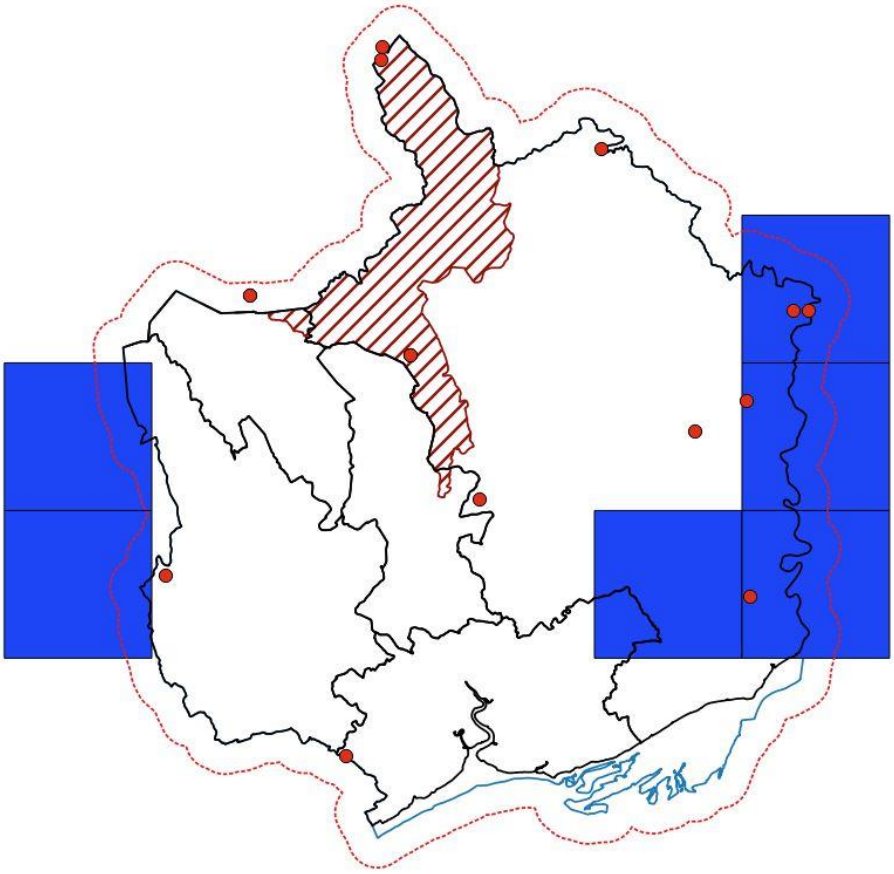
In 2014, Vincent Wildlife Trust carried out a feasibility assessment for reinforcing existing Pine Marten numbers in England and Wales.[66] Subsequently, 51 animals have been translocated from Scotland to mid-Wales in 2015–2017,[67] and 18 animals have been translocated to the Forest of Dean in 2019.[68]

Outlook: At a UK level, the Pine Marten population has Favourable Conservation status,[70] and both population and range are predicted to increase.[5] Threats to Pine Marten populations and barriers preventing range expansion include poor management and fragmentation of woodlands,[5] and road mortalities.[66]

Greater Gwent range: Gwent does have habitat suitable for Pine Martens (Scottish populations show a preference for broadleaf woodland, scrub and grassland).[66] The Forest of Dean Potential Reinforcement Region (PRR), identified by MacPherson (2014), extends into Gwent, along the Wye Valley Woodlands across to Wentwood. There may also be suitable habitat along the Caerphilly/Merthyr border, as part of the Afan PRR.

There are 12 recent records for Pine Marten within Greater Gwent, all scattered across the study area and within the past 30 years, the most recent being in 2005. However, there is considerable doubt around both verification and location of the records, so these should be regarded as evidence of transient individuals at best, rather than any established population.

Map showing locations of Pine Marten records, together with PRR regions identified by MacPherson (2014)



Trends: It is too early to determine the success of the reinforcement projects, although the prospects are positive.[5] The Scottish population has been expanding since the 1980s, demonstrating that the population can recover, albeit slowly, if there is suitable habitat.[69]

Polecat *Mustela putoris* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981) – Schedule 6

Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[5] LEAST CONCERN(UK), LEAST CONCERN (Wales)

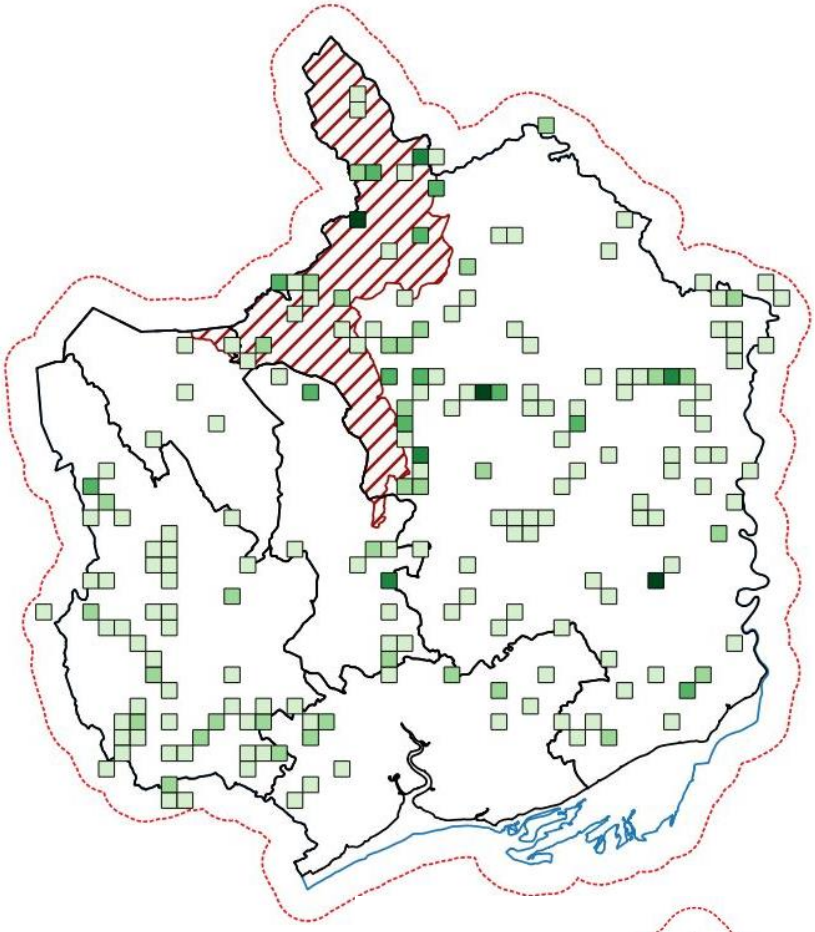
Data availability: Moderate (292 records)

Context: Polecats suffered a severe decline in the nineteenth century and were extinct across most of Britain by 1915.[71] Wales has always been a stronghold for the species, which is now returning to England. While the British population is increasing,[52] there are declines in parts of Europe.[72] There are concerns regarding hybridisation with domestic ferrets, but it appears that the pure Polecat has a competitive advantage over the polecat-ferret hybrid, and Greater Gwent is classified as Polecat Purity Zone 1 (>95% of records conform to the true polecat phenotype) by the Vincent Wildlife Trust.[71] All neighbouring counties are also Polecat Purity Zone 1, except for Gloucestershire, which remains unclassified due to low numbers of records.

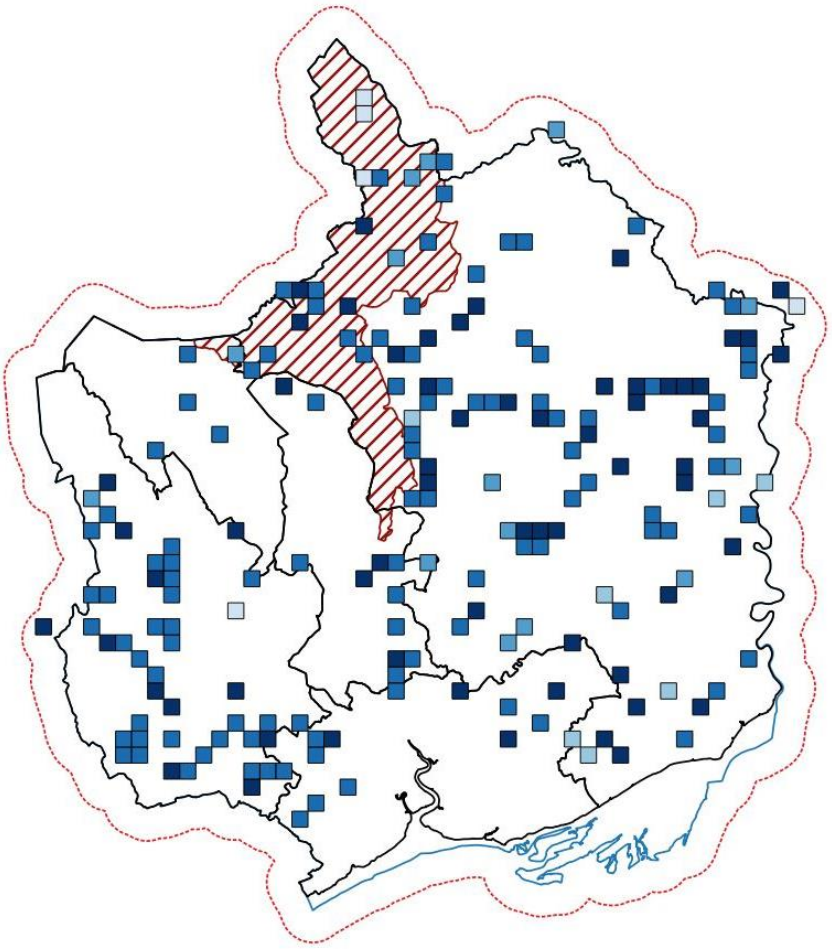
Outlook: The UK Polecat population and range are predicted to increase. They use a wide range of habitats and can adapt to different prey sources.[71] Hybridisation does not appear to be a source of concern in the long term. However, threats include trapping and secondary rodenticide poisoning. Analysis of carcasses collected in the national Polecat survey showed that 79% were exposed to rodenticides; this reperesents an increase of 1.7% since 1992, with residues higher in Polecats from arable areas.[73]

Greater Gwent range: Polecats are found at low densities across the study area, with concentrations along main roads: at least 46% of records are of road casualties. Some hotspots are caused by centring of low-resolution records. There are also few records from Newport, which is to be expected as there is less available habitat and prey within the urban area. Only five records (2%) are for polecat-ferrets, or possible polecat-ferrets, although this can be difficult to determine without close examination of the pelage characteristics.

Density of Polecat records, (maximum 5 records/km²)



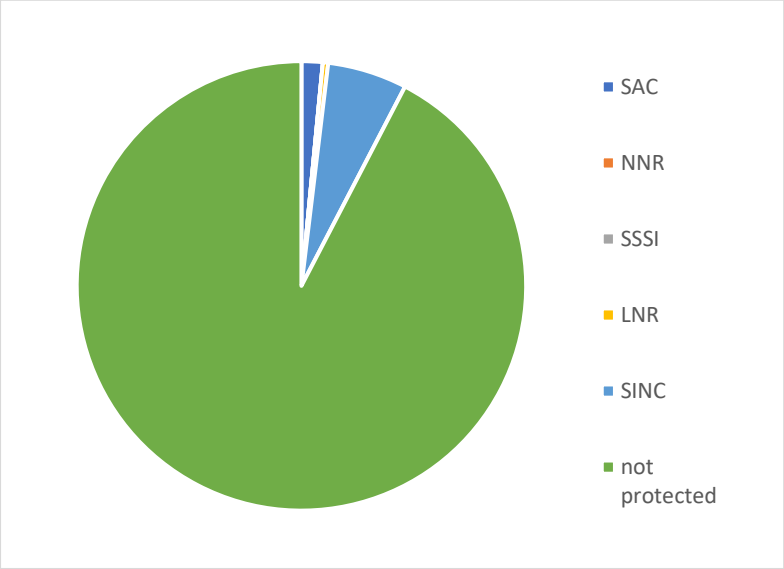
Polecat records by decade



Trends: It is not possible to determine a trend for Greater Gwent. The national Polecat survey carried out by the Vincent Wildlife Trust in 2014–2015 confirmed a stable range in Wales and an increase in range across England,[72] and current estimates for population show an increase in both England and Wales.[5]

Protection: Very few (8%) records are from protected sites, which is not unexpected as they use a wide range of habitats, there are few dedicated surveys for Polecats and many records come from road casualties.

Polecat records found on protected sites



Eurasian Water Shrew *Neomys fodiens* (Pennant, 1771)

Andy Karran

Protection: Protected under Schedule 6 of the Wildlife and Countryside Act (1981, as amended)

Conservation status: Red List:[5] LEAST CONCERN (UK and Wales)

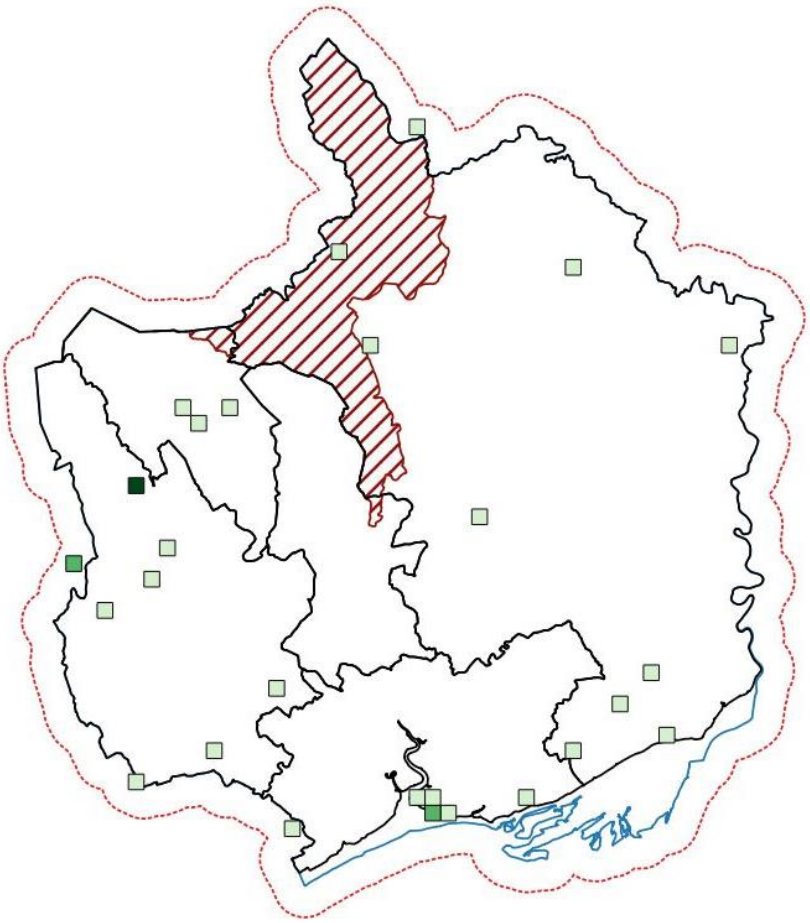
Data availability: Poor (44 records)

Context: Little is known about Water Shrew habitat requirements and population dynamics.[74] Population estimates for the UK are based on the ratio of Common Shrews to Water Shrews, but there is not enough data to determine any trends in population or range.[5] The Mammal Society carried out the first National Water Shrew Survey in 2004 and 2005.[75] Water Shrews can be found in a wide range of aquatic habitats, as well as considerable distances away from water,[74] but their cryptic nature and low population density (as little as 0.78/ha)[5] make them difficult to survey.

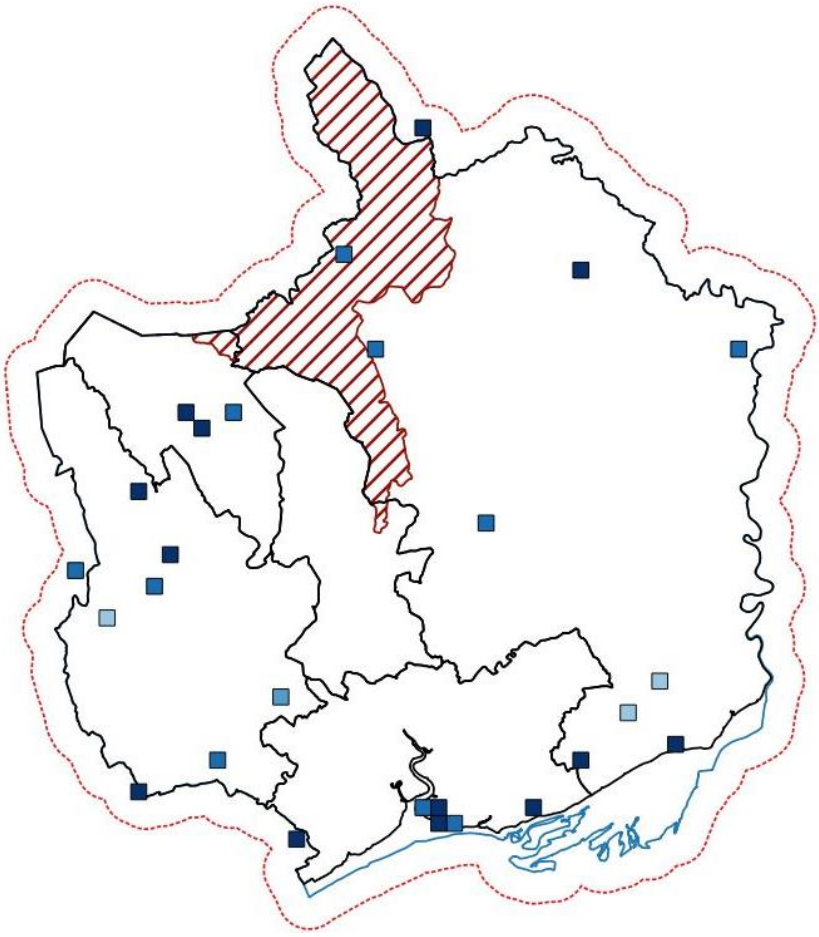
Outlook: There seems to be a possible increase in awareness of Water Shrews in Greater Gwent: over half of Water Shrew records in the study area are from the last decade, although this could be due to a general increase in recording. However, the future trend for Water Shrews is predicted to be a decline caused by reduced habitat quality and quantity and loss of connectivity between habitats.[5]

Greater Gwent range: Six sites within Greater Gwent were surveyed as a part of the National Water Shrew Survey,[74] but none found evidence of Water Shrews. Records from other sources are thinly spread across the study area. Hotspots can be found at Newport Wetlands, Parc Taf Bargoed and New Tredegar, although this is more likely to be a consequence of survey effort and possible duplicate records than actual distribution.

Water Shrew record density (maximum density 6 records/km^2)



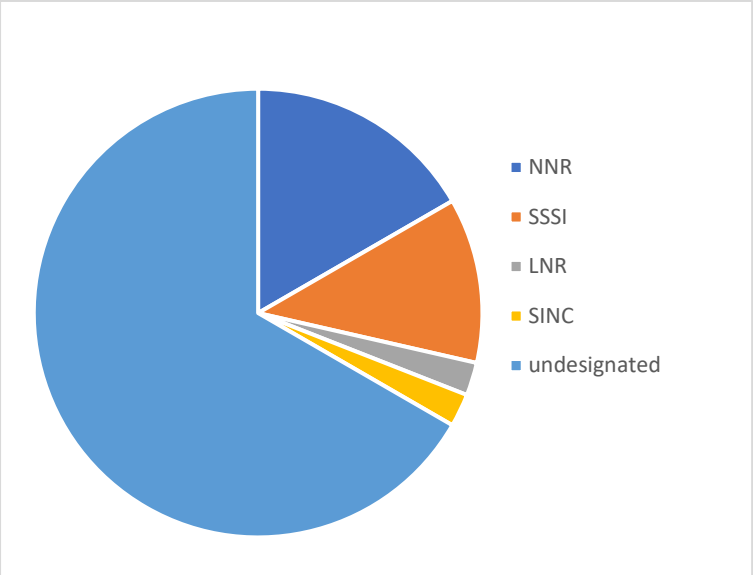
Water Shrew records by date



Population trends: There is not enough data, at either local or national level, to produce population trends.

Protection: Just over 30% of records come from protected sites, with 16% from Newport Wetlands NNR. Two records are from Magor Marsh SSSI, and another two from other parts of the Gwent Levels SSSIs. One record is from Nelson Bog SSSI. The LNR record is from Cwmcelyn Pond, and the SINC record is from Parc Coetir Bargoed.

Water Shrew records from protected sites



European Water Vole *Arvicola amphibius* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act - Schedule 5 (1981, as amended)

Conservation status: UK BAP Priority Species. Environment (Wales) Act Section 7 Species. Red List:[76] ENDANGERED (UK), ENDANGERED (Wales)

Data availability: Good (3,004 records)

Context: Water Voles were once a common sight but declines in habitat quality in the mid-twentieth century were compounded by predation by introduced American Mink, leading to catastrophic losses. National Water Vole surveys carried out by the Vincent Wildlife Trust estimated a 78% decline in UK population size between 1989–90 and 1996–98,[77] although there is some uncertainty around these population estimates. The Mammal Society suggest a further decrease in population of 50% between 1998 and 2016.[77]

Water Vole range has also contracted: occupancy decreased by 80% between the two national Water Vole surveys,[77] and recent mapping work by the Wildlife Trust and Peoples Trust for Endangered Species suggests further reduction of distribution by 30% between 2006 and 2015,[77] despite numerous reintroductions across the country. The Welsh population is estimated at <10,000, and is considered vulnerable to further declines due to fragmentation.[76]

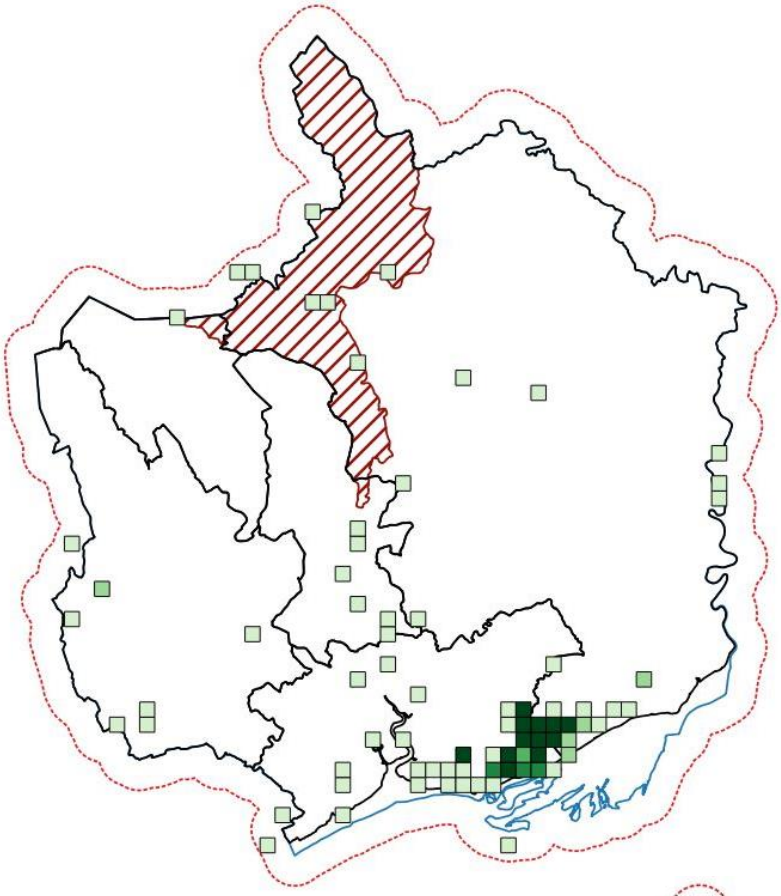
Outlook: At a UK level, the outlook for Water Voles is for continued decline in population.[5] Mink predation is the main threat, but habitat quality and lack of connectivity are also a factor. The National Water Vole Database and Mapping Project[78] reports that reintroductions 'appear to have been highly successful in conserving and/or reintroducing Water Voles to sites – but the data from this project suggest these successes have not yet been expanded at a sufficient scale to reverse the national distribution trends.'

Greater Gwent range: There are very few Water Vole records prior to 2012, when Gwent Wildlife Trust reintroduced Water Voles to Magor Marsh. Records were scattered across the Gwent Levels, along the Usk, Wye and Afon Lwyd and their tributaries, with a group of records at Nelson Bog in Caerphilly. After the reintroduction, Water Voles have dispersed across the Gwent Levels and there are now recent records approximately 16km from the original release site.

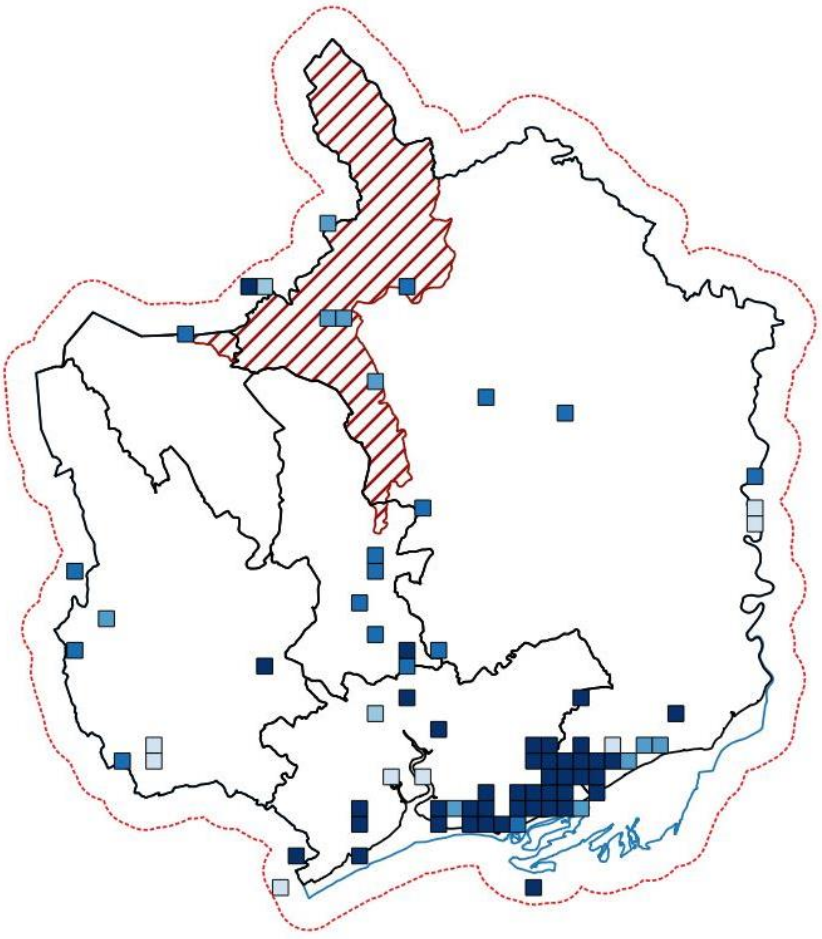
Mink control and habitat improvements have taken place on the River Monnow, and Water Voles were reintroduced onto one of its tributaries, the River Dore, just outside the study area, in 2006.[78] However, there are no recent records for Water Vole from the area, the latest Herefordshire record within the study area was in 1982. It is unclear why this is the case.

Density of records is skewed by the large number of records at Magor Marsh, so an adjusted key is given in order to show relative record densities around Magor Marsh and across the Levels. The maximum density of records at Magor Marsh is 1,936 per km^2.

Density of Water Vole records (maximum set to ≥25)



Water Vole records by decade

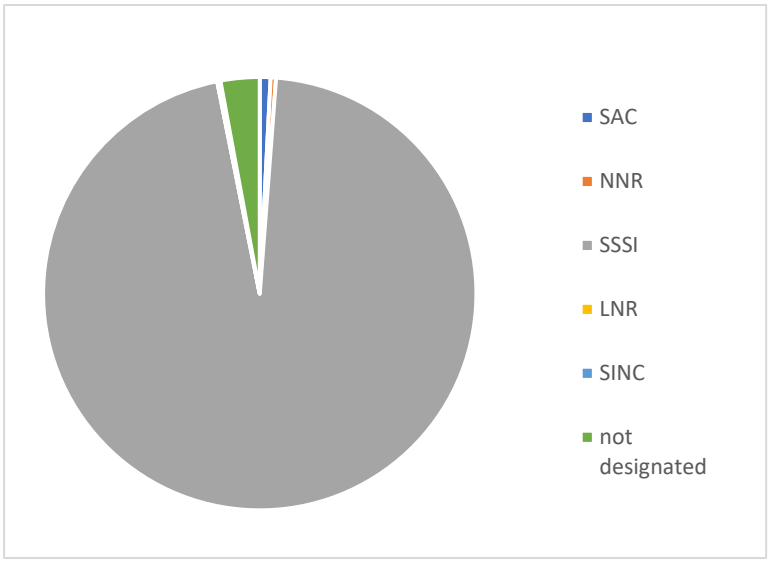


Trends: While the area of occupancy (AOO) for Water Voles in Greater Gwent has increased – there are records from 13 monads in the 1970s and records from 40 monads in the 2010s – it is also important to note that the extent of occupancy (EOO) has decreased, and range is limited to the Gwent Levels, with a few scattered records in the south of Torfaen, Caerphilly and Monmouth.

In terms of population, we can infer a corresponding increase, especially for the Gwent Levels. The National Water Vole Monitoring Programme (NWVMP) was launched in 2015[79] with the aim of revisiting the Vincent Wildlife Trust survey sites, but no results have yet been published.

Protection: The majority of records are from the Gwent Levels SSSIs and Newport Wetlands NNR, with very few (3%) records from elsewhere.

Water Vole records from protected sites



References

1. Mathews F and Harrower C. 2020. IUCN – compliant Red List for Britain's terrestrial mammals. Assessment by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England: Peterborough. Mathews, Smith and Coomber. 2020. The state of mammals in Wales: A report by the Mammal Society for Natural Resources Wales, in association with Wales Mammal Biodiversity Action Forum.
2. People's Trust for Endangered Species. 2020. Living with mammals update 2019. People's Trust for Endangered Species: London.
3. Mammal recording. British Trust for Ornithology: https://www.bto.org/our-science/projects/bbs/taking-part/survey-methods/mammal-recording (accessed 01/02/2021).
4. Protection under UK legislation according to JNCC Conservation Designations spreadsheet, contains NCC/NE/NRW/SNH/NIEA data: https://hub.jncc.gov.uk/assets/478f7160–967b-4366-acdf-8941fd33850b
5. Mathews F, Kubasiewicz LM, Gurnell J, Harrower CA, McDonald RA, Shore RF. 2018. A review of the population and conservation status of British mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England: Peterborough.
6. Welsh Government. 2017. Bovine TB Incidence Map. https://gov.wales/sites/default/files/publications/2017–11/bovine-tb-incidence-map.pdf (accessed 24/12/19).
7. Harris S, Morris P, Wray S and Yalden D. 1995. A review of British mammals: Population estimates and conservation status of British Mammals other than cetaceans. JNCC.
8. Wildlife and Countryside Link and Wales Environment Link. 2019. Wildlife crime in 2018 – A report on the scale of wildlife crime in England and Wales. Wildlife and Countryside Link and Wales Environment Link: London and Cardiff.
9. Clarke GP, White P, and Harris S. 1998. Effects of roads on badger Meles meles populations in south-west England. Biological Conservation 86(2): 117–124.
10. https://www.wildcru.org/research/the-effects-of-weather-conditions-on-badger-population-dynamics/ (accessed 26/12/19)
11. Allen AR, Skuce RA and McDowell SWJ. 2011. Bovine TB: A review of badger to cattle transmission. Agri-food and Biosciences Institute: http://www.dardni.gov.uk
12. Crispell J, Benton CH, Balaz D, De Maio N, Ahkmetova A, Allen A, Biek R, Presho EL, Dale J, Hewinson G, Lycett SJ, Nunez-Garcia J, Skuce RA, Trewby H, Wilson DJ, Zadoks RN, Delahay RJ, Kao RR. 2019. Combining genomics and epidemiology to analyse bi-directional transmission of Mycobacterium bovis in a multi-host system. Elife: https://elifesciences.org/articles/45833
13. Welsh Government. 2019. Bovine TB report: Quarter 2 (April to June) 2019: https://gov.wales/bovine-tb-report-quarter-2-april-june-2019 (accessed 26/12/2019).
14. Welsh Government. 2017. Wales TB eradication programme: https://gov.wales/sites/default/files/publications/2017–11/wales-bovine-tb-eradication-programme.pdf (accessed 26/12/2019).
15. https://www.bfd.wales/ (accessed26/12/2019).
16. https://gov.wales/badger-vaccination-grant (accessed 26/12/2019).

17. The Wildlife Trusts. 2018. The Wildlife Trusts' beaver reintroductions: https://www.wildlifetrusts.org/sites/default/files/2018–11/181023%20Beaver%20Brochure_WEB.pdf (accessed 21/12/19).
18. Davies, S. 2019. Bringing beavers back. Scottish Wildlife Trust: https://scottishwildlifetrust.org.uk/2019/05/bringing-beavers-back/ (accessed 21/12/19).
19. Campbell-Palmer R, Puttock A, Graham H, Wilson K, Schwab G, Gaywood MJ and Brazier R.E. 2018. Survey of the Tayside area beaver population 2017–2018. Scottish Natural Heritage Commissioned Report No. 1013.
20. Devon Wildlife Trust. 2019. River Otter Beaver Trial (ROBT) – Fourth Annual Report April 2019. Devon Wildlife Trust.
21. https://www.forestryengland.uk/blog/beaver-trial-cropton-forest (accessed 21/12/19).
22. https://www.forestryengland.uk/beavers-greathough-brook (accessed 21/12/19).
23. https://www.dorsetecho.co.uk/news/18046199.beavers-set-return-dorset-hundreds-years/ (accessed21/12/19).
24. https://www.nationaltrust.org.uk/press-release/national-trust-announces-first-beaver-reintroductions (accessed 21/12/19).
25. Jones ACL, Halley DJ, Gow D, Branscombe J, Aykroyd T. 2012. Welsh beaver assessment initiative report: An investigation into the feasibility of reintroducing European Beaver (Castor fiber) to Wales. Wildlife Trusts Wales.
26. Cofnod – North Wales Environmental Information Service. 2018. NRW regional data: North Wales. Occurrence dataset. https://doi.org/10.15468/krljpu accessed via NBN Atlas on 2019–12–21.
27. Thompson P. 2002 (revised 2006 and 2010). Conserving the brown hare. Game and Wildlife Conservation Trust: Fordingbridge.
28. School of Biological Sciences, Bristol University. 2002. Integrating farm management practices with brown hare conservation in pastoral habitats. Defra Science and Research Project BD1436. DEFRA.
29. Aebischer NJ. 2020. GWCTs national gamebag census grey partridge, red grouse, brown hare: Gwent 1970—present. Game and Wildlife Conservation Trust: Fordingbridge.
30. Aebischer NJ, Davey PD and Kingdon NG. 2011. National gamebag census: Mammal trends to 2009. Game and Wildlife Conservation Trust: Fordingbridge.
31. Browne SJ and Aebishcer NJ. 2003. Arable stewardship: Impact of the pilot scheme on the brown hare and grey partridge after five years. DEFRA Report RMP1870.
32. Wembridge, Al-Fulajj and Langton. 2016. The state of Britain's dormice 2016. Peoples Trust for Endangered Species.
33. Bright, Morris and Mitchell-Jones. 2006. The dormouse conservation handbook. 2nd edition. English Nature.
34. Jermyn, Messenger and Birks. 2001. The distribution of the hazel dormouse Muscardinus avellanarius in Wales. The Vincent Wildlife Trust.
35. Bright. 1996. Status and woodland requirements of the dormouse in England. English Nature and Peoples Trust for Endangered Species.
36. Latham, Sherry and Rothwell. 2013 (updated 2016). Ecological connectivity and biodiversity prioritisation in the terrestrial environment of Wales. Countryside Council for Wales/Natural Resources Wales.
37. White. 2019. Hazel dormice on road verges. Peoples Trust for Endangered Species.

38. Data returns from individual monitoring sites courtesy of the National Dormouse Monitoring Programme. Peoples Trust for Endangered Species.
39. Total number of mature dormice in spring and autumn recorded in UK regions. Peoples Trust for Endangered Species. www.ptes.org (download 25/10/2019).
40. Riordan, Lloyd and Macdonald. 2009. Do harvest mouse nest survey results predict population size? Report to Peoples Trust for Endangered Species.
41. Poulton and Turner. 2009. A comparison of nest searches, bait tubes and live trapping for monitoring Harvest Mice (Micromys minutus) and other small mammals. The Mammal Society Research Report No.9. The Mammals Society. https://www.mammal.org.uk/wp-content/uploads/2016/03/Research-Report-9-Methods-for-Harvest-Mice.pdf
42. Pacheo. 2013. Harvest mouse survey – Call for volunteers. Mammal News Autumn 2013. The Mammal Society.
43. Tapping R. 2013. Harvest mice in Wales – Where they might be? CCW science report No. 1036. Cofnod: Bangor.
44. Mathews, Smith and Coomber. 2020. The state of mammals in Wales. A report by the Mammal Society for Natural Resources Wales, in association with Wales Mammal Biodiversity Action Forum.
45. Kettel, Perrow and Reader. 2016. Live trapping in the stalk zone of tall grasses as an effective of monitoring harvest mice (Micromys minutus). European Journal of Wildlife Research 62, 241–245
46. Williams D. 2015. Surrey harvest mouse project – Report for Peoples Trust for Endangered Species. Surrey Wildlife Trust.
47. https://www.welshwildlife.org/eastglamnews/harvest-mice-on-parc-slip/ (accessed 05/04/2020).
48. https://www.vwt.org.uk/projects-all/mise/ (accessed 05/04/2020).
49. Wilson E and Wembridge D. 2018. The state of Britain's hedgehogs 2018. British Hedgehog Preservation Society and Peoples Trust for Endangered Species.
50. Williams BM, Baker PJ, Thomas E. et al. 2018. Reduced occupancy of hedgehogs (Erinaceus europaeus) in rural England and Wales: The influence of habitat and an asymmetric intra-guild predator. Sci Rep 8: 12156.
51. Hubert P, Julliard R, Biagianti S and Poulle M-L. 2011. Ecological factors driving the higher hedgehog (Erinaceus europaeus) density in an urban area compared to the adjacent rural area. Landscape and Urban Planning 103: 34–43.
52. Wembridge D and Langton S. 2015. The state of Britain's hedgehogs 2015. British Hedgehog Preservation Society and Peoples Trust for Endangered Species.
53. Marnham E. (Peoples Trust for Endangered Species) Pers comm., January 2020.
54. Roos S, Johnston A, and Noble D. 2012. UK hedgehog datasets and their potential for long term monitoring. BTO research report no. 598. British Trust for Ornithology for Peoples Trust for Endangered Species and British Hedgehog Preservation Society.
55. Wright PGR, Coomber FG, Bellamy CC, Perkins SE, Mathews F. 2020. Predicting hedgehog mortality risks on British roads using habitat suitability modelling. PeerJ 7: e8154.
56. Hof AR and Bright PW. 2009. The value of green spaces in built-up areas for western hedgehogs. Lutra 52(2): 69–82.
57. https://ptes.org/grants/internship-projects/hedgehogs-and-climate/ (accessed 08/4/2020).
58. Strachan R. 2015. Otter survey of Wales 2009–2010. Natural Resources Wales.

59. JNCC Special Areas of Conservation Descriptions – Species. https://sac.jncc.gov.uk/species/S1355/ (accessed 19/12/19).
60. Chanin P. 2003. Ecology of the European otter. Conserving Natura 2000 Rivers Ecology Series No.10. English Nature: Peterborough.
61. Conservation status assessment for the species: S1355 - Otter (Lutra lutra). European Community directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC). Fourth report by the United Kingdom under Article 17 (January 2013–December 2018).
62. Cardiff University Otter Project. www.cardiff.ac.uk/otter-project/about-us (accessed 19/12/19).
63. Wilkinson C and Chadwick EA. 2012. Otter casualties in South Wales: Recommendations for mitigation. Cardiff University. https://www.cardiff.ac.uk/__data/assets/pdf_file/0007/141388/wilkinson-chadick2012-swrta.pdf.
64. Wilkinson C and Chadwick, EA (2012) Otter Casualties in Mid Wales: Recommendations for Mitigation. Cardiff University. https://www.cardiff.ac.uk/__data/assets/pdf_file/0013/141412/wilkinson-chadwick2012-mwrta.pdf.
65. Harris S, Morris P, Wray S and Yalden D. 1995. A review of British mammals: Population estimates and conservation status of British mammals other than cetateans. JNCC.
66. MacPherson. 2014. Feasibility assessment for reinforcing pine marten numbers in England and Wales. Vincent Wildlife Trust Pine Marten Recovery Project.
67. https://www.vwt.org.uk/projects-all/pine-marten-recovery-project/ (accessed 30/12/2019).
68. Vincent Wildlife Trust Newsletter December 2019. https://pine-marten-recovery-project.org.uk/wp-content/uploads/2019/12/VWTNewsDec2019FinalCompressed.pdf (accessed 30/12/2019).
69. Croose E, Birks JDS, Schofield HW and O'Reilly C. 2014. Distribution of the pine marten (Martes martes) in southern Scotland in 2013. Scottish Natural Heritage Commissioned Report No. 740.
70. JNCC. 2018. Conservation status assessment for the species: S1357 pine marten (Martes martes). 4th UK Habitats Directive Report (January 2013-December 2018). https://jncc.gov.uk/jncc-assets/Art17/S1357-UK-Habitats-Directive-Art17–2019.pdf (accessed 30/12/2019).
71. Croose E. 2016. The distribution and status of the polecat (Mustela putoris) in Britain 2014–2015. The Vincent Wildlife Trust.
72. Croose E, Duckworth JW, Ruette S, Skumatov DV, Kolesnikov VV and Saveljev AP.2018. A review of the status of the western polecat Mustela putoris: A neglected and declining species? Mammalia 82(6): 550–564.
73. Sainsbury KA, Shore RF, Schofield H, Croose E, Pereira MG, Sleep D, Kitchener AC, Hanke G and McDonald RA. 2018. Long-term increase in secondary exposure to anticoagulant rodenticides in European polecats Mustela putoris in Great Britain. Environmental Pollution 235: 689–698.
74. Carter P and Churchfield S. 2006. Distribution and habitat occurrence of water shrews in Great Britain. Environment Agency Science Report SC010073/SR. Environment Agency: Bristol.
75. Carter P. 2006. Shrew News Spring 2006. The Mammal Society: London.
76. Mathews F, Harrower C and Mammal Society. 2020. IUCN-compliant Red List assessment for Britain's terrestrial mammals. Natural England: Peterborough.

77. McGuire C and Whitfield D. 2017. National water vole database and mapping project part 1: Project report 2006–2015. Natural Resources Wales, Peoples Trust for Endangered Species and The Wildlife Trusts.
78. Game and Wildlife Conservation Trust. https://www.gwct.org.uk/research/species/mammals/water-vole/reintroducing-water-voles-to-the-river-dore/ (accessed 1/1/2020).
79. Peoples Trust for Endangered Species (PTES). https://ptes.org/get-involved/surveys/countryside-2/national-water-vole-monitoring-programme/about-our-water-vole-survey/
80. Sainsbury KA, Shore RF, Schofield H, Crosse E, Campbell RD, and McDonald RA (2019) Recent history, current status, conservation and management of native mammalian carnivore species in Great Britain. Mammal Review 49: 171–188.

Bats

Andy Karran

There are 18 species of bat in the UK, 15 of which are found in Greater Gwent. All species are legally protected through the Conservation of Habitats and Species Regulations (2017) (as amended) (Schedule 2) and the Wildlife and Countryside Act (1981) (as amended) (Schedule 5). Many bat species have suffered dramatic declines during the past century, but their strong legal protection, conservation work and greater public awareness mean that some are recovering. However, bats are still threatened by issues such as habitat loss of both roost sites and feeding grounds and fragmentation affecting routes to feeding grounds. They are also known to be vulnerable to wind turbine collisions and barotrauma.[1] Artificial lighting also has a negative impact on bats, causing delays to emergence (leading to reduced access to prey), roost abandonment, reduced breeding success, changes to commuting routes, reduced foraging, and disturbance during hibernation.[2]

Greater Gwent is covered by the Monmouthshire Bat Group (Newport and Monmouthshire) and the Valleys Bat Group (Blaenau Gwent, Torfaen and Caerphilly).

Outlook: Most of the bat species found in Greater Gwent are stable or increasing at the UK level, with a more mixed picture in Wales. There is a lack of data regarding rarer species such as the Serotine and Western Barbastelle. Continuing declines in extent and quality of habitats such as hedgerows and woodlands are likely to affect bat food sources. Although there is increasing awareness of the impact of lighting on bats, light pollution has increased dramatically[3] and is likely to continue to increase with new development. Climate change will affect abundance and availability of insects and may lead to range changes in bats in response. Climate change is predicted to change the extent and distribution of freshwater habitats such as ponds and wetlands, which will affect prey availability for species like Daubenton's Bat.

Current status and trends of bats in Greater Gwent: There are about 20,000 bat records for the study area, but this varies considerably between species. Status is given according to the IUCN Red List criteria, as calculated by Matthews et al.;[1] trends are from 1999 to 2018, as calculated by the most recent National Bat Monitoring Programme (NBMP) results:[3] DD (Data Deficient), LC (Least Concern), NT (Near Threatened), VU (Vulnerable) and EN (Endangered). Note that there is little historic data regarding bat populations[3], so although these trends appear mostly positive, the extent of population losses prior to the start of consistent recording is not well known. Bat populations underwent significant declines, so it is likely that where species are recovering, it is from a very low baseline.

Species	**UK status[1]**	**Wales status[1]**	**UK trend[4]**	**Wales trend[3]**	**Number of records***
Greater Horseshoe Bat (*Rhinolophus ferrumquinum*)	LC	NT	Significant Increase	Increasing to 2011, fluctuating more recently	257
Lesser Horseshoe Bat (*R. hipposideros*)	LC	LC	Significant increase	Significant increase	2,321
Daubenton's Bat (*Myotis daubentonii*)	LC	LC	Stable	Increasing	351
Whiskered/Brandt's Bat (*M. mystacinus/M. brandtii*)	DD	DD	Stable	Fluctuating, considered stable	394
Natterer's Bat (*M. nattereri*)	LC	LC	Significant increase**	Overall significant increase, with recent decline since 2015	288
Common Pipistrelle (*Pipistrellus pipistrellus*)	LC	LC	Significant increase	DD	3,161+
Soprano Pipistrelle (*P. pygmaeus*)	LC	LC	Significant increase**	Significant decline but results not reliable**	1,316+
Nathusius' Pipistrelle (*P. nathusii*)	NT	VU	DD	DD	20
Serotine (*Eptesicus serotinus*)	VU	VU	Stable	DD	150
Noctule (*Nyctalus noctula)*	LC	LC	Stable	DD	919
Leisler's Noctule (*N. leisleri)*	NT	NT	DD	DD	20
Brown long-eared bat (*Plecotus auritus*)	LC	LC	Stable	Increasing to 2015, now thought to be stable	675
Bechstein's bat	LC	EN	DD	DD	13

(*M. bechsteinii*)					
Western Barbastelle (*Barbastella barbastellus*)	VU	VU	DD	DD	21

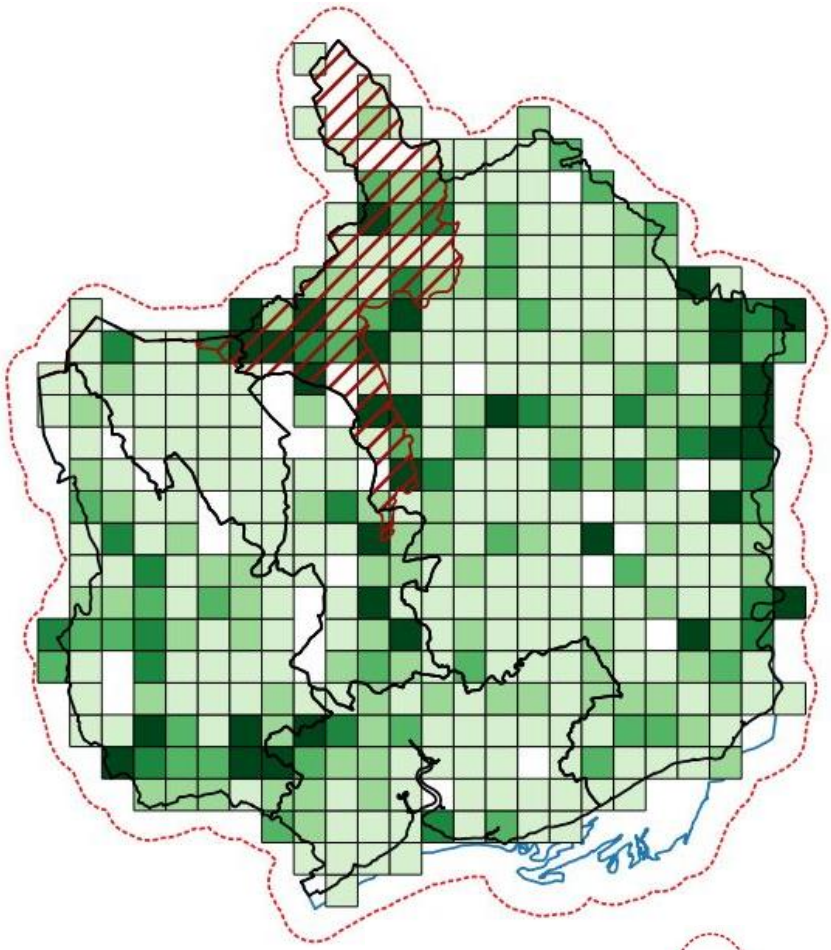
*number of records within Greater Gwent

**treat with caution until further research and monitoring has been carried out

[+] note that there are an additional 230 records prior to the separation of the pipistrelle species

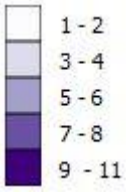
National Bat Monitoring Programme (NBMP): Bat populations are monitored across the UK through the NBMP, co-ordinated by the Bat Conservation Trust. Within the study area, there are 49 roost count sites and 11 hibernation sites registered with NBMP. However, the number of years that records have been returned varies from 1 to 30. Species counted are Common/Soprano Pipistrelle (15 roosts), Brown Long-Eared Bat (1 roost), Brandt's/Whiskered Bat (2 hibernacula), Natterer's Bat (1 hibernaculum), Greater Horseshoe Bat (2 roosts, 4 hibernacula) and Lesser Horseshoe Bat (31 roosts, 11 hibernacula). Note that some monitored sites support multiple species.

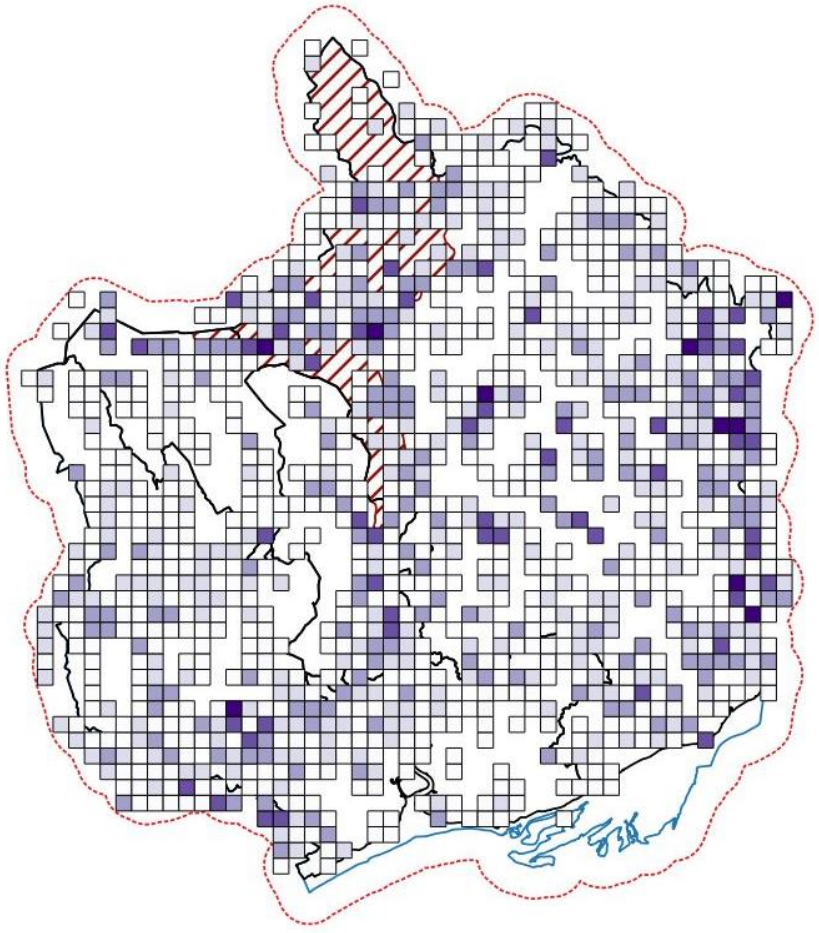
Greater Gwent range: Bats are found across Greater Gwent, with high concentrations of records along the Wye Valley and the Monmouth & Brecon Canal, as well as the Clydach Gorge and the Caerphilly/Newport border area. These areas also have high diversity of recorded bat species. Note that the maximum record density is set to ≥100, as high levels of recording in the Clydach Gorge due to the roadworks (max 858 records per tetrad) would remove any other variation. The map is given in tetrads, to protect specific roost locations.



Record density (all bat species) by tetrad (maximum set to ≥100 records/tetrad)

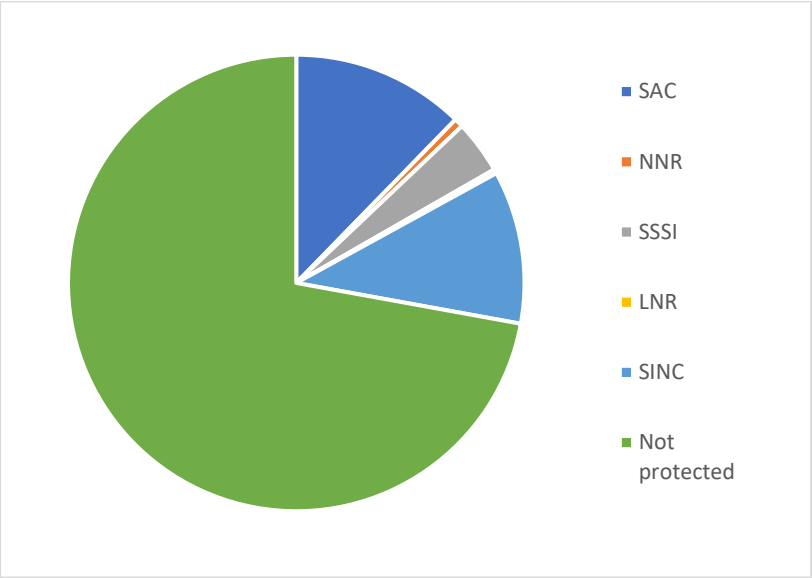
Number of recorded species/km²





Protection: Just under 28% of records come from protected sites, with high numbers of records from designated bat SACs in Monmouthshire and Blaenau Gwent, and the Wye Valley Woodland SACs.

All bat records from protected sites



Bechstein's Bat *Myotis bechsteinii* (Kuhl, 1817)

Protection: Conservation of Habitats and Species Regulations (2017) Schedule 2. Wildlife & Countryside Act (1981 as amended) Schedule 5

Conservation status: Endangered (Wales), Least Concern (UK),[5] UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Poor (13 records)

Steve Wadley

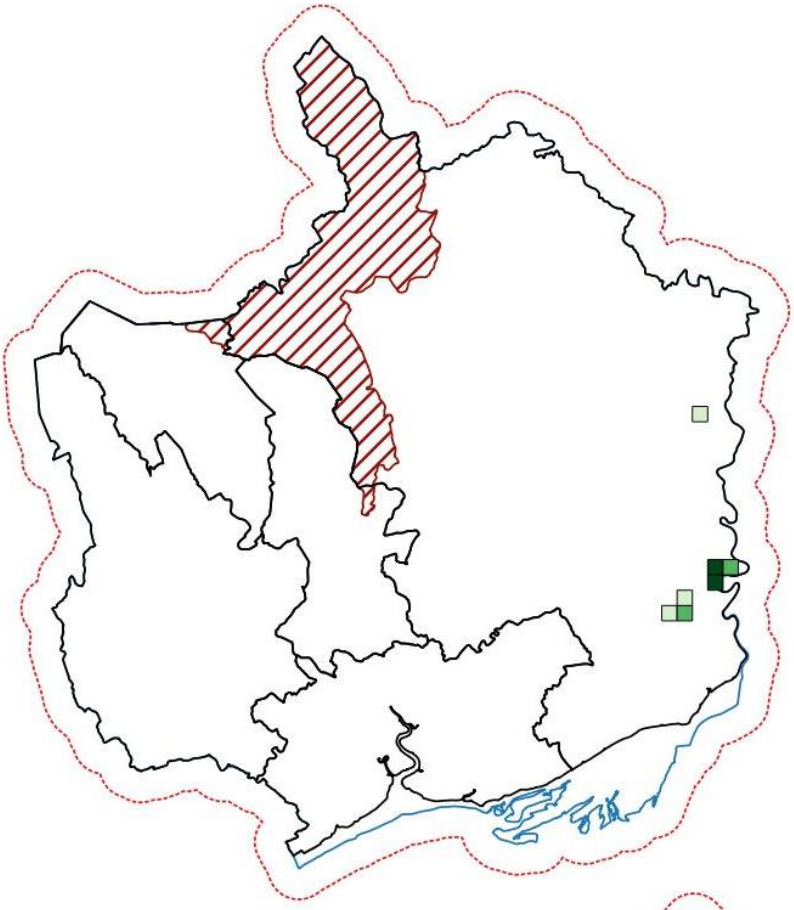
Context: Bechstein's Bat is a rare species, and little is known about them. Their quiet echolocation makes them difficult to detect. Their range is limited to the south of England and the borders of Wales. They prefer broadleaved woodland habitat, particularly ancient woodlands.[6] Prior to 2005 there were thought to be just six breeding populations[7], but now the British population is estimated to be between 10,300 and 55,600,[5] and the Welsh population 120 to 630[8] (with a large amount of uncertainty).

Outlook: Knowledge and recording of the species is improving, particularly through the use of acoustic lures.[6] Given the species' sensitivity to the quality of woodland, particularly understorey cover, declines in woodland conditions may have a negative impact on Bechstein's Bats. Climate change may affect prey availability, but the impacts are difficult to predict.

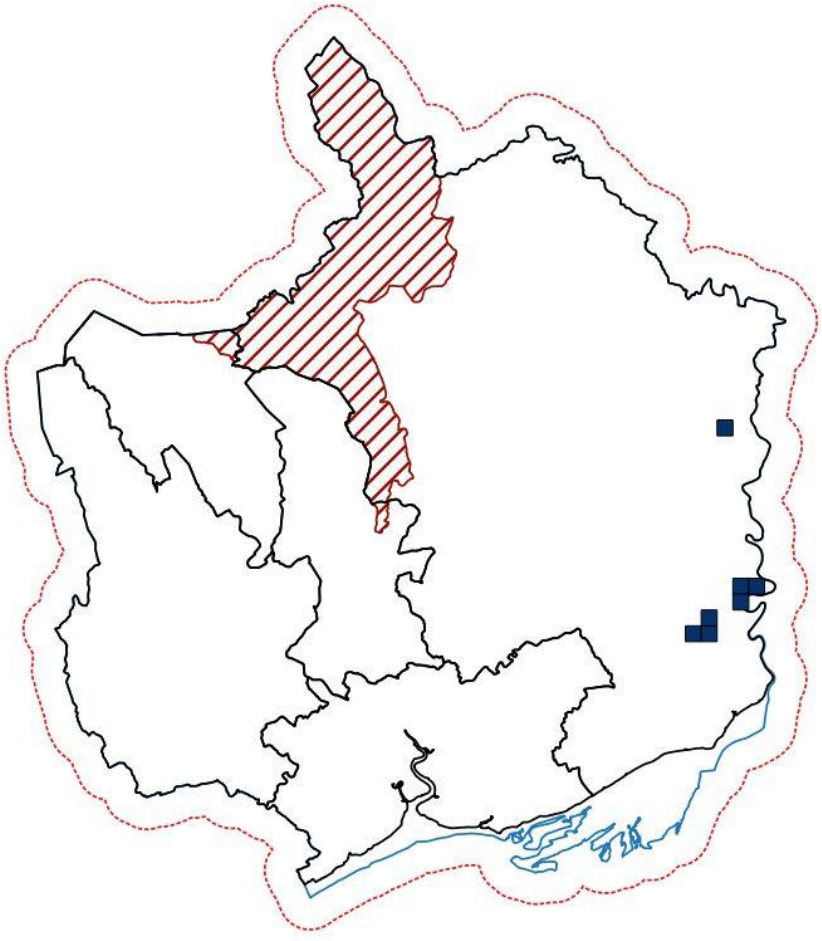
Greater Gwent range: Bechstein's Bats are only found in the east of Greater Gwent, which corresponds to the edge of their British range. There are low numbers of records, as Bechstein's Bats are usually only recorded through specialist trapping under licence. This is most likely an under-representation of Bechstein's Bat distribution, given the difficulties in recording them and the availability of potential habitat within the Wye Valley. The Monmouthshire Bat Group reports trapping up to 25 males at swarming sites, indicating a significant population.[9] It is not known why these records are not with South Wales Biodiversity Records Centre (SEWBReC).

Most significantly, the records include an established colony (recorded twice in different years at the same location) and one pregnant female, the only known breeding colony in Wales. All records are from 2011 onwards, reflecting improved recording methods and recent interest in the species.

Distribution of Bechstein's Bat records across Greater Gwent (max 3 records/km^2)



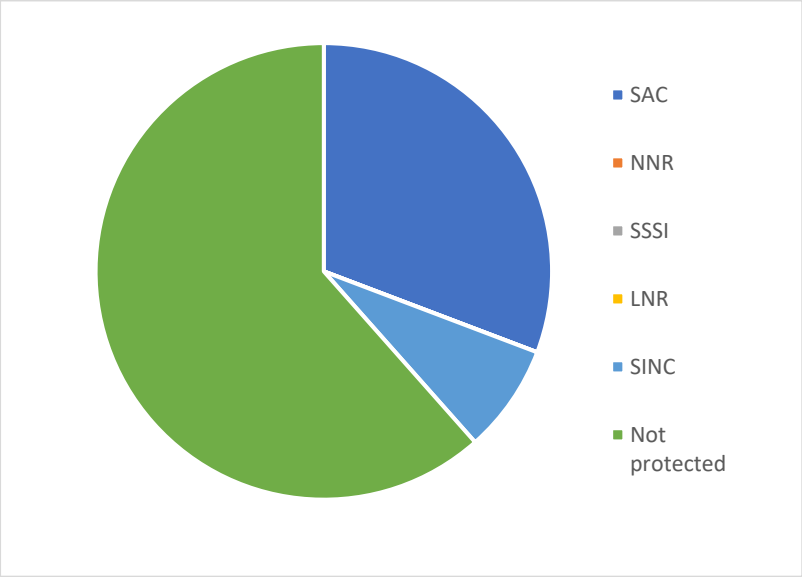
Records of Bechstein's Bat by decade



Population trends: There is not enough data to determine a local or national trend for Bechstein's Bats.[5] Genetic data suggests that there have been recent declines in Great Britain, but levels of inbreeding are less than previously feared.

Protection: 27% of records come from protected sites, with records from the Wye Valley Woodlands SAC and Colonels Wood SINC. It is likely that use of protected woodlands by Bechstein's Bats is higher than indicated, due to their preference for high quality woodland.

Bechstein's Bat records from protected sites



Greater Horseshoe Bat *Rhinolophus ferrumquinum* (Schreber, 1774)

Steve Wadley

Protection: Conservation of Habitats and Species Regulations (2017) Schedule 2. Wildlife & Countryside Act (1981 as amended) Schedule 5

Conservation status: Least Concern (UK), Near Threatened (Wales)[5]

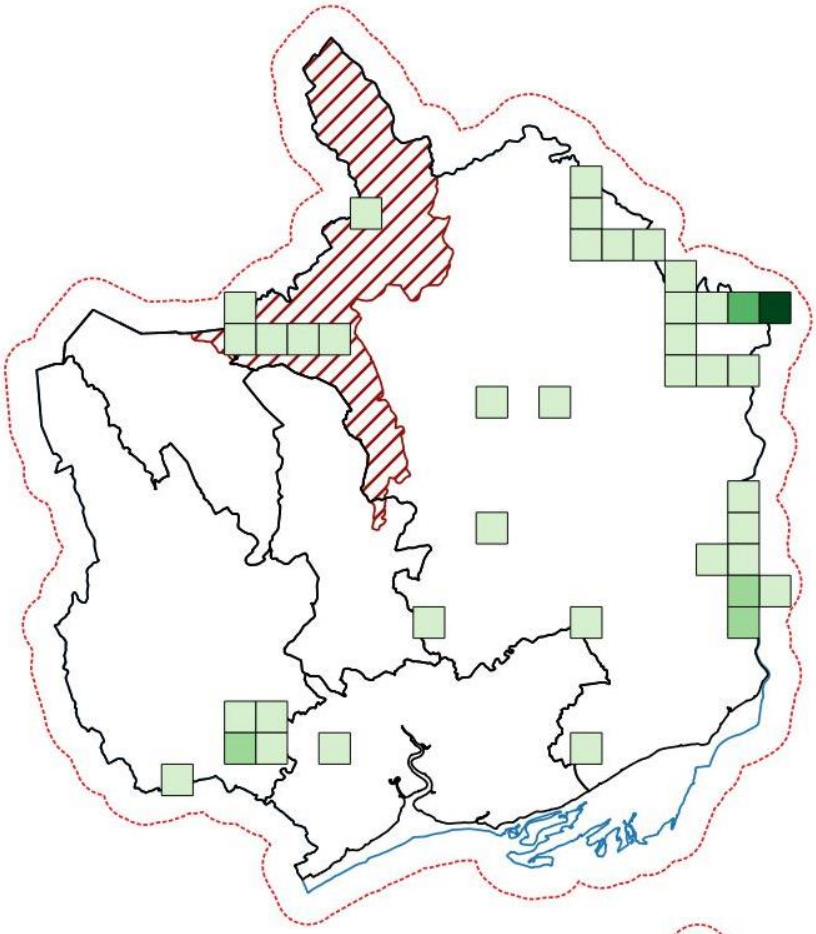
Data availability: Poor (7 records)

Context: Greater Horseshoe Bats are one of the largest British bat species, feeding over woodland edges, hedgerows, pastures and parkland. Maternity roosts are usually in buildings, and hibernation sites are usually caves or tunnels.[5] It is estimated that the number of Greater Horseshoe Bats has declined by over 90% in the last 100 years, due to factors such as roost disturbance and changes in agricultural practices.[10] More recently, both population and range of Greater Horseshoe Bats has been increasing, since the 1990s.[5,11] This is thought to be due to increased legal protection and possibly milder winters.[5] The UK population is estimated at 12,951 individuals,[12] with 2,751 in Wales.[13]

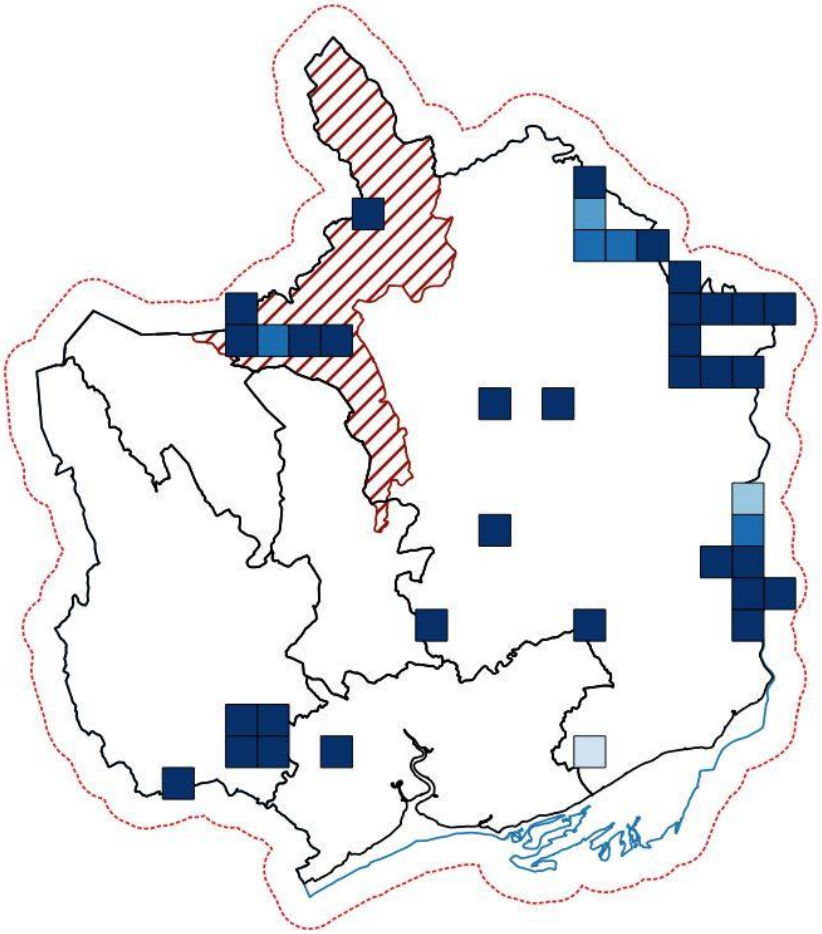
Outlook: Currently, the UK population is predicted to continue to increase in size and range,[5] and the species' favourable conservation status is likely to continue.[12,13] In Greater Gwent, the overall trend appears to be positive, although new developments may impact roosts.[14] Milder winters caused by climate change are likely to favour Greater Horseshoe Bats, although the impact of climate change on their prey species is less clear. Remaining threats include disturbance of roosts and changes in agriculture, such as pesticide use.

Greater Gwent range: There are three known maternity roosts for Greater Horseshoe Bats within Greater Gwent: Monmouth, Caerphilly and Wyndcliffe (discovered in 2017). There are also two important hibernation areas, at Clydach Gorge and the edge of the Forest of Dean. There are more records for the Forest of Dean area, but this may be due to differences in recording effort, as hibernation sites are often difficult to access. There is also a smaller roost within the buffer area in Herefordshire. These give rise to four distinct areas of importance for Greater Horseshoe Bats, with very few records outside of these areas.

Distribution of Greater Horseshoe records across Greater Gwent (max 109 records per tetrad)

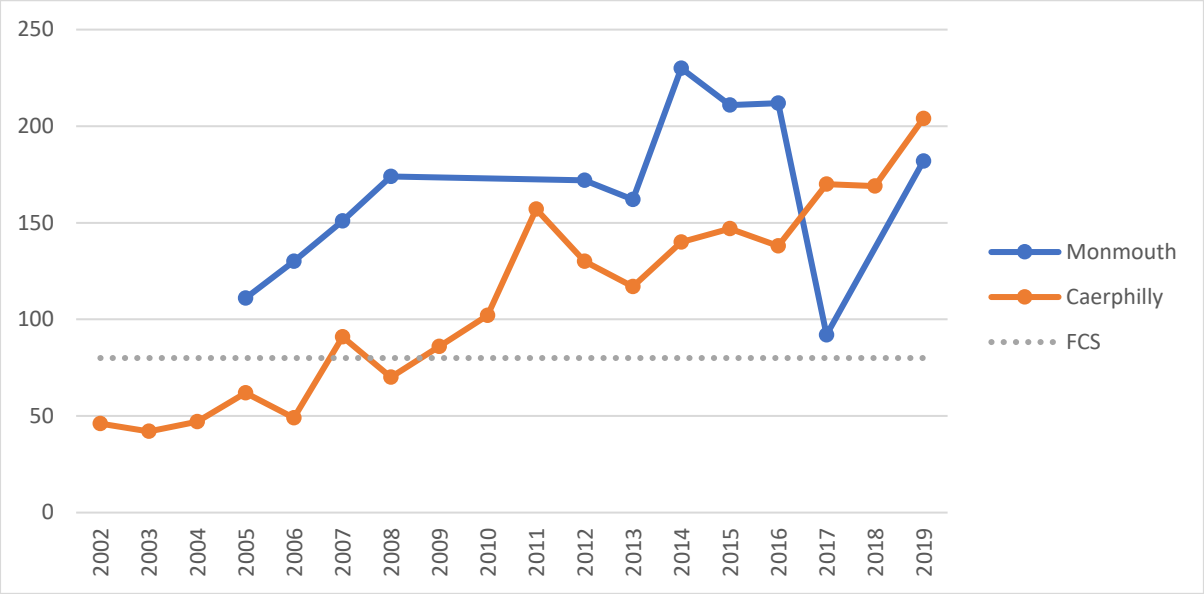


Records of Greater Horseshoe Bats by decade



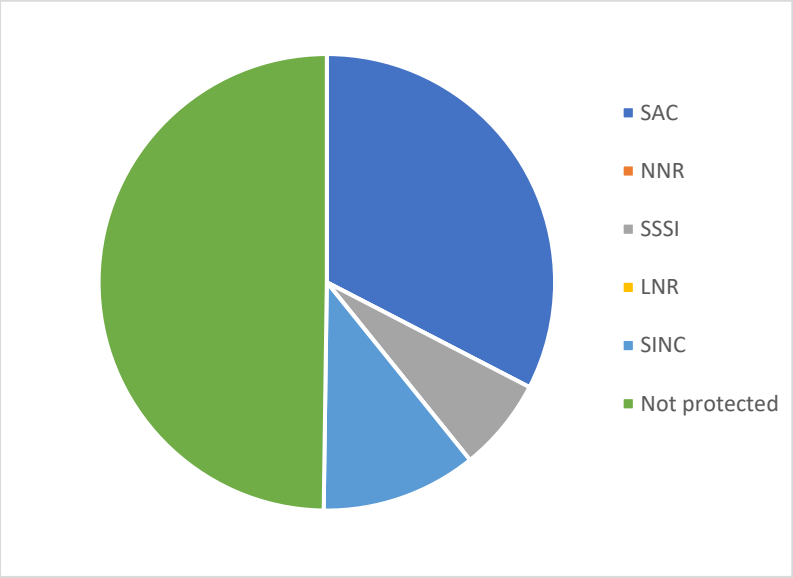
Population trends: Two of the maternity roosts are monitored through the National Bat Monitoring Programme (NBMP). The data for Caerphilly roost shows an upward trend, whereas the Monmouth roost data has no clear trend and is missing data for some years. Both roosts, however, have remained above their favourable conservation status (FCS) of 80 adults[15,16] for the latest decade.

Peak NBMP Counts for Greater Horseshoe Bats at Monmouth and Caerphilly maternity roosts.



Protection: Half (50%) of the Greater Gwent Greater Horseshoe Bat records come from protected sites, with almost a third of records from the Wye Valley Bat SAC and Wye Valley Woodlands SAC. The Monmouth maternity roost is part of the Wye Valley Bat SAC, and the Caerphilly maternity roost is an SSSI. Parts of the hibernation areas are variously protected as SACs, NNR and SSSIs. However, many records are from outside protected areas. This can be explained by the small footprint of the Wye Valley Bat SAC, which is confined to the structure of the roost, so many records associated with the roost will not fall within it, especially less accurate records. Also, Greater Horseshoe Bats can forage some distance from their roost; the Bat Conservation Trust recommends a core sustenance zone of 3km radius.[17]

Greater Horseshoe Bat records from protected sites



Lesser Horseshoe Bat *Rhinolophus hipposideros* (Bechstein, 1800)

Protection: Conservation of Habitats and Species Regulations (2017) Schedule 2. Wildlife & Countryside Act (1981 as amended) Schedule 5

Conservation status: Least Concern (UK & Wales),[5] UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Good (3,168 records)

Steve Wadley

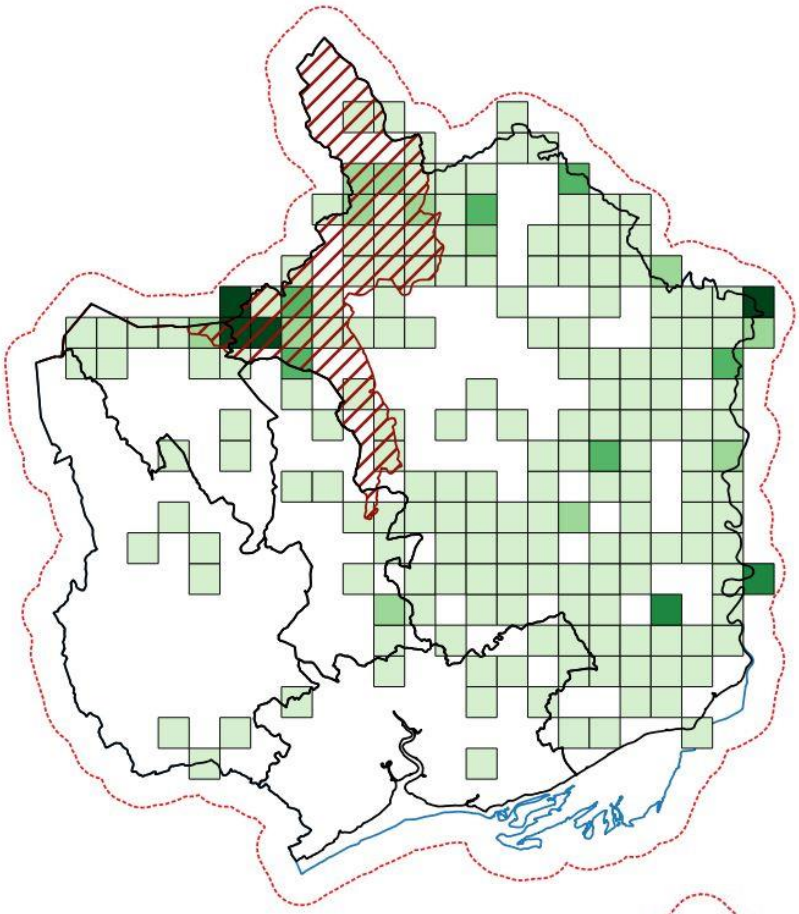
Context: Lesser Horseshoe Bats are one of our smallest bat species, with a limited UK range, restricted to Wales, the west of England and western Ireland.[18] Drastic declines and local extinctions have occurred across northern and western Europe since the 1950s.[3] The reasons for the declines are not fully understood, but have been linked to agricultural intensification, loss of foraging areas and loss of roosts and hibernacula.[18]

Recent studies indicate that the UK population is recovering,[5] and the latest Article 17 reporting[19] gives the Lesser Horseshoe Bat population and range Favourable Status, with a population estimate of 50,400 (significantly higher than previous estimates). Lesser Horseshoe Bats have been the focus of targeted conservation work, particularly by Vincent Wildlife Trusts, who own or manage several roosts. The Our Beacons for Bats project ran from 2010 to 2014 and took place on the border of the study area and beyond; it focused on community engagement, mapping bat foraging and commuting areas, and habitat enhancement.

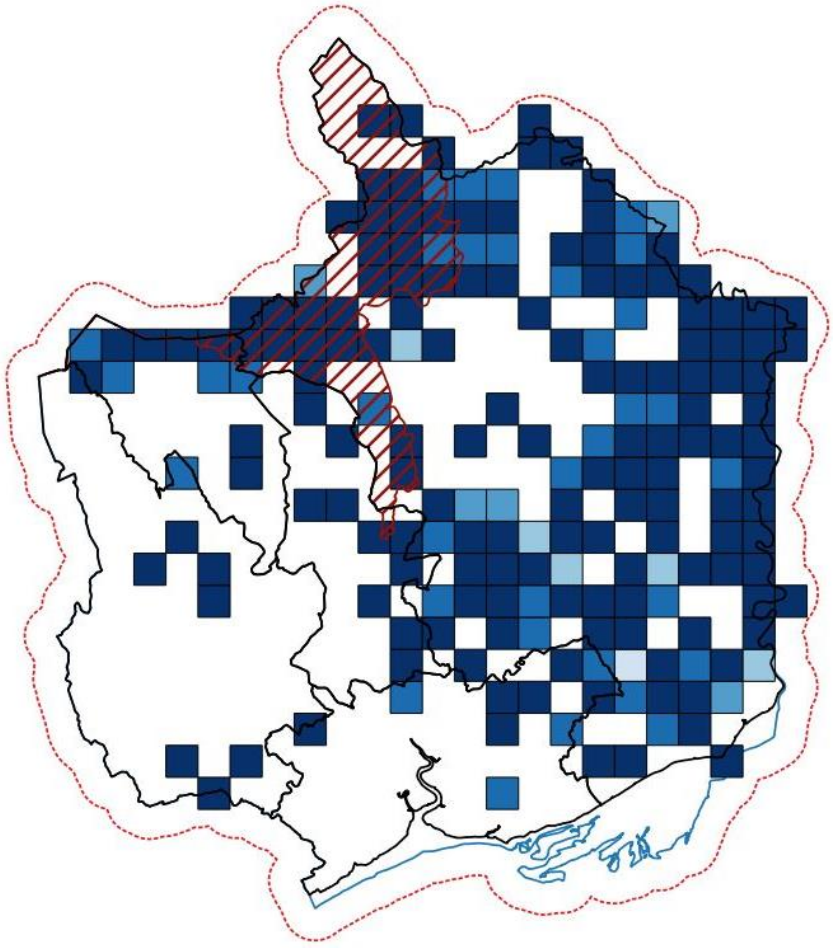
Outlook: Currently, the UK and Welsh population and range are predicted to continue to increase.[5] The Lesser Horseshoe Bat has benefitted from strong legal protection, designation of roosts, hibernacula and foraging grounds as protected sites, and targeted conservation efforts. Future threats include land-use changes, roads, artificial lighting and disturbance.[5] Climate change is likely to affect prey availability and hibernation, but the effects are difficult to predict.

Greater Gwent range: Lesser Horseshoe Bats are found across the north and east of Greater Gwent, with recording hotspots associated with the Clydach Gorge, the Usk Bat Site SAC, the Wye Valley Woodlands and Wye Valley and Forest of Dean Bat Sites SAC.

Greater Gwent contains two SACs designated for their Lesser Horseshoe Bat populations: the Usk Bat Sites SAC, supporting up to 5% of the UK population; and the Wye Valley and Forest of Dean Bat Sites SAC, supporting the greatest concentration in the UK (about 26% of the UK population). It is important to note that both of these protected sites extend significantly beyond Greater Gwent.

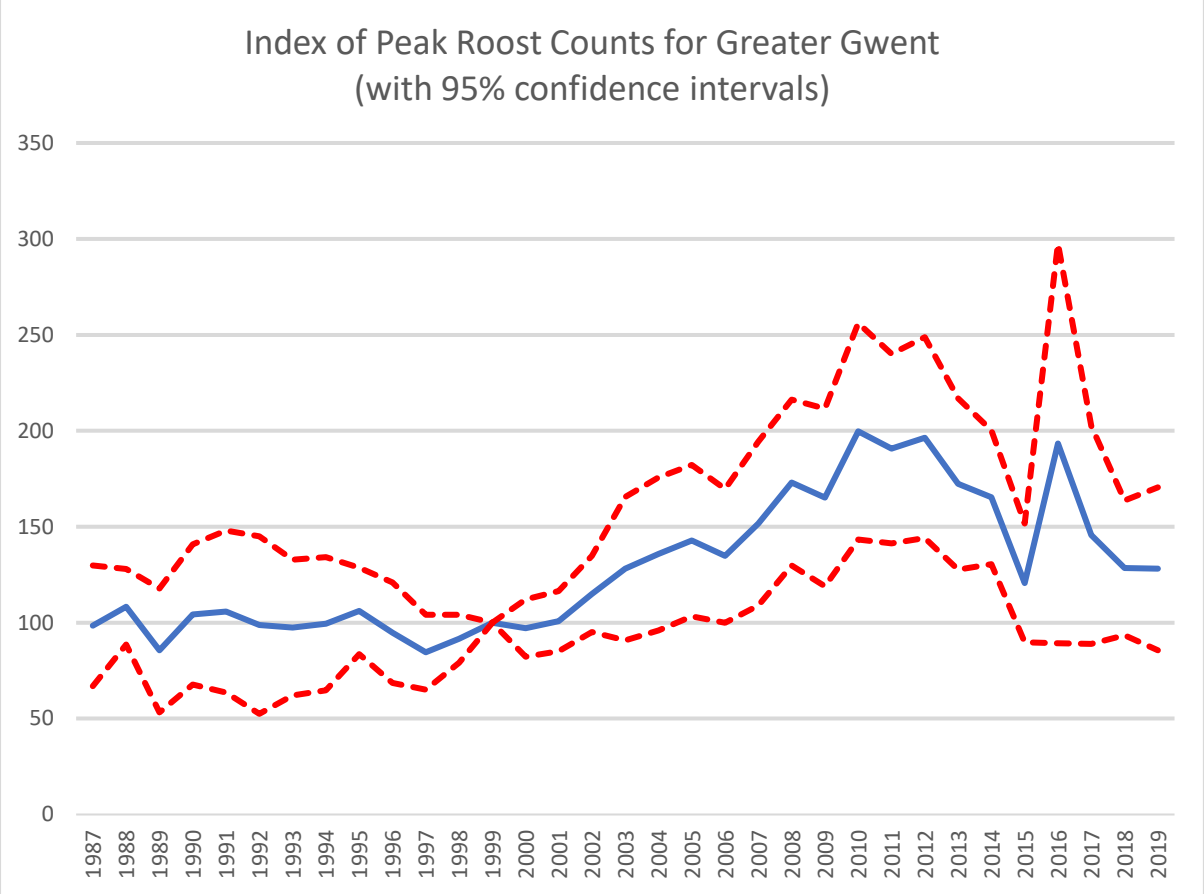


Distribution of Lesser Horseshoe Bat records across Greater Gwent (by tetrad) (maximum ≥ 100/tetrad)



Records of Lesser Horseshoe Bat by decade

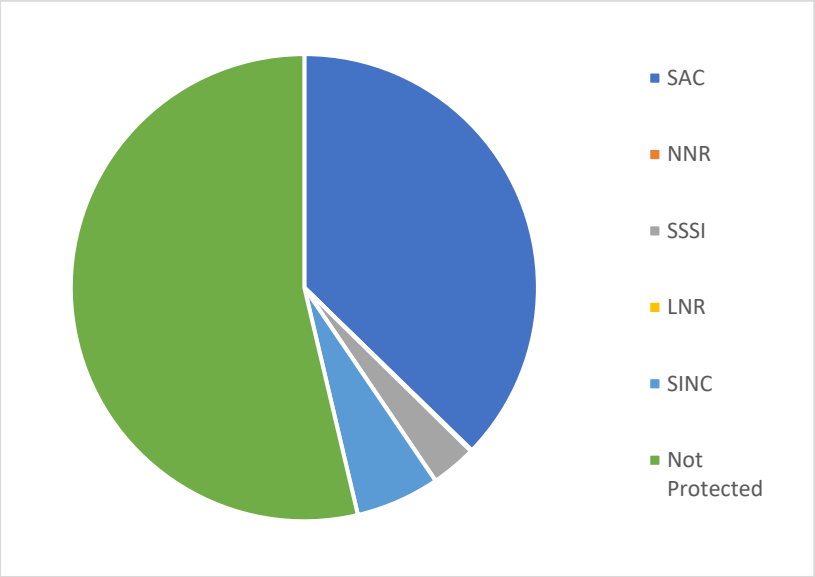
Population trends: Thirty-one roosts and 11 hibernacula within the study area have been monitored as a part of the NBMP, but many have only a few years of data. The following index uses the peak counts from 14 roost sites with 15 or more years of reporting, where there was a return in 1999, the base year used by the NBMP. Note that this is not statistically significant, as it is based on a limited number of sites, but it does follow a similar pattern of general increase as the national trends produced by the NBMP.[11]



Three of the maternity roosts within the Wye Valley and Forest of Dean Bat Sites SAC have NBMP records; the most recent records for all three are above the lower limits for favourable conditions. Monitoring is more complicated within the Usk Bat Sites SAC due to access to cave sites, and monitoring needs have to be balanced against the risk of disturbance.

Protection: 46% of records come from protected sites, with high numbers of records from the Bat Sites SACs. It is important to acknowledge the large number of records from outside of protected sites, which show use of the wider countryside for commuting and foraging, as the SACs often only protect the roost or hibernacula structure.

Lesser Horseshoe Bat records from protected sites



Western Barbastelle Bat *Barbastella barbastellus* (Schreber, 1774)

Protection: Conservation of Habitats and Species Regulations (2017) Schedule 2. Wildlife & Countryside Act (1981 as amended) Schedule 5

Conservation status: Vulnerable (UK & Wales),[5] UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Poor (32 records)

Hugh Clark/www.bats.org.uk

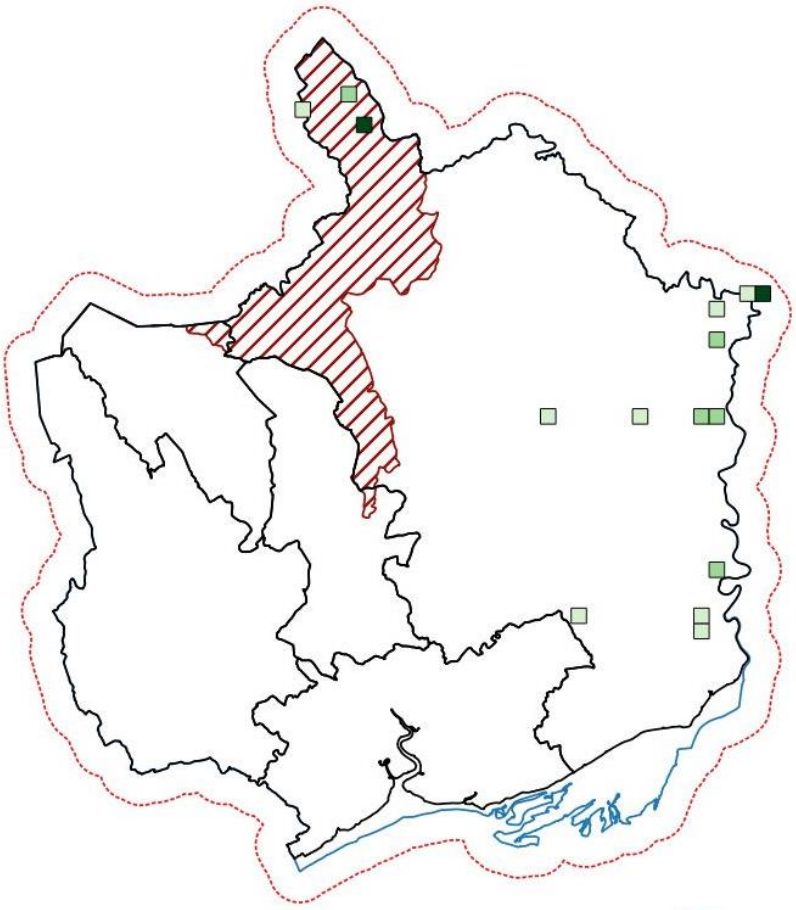
Context: The Western Barbastelle Bat is a rare species, and little is known about its ecology and distribution. Its range is thinly spread across the south of England and Wales, and it is thought that it prefers wooded landscapes with water.[20] The Welsh population is estimated at just 500 individuals,[21] but this is based on very limited data.

Outlook: There is not enough data about the species to determine a population trend.[5] However, if the population is low and thinly distributed, this makes the species especially vulnerable. Changes in land use are likely to negatively affect Western Barbastelle Bats.[21]

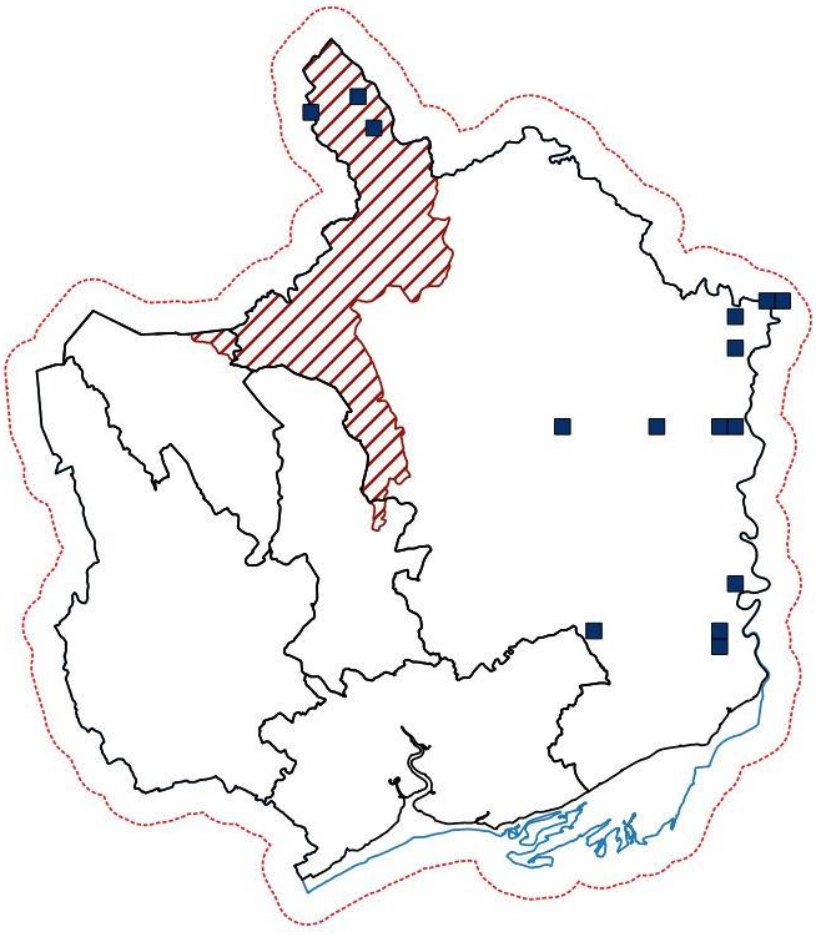
Greater Gwent range: Scattered records for Barbastelle Bats are found along the Wye Valley, with a few records in central Monmouthshire. There are three records for Barbastelle Bats within the Usk Bat Sites SAC (not mapped as they do not occur within an entire grid square) dating from the 1970s, but all other records are from 2010 onwards. Given the high levels of recording effort in and around the Usk Bat SAC over a long time-period, it seems likely that the population there has died out, or that the original records were erroneous.

Western Barbastelle Bats seem less likely to be recorded casually than other bat species. Half of the SEWBReC records for Barbastelle are from trapping (under licence), sometimes with radio tracking. As with many species, such targeted recording efforts are likely to yield a greater understanding of the local populations but trapping and tracking are expensive and require considerable expertise, as well as licensing approval.

Distribution of Barbastelle records across Greater Gwent (max 5/km^2)



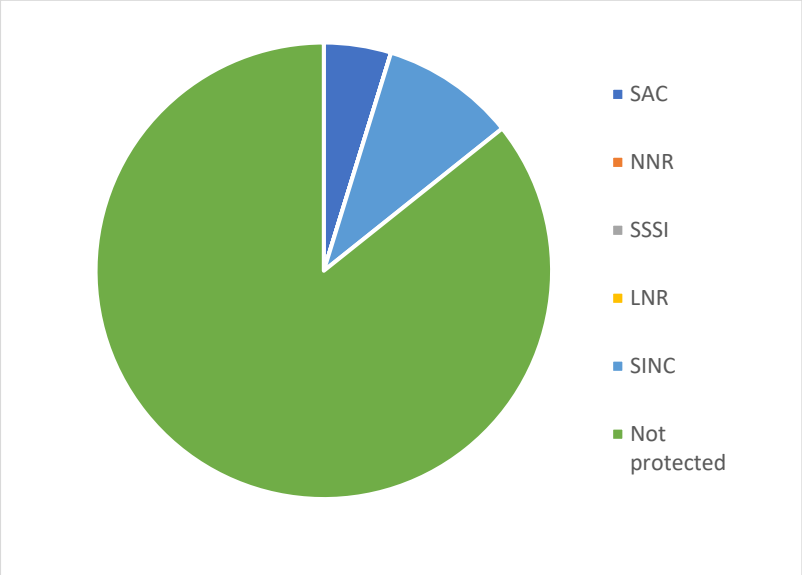
Records of Barbastelle by decade



Population trends: There is not enough data to determine local or national population trends for Barbastelle bats.

Protection: Just 14% of Greater Gwent records come from protected sites, with records from the Wye Valley Woodlands SAC and Colonels Wood SINC. There are, however, a high number of records from within the Wye Valley AONB. Barbastelle bats can range considerable distances from their roosts (which often change location over time), and the current recommendation is for positive landscape management within 7km of a roost site,[22] so it is likely that many of the protected woodlands within the Wye Valley are used for roosting or foraging.

Barbastelle Bat records from protected sites



References

1. Mathews F, Richardson S, Lintott P and Hosken D. 2016. Understanding the Risk to European Protected Species, (bats) at Onshore Wind Turbine Sites to inform Risk Management. University of Exeter, funded by DEFRA.
2. Stone EL. 2013. Bats and Lighting: Overview of current evidence and mitigation.
3. Harris S, Morris P, Wray S and Yalden D. 1995. A Review of British Mammals: Population Estimates and Conservation Status of British Mammals other than Cetaceans. JNCC, Peterborough
4. Bat Conservation Trust. 2020. The National Bat Monitoring Programme Annual Report 2019. Bat Conservation Trust, London: http://www.bats.org.uk/our-work/national-bat-monitoringprogramme/reports/nbmp-annual-report.
5. Mathews F, Kubasiewicz LM, Gurnell J, Harrower CA, McDonald RA and Shore RF. 2018. A Review of the Population and Conservation Status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough.
6. Miller H. 2011. Bechstein's Bat Survey Final Report September 2007–September 2011. Bat Conservation Trust.
7. Bat Conservation Trust. 2010. Bechstein's Bat Factsheet. Bat Conservation Trust, London
8. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Supporting documentation for the conservation assessment for the species: S1323 Bechstein's bat (Myotis bechsteinii), Wales: https://jncc.gov.uk/jncc-assets/Art17/S1323-WA-Habitats-Directive-Art17–2019.pdf
9. Monmouthshire Bat Group. 2021. Pers Comm.
10. Bat Conservation Trust. 2010. Greater Horseshoe Bat Factsheet. Bat Conservation Trust, London.
11. Bat Conservation Trust. 2020. The National Bat Monitoring Programme Annual Report 2019. Bat Conservation Trust, London.
12. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Conservation status assessment for the species: S1304 Greater horseshoe bat (Rhinolophus ferrumequinum): https://jncc.gov.uk/jncc-assets/Art17/S1304-UK-Habitats-Directive-Art17–2019.pdf
13. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Supporting documentation for the conservation assessment for the species: S1304 Greater horseshoe bat (Rhinolophus ferrumequinum), Wales: https://jncc.gov.uk/jncc-assets/Art17/S1304-WA-Habitats-Directive-Art17–2019.pdf
14. Jones A and Stinchcombe K. 2021. Pers Comm.
15. Countryside Council for Wales. 2008. Core Management Plan for Wye Valley and Forest of Dean Bat SAC. Countryside Council for Wales, Bangor.
16. Countryside Council for Wales. 2011. Ruperra Castle and Woodlands Site of Special Scientific Interest: Your Special Site and its Future. Countryside Council for Wales, Bangor.
17. Bat Conservation Trust. 2020. Core Sustenance Zones and habitats of importance for designing Biodiversity Net Gain for bats. Bat Conservation Trust, London.
18. Bat Conservation Trust. 2010. Lesser Horseshoe Bat Factsheet. Bat Conservation Trust, London.
19. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Conservation Status Assessment for the species: S1303 Lesser Horseshoe Bat (Rhinolophus hipposideros): https://jncc.gov.uk/jncc-assets/Art17/S1303-UK-Habitats-Directive-Art17–2019.pdf
20. Bat Conservation Trust. 2010. Barbastelle Bat Factsheet. Bat Conservation Trust, London.
21. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Supporting documentation for the conservation status assessment for the species: S1308 Barbastelle (Barbastella

barbastellus), Wales: https://jncc.gov.uk/jncc-assets/Art17/S1308-WA-Habitats-Directive-Art17–2019.pdf

22. Zeale M, Davidson- Watts I and Jones G. 2012. Home Range Use and Habitat Selection by Barbastelle Bats.

Birds

Birds are one of the most recorded taxonomic groups in the UK, with decades of high-quality data meaning that we are more certain about trends in bird populations and distribution than in other species groups. Over 600 species of birds have been recorded in Britain. [1] In Gwent there are around 130 breeding or probable breeding species.[2] This wealth of data, their sensitivity to change and position within food chains means that birds are often used as indicators for the overall health of ecosystems. For example, Birds of the Wider Countryside and at Sea is one of the UK's Biodiversity Indicators.[3]

Despite long-standing public affection for birds, they are still subject to pressures including habitat loss, changes in land management, disease and climate change. The State of the UK's Birds 2020 estimates that there were 19 million fewer breeding pairs of native birds in 2017 compared to 1966.[4] The overall biodiversity indicator for birds is declining,[3] and the Red List of Birds of Conservation Concern is growing, with an additional 20 species moving onto the Red List in its latest review.[5]

Within Greater Gwent, birds are well recorded and studied. The Gwent Ornithological Society (GOS) was formed in 1961 as the Pontypool Bird Club and has published three comprehensive reviews of the status of birds within Gwent – in 1977, 1985 and 2007. Most of the data within this section is owed to the dedication of GOS members; the gathering and compiling of such extensive and comprehensive records should be recognised as a significant accomplishment.

The main scheme for monitoring bird populations is the Breeding Bird Survey (BBS) run by the British Trust for Ornithology, JNCC and RSPB. Greater Gwent is well covered by BBS, with 74 survey squares within (or partly within) the study area (see Figure 1). From these, BTO were able to calculate population trends for 56 of the 133 species recorded by the BBS in Greater Gwent (see Figure 2). A fifth (11 species) of the 56 showed steep, long-term (1995–2018) declines equivalent to being on the Red List. A further 10 species showed moderate long-term (1995–2018) declines equivalent to being on the Amber List. Only 14 species (25%) showed significant increases over the same period.[6] Of most concern is that the 56 species for which trends could be calculated are more likely to be common and widespread species.

The worst declines were experienced by Yellowhammer (*Emberiza citronella*) (98%). Cuckoo (*Cuculus canorus*) (77%) Starling (*Sturnus vulgaris*) (-75%) and Rook (*Corvus frugilegus*) (74%). The strongest increases were for Canada Goose (*Branta canadensis*) (275%), Sparrowhawk (*Accipiter nisus*) (252%), Stock Dove (*Columba oenas*) (212%) and Raven (*C. corax*) (210%).

Figure 1. BBS squares within the study area (courtesy of BTO)[6]

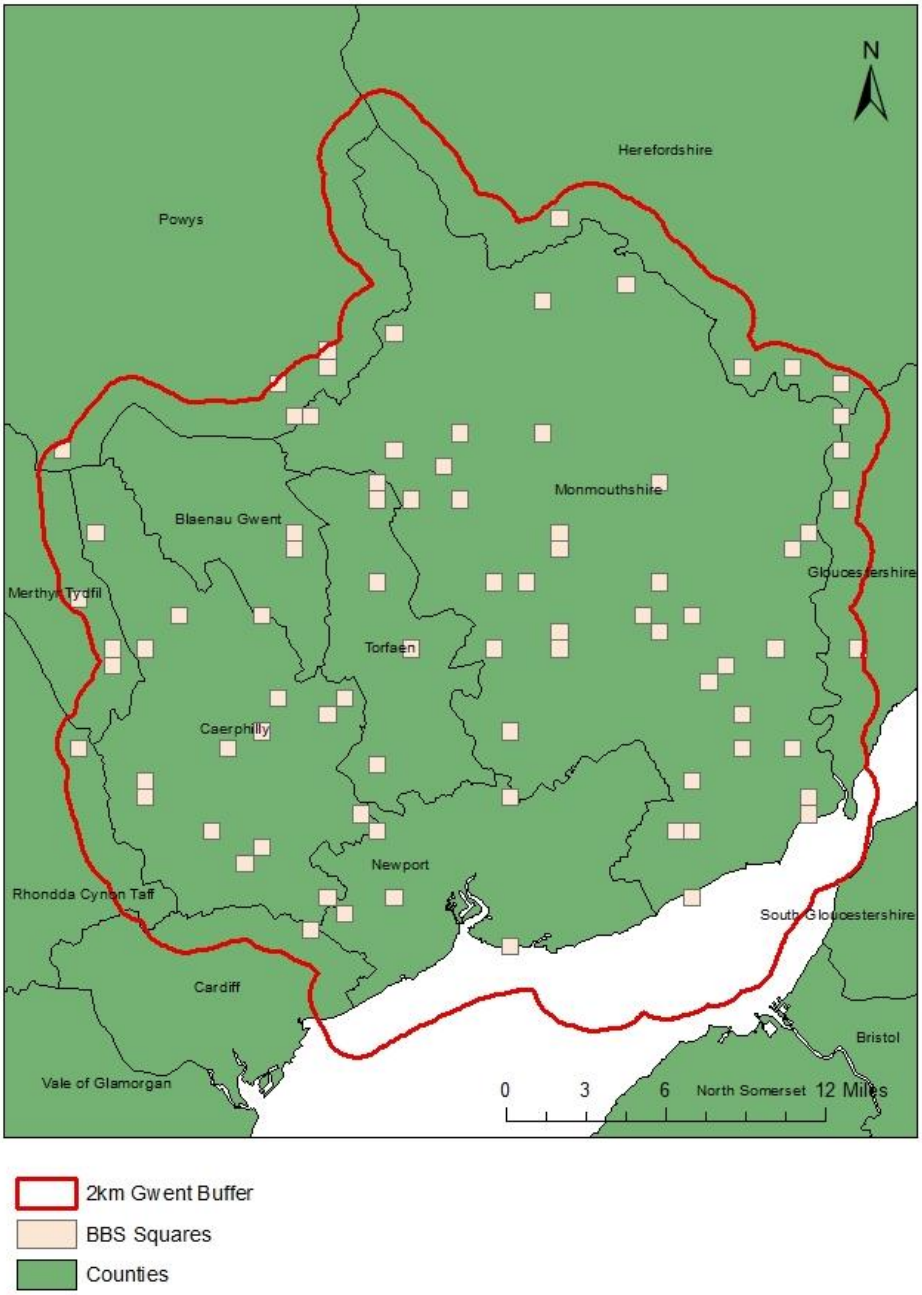


Figure 2. Long-term trends (1995–2018) for 56 species within Greater Gwent, based on the BTO/JNCC/RSPB Breeding Bird Survey (number of species shown in brackets)[6]

Strong Decline (11)	Moderate Decline (10)	No Significant Change (21)	Moderate Increase (6)	Strong Increase (8)

Combined indicators were produced for upland and lowland farmland birds and woodland birds, and together with indicators for all of Wales using the same species.[6] Species used to produce the

indicators are shown in the table at the end of the section. The lowland (Figure 3) and upland (Figure 4) farmland bird indicators show declines of 45% and 30%, respectively, over the BBS period, largely in accordance with UK as well as Wales patterns for farmland and upland birds. Although it fell in the last year, the Greater Gwent woodland indicator (Figure 5) is broadly stable.

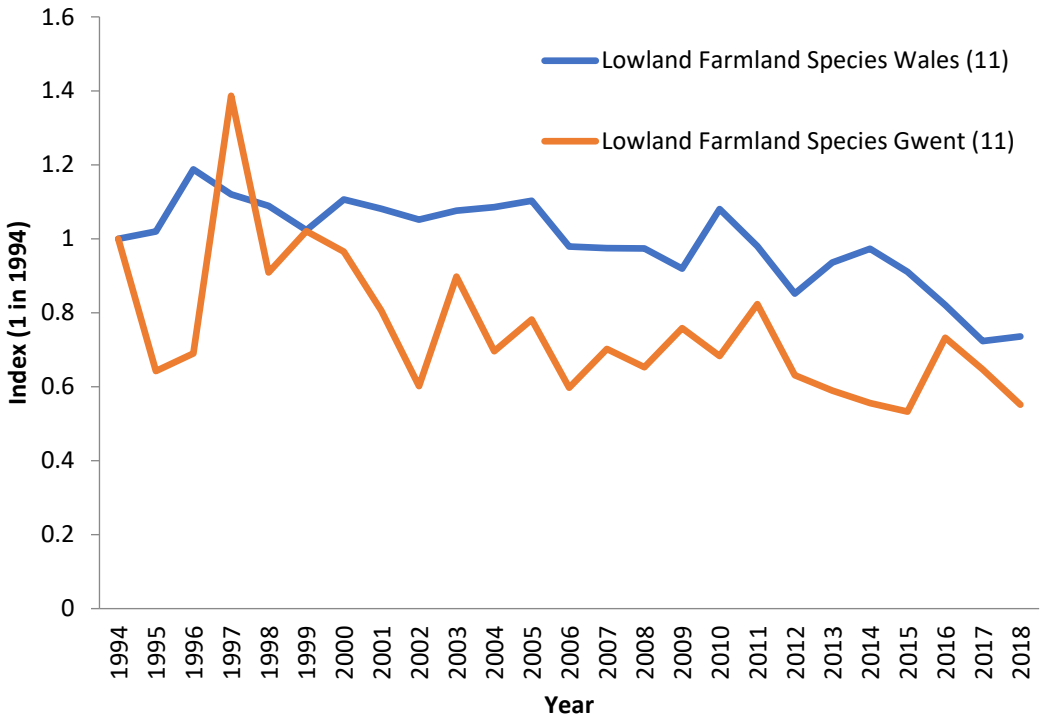


Figure 3. Multi-species lowland farmland bird indicators for Wales and the Greater Gwent region from 1994 to 2018 for the same 11 indicator bird species.[6]

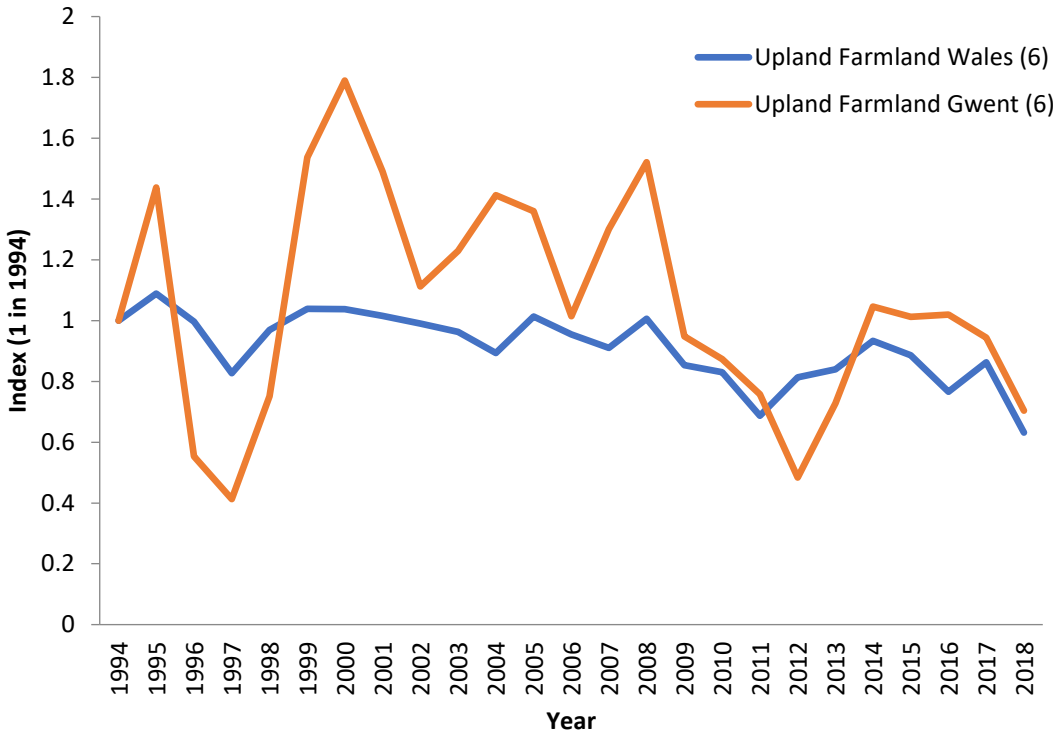


Figure 4. Multi-species upland farmland bird indicators for Wales and the Greater Gwent region from 1994 to 2018 for the same six indicator bird species.[6]

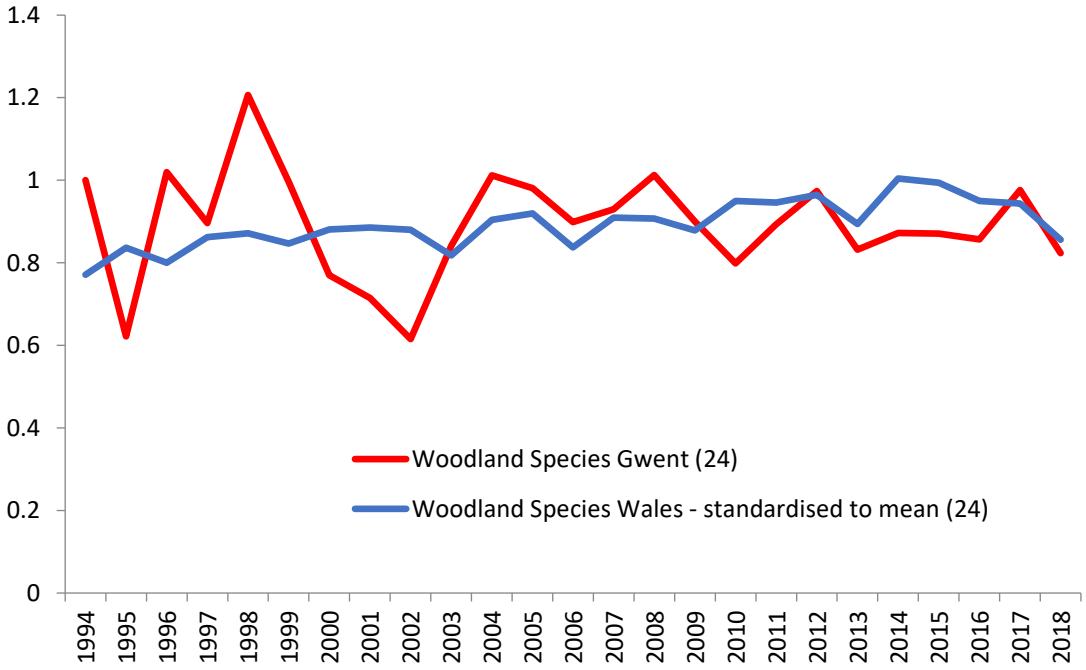


Figure 5. Multi-species woodland bird indicators for Wales and the Greater Gwent region from 1994 to 2018 for the same 24 indicator bird species, standardised to the same mean for the time series (so not unduly influenced by the start year values).[6]

The following 36 bird species profiles are divided into loose habitat sections for convenience: farmland, freshwater and wetlands, upland, urban, waders and woodland.

Species used in indicators

Lowland Farmland	**Upland Farmland**	**Woodland**
Yellowhammer	Grey Wagtail	Willow Warbler
Starling	Curlew	Chaffinch
Rook	Wheatear	Goldcrest
Greenfinch	Buzzard	Green Woodpecker
Jackdaw	Meadow Pipit	Blue Tit
Linnet	Raven	Wren
Whitethroat		Coal Tit
Woodpigeon		Bullfinch
Skylark		Robin
Goldfinch		Garden Warbler
Stock Dove		Redstart
		Jay
		Long-Tailed Tit
		Song Thrush
		Chiffchaff
		Great Tit
		Blackbird
		Nuthatch
		Treecreeper
		Dunnock
		Blackcap
		Great Spotted Woodpecker
		Tree Pipit
		Sparrowhawk

References

1. British Ornithologists Union (BOU). 2018. The British List: A Checklist of Birds of Britain (9th edition). Ibis 160: 190–240.
2. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR, & Williams RA. 2008. The Birds of Gwent. Gwent Ornithological Society.
3. UKBI - C5. Birds of the Wider Countryside and at Sea. JNCC - Adviser to Government on Nature Conservation. https://jncc.gov.uk/our-work/ukbi-c5-birds-of-the-wider-countryside-and-at-sea/ (accessed 06/06/21).
4. Burns F, Eaton MA, Balmer DE, Banks A, Caldow R, Donelan JL, Douse A, Duigan C, Foster S, Frost T, Grice PV, Hall C, Hanmer HJ, Harris SJ, Johnstone I, Lindley P, McCulloch N, Noble DG, Risely K, Robinson RA, Wotton S. 2020. The State of the UK's Birds 2020. The RSPB, BTO, WWT, DAERA, JNCC, NatureScot, NE and NRW, Sandy, Bedfordshire.
5. Eaton M, Aebischer N, Brown A, Hearn R, Lock L, Musgrove A, Noble D, Stroud D and Gregory R. 2015. Birds Of Conservation Concern 4: The Population Status of Birds in the UK, Channel Islands and Isle of Man. British Birds 108: 708–746.
6. Barnes A and Noble D. 2020. A Summary of the State of Terrestrial Wild Bird Populations in Greater Gwent Based on Data from the BTO/JNCC/RSPB Breeding Bird Survey, 1994 to 2018. British Trust for Ornithology, Thetford, Norfolk.

Farmland birds

Barn Owl *Tyto alba* (Scopoli, 1769)

Pete Hadfield

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 1

Conservation status: Green (UK & Wales)

Data availability: Moderate (598 records)

Context: Unlike Britain's other familiar owl, the Tawny, which favours woodland, the Barn Owl prefers open habitats, especially lowland farmland that has rough grazing where field voles, its main prey, abounds. Suitable nest sites include buildings and cavities in rock faces and trees, with purpose-built boxes readily used. Barn Owls are generally very sedentary with juveniles normally dispersing less than 10km from the nest site,[1] and adults being faithful to a breeding area. Barn Owls are vulnerable to a number of factors: lack of suitable habitat limits population distribution; quality of habitat limits breeding productivity; rodenticides can lead to poisoning; barn conversions can reduce available nest-sites; and road mortality is also a significant factor. Additionally, differing levels of prey due to three-year vole cycles and cold/wet winters can cause more short-term population fluctuations. Barn Owls are of least conservation concern in the UK (downgraded from Amber in 2015). However, they are fully protected by Schedule 1 of the Wildlife & Countryside Act.

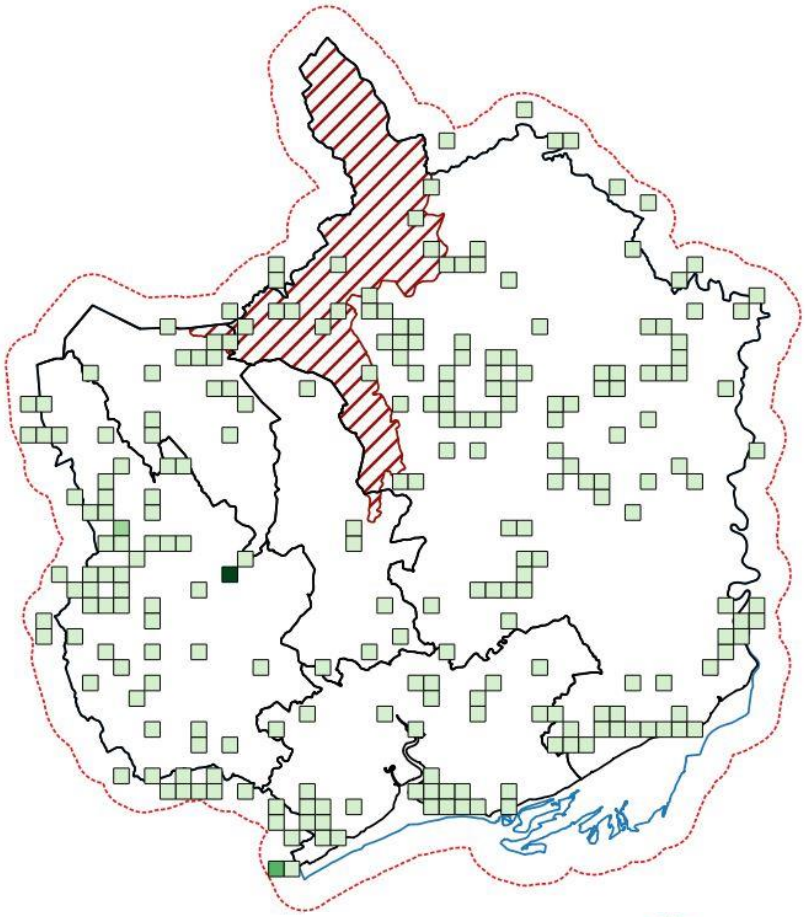
Outlook: Barn Owls were certainly a far commoner species at the beginning of the twentieth century than they are today, however numbers have recovered from their nadir in the 1970s and 80s.[2] There is a more southerly and lowland bias to their UK distribution as a direct consequence of their vulnerability to severe winter weather. The UK breeding population was 4000–14,000 pairs in 2016.[3] The BTO's Breeding Bird Survey[4] shows that Barn Owls recovered with an increase of 251% between 1995–2018. However, the shorter-term picture is of a 33% reduction in 2010–2018 and 41% in 2018–2019. The future currently looks relatively assured for Barn Owls, certainly in comparison with the low levels seen in the 1970s, but they are still vulnerable to the many threats that still exist and there is no room for complacency.

A number of modest nest box projects are run in the county by volunteers in the north-west, the Usk Valley and on the Caldicot Levels. The latter, run by the Goldcliff Ringing Group, recorded six breeding pairs in 2020, with other boxes being used as roost sites.[5]

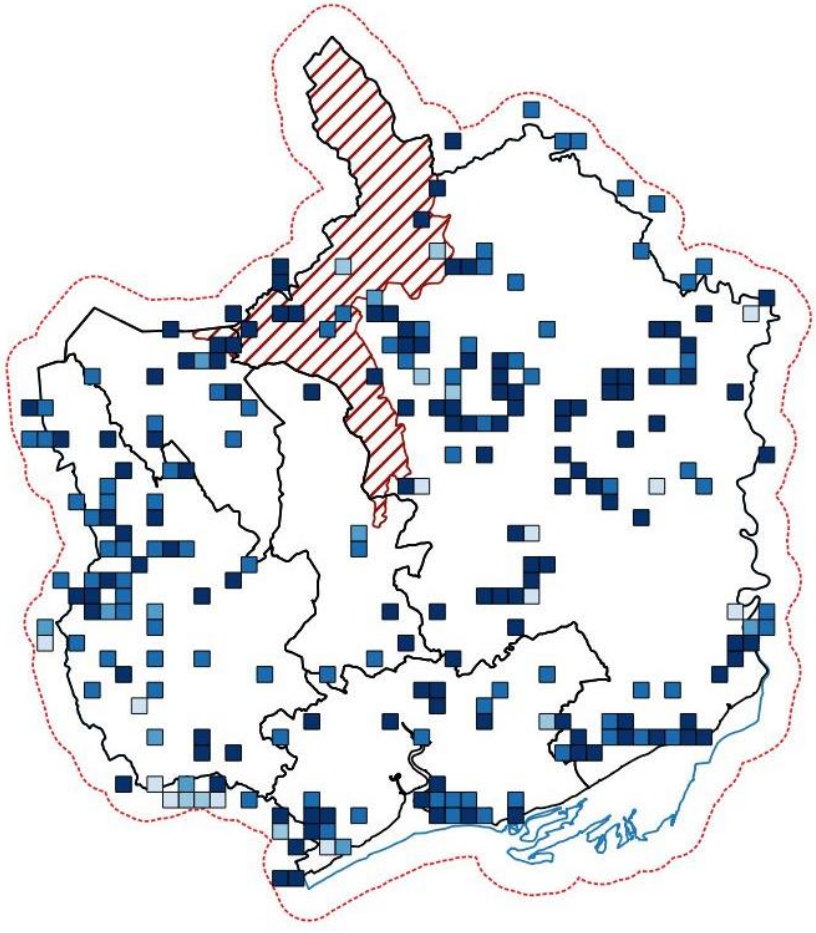
Greater Gwent range: The Barn Owl is described as 'an uncommon resident (some possibly the result of earlier re-introductions' in The Birds of Gwent.[6] This was still the case in the Gwent Bird Report 2018.[7] Barn Owls are distributed widely across Gwent, although the coastal strip and the Usk Valley would appear to be strongholds, and areas of the very highest ground are generally shunned. The Barn Owl's fortunes have changed over time in Gwent, although short-term fluctuations in population in response to harsh winters and cycles of prey abundance make it difficult to monitor population levels. The national Barn Owl survey in 1932 suggested a Gwent population of 120 pairs,[8] and Birds of

Monmouthshire (1963) described it as 'fairly common'.[9] Mirroring the population declines across the rest of the UK, the 'fairly common' was soon no longer applicable: 'only 7 records were received' in 1981.[10] Conversely a few years either side of this, in 1976, 'the number of reports remains encouragingly high'[11] and 'another encouraging increase'[12] in 1985 was noted. This perhaps reflects the natural fluctuations already alluded to. Still, the population was certainly much reduced from that in 1932 and indeed in 1967; a survey undertaken in 1982–85 by the Hawk and Owl Trust estimated 25 pairs for Gwent,[13] a considerable reduction on the 120 pairs of 1932. The second Gwent Atlas estimated there to be 25–50 pairs,[4] which suggests an improvement on the situation a few decades earlier.

On the following map, the 'Hotspot' is a recording hotspot – an individual or pair being very closely monitored (almost daily).



Distribution of Barn Owl records across Greater Gwent (maximum 78 records/km^2)



Barn Owl records by decade

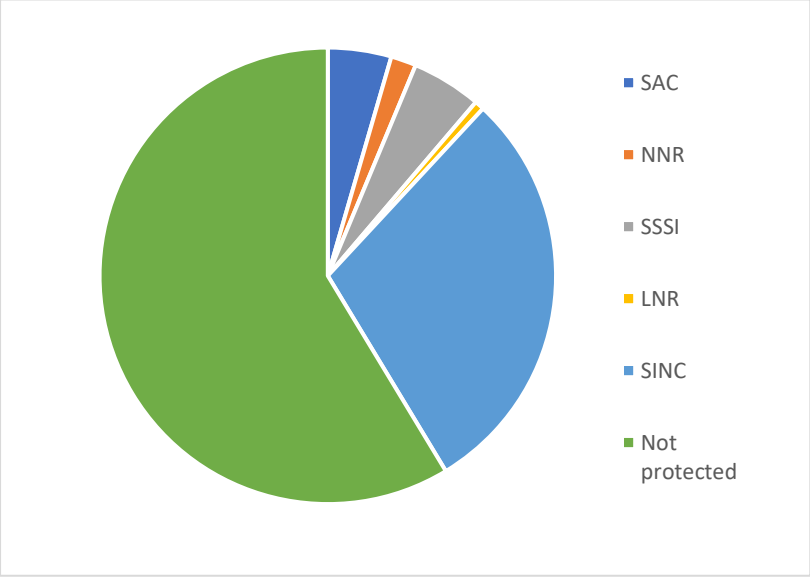
Habitats patterns: Barn Owls are birds of rough grassland that favour lowland rural areas but are largely absent from the highest exposed ground, thus avoiding the harshest winter weather. A lot of records are close to main roads with 50 (11%) being within 100m of motorways, dual carriageways, A-roads and primary roads. Eleven of these were casualties (although two were on the railway line next to the A40). There may be a number of factors at play here: they perhaps utilise the rough grassland of road verges for hunting, but observers are also most likely to see this largely crepuscular species showing up in car headlights.

Population trends: Populations fluctuate, overall it would be fair to say that Barn Owl populations are not at the levels of 100 years ago but are better than the low years of the 1970s/80s. The Barn Owl Trust publishes its 'State of the UK Barn Owl Population' every year (note this does not include Gwent records, but does include some from many other parts of the UK, including Wales). Headlines from recent years include 'the worst year since records began' (2013), immediately followed by 'an exceptionally good year' (2014), 'a poor year almost everywhere' (2015), 'a poor year in most areas' (2016), 'generally a good year' (2017), 'generally a poor year' (2018) and most recently 'a relatively good year (2019).[14]

Protection: No particular site, as expected – scattered records from Usk Bat Sites SAC, Wye Valley Woodlands SAC, Aberbargoed Grasslands, and then mostly Newport Wetlands and the Gwent Levels. The SINCs are scattered across the area but include the well monitored sites at Treowen and Bargoed.

Barn Owls are protected in some planning policy and Supplementary Planning Guidance (SPG): Monmouthshire County Council has particular SPG for barn conversions that require bat and barn owl surveys and potentially compensatory measures to be undertaken.[15]

Barn Owl records from protected sites



Fieldfare *Turdus pilaris* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 1

Conservation status: Amber (Wales[16]) Red (UK[17])

Data availability: 2,169 (Good)

Context: Fieldfares are widespread within the UK as a wintering species. However, their wild, flighty nature make them much less familiar than many of our other thrushes, with only extreme cold weather driving them into our gardens. They are by far at their commonest as a wintering bird, also passing through in good numbers on migration, and only breeding extremely rarely. This means that Fieldfares are vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source, both impacted by climate change.[18] They are one of a number of thrush species whose numbers in the UK are boosted in winter. However, like their cousin the Redwing, very few if any remain to breed. The large wintering population arrives from further north in Scandinavia.[19] Fieldfares eat invertebrates and, particularly in winter, fruit.[20] The number of Fieldfares wintering in the UK is quoted as being 720,000 (1981–84).[21] Breeding populations have always been very low with none confirmed in some years, although potential pairs did reach double figures in various years in the 1970s, 1980s, and as recently as the early 90s, with the majority of records from Scotland (but some English records).[22] The current UK breeding population is quoted as 0–1 pairs in the period 2013–2017.[20]

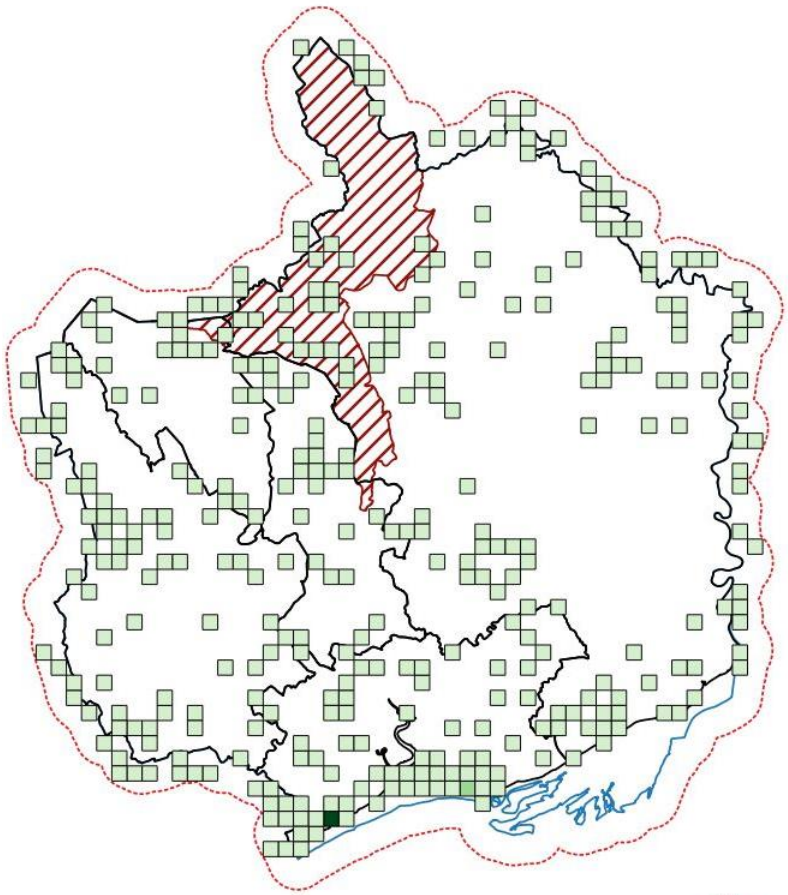
Outlook: The Fieldfare has always been a very rare breeding bird in the UK. The first confirmed record only occurred in 1967, and they have only been recorded breeding in very low numbers, fairly irregularly ever since.[23] In contrast to the very small, irregular and localised breeding population, the wintering population is considerably larger (720,000 (1981–84)).[21] It is difficult to find any wintering population trend data for the UK, however it has been noted that the overall world population is stable.[24] Fieldfares are Red listed in the UK Birds of Conservation Concern, this is due to declines in breeding numbers; wintering numbers are not mentioned, which indicates there are no current concerns regarding the UK wintering population.[17] It should be noted that Fieldfares are Amber on the latest Welsh Birds of Conservation Concern[16] due to their being on the European Red List of Birds (ERLoB), all be it as a species of 'Least Concern'. They are not on the Red List in Wales as there are no breeding populations to be of concern.

Greater Gwent range: The latest Gwent Bird Report (2018) records Fieldfares as being a 'Common Winter Visitor'.[7] It would be fair to say this has been the case for a while, with the Birds of Gwent 2008 recording Fieldfares as being a 'Common Winter Visitor'[6] and the 1977 publication calling it a 'Regular winter visitor, sometimes in very large numbers'.[25] The Birds of Gwent 2008 also references much earlier books (Birds of Monmouthshire 1937 and 1963), which note it was a regular winter visitor at these times as well.[6] Fieldfares can be found in many places within Gwent, with low-lying fields and berry-bearing hedgerows being favoured locations.[6] Flocks of several thousand birds have been recorded, particularly in association with severe winter weather. The Gwent Levels have been noted

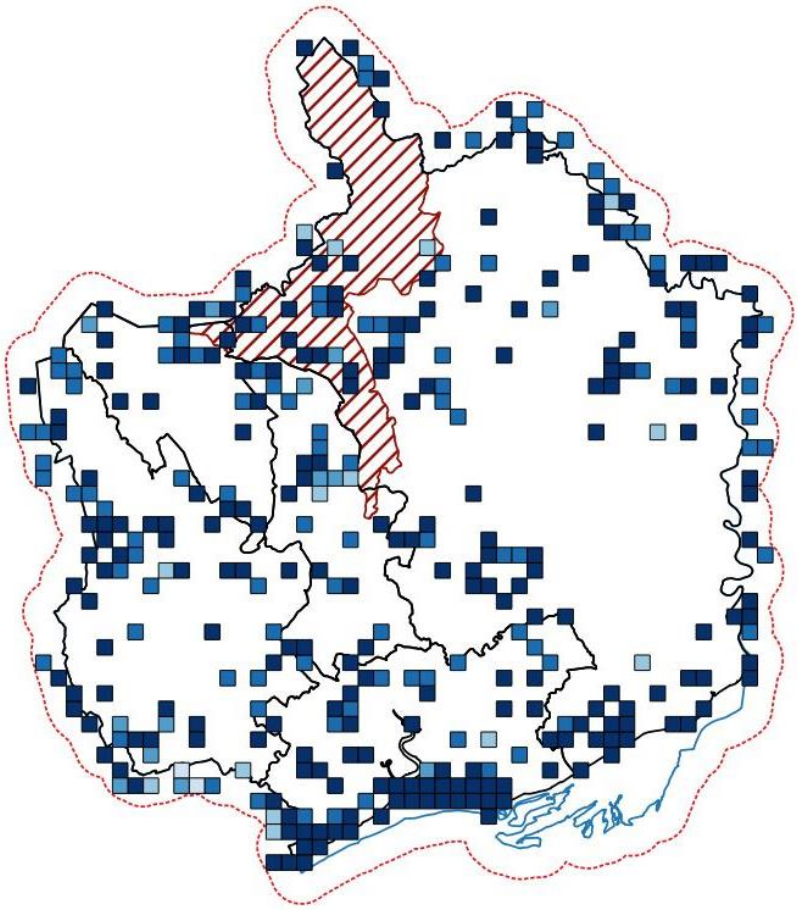
to support large numbers at times. Orchards, of which Gwent has quite a few, can also be utilised when weather is adverse, and they will also enter gardens in severe weather.

There are record hotspots at Peterstone, Newport Wetlands and Llandegfedd (likely to be concentrations of recorder effort rather than particularly high numbers in those places). Otherwise, records are well distributed.

Distribution of Fieldfare records across Greater Gwent (max 86 records/km²)



Records of Fieldfare by decade

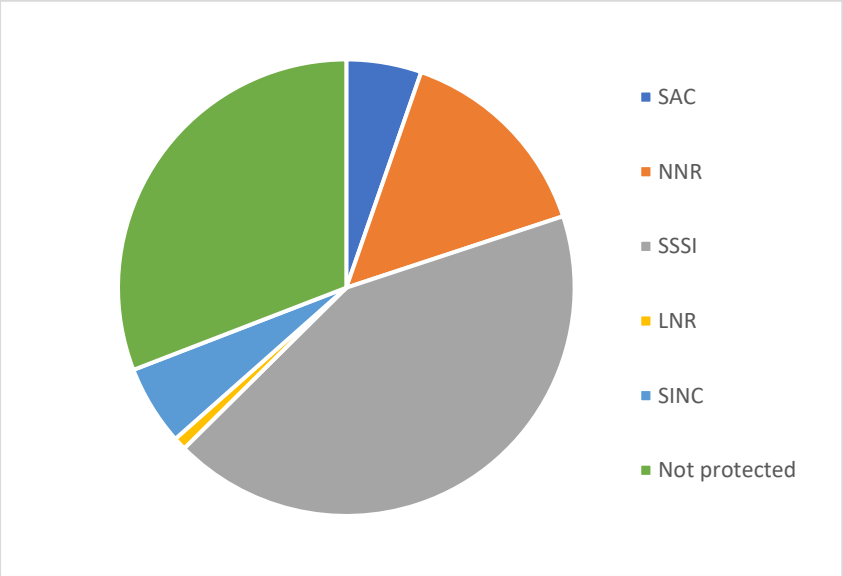


Habitats patterns: Fieldfares are recorded across much of Gwent. However, they favour lowland fields, berry-bearing hedgerows/hillsides and orchards.

Population trends: There seems to be no concern regarding wintering Fieldfare population levels in the UK (although the already low breeding numbers have fallen). There is similarly not currently any apparent concern in Gwent, although climate change may bring about changes in Fieldfare numbers in the future. Conservation efforts in Gwent can do little to directly influence this, but the habitat can be maintained in good condition for them, with hedgerows and their berry-bearing shrubs retained, berry-bearing shrubs included in the mix of new planting schemes, and orchards preserved and enhanced.

Protection: 69% of records come from protected sites, with high numbers of records from the following. SAC records come from the erroneous records in the Severn Estuary, Usk Bat SAC and a few from Aberbargoed Grasslands and along the River Usk. NNR records are from Newport Wetlands. SSSI records are from the Gwent Levels, Llandegfedd Reservoir, Nedern Brook and the Blorenge. LNR records are from Garn Lakes, Park Bryn Bach, Beaufort Ponds and others. SINC records are widely scattered across numerous sites, including Parc Cwm Darren, Treowen, Rudry Common and Lasgarn Woods.

Fieldfare records from protected sites



Northern Lapwing *Vanellus vanellus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981 as amended)

Conservation status: Red (UK[17] & Wales[16]) Wales. Section 7 Priority Species

Data availability: Good (2083 records – Breeding season only)

Context: A much loved bird due to its appearance, energetic display flight and evocative call, the lapwing was once familiar to most, with a whole host of local names. However, it is sadly a much scarcer sight now, particularly as a breeding species. Lapwings are both resident breeders and migrants, with their numbers being greatly swollen by birds from the continent in the winter (UK wintering population of 635,000).[21] When breeding, they are birds of open country, favouring farmland and wet grassland where they can have a good view of any approaching predators. In winter, the flocks can range wider and can often be found near the coast. Loss of habitat is thought to be the main driver for population decreases, with the change from spring- to autumn-sown crops and the drainage of wet grassland as part of agricultural 'improvement' the main issues.[26]

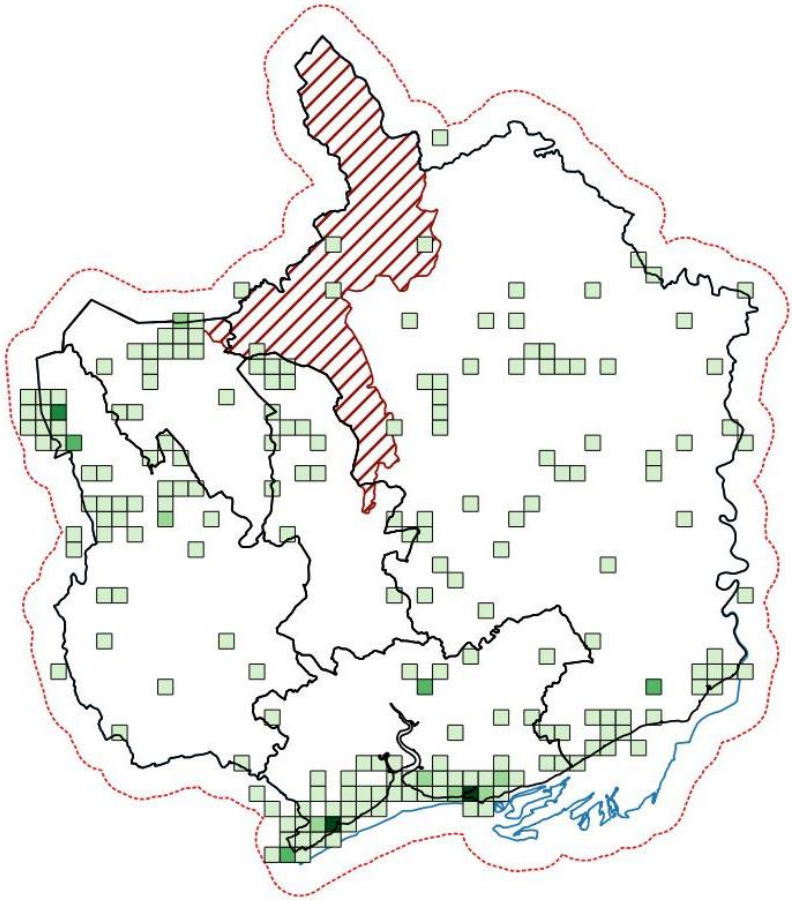
Outlook: The UK population was formerly widespread and abundant, including in Wales. While Lapwings are still widespread, their numbers are greatly reduced: the estimated UK breeding population in 2016 was 97,500 pairs.[21] Early declines were largely due to egg collecting for food, however, the Lapwing Act 1926 prohibited this and populations bounced back.[27] Since the 1940s farming practices have been the driver for population declines. The populations stabilised at a lower level in the 1960s, although there was a further sharp and sustained decline in the 1980s, including range contractions in SW England and parts of Wales.[27] As before, this was driven by changes in farm practices and intensification. The losses were greatest in southern England and Wales.[27] There were longer term declines of 63% (Farmland) and 56% (Wet Grassland) between 1975 and 2017 (described as 'weak decline'). However, in 2012–2017 there was a 5% increase (Farmland), noted as 'little change', and an 8% 'weak decline' (Wet Grassland).[3] The more recent BTO Breeding Bird Survey corroborates this decline, with a 43% decline (1995–2018), 33% decline (2008–18) and 4% decline (2018–19).[4] Lapwing populations are still declining in large parts of the UK, and it would appear that agri-environmental schemes are perhaps their best chance of a change in fortunes.

Greater Gwent range: Lapwings are described as 'breeds in moderate but decreasing numbers, over a sizeable but rapidly contracting range. A passage migrant and winter visitor in substantial numbers' in The Birds of Gwent.[6] The Gwent Bird Atlas in 1987 gave an estimation of 1,000 pairs. [28] However, 1993 survey work showed there to be between 167–185 pairs, with the largest colony at Waun-y-pound, Ebbw Vale hosting 50–55 pairs (this whole colony was lost to development in 1996).[6] In the early part of the twenty-first century the RSPB ran the 'Heads of the Valleys Lapwing Project', with the reclaimed coal spoil areas providing good nesting habitat, and 10% of the Welsh population (60 pairs) believed to be utilising the area.[29] In 2003, breeding population estimates were considered to be at the lower end of 220–500 pairs, which is thought to indicate a reversal of declines, substantially

attributable to the success of Newport Wetlands.[6] However, if there was a reversal of fortunes, it was short lived: numbers are currently significantly lower, and the Heads of Valleys population virtually gone, while another good site at Ben Ward's fields has been largely lost to roadworks. The Gwent Bird Report 2018 indicates that the population is still declining, with the only confirmed breeding being at Newport Wetlands (although there were a small number of other unconfirmed sites).[7] Analysis of Lapwing records at Newport Wetlands,[30] which is far and away the most significant site now left in Gwent over the last 20 years, make interesting reading. Numbers started at 8 pairs in 2000 and rapidly increased to a peak of 57 pairs in 2004. Since then, there was a decline to a low of 15 pairs in 2018 (up to 23 pairs in 2019). The productivity (number of chicks fledged) is particularly noteworthy, with numbers generally very low; the highest was 24 fledged in 2014 (when interestingly the number of pairs was only 22), this contrasts with 2005, when only 5 fledged from 55 pairs. Numbers of chick fledged has fluctuated but it has been worryingly low since the highpoint of 2014, with only 0,8,0,1 & 1 fledged in the five years from 2015 to 2019. Predation would seem to be the main cause of the low productivity at Newport Wetlands, despite the predator deterrent/exclusion measures there.

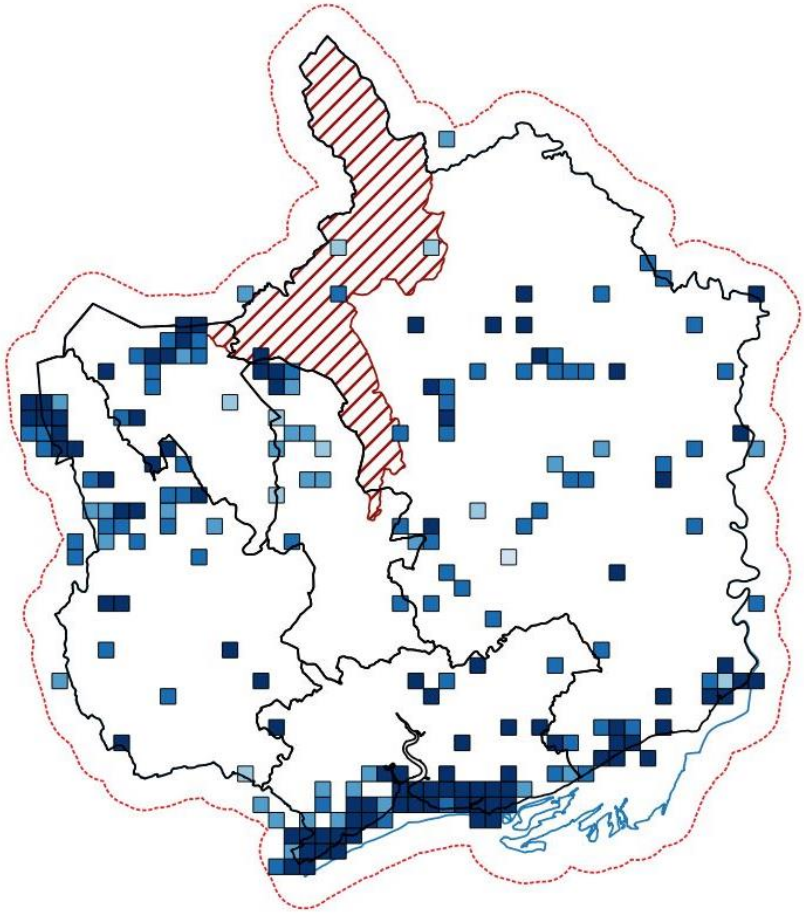
Maps show records within the breeding season – (March-September) to distinguish the resident breeding population from the larger wintering population. Recording hotspots are at Newport Wetlands, Peterstone Wentloog, Fochriw and Rhaslas Pond. Note the patterns of loss shown by historic record: shrinking patches at the Heads of the Valleys, Fochriw and the Blorenge, and on the western Levels. Loss of scattered records in Torfaen.

Density of Breeding Lapwing records, maximum ≥100 records/km^2 (true maximum 582/km^2)



,

Breeding Lapwing records by decade

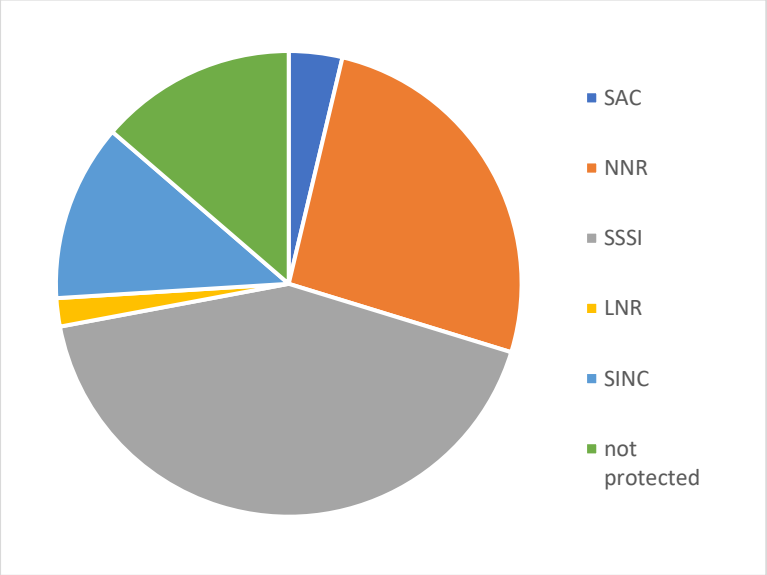


Habitats patterns: There is a definite correlation between the flat, open grassland of the Gwent Levels and areas of reclaimed coal spoil in the north-west of Greater Gwent. There is also a concentration of records at or near the coast, as this is where wintering Lapwing tend to concentrate, particularly during periods of harsher weather.

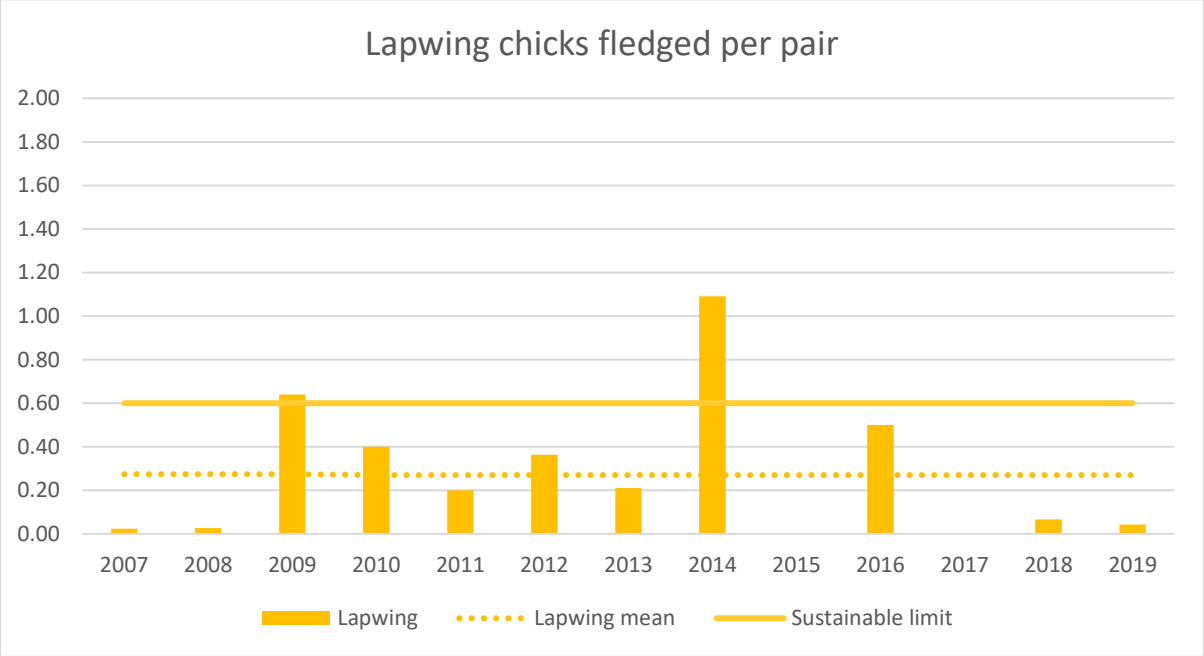
Population trends: Lapwings continue to decline in the UK, with more westerly areas hardest hit. This includes Wales and is apparent in the Gwent population, which continues to decline. The Heads of the Valley population has virtually gone and the Newport Wetlands is the only reliable site; even there, numbers are down on what they were 10–15 years ago. Since 2007 the productivity (chicks per pair) has been below the sustainable level (0.6 chicks/pair) in every year bar two (2009 and 2014), the average productivity being <0.3.[30] This does not bode well for the long-term survival of the Lapwing unless productivity can be remedied at Newport Wetlands and agri-environmental schemes devised to help Lapwings in the wider farmland of Gwent.

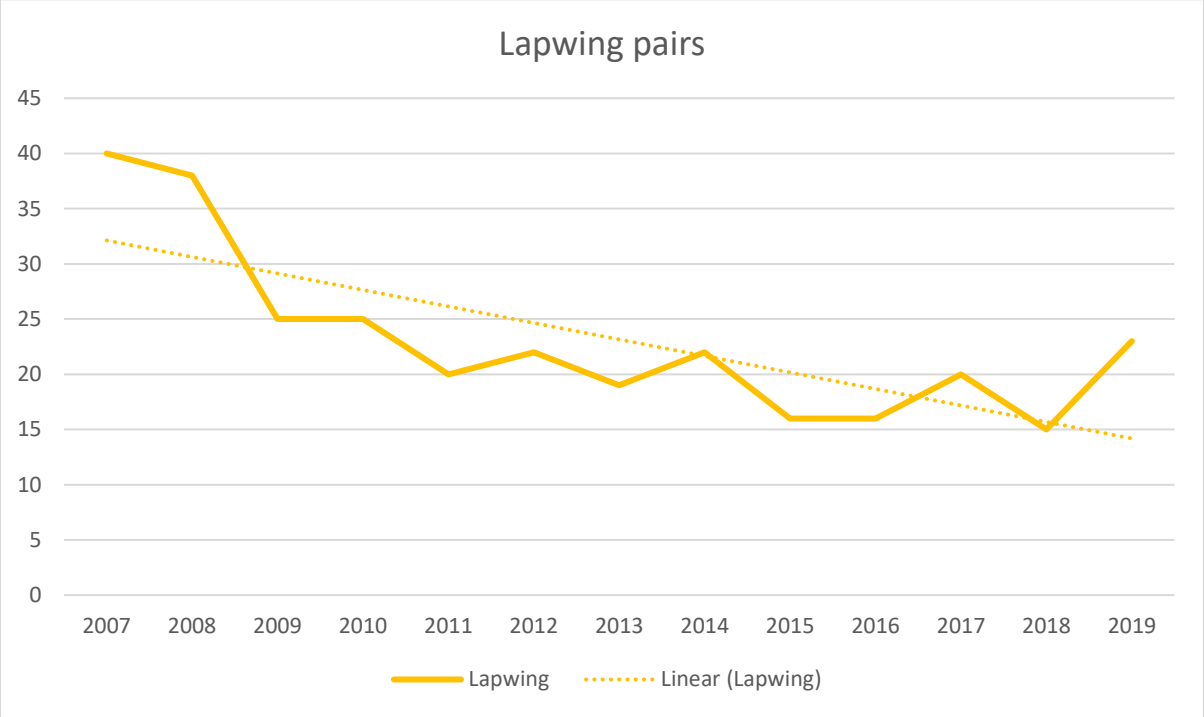
Protection: 86% of records come from protected sites, with high numbers of records from the Gwent Levels and particularly Newport Wetlands. The northern populations are often on SINCs, for example, Garnlydan, Cefn Gelligaer and Garn Lakes.

Breeding Lapwing records from protected sites



Specific surveys: The following shows Lapwing populations at Newport Wetlands, taken from data kindly provided by Natural Resources Wales:[30]





Tree Sparrow *Passer montanus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981 as amended)

Conservation status: Red (UK[17] & Wales[16]) Wales Section 7 Priority Species

Data availability: Poor (219 records)

Context: A resident bird that is also recorded as a passage migrant, the Tree Sparrow is a 'farmland' bird' and, unlike its cousin the House Sparrow, is not associated with human habitation. It was once widespread throughout the UK, but populations are now much patchier; while some localised populations are doing well, the Tree Sparrow is now largely absent from large areas.[31] The Tree Sparrow relies on invertebrate prey to feed its young during the breeding season, but feeds on seeds, preferring smaller 'weed' seeds to larger cereal grains, in winter.[32] They are loosely colonial, forming small aggregations in the breeding season and larger flocks in the winter.[32] Tree Sparrows are a hole-nesting species, so require trees that provide these opportunities. Their specific requirements both during the breeding season and over winter make them vulnerable to adverse changes in the countryside, and they have suffered huge declines, with a hugely alarming 95% decline between 1970 and 1998.[31] It is thought the decline is due to agricultural intensification, involving increased use of herbicides and a move towards autumn-sown crops.[31] This has resulted in a reduction in invertebrates for nestlings and seed availability over the winter.

Outlook: The UK population was formerly widespread, including in Wales. As mentioned, their numbers have declined hugely, as has their distribution. The best populations are now found across the Midlands, Southern and Eastern England; [33] they are almost absent from the South West, Wales and the North West.[33] The estimated UK breeding population in 2016 was 245,000 pairs.[21] There are longer term reductions of 90% between 1975–2017 (described as 'strong decline'). However, more recently there has been 'little change', with a small 4% decline from 2012–2017.[3] The previously quoted 95% decline between 1970 and 1998 corroborates this decline. The more recent BTO Breeding Bird Survey,[4] however, shows signs of recovery and some optimism, with an increase of 117% between 1995–2018, although it must be remembered that these more recent increases are from a very low level and numbers do not approach those of pre-1970 populations. So, while the Tree Sparrow is still at a low, there are signs of improvement brought about by increased understanding of its habitat requirements and specific conservation initiatives.

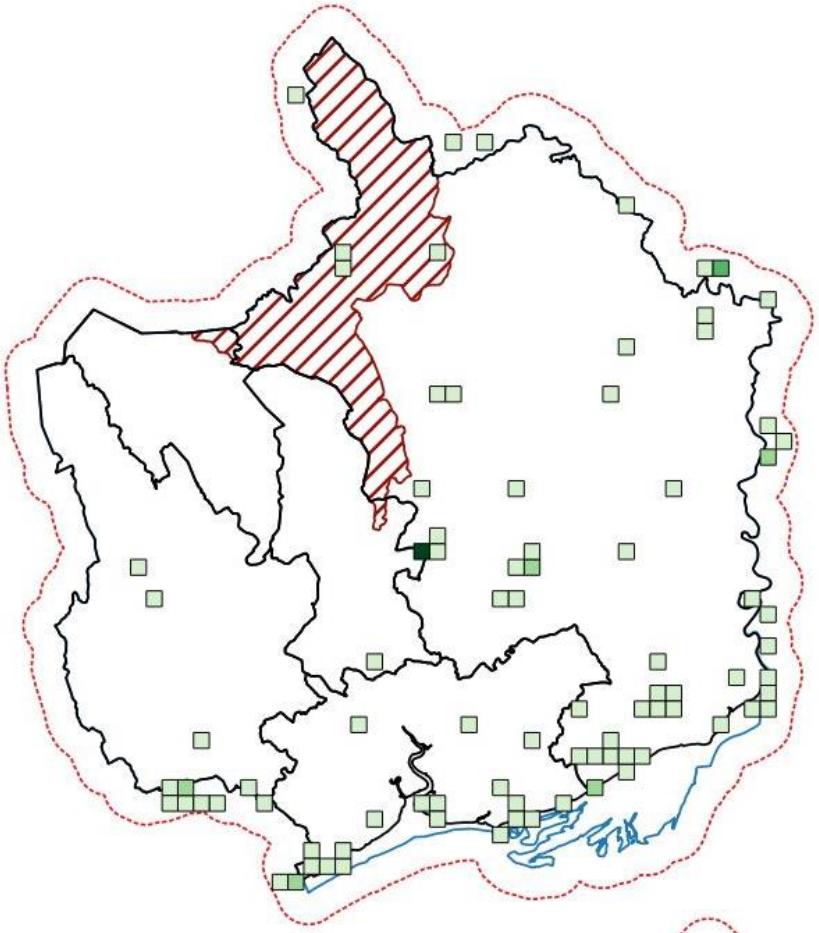
Greater Gwent range: As a breeding species, Tree Sparrows are just about extinct in Greater Gwent, with two pairs in 2013,[34] a single unsuccessful pair in 2015,[35] and a single pair that didn't breed in 2017[7] from Porton on the Gwent Levels. With ten pairs nesting there in 2006,[6] nest boxes were provided to aid this population, but these numbers have since fallen away.

It would appear that Tree Sparrows have historically fluctuated, with the 1937 Birds of Monmouthshire describing it as a 'very local resident' but the 1977 Birds of Gwent describing it as 'fairly common in all areas apart from the industrial valleys' with flocks of 30 often and up to 80 birds

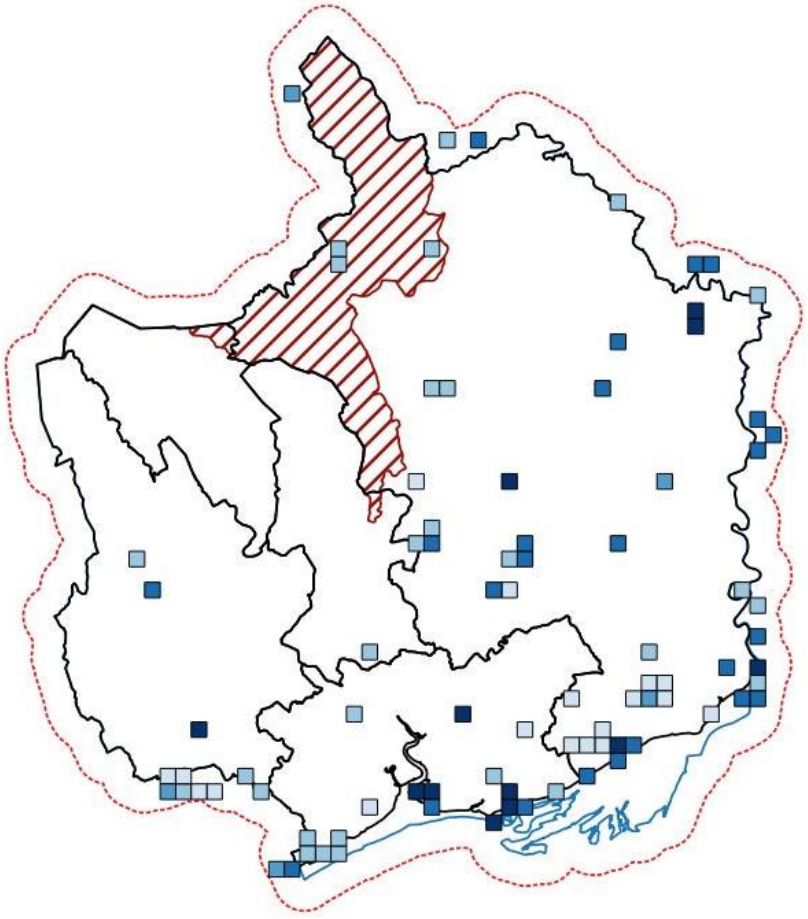
encountered.[6] Throughout all of this, the Gwent Levels and Usk floodplain have been noted to be strongholds, with pollarded willows and old orchards being important nest sites. Pollarding of willows has however much declined, and many orchards have been lost, making nest boxes a more important resource. Several nest-box schemes were established at places such as Llandegfedd Reservoir, Raglan, Porton and New Inn. The New Inn population fledged 189 young in 1981,[6] but only the Porton population has shown any activity (albeit very limited) in recent years.

Concentrations of records are at Llandegfedd, Chepstow and Gwent Levels, although the Llandegfedd records are mostly in the 1980s, with one in 2006. The most recent records are from the Gwent Levels.

Distribution of Tree Sparrow records across Greater Gwent (max 21 records/km^2)



Tree Sparrow records by decade

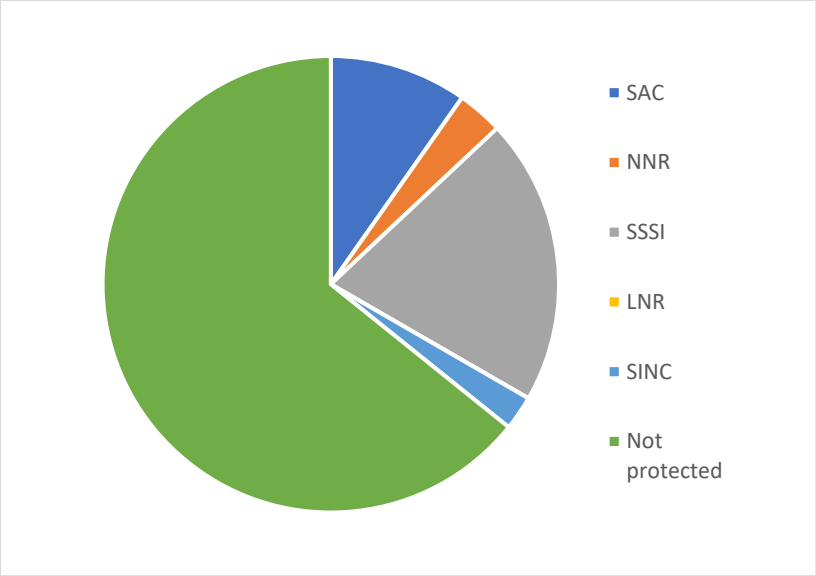


Habitats patterns: Linked to the Gwent Levels and along the two main watercourses of the River Usk and River Wye, showing a preference for being reasonably close to wetland habitats, likely because insects that are associated with wetlands are an important part of their diet during the breeding season.

Population trends: The decline in population to near extinction in Gwent has been documented previously; UK populations also fell greatly. However, despite populations being low, there have been signs of recovery more recently. It remains to be seen if the Gwent population can be saved; doing so would need lessons to be learned from successful schemes in other parts of the UK, suitable funding, committed individuals and buy-in from landowners to ensure habitat requirements are suitable all year round.

Protection: 36% of records come from protected sites, with high numbers of records coming from the Levels (spilling into the estuary) and historic records from Llandegfedd SSSI.

Tree Sparrow records from protected sites



Turtle Dove *Streptopelia turtur* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act 1981 (as amended)

Conservation status: VULNERABLE (Global)[36]

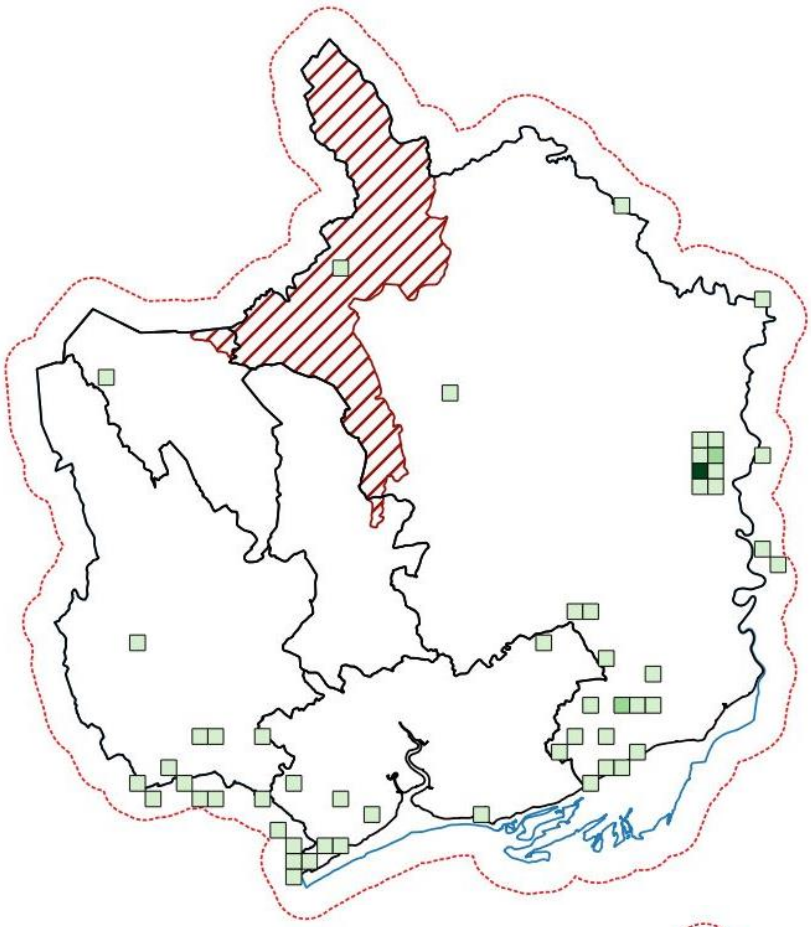
Red (UK[17] & Wales[16]) Wales Section 7 Priority Species

Data availability: Poor (163 records)

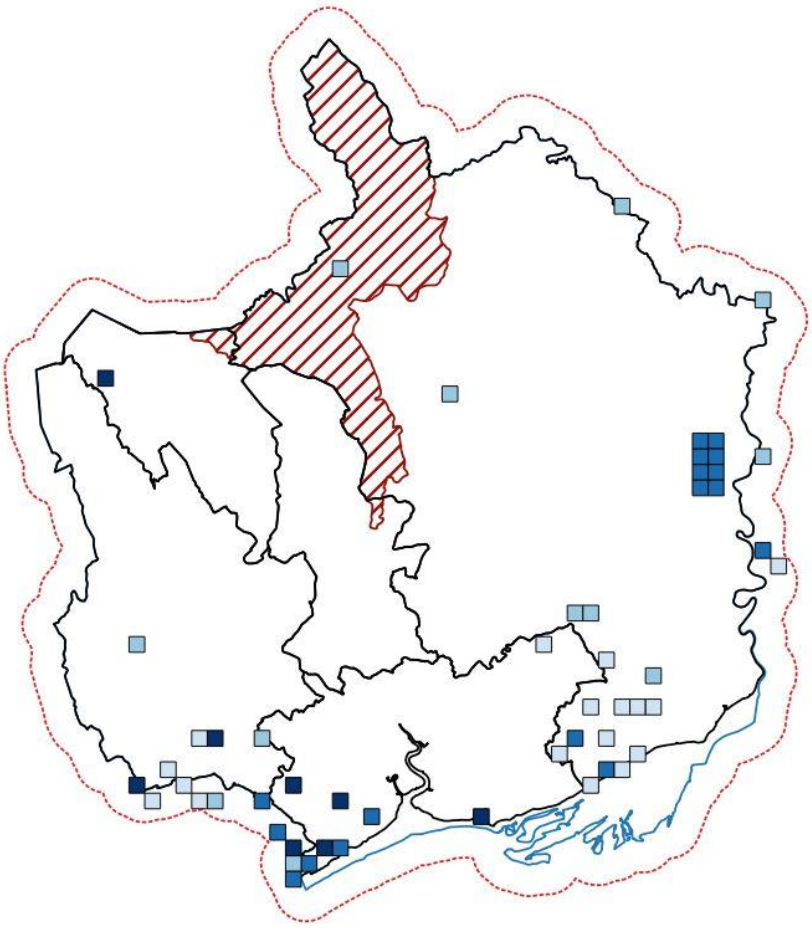
Context: A migrant bird that is a summer visitor to the UK, the Turtle Dove spends its winter in sub-Saharan Africa.[6] This means that the Turtle Dove is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source, all of which are impacted by climate change.[18] Further drivers of the Turtle Doves decline include the changes in farming practices that have negatively impacted many of our farmland birds, habitat loss on their African wintering grounds, high levels of hunting along the migration route (most notably Malta) and trichomoniasis disease.[37] The combination of these factors mean that the Turtle Dove is the UK's fastest declining bird species,[37] with a shocking 94% population decline in the UK since 1995 and extinction (which has already happened in Wales) a real possibility. It is considered that habitat loss and the associated food shortages on their breeding grounds in the UK is the most damaging factor.[37] The Turtle Doves problems are exacerbated by their being obligate granivores, meaning that they only eat seeds; the loss of 'weed' seeds in our countryside means greatly reduced breeding success.

Outlook: The UK population was formerly widespread across much of England and, although scarce in much of Wales, it was once more abundant in the lowland border counties.[6] They are now confined to a few counties in SE England, with Kent and Sussex being the stronghold. There are thought to be just 1,000 pairs left.[38] There are longer term reductions of 98% between 1975–2017 (described as 'strong decline'), with a less severe but still 'strong decline' of 51% from 2012–2017.[3] The BTO's Breeding Bird Survey[4] corroborates this, recording a decline of 95% between 1995–2018. Various conservation organisations (such as Operation Turtle Dove[39]) are working to slow and reverse the decline, and some success stories; for example, there were 16 singing males on the Knepp Estate in 2017 compared to 3 in 2009.[40]

Greater Gwent range: As a breeding species, Turtle Doves are extinct within Gwent (as they are across the whole of Wales). In 1963 the Birds of Monmouthshire described Turtle Doves as 'regular summer visitors', although breeding areas were restricted to central eastern districts, as Gwent was at the edge of their range.[6] There were suggestions even then that numbers were declining, although this was little evident throughout the rest of the 1960s.[6] However, during the 1970s the Gwent population certainly did decline, with confirmed breeding becoming sporadic and populations shrinking until the population was confined to an area centred on Trelleck and Cleddon Bog by the mid 1990s.[6] Birds could still be found in this locality until 2005, but breeding was last confirmed in 1997. This is reflected in the hotspot at Trellech, with a smaller one at Caerwent. There are only nine records from the last decade – the most recent in 2016. Most of the more recent records are for single birds, mostly on the eastern Levels/Rhymney.



Distribution of Turtle Dove records across Greater Gwent (max 41 records/km^2)

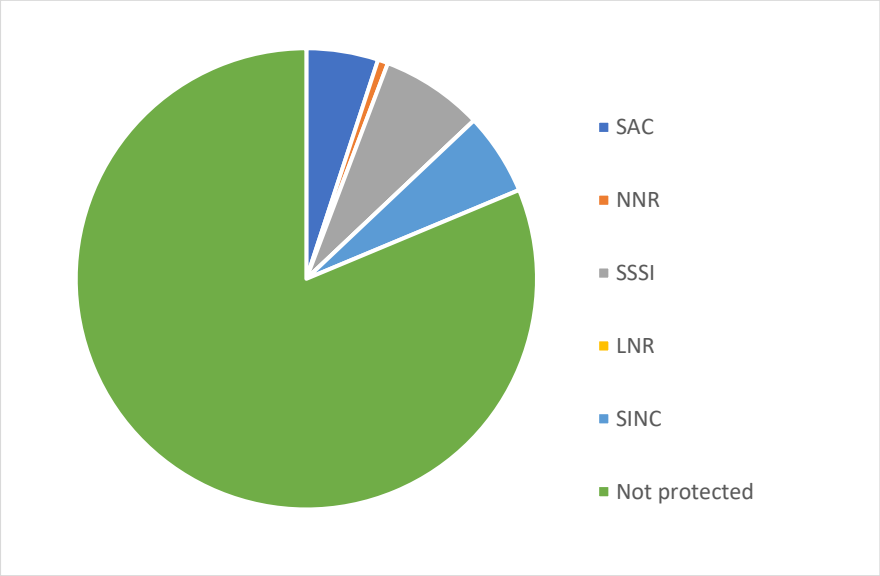


Turtle Dove records by decade

Population trends: The decline in population to extinction in Gwent and Wales has been documented. With the population continuing to fall in the UK, the chances of Gwent being repopulated are slim, particularly with so few migrating birds being recorded. Our best hope is to try to manage our farmland for the suite of farmland birds that we still have and hope that Turtle Doves return one day. If they were to return, then efforts should be made to further enhance their favoured areas, learning from lessons learnt in other parts of the UK.

Protection: Most of the records are from areas that are outside of protection. Those that are from protected areas are from the Gwent Levels SSSIs (including a few that are mis-recorded and end up in the estuary SAC). It should be noted that the area where their population held on longest, Cleddon Bog, is a SSSI, and the adjacent Trellech area has a strong network of SINCs, including Broad Meend and Beacon Hill.

Turtle Dove records from protected sites



References

1. https://www.barnowltrust.org.uk/barn-owl-facts/juvenile-dispersal-barn-owls/
2. https://www.bto.org/our-science/projects/project-owl/learn-about-owls/barn-owl
3. DEFRA. 2019. Wild Bird Populations in the UK 1970–2018, 40.
4. https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf
5. Clarke RM. 2021. Pers Comm.
6. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 223–225.
7. Gwent Bird Report 2018.
8. Blaker GB. 1934. The Barn Owl in England and Wales. RSPB, London.
9. Humphreys PN. 1963. The Birds of Monmouthshire. Newport Museum.
10. Gwent Bird Report 1981.
11. Gwent Bird Report 1976.
12. Gwent Bird Report 1985.
13. Shawyer C. 1987. The Barn Owl in the British Isles: Its Past, Present and Future. Hawk Trust, London.
14. https://www.barnowltrust.org.uk/barn-owl-facts/current-uk-barn-owl-population/
15. https://www.monmouthshire.gov.uk/app/uploads/2015/07/H4-LDP-Barn-Conversion-SPG-April-2015.pdf
16. Johnstone I and Bladwell S. 2016. Birds of Conservation Concern in Wales 3: The Population Status of Birds in Wales. Birds in Wales 13:1, 3–31.
17. Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. 2015. Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108: 708–746.
18. Pearce-Higgins JW and Crick HQP. 2019. One-Third of English Breeding Bird Species Show Evidence of Population Responses to Climatic Variables Over 50 Years. Bird Study 66:2, 159–172, DOI: 10.1080/00063657.2019.1630360
19. https://www.bto.org/our-science/projects/gbw/gardens-wildlife/garden-birds/a-z-garden-birds/fieldfare
20. Robinson R.A. 2005. *BirdFacts: Profiles of birds occurring in Britain & Ireland*. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 2/3 /2021).
21. https://www.bto.org/sites/default/files/publications/apep4-population-estimates-birds-great-britain-uk-2020.pdf
22. https://rbbp.org.uk/explore-reports/
23. Holloway, S. 1996. The Historical Atlas of Breeding Birds in Britain and Ireland: 1875–1900. Poyser, London.
24. BirdLife International. 2021. Species factsheet: *Turdus pilaris*. http://www.birdlife.org (accessed 2/3/2021).
25. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 117.
26. https://www.bto.org/understanding-birds/species-focus/lapwing
27. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/lapwing/population-trends/
28. Tyler S, Lewis J, Venables A and Walton J. 1987. The Gwent Atlas of Breeding Birds.
29. https://www.rspb.org.uk/our-work/conservation/projects/heads-of-the-valleys-lapwing-project/
30. Survey information provided by Natural Resources Wales (July 2020).

31. https://www.birdguides.com/articles/back-from-the-brink--no-12
32. https://www.bto.org/our-science/projects/gbw/gardens-wildlife/garden-birds/a-z-garden-birds/tree-sparrow
33. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/tree-sparrow/
34. Gwent Bird Report 2014.
35. Gwent Bird Report 2016.
36. BirdLife International. 2019. Streptopelia turtur. The IUCN Red List of Threatened Species 2019: e.T22690419A154373407. https://dx.doi.org/10.2305/IUCN.UK.2019–3.RLTS.T22690419A154373407.en (accessed 17/7/ 2020).
37. https://www.operationturtledove.org/turtle-doves/what-is-a-turtle-dove/
38. https://www.theguardian.com/environment/2019/nov/07/turtle-dove-flies-towards-extinction-numbers-halve-uk
39. https://www.operationturtledove.org/turtle-doves/ecology-habitat-and-food/
40. https://knepp.co.uk/turtle-doves

Freshwater and wetland birds

Bittern *Botaurus stellaris* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act 1981 (Schedule 1)

Conservation status: UKBAP Priority, Wales Section 7 Priority Species, Amber (UK[1] & Wales[2]) recently downgraded from Red to Amber (UK list)

Data availability: Moderate (73 records)

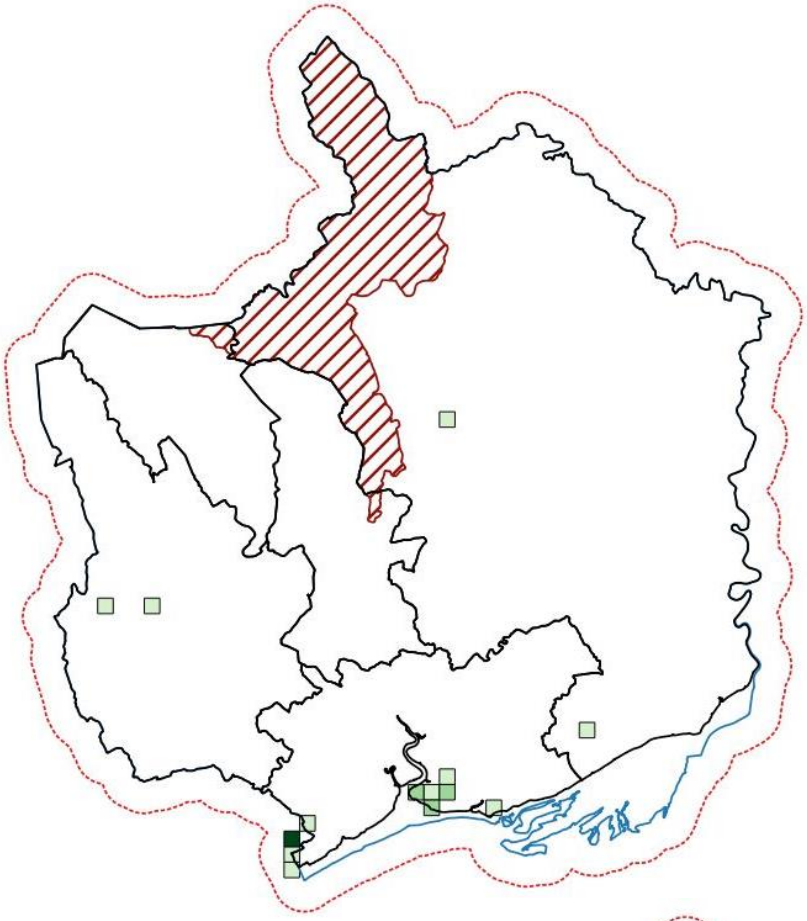
Context: A bird that, because of its very particular lifestyle, is confined to wetlands and more specifically reedbeds, where they have access to their diet of fish and are well camouflaged. It is quite rarely seen because it is so secretive and well hidden in its reedbed home. However, the booming call of males during the breeding season is distinctive and far carrying, so can reveal their presence. Bitterns are resident in the UK, where the population is boosted every winter by an influx of individuals from the continent. The Bittern was on the verge of extinction in the UK as recently as the 1990s but has made a pleasing comeback. The main threat to Bitterns is the loss of their very specific reedbed habitat. Historically, this was due to drainage of land for agriculture and water abstraction in the wider catchments that feed the reedbeds.[3] While water abstraction is still a potential threat, the main threats are currently neglect and lack of management allowing reedbeds to dry out and become unsuitable;[3] reedbeds are an early successional habitat that will eventually silt up and dry out to form woodland without intervention. As with all wildlife that relies on an aquatic environment, pollution incidents could have localised impacts as well.

Outlook: The UK population has a strong bias towards areas where there are large reedbeds; the vast majority are within England, with a more southerly and easterly bias, the real strongholds being the reedbeds of East Anglia and the Avalon marshes in Somerset. The numbers had reached such a level that there was a real threat of extinction in the 1990s. Since then targeted conservation work to create and maintain reedbeds in a suitable condition has seen a marked increase in breeding numbers, so that the Bittern has moved from the Red to the Amber List.[1] This recovery led to there being a breeding population estimate of 191 pairs in 2017 and a wintering population of 795.[4] Bitterns had not nested in Wales since 1984, until, after a gap of 32 years, they bred at Malltraeth Marshes on Anglesey.[5] It would seem the Bittern population has been saved by a greater understanding of its habitat requirements, concerted conservation efforts and many of the most important sites being within protected nature reserves. The Bittern looks secure, and it seems its population will expand further.

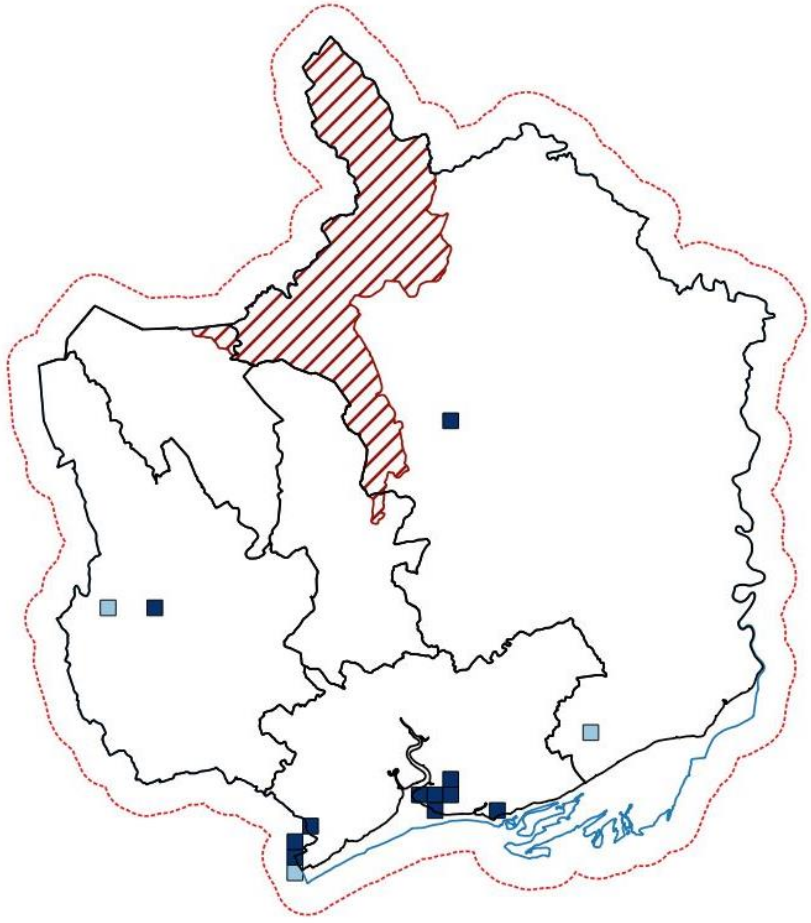
Greater Gwent range: The Bittern is described as 'a very rare winter visitor: regular at one site since 2002' in The Birds of Gwent.[6] This status has since improved, with records being more frequent, probably because of the general increase in the UK population and occasional winter influxes. The one regular site mentioned above is Newport Wetlands, where the Bittern has remained a regular site ever since, a 'booming' male in 2015 was the first record of a territorial Bittern in Gwent in modern times;[7] a pair were noted and considered a breeding pair in 2017,[8] culminating in two pairs proved to be

breeding in 2020 – the first time Bitterns have been proved to have bred in South Wales for 200 years.[9] The hotspot on the below map is Hendre Lake, just outside Greater Gwent. The majority of the other records are all from the Gwent Levels. The outlier ones are old records (1970 and 1985) from Nelson Bog and Magor (1985) and more recent ones from the River Rhymney at Ystrad Mynach (2012) and Llanfair Kilgeddin (2016). Apart from one record in 1985, the Gwent Levels records start from 2009, so reflect a relatively recent coloniser.

Distribution of Bittern records across Greater Gwent (maximum 27 record/km^2)



Bittern Records by decade

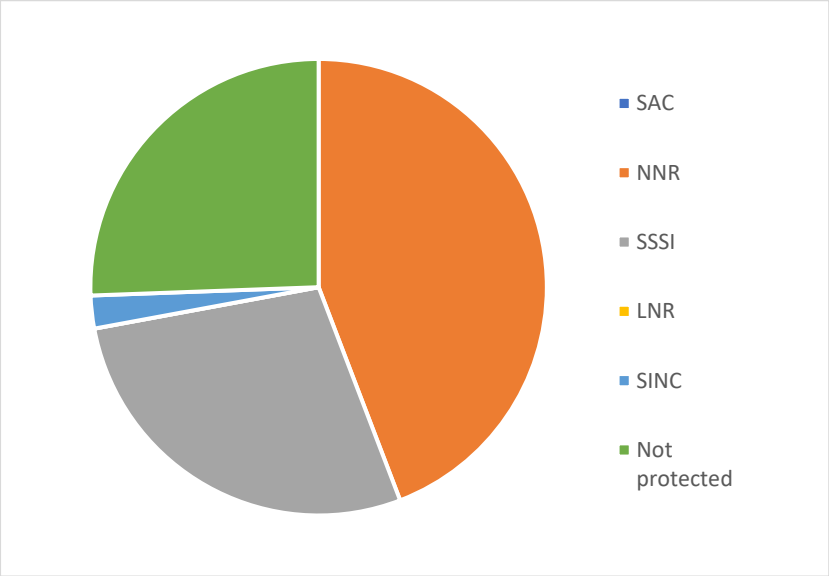


Habitats patterns: The Bittern is very strongly associated with reedbeds, and it is little surprise that the extensive, relatively recently created reedbeds at Newport Wetlands should now be a regular site for them, culminating in breeding in 2020.

Population trends: Things currently look positive for Bitterns in Gwent, with records increasing and the first breeding records for 200 years in 2020. There is no reason to suppose this will not continue, provided appropriate management is funded at Newport Wetlands. Numbers will however be limited, as it is likely that Newport Wetlands represents the only suitably large reedbed in Gwent.

Protection: Most records are from protected sites as the Gwent Levels and particularly the NNR at Newport Wetlands is the focal point for Bitterns in Gwent.

Bittern records from protected sites



Cetti's Warbler *Cettia cetti* (Temminck, 1820)

Andy Karran

Protection: Wildlife & Countryside Act (1981) (Schedule 1)

Conservation status: Green (UK[1] & Wales[2])

Data availability: Good (2228 records)

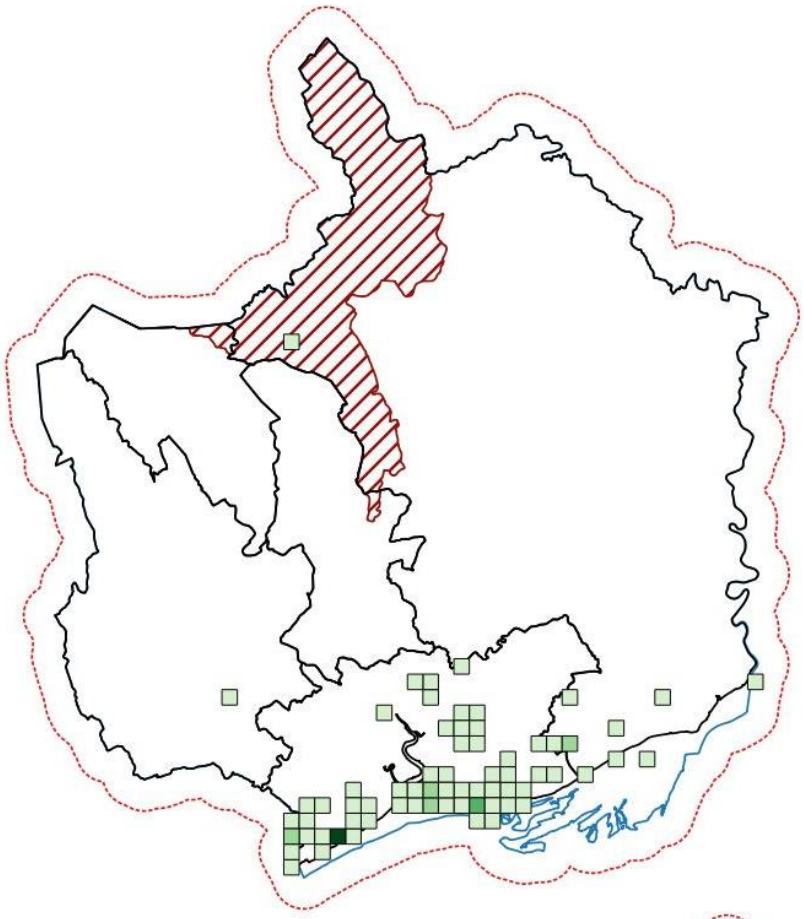
Context: Along with the Dartford Warbler, the Cetti's Warbler is the only UK warbler that is not migratory, staying with us all year round. They are a secretive species, rarely seen, as they favour the cover of thick Bramble & Willow scrub, as well as reedbeds. Despite their secretive nature, they are quite often recorded as they give away their presence with a distinctive and astonishingly loud song. Cetti's Warblers are a success story, with a population that has increased and expanded rapidly over the last 60 years. They could still, however, be vulnerable to localised scrub clearance, and are susceptible to cold winters. Cetti's Warblers are of least conservation concern in the UK but are fully protected on Schedule 1 of the Wildlife & Countryside Act as population numbers were still low when this legislation was enacted. Interestingly 'Cetti's Warbler is unique amongst British birds in having only ten tail feathers, and in laying bright red eggs'.[10]

Outlook: Cetti's Warblers were not recorded in the UK until 1961. Since then, the population has increased greatly, with breeding first proved in 1972. They have a generally southern bias to their population within the UK. The UK breeding population is quoted as being 3,450 singing males in 2016.[10] There was a long-term increase of 693% between 1975 and 2017 (described as 'strong increase'), with a lesser but still 'strong increase' of 47% from 2012 to 2017.[11] The BTO Breeding Bird Survey[12] corroborates this, showing an increase of 417% between 1995 and 2018. There is potential for the Cetti's Warbler to spread even further north in the UK in response to milder winters, although suitable habitat may limit increases, and harsh winters may check populations.

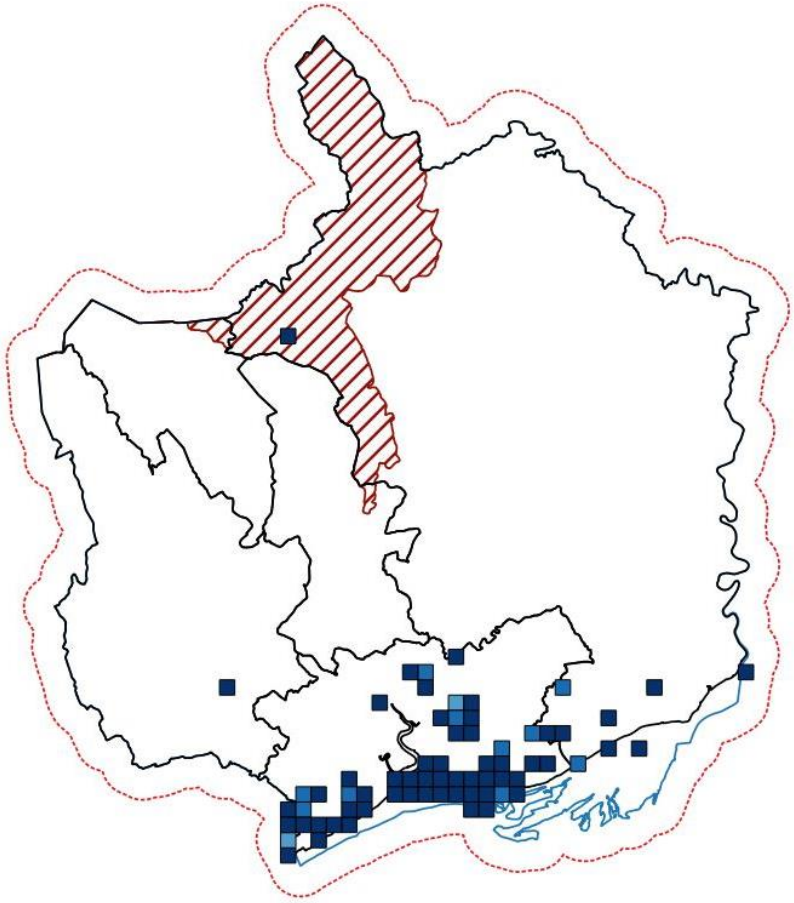
Greater Gwent range: Cetti's Warbler are described as being 'an uncommon resident' in The Birds of Gwent.[13] This status has changed in the years since it was published, and, while not common and widespread, the Cetti's Warbler could certainly be said to be locally common in suitable habitat, which is primarily the Gwent Levels. It is described in the Gwent Bird report 2018 as an 'uncommon breeding resident though with recent range expansion'.[8]

It was only first recorded in Gwent in 1988, on the Levels, and numbers recorded increased noticeably from 1994.[13] Breeding was first conclusively proved in 2001,[13] and numbers have increased significantly since then, with Newport Wetlands Reserve remaining the prime site throughout, although they can now be found across much of the Levels. Numbers were checked by the 'Beast from the East' in 2018 (pairs dropped from 64 in 2017 to 43 in 2018);[8] they will bounce back if such weather events are not regular. Across the Gwent Levels, high concentrations can be found at Peterstone Gout, as well as the Newport Wetlands. This is partly due to recorder effort at these two well known 'birding' sites, although Newport Wetlands is undoubtedly the prime site due to its size and ideal habitat.

Distribution of Cetti's Warbler records across Greater Gwent (maximum 632 records/km²)



Cetti's Warbler records by decade

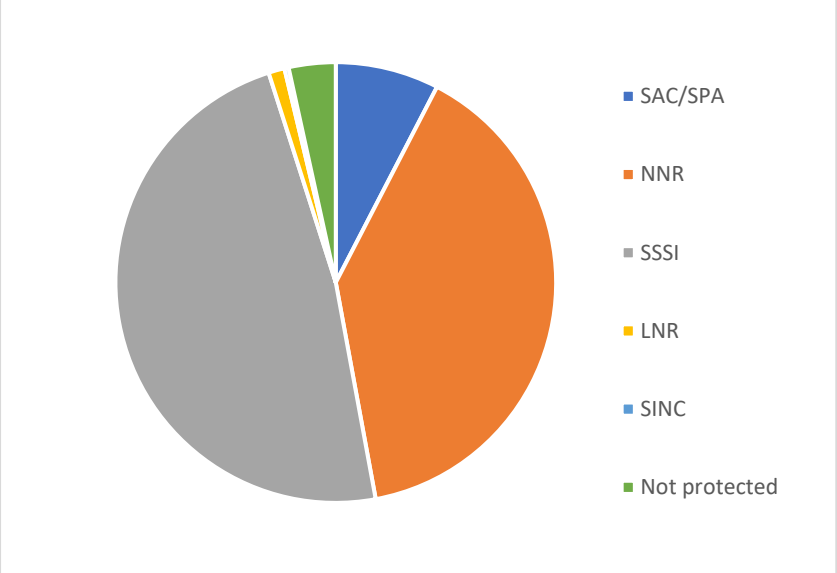


Habitats patterns: Very closely linked to an abundance of their preferred scrubby/reedbed wetland habitat, which abounds on the Gwent Levels and particularly at Newport Wetlands.

Population trends: The colonisation of Gwent and subsequent expansion and increase in numbers has been documented previously. With the UK population continuing to increase, it seems likely that the population will continue to thrive in Gwent, with perhaps an expansion of their range and potentially more records and breeding pairs away from the Gwent Levels stronghold. The only likely check to populations is extreme cold winter weather events.

Protection: As would be expected with a bird whose population is heavily associated with the highly protected Gwent Levels, the majority of records are from within protected sites, the NNR being Newport Wetlands and SSSIs largely being those on the Levels. The SAC/SPA records are likely to be record 'slippage', when records are centred or mis-recorded and they end up in the estuary.

Cetti's Warbler records from protected sites



Dipper *Cinclus cinclus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981)

Conservation status: Amber (UK[1] & Wales[2])

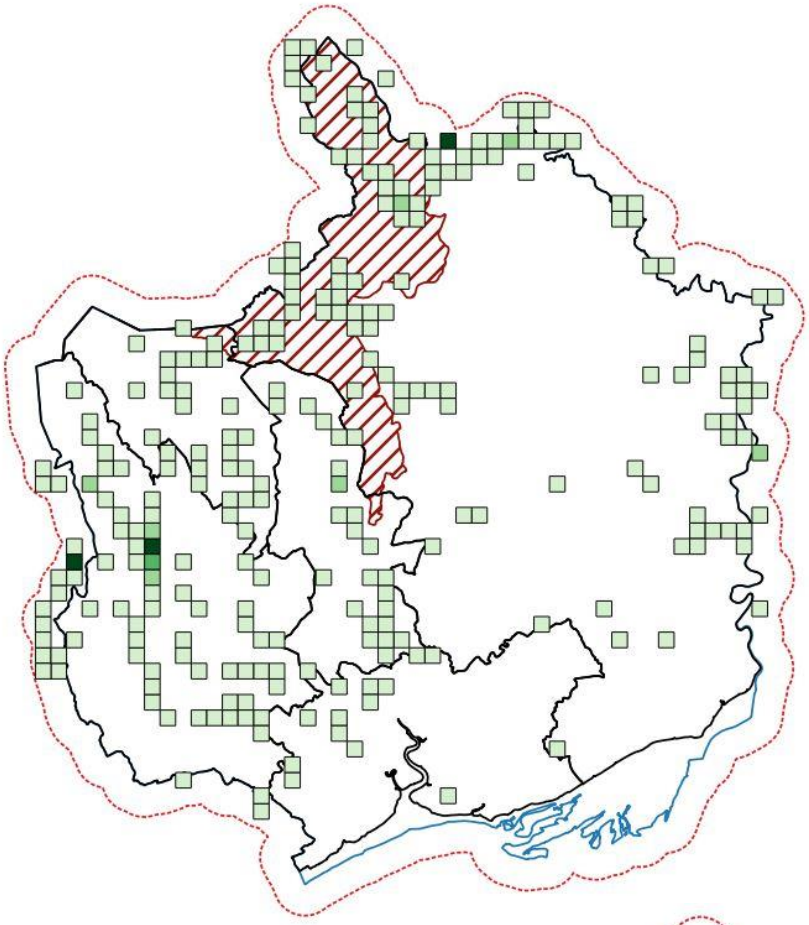
Data availability: Good (1,705 records)

Context: The Dipper is a bird that, because of its very particular lifestyle, is confined to our watercourses. It is resident and stays with us all year round, moving only relatively short distances (less than 2.5km) and generally staying within the same watershed, although post-breeding dispersal of juveniles (particularly females) can be over greater distances and between watersheds.[14] There are also some local movements in winter to more lowland rivers, particularly in relation to severe, cold weather, although frequent appearances in coastal regions appear to be confined to the past.[15] Dippers are vulnerable to declines in water quality and pollution incidents, which adversely affect the invertebrate fauna on which they rely for food and increase water turbidity, making it harder for them to locate their prey. Dippers were added to the UK Birds of Conservation Concern Amber List in 2015 due to a UK-wide 27% drop in breeding numbers over the preceding 25 years.[1] They were subsequently added to the Amber List in Wales in 2016 due to a 35% drop.[2] Feral Mink, pollution incidents, more unpredictable weather (including flooding) and loss of nest sites with bridge repairs are all possible reasons for population loss.

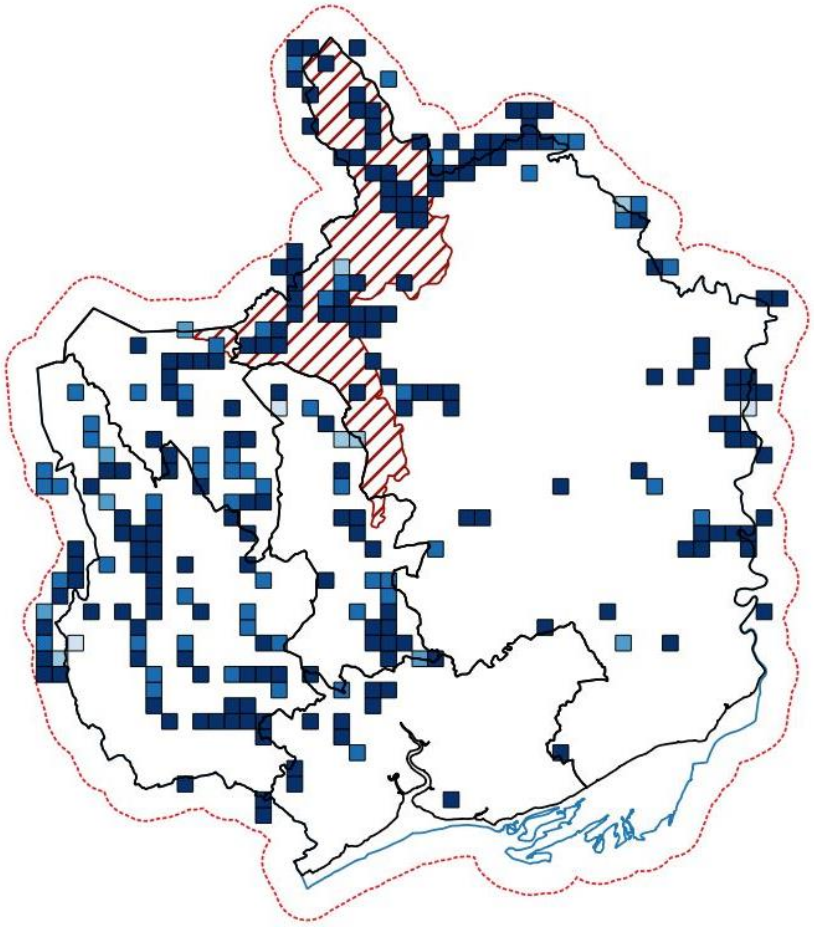
The Dipper has a particular significance amongst the avian fauna of Gwent, as it is the emblem of the Gwent Ornithological Society, whose newsletter is entitled 'The Dipper'.

Outlook: The UK population has a northerly and westerly bias in the UK, with a breeding population estimate of 6,900 to 20,500 pairs,[16] half of which are in Scotland. The numbers have fluctuated, remaining stable in many parts but with noticeable reductions in some parts, including West Wales. There was a longer-term reduction of 21% between 1975 and 2017 (described as 'little change'); shorter-term, more recent, data shows a 13% increase from 2012–2017 (described as 'weak increase').[11] The BTO Waterways Breeding Bird Survey (incorporated into the Breeding Bird Survey[16]) generally indicates a modest reduction in numbers between 1995 and 2018, albeit a less pronounced reduction in more recent years.

Greater Gwent range: The Dipper is described as 'a fairly common resident on suitable watercourses throughout the county' in The Birds of Gwent.[15] Mirroring the UK as a whole, Dippers are most numerous in the north and north-west of Gwent, this forms a strong correlation with the more upland areas, where there are the smaller, rocky, clear and well oxygenated watercourses they favour. There are also good numbers in the east on tributaries of the River Wye. Hotspots are at Parc Taf Bargoed and Bargoed Park (recording hotspots) and the Monnow (probably the result of centred records). Generally, they are on the Rhymney, Sirhowy, Ebbw Afon Lwyd, Honddu, upper parts of the Usk, Monnow, Trothy, Anghiddy and parts of the Wye, plus other minor tributaries.



Distribution of Dipper records across Greater Gwent (max 122/km^2)



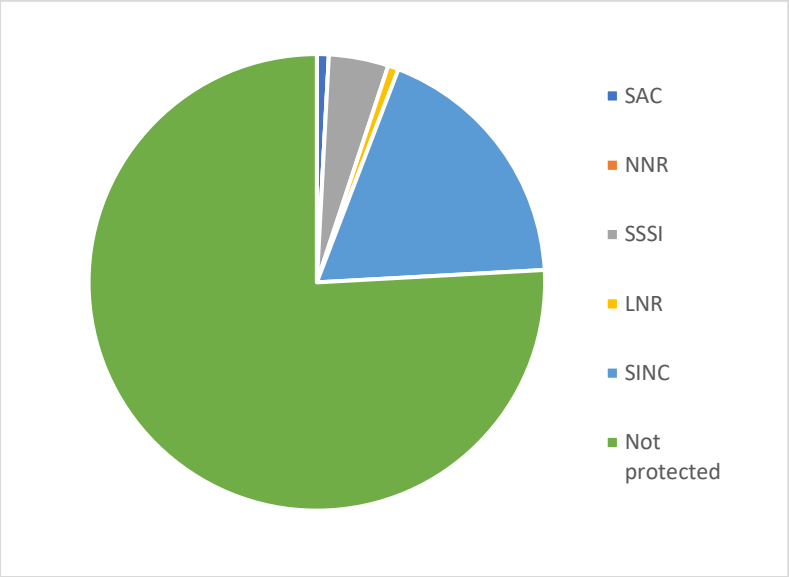
Dipper records by decade

Habitats patterns: Very much confined to watercourses, Dippers are now present on every significant watercourse in Gwent. There are very occasional records from still waterbodies.

Population trends: Currently things look reasonably good for Dippers: water pollution levels are much better than they were historically, and Dippers are well distributed on suitable watercourses within Gwent. If episodes of flooding and drought, causing greatly fluctuating water levels, become more common place, then this could have an adverse impact on Dipper populations.

Protection: While the below chart seems to show that much of the Dipper population is within habitat that has no level of protection, this is far from the truth. Both the River Wye and River Usk have the highest level of protection as SAC, and most of the watercourses within Gwent are covered by SINCs (notable exceptions being the Anghiddy and Honddu, which are good Dipper sites) but Dipper records may not actually appear within them because they are narrow linear habitats.

Dipper records from protected sites



Little Egret *Egretta garzetta* (Linnaeus, 1766)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Green (UK[1]), Green (Wales[2])

Data Availability: Good (4,494 records)

Context: Not long ago, the Little Egret was a rare and exciting visitor to the UK. However, the status of this small, white heron has changed radically in recent times. Despite now being a familiar sight, they still provide an element of exotic glamour to our avifauna. It is likely that Little Egret were present in the UK and a commoner bird across Europe before hunting, particularly for their plume feathers reduced the population greatly. After protection was brought in, Little Egrets spread northwards from southern Europe, with increasing numbers being recorded in the UK; significant numbers arrived in 1989, followed by breeding in Dorset in 1996.[17] The effects of climate change have also been postulated as possible reasons for the range expansion and colonisation of the UK.[18] Little Egrets are most abundant along the south and east coasts of England and in Wales, but they are spreading inland and northwards.[17] Little Egrets largely feed on small fish, but will also take amphibians and large insects.[19] The UK population has increased since their first colonisation and continues to grow, with an overall increase of 59% between 2013 and 2018.[11] The breeding population is boosted by an influx of birds from the continent in the autumn/winter.

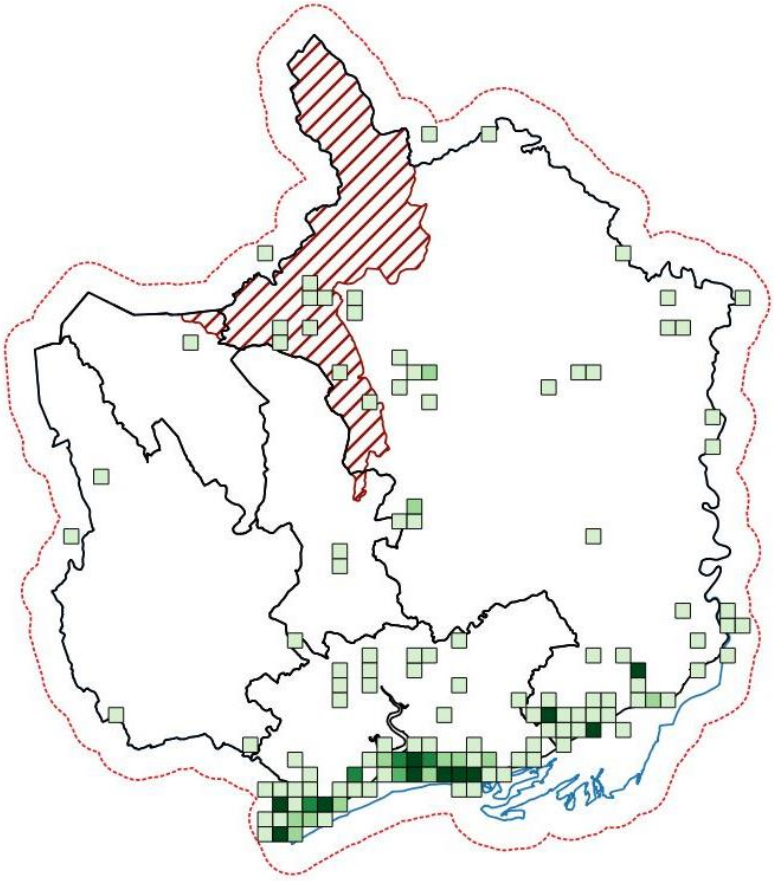
Outlook: As previously stated, the Little Egret was until recent times (1980s) a rare vagrant to the UK. A significant influx in 1989 led to breeding taking place in 1996; since then, the breeding and wintering populations have continued to grow and spread further north. The BTO Breeding Bird Survey,[12] corroborates this, noting a huge increase of 2,399% between 1995 and 2018, 64% between 2008 and 2018, and 10% in the single year 2018–2019. The estimated UK breeding population in 2012–2017 was 1,100 pairs.[4] In contrast to this relatively small but growing breeding population, the wintering population is quite a bit larger (11,500 in 2012/13–2016/17) and was subject to a 'strong increase' of 59% from 2013–2018.[12] The Wetland Bird Survey (WeBS) surveys[20] further corroborates these increases, noting a 39% increase in the UK as a whole and 59% in Wales from 2007/08 to 2017/18.

Greater Gwent range: The latest Gwent Bird Report (2018) records Little Egrets as 'uncommon away from the coast; rare breeding resident.'[8] There is no mention of Little Egrets in The Birds of Gwent in 1977[21] or the first The Gwent Atlas of Breeding Birds, which covers the period 1981–1985.[22] Little Egret are first mentioned in 2008's The Birds of Gwent, where it is described as 'uncommon throughout the year. Breeds at one location.'[23] The first record in Gwent was in fact in 1989,[23] as part of the first significant influx into the UK. The first breeding followed 12 years later, in 2001,[23] just 5 years behind the first UK breeding record. Reference to the 2016 Gwent Bird Report indicates that there were two breeding colonies in Gwent, both situated on the Gwent Levels, with the Magor Marsh colony being newly established.[7] By the time of the 2018 Gwent Bird Report, it is interesting to note that the Magor Marsh colony had expanded to the cost of the other Gwent Levels colony at Whitson Court, which had been abandoned.[8] There are also significant roost sites, with 42 being a peak count at the Magor Marsh

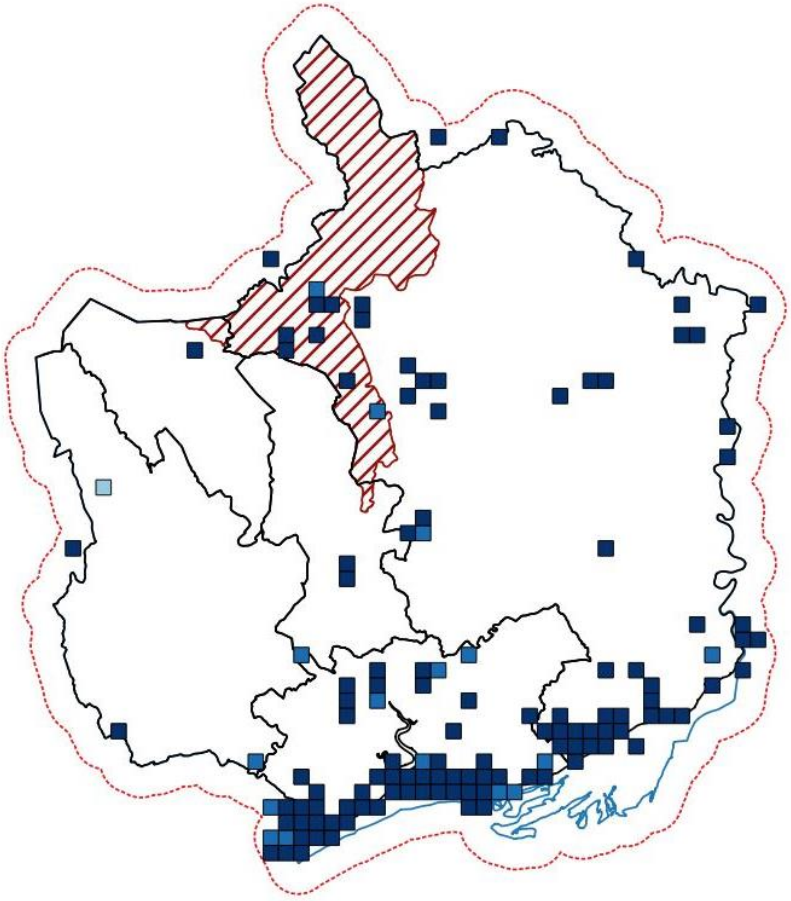
roost in 2018.[7] Little Egrets can be encountered in Gwent all year round, but – as in the rest of the UK – there are a greater number of birds present over winter. The Gwent Levels and foreshore is the location most likely to hold Little Egrets, but they can be encountered inland in small numbers associated with various waterbodies.

The main recording hotspots are Peterstone Wentlooge and Goldcliff. There are other noticeable hotspots at Nedern Brook, Collister Pill, Caldicot Pill, the Moorings and Rumney Great Wharf. The Gloucestershire hotspot is likely a false one, due to centring of low-resolution records. Away from the Levels, there are clusters of records at Llandegfedd and the River Usk near the Bryn.

Distribution of Little Egret records across Greater Gwent (maximum≥100 records/km^2)



Records of Little Egret by decade

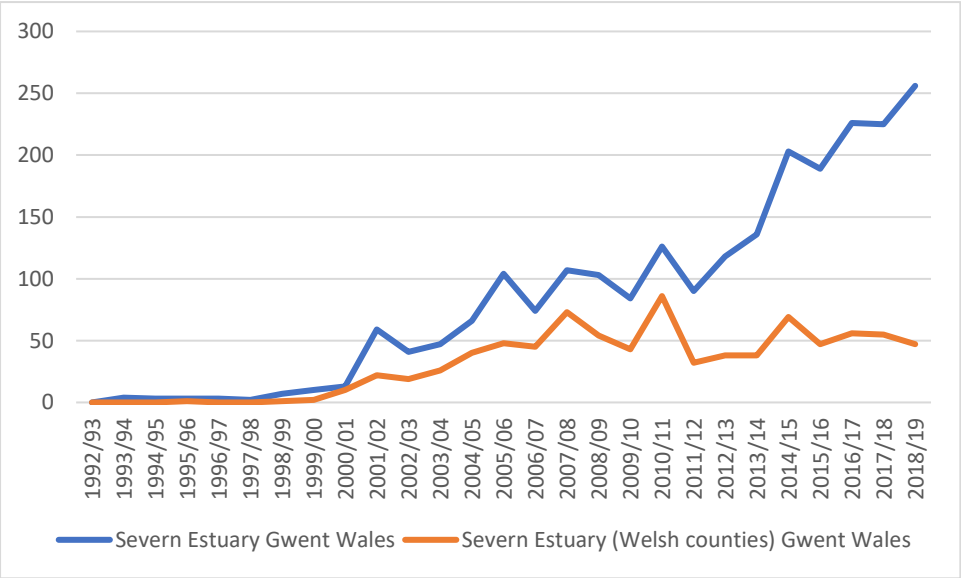


Habitats patterns: Little Egrets are strongly associated with wetland habitats, with the Gwent Levels and foreshore being the main habitat utilised.

Population trends: As previously stated, the Little Egret has only recently colonised and subsequently established breeding populations within the UK. Gwent has been no different, with the first breeding recorded in 2001. These increases are due to a reduction in persecution allowing an increase in range and the impact of climate change. The WeBS counts shown below clearly show the increases in the Severn Estuary from very low numbers in the early 1990s to counts in the hundreds now. The Severn Estuary population appears to be increasing, whereas the population in the Welsh counties has levelled out in the last 10 years. The population is now clearly very well established and of low conservation concern. However, it should be noted that the breeding population in Gwent is still at a low level (9 pairs) and concentrated at just two sites,[8] which makes it inherently vulnerable. These and any new sites should be protected from disturbance.

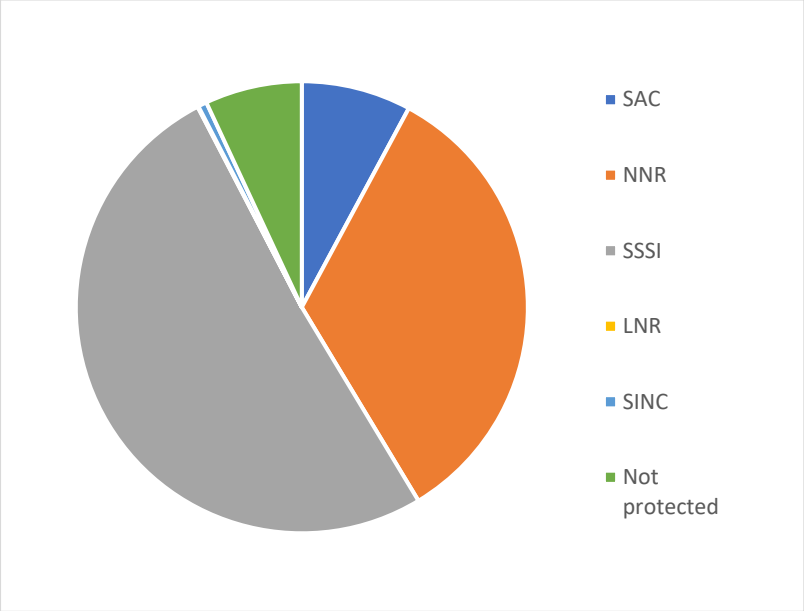
The WeBS counts represent the population at the most numerous recorded site (Severn Estuary), rather than the whole of Greater Gwent. Note that some annual counts are given as a minimum number rather than a count/estimate.

Winter WeBS Peak Counts for Little Egret on the Severn Estuary[24]



Protection: 93% of records come from protected sites, with records from the Severn Estuary SAC, together with high numbers of records from the Newport Wetlands NNR and Gwent Levels and Llandegfedd SSSIs.

Little Egret records from protected sites



Pintail Anas acuta (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 2

Conservation status: Red (Wales[1]) & Amber (UK[2])

Data Availability: Good (1,474 records)

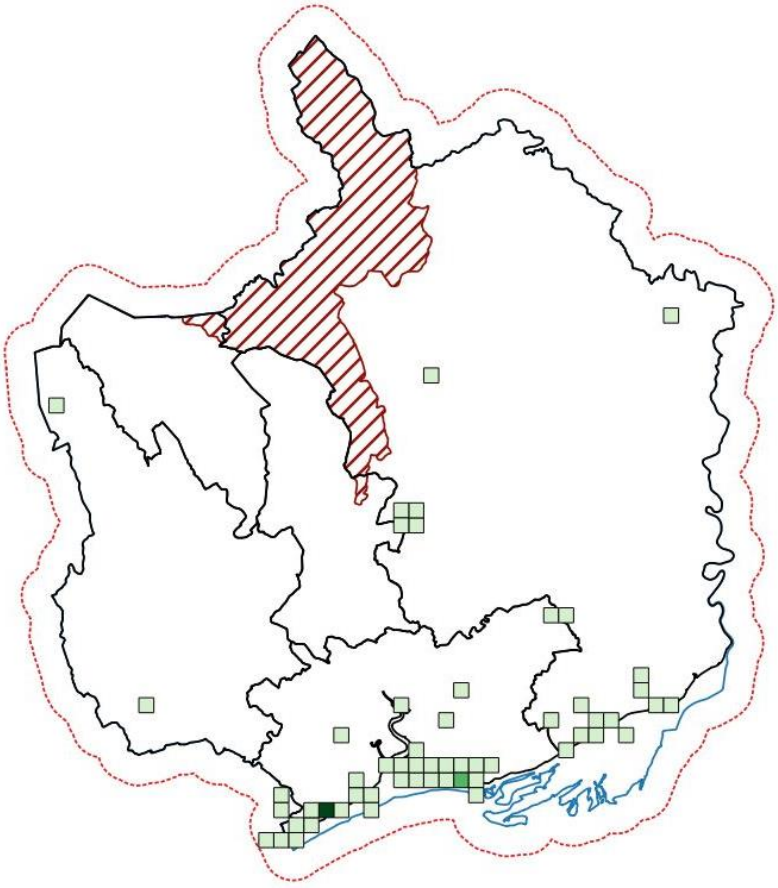
Context: The Pintail is a relatively common duck species within the UK as a wintering species, but perhaps one that people are less familiar with given their liking for wilder habitats and shy nature. They are by far at their commonest as a wintering bird, but also pass through on migration, although only very small numbers stay to breed. This means that Pintail are vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[25] They are one of a whole host of duck species that winter in the UK in considerable numbers. The Pintail that breed in the UK are restricted by their very specific breeding requirements, needing freshwater pools in grassland.[26] This habitat is very vulnerable to a warming climate, as these shallow pools may dry out.[27] The small numbers of breeding birds are largely in northern Scotland.[28] Far greater numbers winter in the UK with birds coming from more northerly climes such as northwest Siberia, others migrate further south to sub-tropical Africa.[29] Pintail have an omnivorous diet, extracting this from submerged mud.[26] Overall in the UK, there has been a decrease of 24% in relation to wintering birds between 1992/93 and 2017/19.[20] The decrease in wintering numbers may be a response to milder winters meaning more Pintail winter further east, in places such as the Netherlands, but it is still concerning.[30] Breeding population trends are hard to find, but part of the reason for the Pintail being Amber listed is recent falls in breeding numbers and range. This would appear to be the case, with only an estimated 27 pairs in 2012–2017,[4] and the Rare Breeding Birds Panel recording there being a 'weak decrease' (35% over 25 years).[31]

Outlook: The only location where Pintail bred in the UK in the nineteenth century was a single site in Scotland.[32] Records increased during the twentieth century but were always scattered and at low numbers, with regular areas sometimes being abandoned due to sensitivity to water levels.[32] The estimated UK breeding population was never large and was only 27 pairs in 2012–2017;[31] this is apparently a reduction on previous levels, and Pintail were never more than very scarce however. In contrast to the small and localised breeding population, the wintering population is considerably larger (20,000 in 2012/13–2016/17)[31] but has been subject to alterations (principally decreases): 8% decrease 1975–2018 (described as 'little change'), with this altering in more recent times with a 7% increase (described as 'slight increase') from 2013 to 2018.[11] The WeBS surveys[20] show far more of a decrease: decreases of 24% increase in the UK as a whole (conversely 28% increase in Wales) from 1992/93 to 2017/18 and a more severe decrease of 29% in the UK from 2007/08 to 2017/18 (52% decrease in Wales). This wintering population is quite widely distributed throughout the UK, largely utilising sheltered coasts and estuaries, however the main concentrations are quite localised.[33]

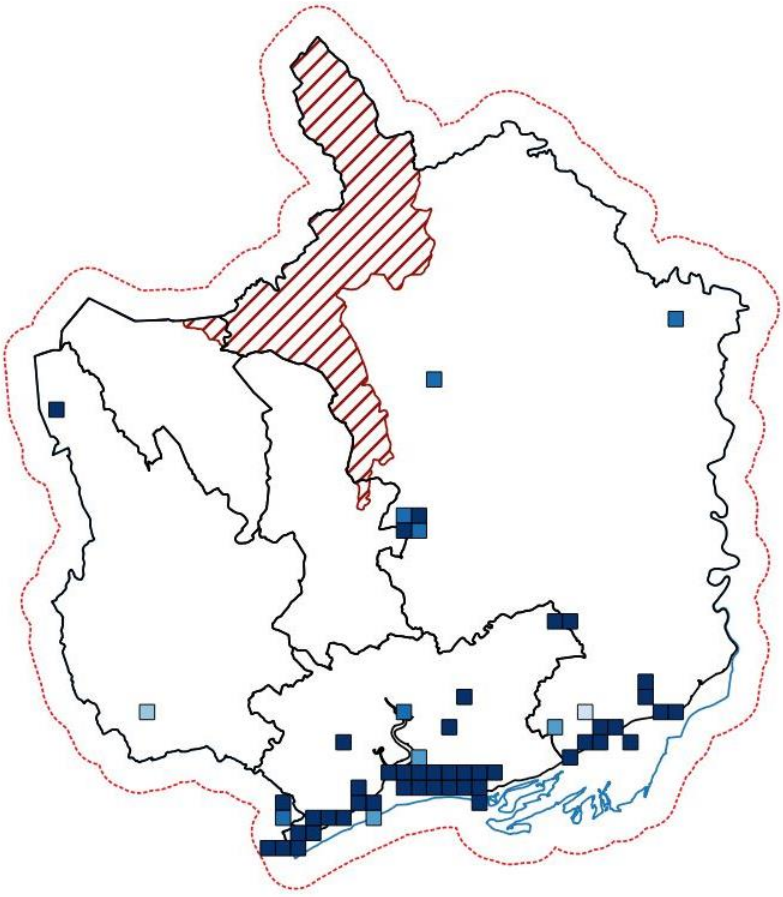
Greater Gwent range: The latest Gwent Bird Report (2018) records Pintail as being a 'fairly common winter visitor at main coastal sites; casual elsewhere'.[7] This has been the case for a long while, with the Birds of Gwent noting 'a fairly common winter visitor and passage migrant mostly to coastal sites. Winter numbers exceed the threshold for International Importance' in 2008[34] and a 'regular and fairly common winter visitor, mainly to the coast, but also to one or two inland waters. Numbers are usually small, but are subject to considerable fluctuation from one year to another' in 1977.[35] The Severn Estuary has been noted to be of great importance for Pintail, hosting populations of National Importance.[36] Those found within Gwent form a significant part of these populations, with an annual peak count of 682 (which actually exceeds the International importance threshold) in the early years of the twenty-first century.[34] Peterstone, St. Brides, Goldcliff and Newport Wetlands are recognised as the most important sites within the Birds of Gwent 2008.[20] Much smaller numbers are recorded at a number of inland sites, including Llandegfedd Reservoir. As previously stated, Pintail are an important part of the Severn Estuary avifauna over winter. The numbers recorded in recent years are however reduced, with the Gwent Bird Report 2014[37] noting that 'numbers remain considerably lower than in the previous decade'. This reflects the declines noted both in Wales and the UK as a whole, possibly due to more birds wintering further east as a response to generally milder winters. The continued importance of Peterstone is confirmed in the Gwent Bird Report 2018: 'Peterstone remains by far the most important site'.[7]

There are record hotspots at Peterstone, Newport Wetlands and Llandegfedd, with really good coverage of recent records.

Distribution of Pintail records across Greater Gwent (max 576/km^2)



Records of Pintail by decade

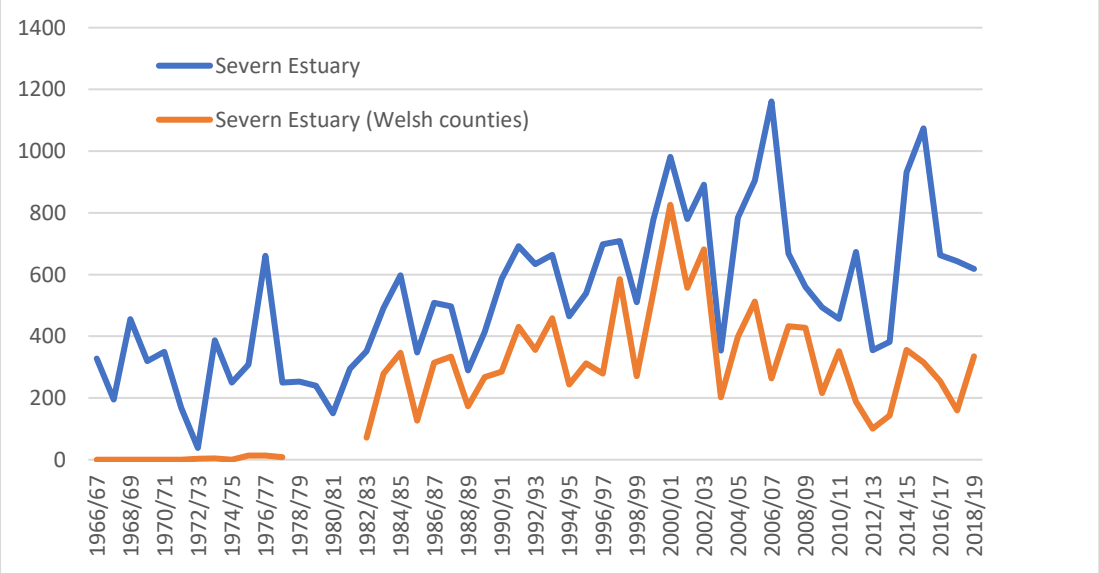


Habitats patterns: Pintail are very much a bird of the Severn Estuary coast. However, they are also recorded in small numbers at several inland sites, most notably Llandegfedd Reservoir.

Population trends: As previously stated, there have been general decreases in the Pintail wintering populations within the UK. At least for a while, particularly during the 1990s, Wales bucked this trend and saw numbers increase. However, in the last 10 years or so, Wales has also seen decreases. Gwent has been no different, showing a similar pattern to the overall Wales population. It would appear that the Pintail population that winters in Gwent is currently reduced but still of high importance as a significant part of the Nationally Important Severn Estuary population. Ongoing studies of trends is of great importance to monitor the populations, particularly as investigations continue into Severn barrages, lagoons and tidal power. The potential impacts of these upon wintering Pintail populations, together with the other waders and wildfowl, should be given great scrutiny.[38] It would also be important to extricate any of the currently occurring declines that may be due to climate change altering wintering ranges from other factors.

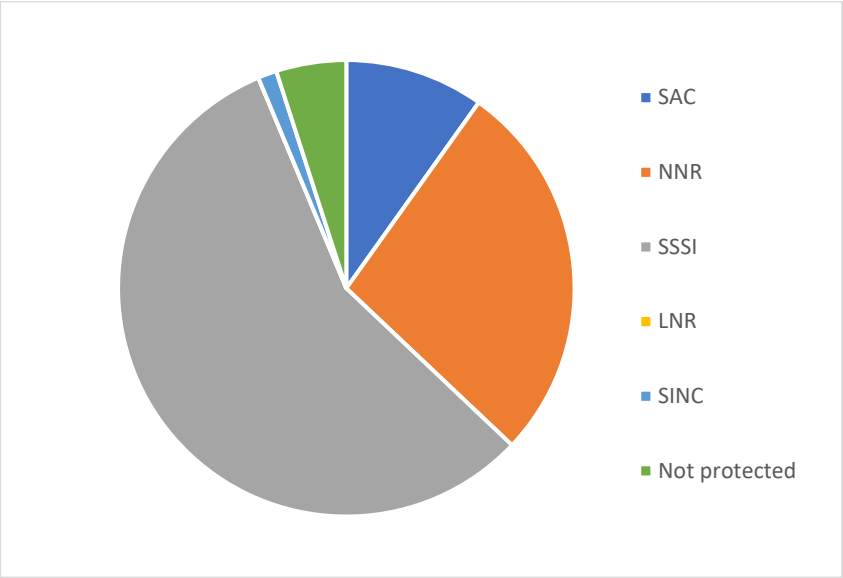
Details of the numbers wintering on the Severn Estuary through WeBS counts[34] are shown below. The graph shows the decline in the population in the twenty-first century after previous increases. It is unclear why the numbers recorded in the 1970s should be so low in Welsh counties. Numbers in Gwent were low at that time as the population centred on the Rhymney Estuary (outside of Gwent to the west). However, Pintail were still present in the Severn Estuary (perhaps not picked up by WeBS). This population became more mobile and moved to Peterstone regularly in the 1980s.[34]

WeBS counts for Pintail on the Severn Estuary[24]



Protection: 95% of records come from protected sites, with high numbers of records from the Severn Estuary SAC, Newport Wetlands NNR, Gwent Levels and Llandegfedd SSSIs. The SINC is Rhaslas Pond.

Pintail records from protected sites



Reed Warbler Acrocephalus scirpaceus (Hermann, 1804)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Green (UK[1]) Green (Wales[2])

Data availability: Good (1,493 records)

Context: A migrant bird that is a summer visitor to the UK, the Reed Warbler spends its winters in Africa.[39] This means that the Reed Warbler is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[25] They are one of a whole host of warblers that breed in the UK, most of which make long-distance migration to distant wintering grounds. Reed Warblers are largely insectivorous but will take berries in the autumn.[39] They are widespread across large parts of lowland central and southern England and Wales in their reedbed habitat; they are much scarcer in Scotland and Ireland.[39] As their name implies, they are very much a bird of reedbeds and associated scrub. Consequently, they are quite hard to see, but they give themselves away by their chattering song. In contrast with many of our other long-distance summer migrants, there has been a general increase in populations, with an overall 79% increase between 1975 and 2018.[11] These increases have been driven by a remarkable range expansion further north and west in the UK since the 1960s.[40] Improved breeding performance, the warming climate and improved habitat management have been suggested as reasons for this range expansion. [40]

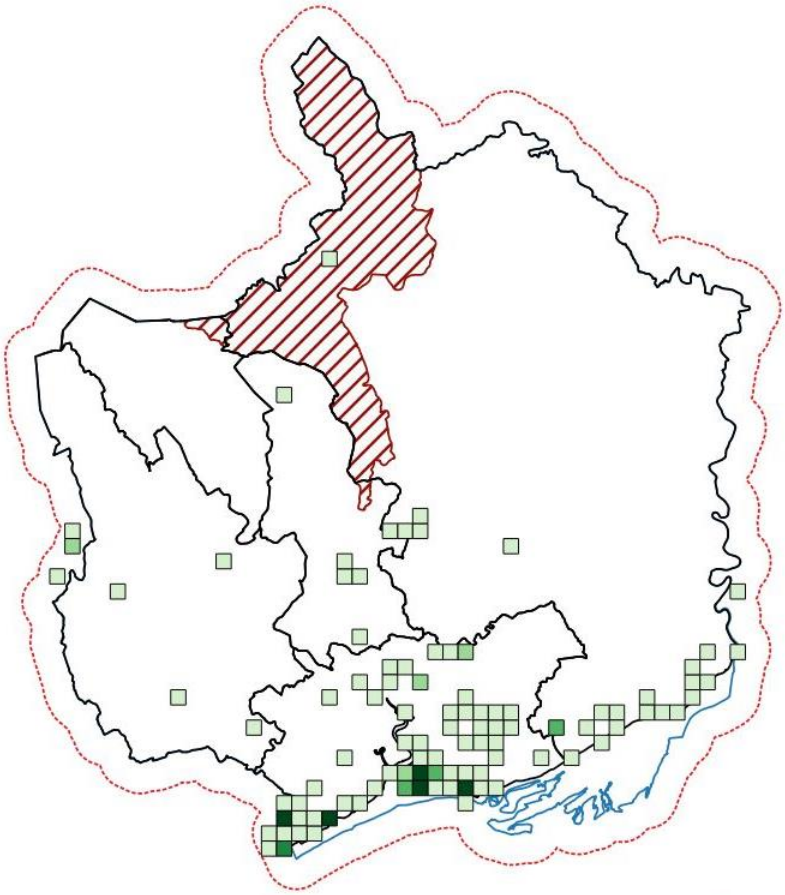
Outlook: It would appear that the Reed Warbler population and distribution has fluctuated over the last couple of centuries.[32] At the end of the nineteenth century, the Reed Warbler bred in most English and Welsh counties south of (and including) Yorkshire and Lancashire.[32] However, by the 1930s, it had been lost from much of the northern and western borders (including significant parts of Wales) of its range, and this remained the case until the 1970s.[32] From the 1970s onwards however, the population range has expanded, and the Reed Warbler has recolonised areas lost previously. Now, the range resembles that at the end of the nineteenth century, with breeding also in Scotland and Ireland.[32] The estimated UK breeding population in 2016 was 130,000 pairs.[4] This represents an increase in recent years: 79% increase between 1975 and 2018 (described as 'weak increase'), with this stabilising more recently, with no change between 2012 and 2017.[11] The BTO Breeding Bird Survey[12] further illustrates these patterns with a 21% increase between 1995 and 2018 in the UK as a whole.

Greater Gwent range: The distribution of Reed Warblers within Gwent is limited by their habitat requirements. Most of the region's reedbeds and reed-fringed reens are on the Gwent Levels in the south of Gwent, and correspondingly this is where Reed Warblers are concentrated.[41] The latest Gwent Bird Report (2018) records Reed Warbler as a 'fairly common breeding summer visitor/passage migrant'.[8] This has been the case for quite a while, but with a general increase in numbers. The Birds of Gwent in 1977 recorded it as a 'breeding summer visitor. It is an uncommon but fairly regular visitor, mainly to areas on the coastal levels'.[42] The Birds of Gwent in 2008 recorded Reed Warbler as being 'a fairly common summer visitor and passage migrant'.[41] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 200–300 pairs,[43] with the second atlas (1998–

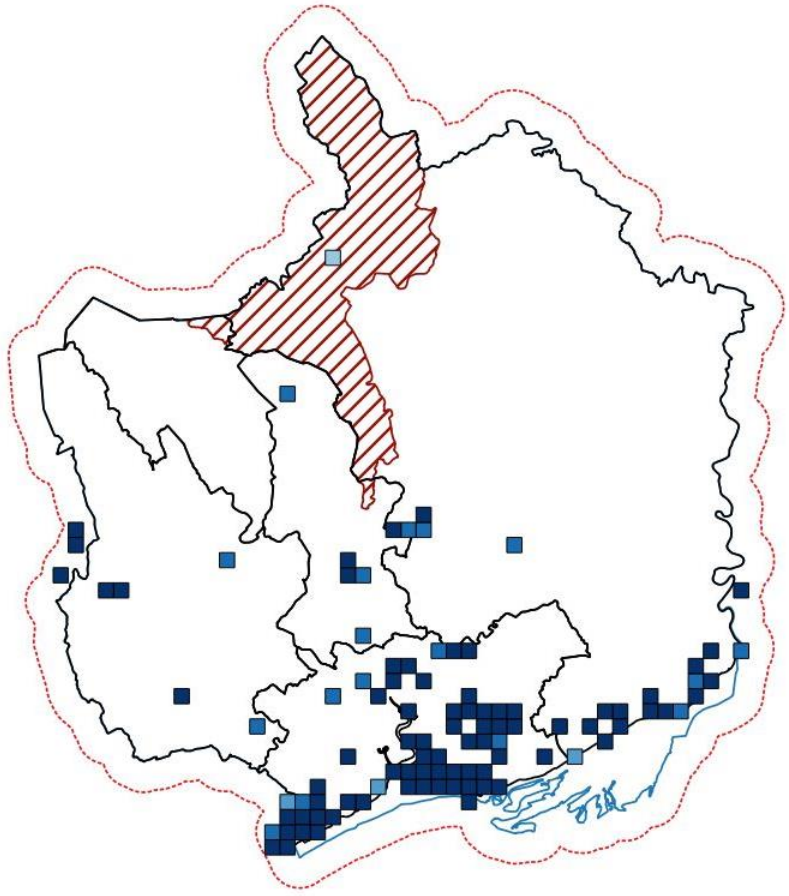
2003) estimating an increased population of 310–570 pairs.[41] This again clearly illustrates an increase. The establishment of the reedbeds at the Newport Wetlands Reserve has been noted as being noticeably beneficial for Reed Warblers.[41]

Hotspots for records are across the Gwent Levels, with concentrations at Peterstone Wentloog and Newport Wetlands, plus St Mellons in the buffer area. Away from the Levels there are clusters of records at Llandegfedd.

Distribution of Reed Warbler records across Greater Gwent (max >100)



Records of Reed Warbler by decade

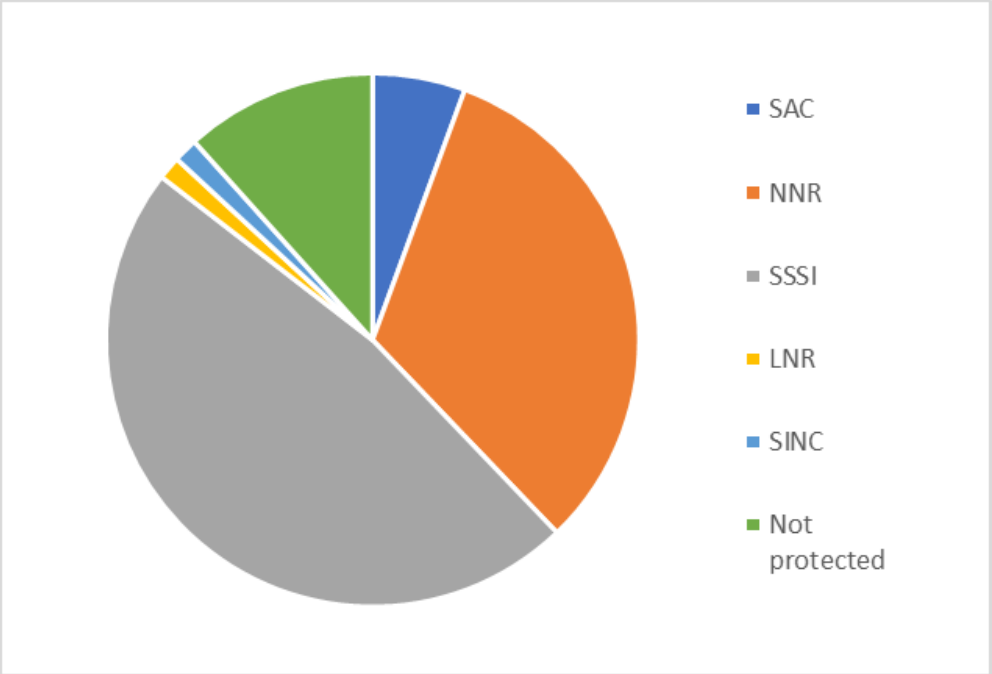


Habitats patterns: Reed Warblers are very much birds of reedbeds and reed-fringed reens/ditches.

Population trends: As previously stated, there have been increases in Reed Warbler populations within the UK, and their range has expanded further to the north into Scotland and westwards into Ireland. Gwent has been no different, with the breeding population generally increasing. However, it has remained largely confined to the Gwent Levels, as this is where suitable reed habitat is present, both in the form of reedbeds (most notably at Newport Wetlands) and also the more widely distributed reed-fringed reens. Reed Warblers are not currently of great conservation concern. However, it should be noted that many of our long-distance summer migrants are not faring so well, and issues on wintering grounds in Africa that affect them could come to affect Reed Warblers, so there should not be complacency. These climate change problems are difficult to address through more local conservation initiatives. However, habitats in Gwent can still be preserved and enhanced in such a condition as to maximise the potential available resources for breeding Reed Warblers to ensure productivity rates are high. The management of the many kilometres of reens (64km of main reen and 137km of lesser reen) on the Gwent Levels could be an important factor in the future success of Reed Warblers. While there will be a variety of management prescriptions in place for the reens based on different ecological and agricultural needs, economics and water control, reed-lined stretches should be maintained persist to provide suitable habitat for Reed Warblers.

Protection: 88% of records come from protected sites, with high numbers of records from the following: SAC records from the Severn Estuary; NNR records from Newport Wetlands; SSSI records from the Gwent Levels and Llandegfedd; LNR records from St. Julian's Park; SINC records from The Moorings, Rogiet Country Park and various others.

Reed Warbler records from protected sites



Shoveler *Anas clypeata* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended) Schedule 2

Conservation status: Amber (UK[1]), Amber (Wales[2])

Data Availability: Good (2,407 records)

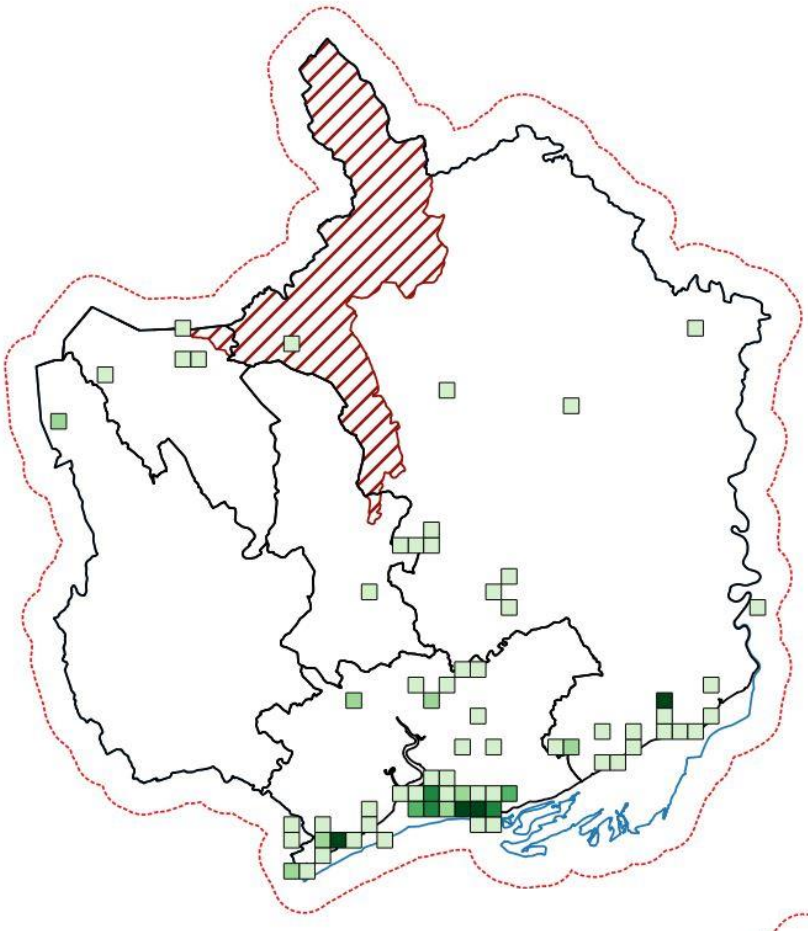
Context: Shovelers are a relatively familiar duck species in the UK, their over-sized and distinctively shaped beak giving them their name. They are by far at their commonest as a wintering bird, but also pass through on migration, and smaller numbers stay to breed. This means that the Shoveler is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[25] They are one of a whole host of duck species that winter in the UK in considerable numbers with only a relatively small number staying to breed. The Shoveler that breed in the UK are concentrated in southern and eastern England, with much smaller numbers in Scotland and western parts of England.[44] The breeding birds move further south in the winter, to be replaced by continental birds from further north that winter in the UK.[44] Shoveler are omnivorous and filter small invertebrates and seeds from the water with their specialised bills.[45] Overall in the UK, there was an increase of 132% in relation to wintering birds between 1975 and 2018.[11] The increase in wintering numbers is thought to be a response to milder winters meaning more Shoveler winter further north rather than in Spain or France. Breeding population trends are hard to find, but part of the reason for the Shoveler being Amber listed is recent falls in breeding numbers and range.[45] However, the BTO website[45] indicates that, following a 'slight decrease' between 1969 and 1995, the population has subsequently been largely stable.

Outlook: The Shoveler was seemingly quite a scarce breeder in the UK in the nineteenth century, with wildfowling being implicated in the low numbers.[32] Protection was introduced towards the end of the nineteenth century and, by the 1930s, Shoveler were breeding in most English counties and many Scottish counties, and was more widespread in Ireland but more localised in Wales (southern coast and Anglesey).[32] By the 1950s the increases in some areas were being balanced by losses in others due to habitat loss; increasingly, while doing well on managed reserves, Shoveler populations were being lost in more marginal areas.[7] The estimated UK breeding population in 2012–2017 was 1,100 pairs.[4] In contrast to the relatively small breeding population, the wintering population is much larger (19,500 in2012/13–2016/17) and has been subject to significant increases: 132% increase between 1975 and 2018 (described as 'weak increase'), with this continuing in more recent times with a 25% increase (described as 'strong increase') from 2013–2018.[32] The WeBS surveys[20] largely corroborate these increases, with a 68% increase in the UK as a whole (75% in Wales) from 1992/93 to 2017/18 and a 13% increase in the UK from 2007/08 to 2017/18, although there was been a contrasting 23% decrease in Wales over a similar time period. This wintering population is widely distributed throughout the UK, utilising both the coast and freshwater bodies. However, a considerable percentage of Shoveler are concentrated within a relatively small number of favoured sites.[46]

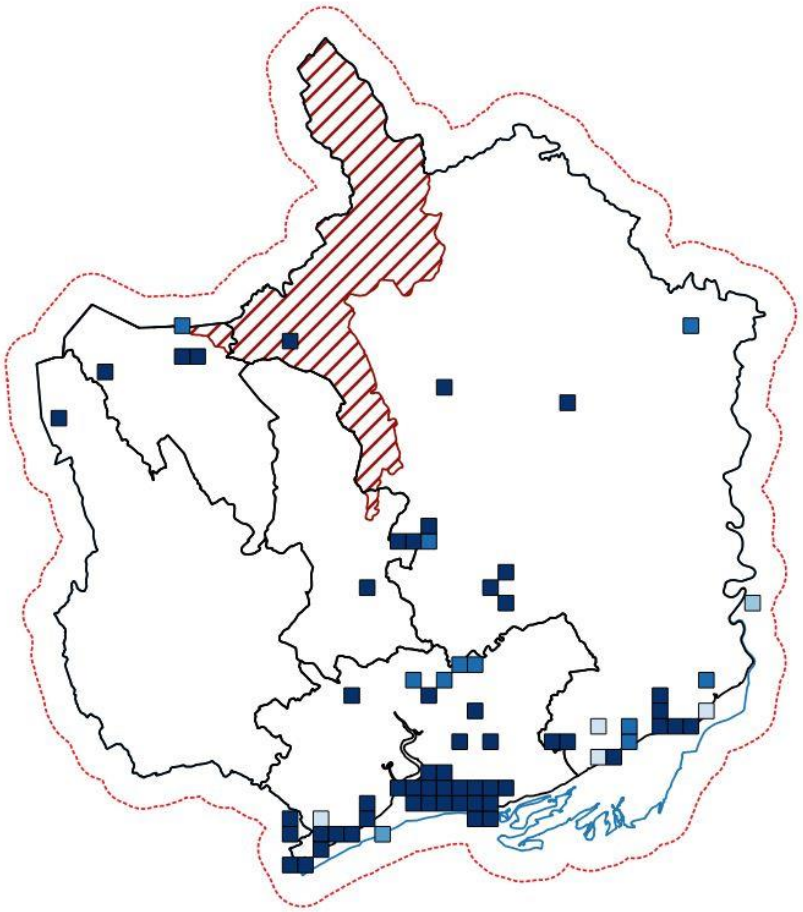
Greater Gwent range: The latest Gwent Bird Report (2018) records Shovelers as being 'fairly common in winter; scarce in summer; very rare breeder.'[8] This has been the case for a long while, but wintering numbers have been increasing to some extent over time: The Birds of Gwent recorded Shovelers as being 'a common winter visitor at two sites, where numbers exceed the threshold for National Importance. Also a scarce passage migrant and rare breeder' in 2008[47] and as a 'frequent winter visitor in quite large numbers; rarely breeds' in 1977.[48] The Severn Estuary, and Gwent in particular, has been noted to be of great importance for Shoveler, with the Peterstone Foreshore and Newport Wetlands both hosting populations of National Importance.[47] Inland in Gwent, Shovelers are annual, but generally only recorded in small numbers, with Llandegfedd Reservoir perhaps being the best site. As previously stated, Shoveler are a relatively common and important part of the Severn Estuary avifauna over winter. Numbers have generally increased in recent times, and this mirrors the situation in the UK as a whole and is likely due to similar reasons – the most significant of these being fewer birds migrating to France/Spain and spending the winter further north in the UK as a response to generally milder winters. Shoveler have never been remotely common, and likely never regular, as a breeding species in Gwent. The focal point for previous breeding activity has been various locations on the Levels.[47] It is likely that Shoveler will continue to breed sporadically on the Levels, although there is nothing to suggest that larger breeding populations will be established.

Records are largely focused along the Severn Estuary coast; occasional records are inland, with Llandegfedd Reservoir being a focus and some at various other inland waterbodies, with perhaps some focus in the vicinity of the Usk.

Distribution of Shoveler records across Greater Gwent (maximum≥100 records/km^2)



Records of Shoveler by decade



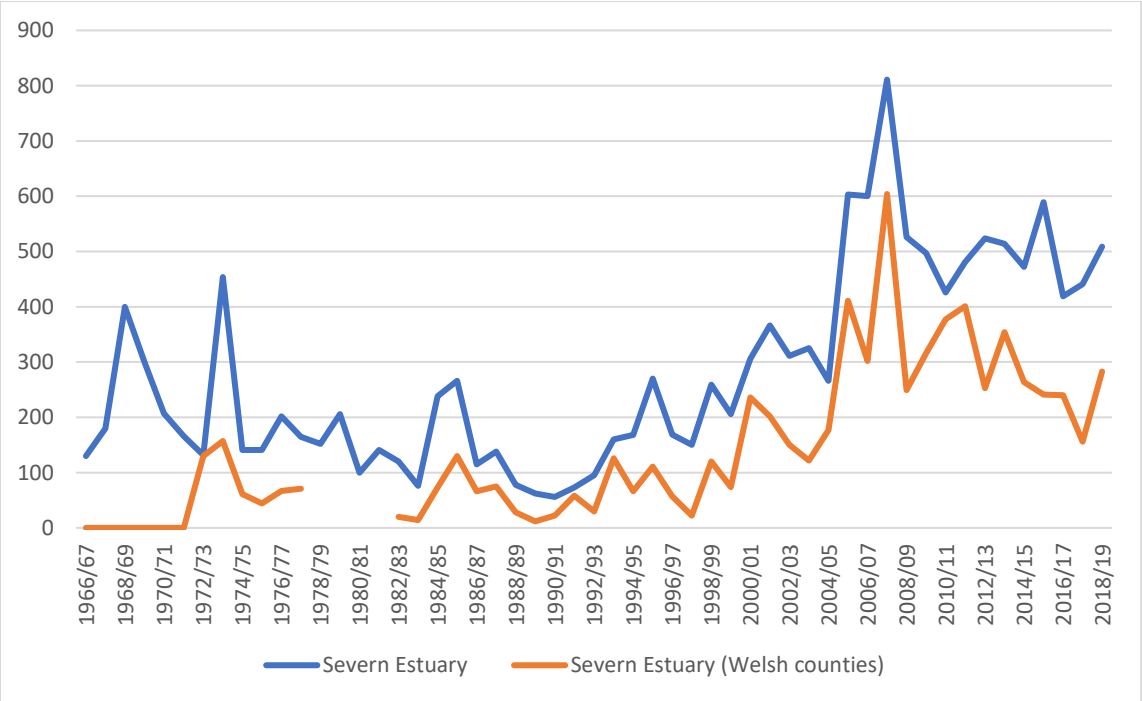
Habitats patterns: Shovelers are very much a bird of the Severn Estuary coast, with small numbers inland at various waterbodies.

Population trends: As previously stated, there have been noticeable increases in the Shoveler wintering populations within the UK; Gwent has been no different. It would appear that the Shoveler population that winters in Gwent is currently secure and still of high significance, with two Nationally Important Sites in the vicinity of the Severn Estuary. Despite this, ongoing studies of trends is still of great importance to monitor the populations, particularly as investigations continue into Severn barrages, lagoons and tidal power. The potential impacts of these on wintering Shoveler populations, together with the other waders and wildfowl, would have to be given great scrutiny.[38]

Details of the numbers wintering on the Severn Estuary through WeBS counts are shown below. The graph shows a generally increasing population, with a clear upwards turn at the beginning of the twenty-first century, perhaps due to the establishment of the second Nationally Important wintering population at Newport Wetlands. After this, numbers dropped back fairly quickly but appear to have stabilised at a higher level than previously. This represents the population at the most numerous recorded site (Severn Estuary), rather than the whole of Greater Gwent.

Note that some annual counts are given as a minimum number rather than a count/estimate

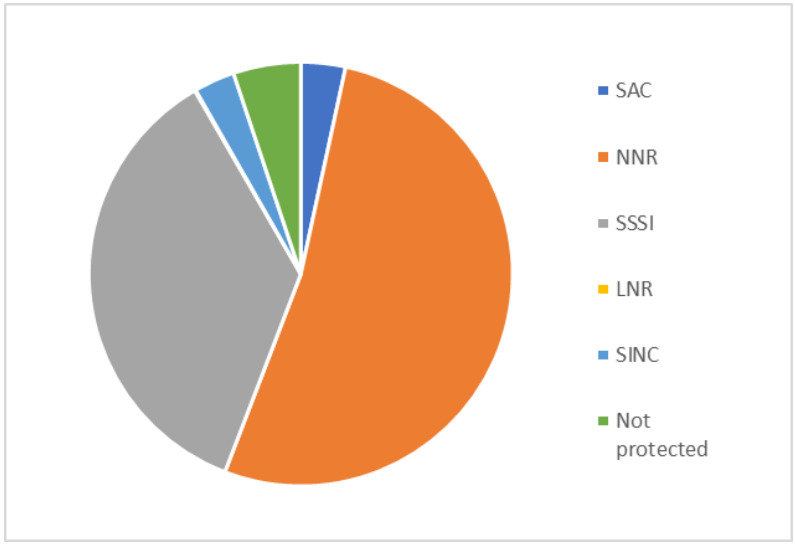
Winter WeBS Peak counts for Shoveler on the Severn Estuary[24]



As previously stated, it is unlikely that the Shoveler will be anything more than a scarce/rare and very localised breeding bird in Gwent. However, with the establishment of Newport Wetlands, there is perhaps the possibility of Shoveler becoming annual breeders in very low numbers.

Protection: 95% of records come from protected sites, with records from the Severn Estuary SAC, together with high numbers of records from the Newport Wetlands NNR and Gwent Levels and Llandegfedd SSSIs, and also some from SINCs in the region of the Heads of the Valleys and adjacent to the Usk.

Shoveler records from protected sites



Snipe *Gallinago gallinago* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended) Schedule 2

Conservation status: Amber (UK[1] and Wales[2])

Data Availability: Good (2095 records)

Context: Snipe are widespread within the UK, both as a breeding bird and wintering. They are less tied to the coast than many of our other wading birds, being birds of damp moorlands, marshy grassland and well-vegetated wetlands, although there are more birds at the coast during the winter. They are noticeably commoner as a wintering bird, However, they also pass through on migration and considerable numbers stay to breed. This means that the Snipe is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[25] Snipe breed in damp places, including lowland meadow/marshy grassland, however their stronghold is in the uplands/moorlands.[49,50] The Snipe's diet includes small invertebrates, including worms and insect larvae,[50] and they utilise their long bill to catch these.[51] They are particularly well known for their display flights during the breeding season, when they make a distinctive drumming sound using their tail feathers.[51] It should be noted that they are regarded as a 'game bird' and are shot in the UK (open season is 12 August to 31 January).[52] In the UK, there has been a decline in breeding numbers of 79% between 1970 and 2017.[11] Little information can be found on trends of wintering Snipe, although it is possible that wintering numbers should have similarly fallen to some degree, although many of our wintering birds are from breeding populations much further north and east[50].

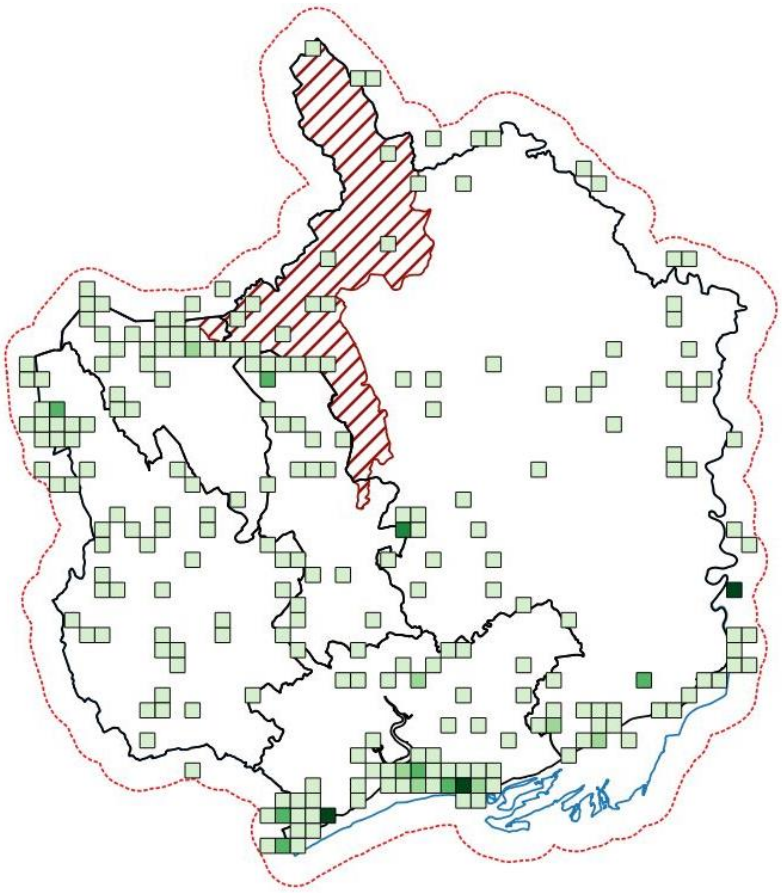
Outlook: Snipe were already suffering declines in the nineteenth century due to drainage, reclamation, enclosure of farmland in the lowlands[32] and vast numbers being shot.[32] However, these fortunes reversed, and breeding populations increased in the early twentieth century, stabilising in the 1930s/40s. This was thought to be due to a depression in agriculture and reduction in shooting. Declines however became apparent again in the 1950s and carried on due to continued loss of habitat.[32] The estimated UK breeding population in 2016 was 66,500 pairs.[4] This is less than it was historically, with the declines brought about by the drainage of wetland habitats. As outlined previously, there was a 79% reduction between 1970 and 2017 (described as 'strong decline'). However there has been a recent increase of 36% (described as 'strong increase') from 2012–2017,[52] although this is a recovery from much-reduced levels. The BTO Breeding Bird Survey[8] further corroborates the more recent increases, with a 26% increase between 1995–2018 in the UK. Most recently, however, there are indications that all is still not well, with decreases of 9% and 20% in 2008–2018 and 2018–2019 respectively.[4]

The wintering population is larger (110,000 in 2004–2005)[4] and is quite well distributed throughout the UK, with many of the UK breeding Snipe being resident. However, there are significant influxes from Northern Europe. There is limited information available to judge trends in the wintering population.

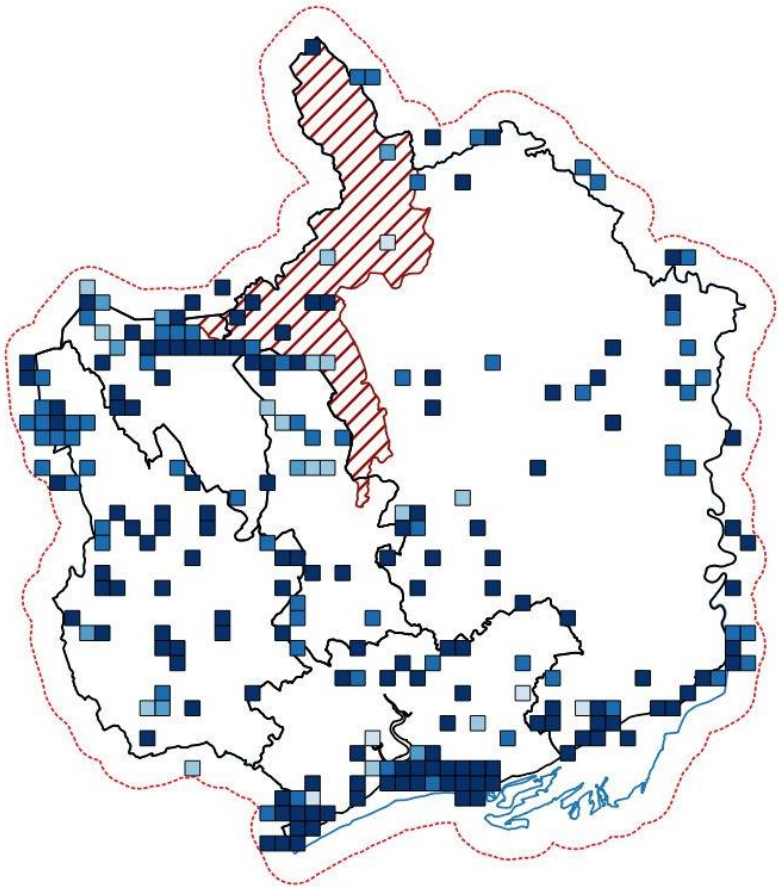
Greater Gwent range: The latest Gwent Bird Report (2018) records Snipe as a 'fairly common winter visitor; uncommon breeder'.[8] This has been the case for a long while, but with breeding numbers decreasing to some extent over time: The Birds of Gwent recorded Snipe as being 'a winter visitor in moderate numbers; a small, and probably decreasing, breeding population' in 2008[53] and as a 'Resident Breeder and Winter Visitor' in 1977.[54] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population that may not exceed 50 pairs;[55] the second atlas (1998–2003) estimated a total of around 20 pairs.[8] This indicates a decline in population. Gwent breeding is now almost entirely confined to favoured upland sites in the north of the county, with the greatest losses occurring at lowland sites, and agricultural intensification and drainage of land being implicated (as in the rest of the UK). Trefil and Waunafon Bog are mentioned as being important sites in the latest Birds of Gwent (2008).[53] At other times of the year, Snipe can be found widespread within Gwent, with notable concentrations near the coast: the Severn Estuary is the fourth most important Snipe wintering WeBS site in the UK.[53]

The main recording hotspot is at Goldcliff (441 records). There are also concentrations at Peterstone Wentlooge, Newport Wetlands, Rhaslas Pond, Llandegfedd Reservoir, Garn Lakes, Nedern Brook and St Mellons and Rumney Great Wharf. The Gloucestershire hotspot is likely a false one due to centring of low-resolution records. Generally, Sniper are much more widespread across the area than our other more coastal waders.

Distribution of Snipe records across Greater Gwent (maximum≥100 records/km^2)



Records of Snipe by decade

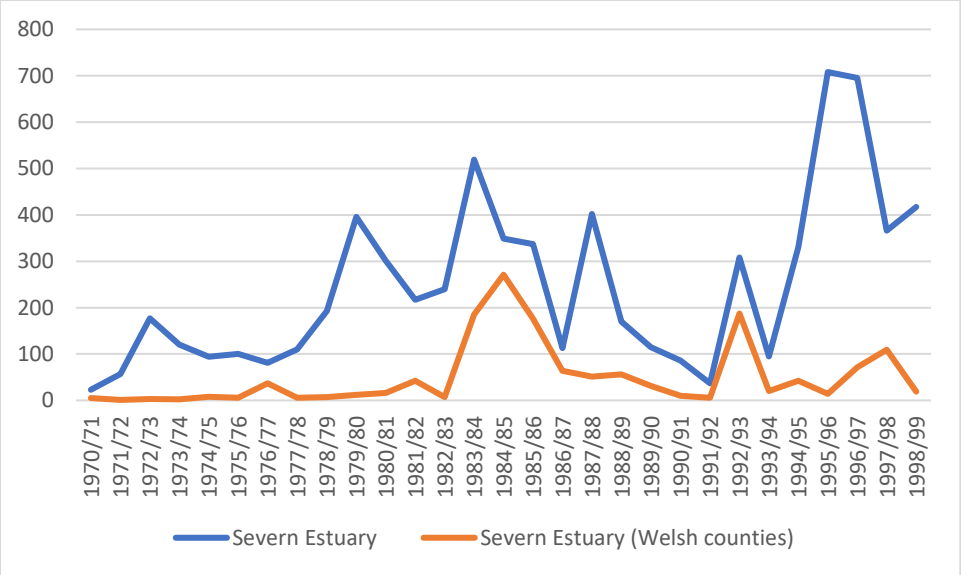


Habitats patterns: Snipe are very much a bird of wet grassland, on damp moorland in the uplands as a breeding bird and more widespread over winter with a coastal bias.

Population trends: Trends for the UK wintering population are hard to find, but it would appear to be more stable than the breeding population. This also appears to be true within Gwent. Despite this, ongoing studies of trends are still of great importance to monitor the populations. While less significant than for many of our other wading birds, the potential impact of Severn barrages, lagoons and tidal power on wintering Snipe populations would have to be given great scrutiny.[38]

Note that some annual counts are given as a minimum number rather than a count/estimate. So, this represents the population at the most numerous recorded site (Severn Estuary), rather than in the whole of Greater Gwent.

Winter WeBS Peak counts for Snipe on the Severn Estuary[24]

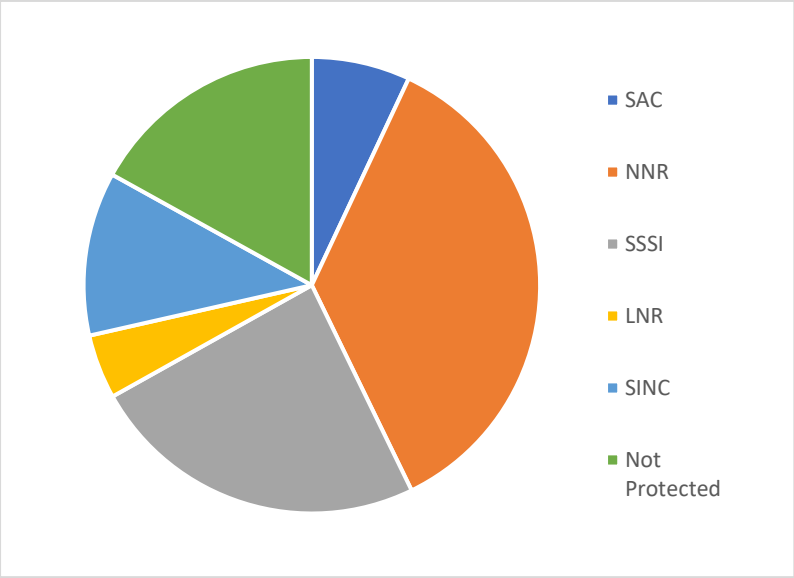


Fourteen other WeBS sites within Gwent have recorded Snipe, mostly in small numbers; the highest 5-year average outside the estuary is from Machine Pond, with nine records.

Snipe breeding numbers have decreased in Gwent, with breeding records now almost exclusively from the uplands. Increasing numbers within Gwent would need changes of management within potentially suitable sites. Management of extensive uplands sites could be reviewed to attempt to make them more suitable for breeding Snipe. Alterations in grazing pressure and the blocking of drainage channels to make areas of the uplands damper (which would also have flood prevention benefits) could help boost the Snipe breeding population.[56]

Protection: 95% of records come from protected sites, with high numbers of records from obvious sites such as the Newport Wetlands, Gwent Levels and Llandegfedd SSSIs, with a few from Keepers Pond (Blorenge) and Nelson Bog SSSIs. LNR records are from Garn Lakes, Machine Pond, Parc Nant y Waun and The Moorings. There are also scattered SINC records, with concentrations around Garn yr Erw and Gelligaer Common.

Snipe records from protected sites



Water Rail *Rallus aquaticus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Green (UK[1]), Green (Wales[2])

Data Availability: Low (554 records)

Context: The Water Rail is shy and skulks within its wetland habitat. This makes it difficult to observe and easy to overlook. They are more often heard than seen, making all sorts of odd noises from deep within reedbeds; these noises ranging from 'squealing piglets' to the 'purring of contented squirrels'.[57] The UK's breeding Water Rails are largely resident, however there is a noticeable influx of birds in the winter.[58] The Water Rails that breed in the UK are widely but thinly distributed and are absent from the uplands. They are most abundant in eastern England and along the south coast, where suitable habitat is present.[58] In winter they are more numerous and widespread due to the influx of birds from continental Europe.[58] Water Rails are omnivorous, but largely eat animal matter, caught using their long beaks in shallow water.[57] Population statistics for this elusive, difficult to survey species are relatively sparse. However, the BTO website[57] indicates that following a 'slight decrease' between 1969 and 1995, the population has subsequently been largely stable.

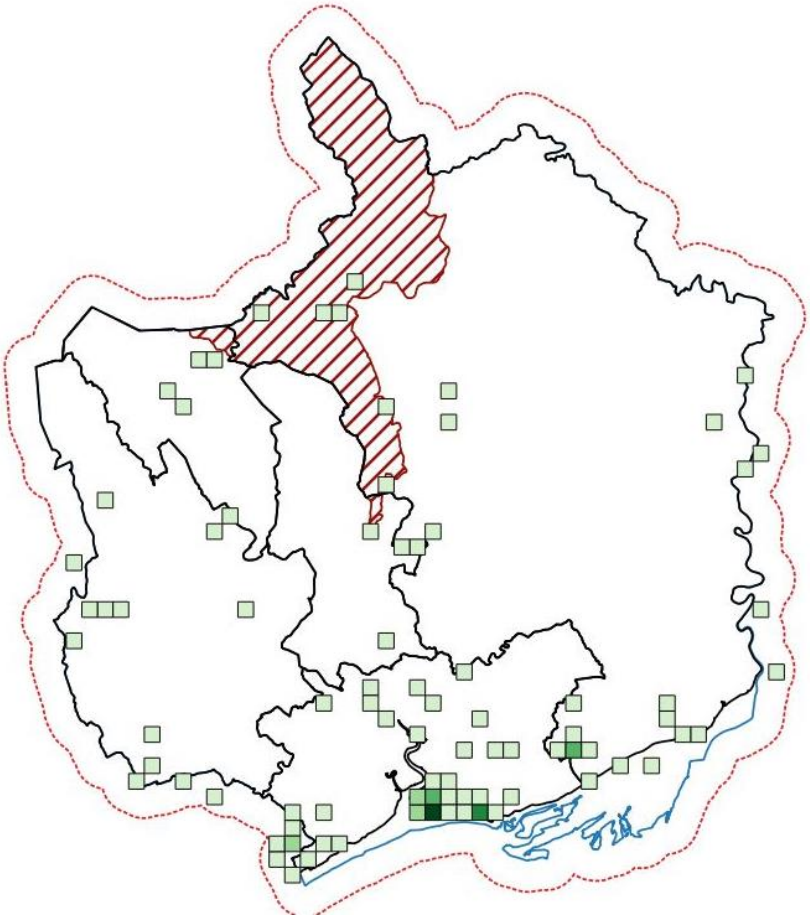
Outlook: At the end of the nineteenth century Water Rails were widely distributed and considered common as a breeding bird in many areas within the UK.[32] Despite this, it was considered to be somewhat threatened, with drainage of land impacting on both breeding and wintering habitats.[32] This, coupled with shooting and egg collecting, led to a reduction in numbers, although it was only in the 1960s that these led to noticeable and considerable gaps appearing in Water Rails' breeding distribution in the UK.[32] There then followed some re-colonisation of deserted areas, with abandoned canals and gravel pits being utilised, and wetlands on nature reserves being created.[32] There was noted to be a similar distribution between the bird atlases in 1968–72 and 1988–91, although numbers had thinned across the range,[32] as highlighted in the previously mentioned 'slight decrease' between 1969 and 1995 noted by the BTO.[57] Since then numbers have been largely stable, with possibly some slight decline, as noted by the WeBS surveys:[20] a small 3% decrease in the UK as a whole (6% in Wales) from 2007/08 to 2017/18. The current (2016) breeding population is 3,900 pairs.[4] It should be noted that the Water Rail was previously Amber listed due to contraction of range; it is now Green listed, reflecting the stabilisation of the population.

Greater Gwent range: The latest Gwent Bird Report (2018) records Water Rails as an 'uncommon winter visitor and very scarce breeder.'[8] This has been the case for a long while, but breeding numbers have likely increased since the establishment of Newport Wetlands. The Birds of Gwent recorded Water Rails as being 'an uncommon winter visitor and resident', with an estimated 30 pairs in 2008;[59] and as 'breeds in small numbers with an influx of visitors during the winter' in 1977.[60] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 2 probable and 11 possible pairs,[61] with the second atlas (1998–2003) estimating a population of around 30 pairs.[59] The second atlas noted that breeding was almost entirely on the Gwent Levels, with a stronghold at

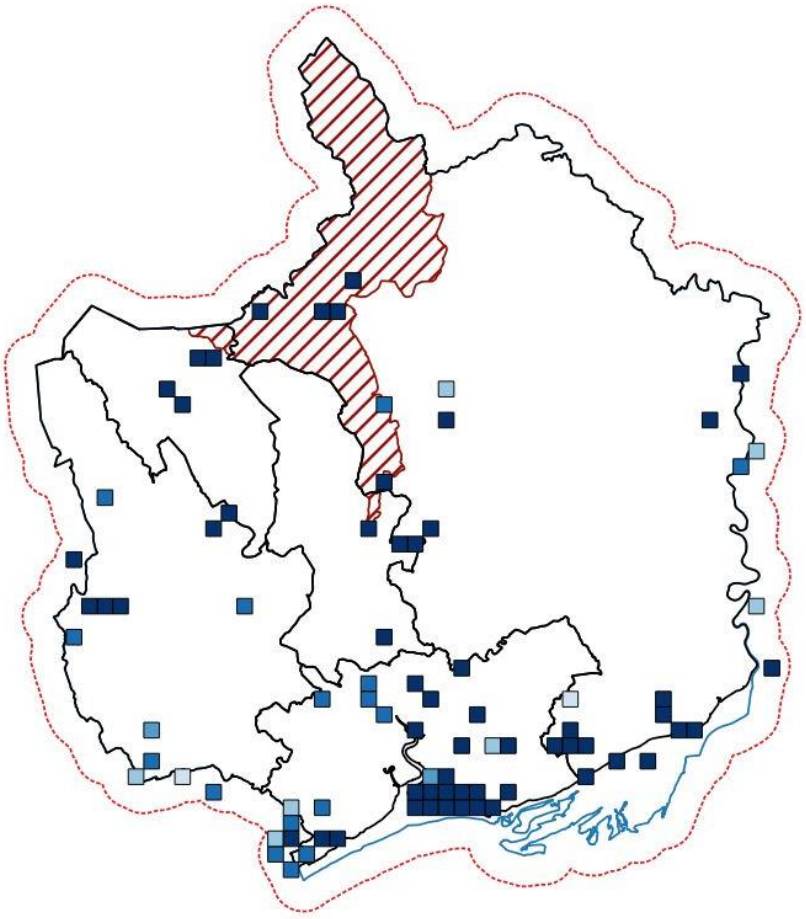
Newport Wetlands; the number of pairs increased greatly with the establishment of the reedbeds, from 2–3 pairs in 1996 to 20–24 in 2005.[59] This indicates an increase in the population, all be it one that is largely focussed on one area. Winter records in Gwent are more widespread and include small ponds and the Monmouthshire-Brecon Canal.[60]

The main recording hotspots are at Newport Wetlands, together with Goldcliff, Magor Marsh and St Mellons.

Distribution of Water Rail records across Greater Gwent (maximum≥100 records/km²)



Records of Water Rail by decade

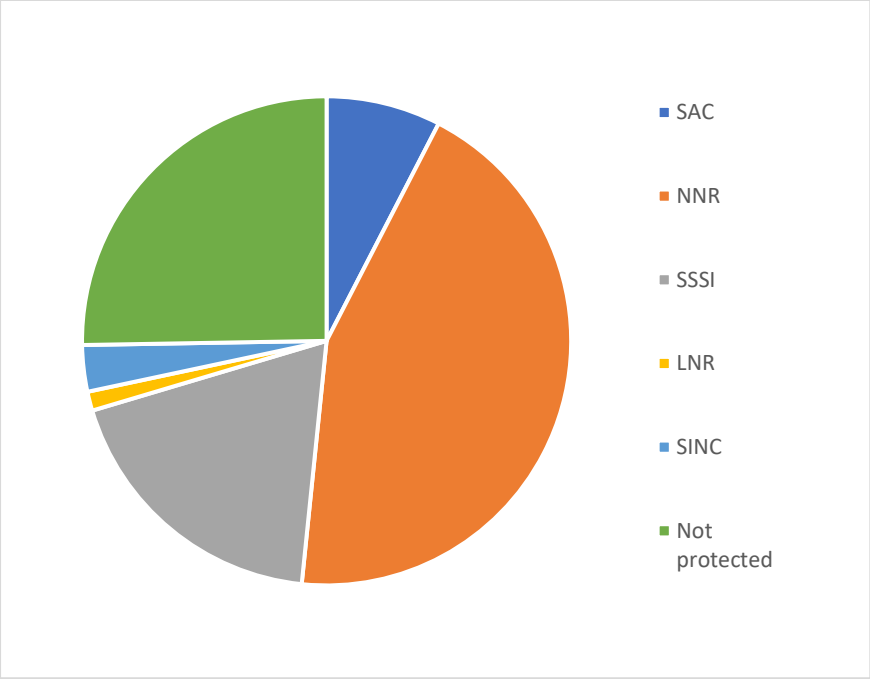


Habitats patterns: Water Rails are very much closely linked with dense, marshy vegetation, with reedbeds being particularly favoured.

Population trends: The Water Rail population seems now to be relatively stable. The reedbeds at Newport Wetlands are the stronghold of the species and have resulted in breeding and wintering numbers being higher than before its formation. Provided this area continues to be appropriately managed, the Water Rail population in Gwent would appear secure. The creation of additional waterbodies and appropriate management of the huge network of reens could aid further increases in the population.

Protection: 76% of records come from protected sites, with records from the Severn Estuary SAC, together with high numbers of records from the Newport Wetlands NNR and Gwent Levels (particularly Magor Marsh) and Llandegfedd SSSIs. LNR records were from St. Julian's and SINC records from The Moorings and a few other places.

Water Rail records from protected sites



Whooper Swan Cygnus cygnus (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 1

Conservation status: Amber (UK[1]), Green (Wales[2])

Data Availability: 33 (Poor)

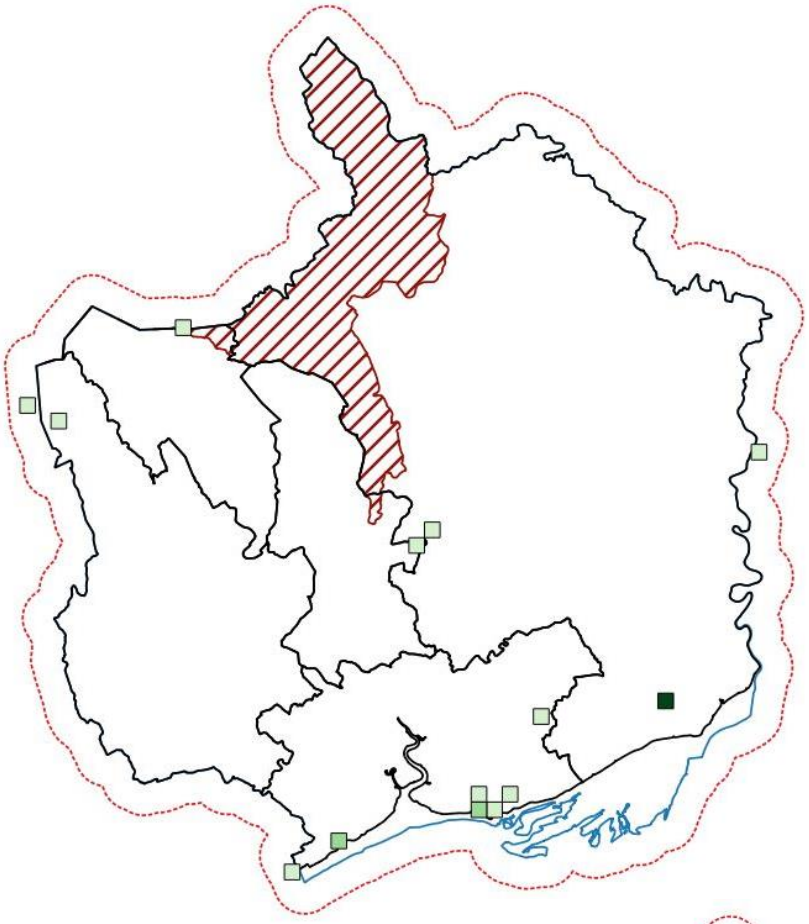
Context: Whooper Swans are quite widespread within the UK as a wintering species. However, people are not so familiar with the species as they are with the familiar, tamer, Mute Swan. They are by far at their commonest as a wintering bird, with only very small numbers remaining to breed. This means that Whooper Swans are vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[25] They are one of a whole host of 'wildfowl' species that winter in the UK in considerable numbers with only a relatively small number staying to breed. The small number of Whooper Swans that breed in the UK are in the north.[62] The larger wintering population arrive from their breeding grounds further north in Iceland.[63] Whooper Swans have a vegetarian diet, the wintering population eat 'improved grass, leftover potatoes, sugar beet, winter wheat and grain'.[63] Overall in the UK, there has been an increase of 210% in relation to wintering birds between 1992 and 2018.[20] Breeding population trends show a 'strong increase', with a 371% increase over the 25 years up to 2018, although numbers always have been, and still are, very low.[31] The current UK breeding population is quoted as 28 pairs in the period 2013–2017.[64]

Outlook: Whooper Swans were always a rare breeding bird in the UK. It appears they went extinct in the UK as a breeding bird in the late eighteenth century.[32] Breeding commenced again in the early twentieth century but was very intermittent until 1978, after which they have bred annually in small numbers.[32] The current UK breeding population is quoted as 28 pairs in the period 2013–2017.[31] In contrast to the small and localised breeding population, the wintering population is considerably larger (19,500 in 2015)[4] and has been subject to significant increases: 813% increase between 1975 – 2018 (described as 'strong increase'), with this continuing in more recent times with a 9% increase (described as 'strong increase') from 2013–2018.[65] The WeBS surveys[20] largely corroborate these increases, with a 210% increase in the UK as a whole (67% in Wales) from 1992/93 to 2017/18 and an increase of 43% in the UK from 2007/08 to 2017/18, However, there was actually a 17% decrease in Wales over this period. This wintering population occurs throughout the UK on estuaries and wetlands, it is however localised.[66] The localised nature of the population is one of the reasons they are UK Amber listed despite increasing populations.[66]

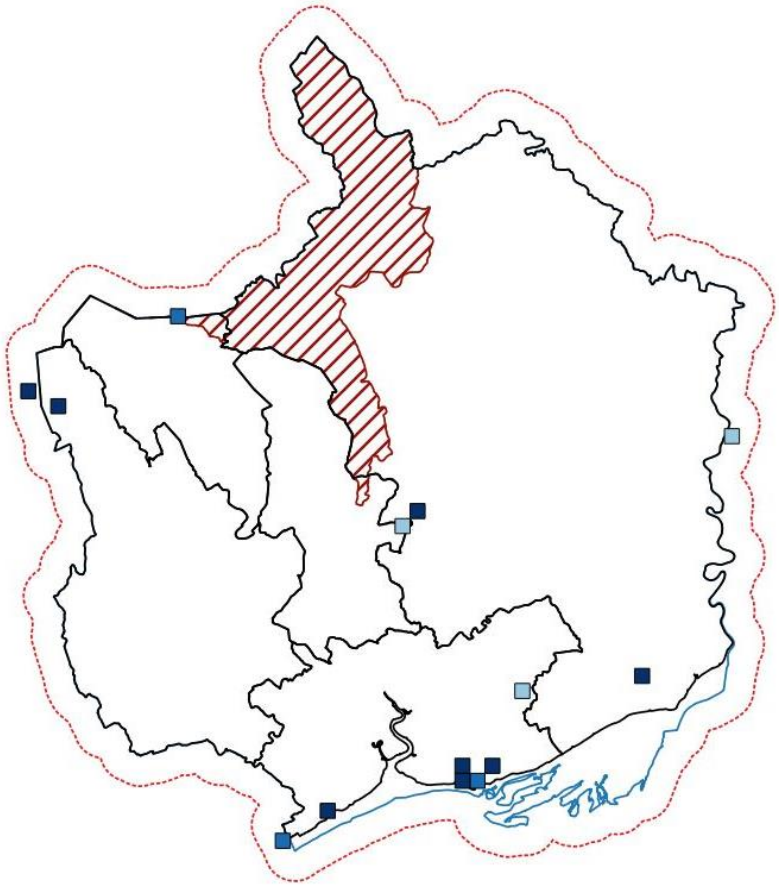
Greater Gwent range: The latest Gwent Bird Report (2018) records Whooper Swans as being a 'rare winter visitor'.[8] While never a common bird, this reflects a reduction in wintering numbers over time (despite most SEWBReC records being in the last 10 years (see below)), with the Birds of Gwent 2008 recording Whooper Swans as being 'a very scarce winter visitor'[67] in 2008 and as 'fairly regular winter visitor in recent years, though usually only in small numbers' in 1977.[68] It should be noted that the first Gwent record is as recent as 1960.[67] Wales as a whole is not hugely blessed with many wintering Whooper Swans (main wintering sites are in Scotland and on the Ouse Washes), and Gwent is similar.

The main hotspots for records are at Nedern Brook, Newport Wetlands and Peterstone. There are actually very low numbers of records. Interestingly, there are historic clusters of records at Lisvane and Pontyscill (just outside the study area) but nothing at either site since 1990. Most records (73%) are within the last decade, presumably as Newport Wetlands has developed.

Distribution of Whooper Swan records across Greater Gwent (max 10 records/km^2)



Records of Whooper Swan by decade



Habitats patterns: As would be expected of a swan, records are generally from wetland areas or adjacent fields.

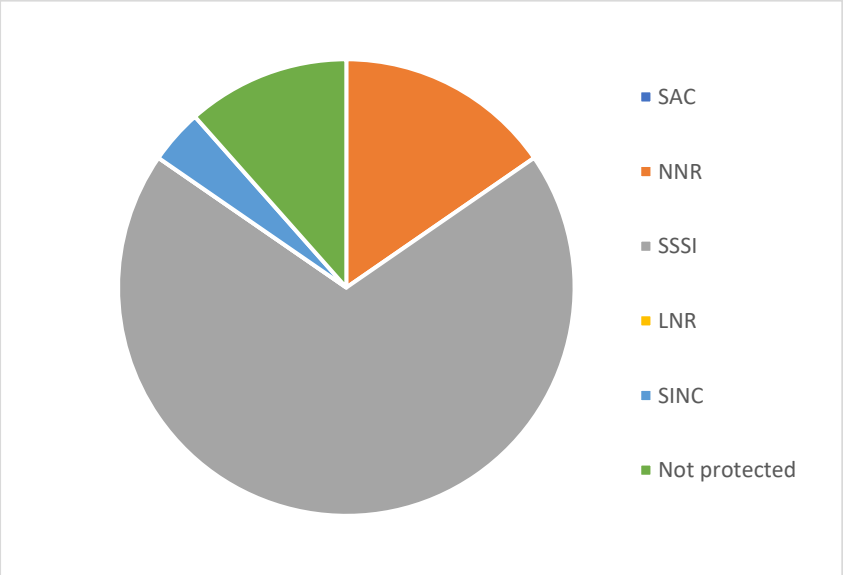
Population trends: As previously stated, there have been noticeable increases in the Whooper Swan wintering populations within the UK. Numbers in Gwent are, and have always been low, so that these increases have not been noticed. In fact, Whooper Swans would appear to be scarcer now than they were in the 1970s. There would appear to be a bias towards more recent records being at Newport Wetlands, although numbers are only very small. Gwent, and indeed Wales as a whole, is not a significant area for Whooper Swans within the UK.

Reference has been made to WeBS Counts on the Severn Estuary[24] and a few other sites within Gwent. Numbers are so low that no clear patterns can be seen, although it can be noted that the Severn Estuary is the most commonly utilised site, with records in most years and very irregular records at other sites such as Llandegfedd Reservoir, Ynys-y-fro, River Usk and Undy. A record of 25 birds at Llandegfedd Reservoir in 1971–72 is exceptional.

It would seem unlikely that the wintering population status of Whooper Swans in Gwent will change significantly in the near future. No specific measures really need to be taken to alter this, as the UK's main Whooper Swan populations appear to be faring well in their core areas further north and east. However, ensuring our current wetlands are preserved in good condition and, where possible, increased in size will ensure there is suitable habitat available for any Whooper Swans that stray into Gwent in the future.

Protection: 88% of records come from protected sites, with records not being high anywhere. NNR records are from Newport Wetlands; SSSI records from Nedern Brook, Gwent Levels and Llandegfedd. There is also a single SINC record from Rhaslas Pond.

Whooper Swan records from protected sites



Wigeon *Mareca penelope* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended) Schedule 2

Conservation status: Amber (UK[1]), Amber (Wales[2])

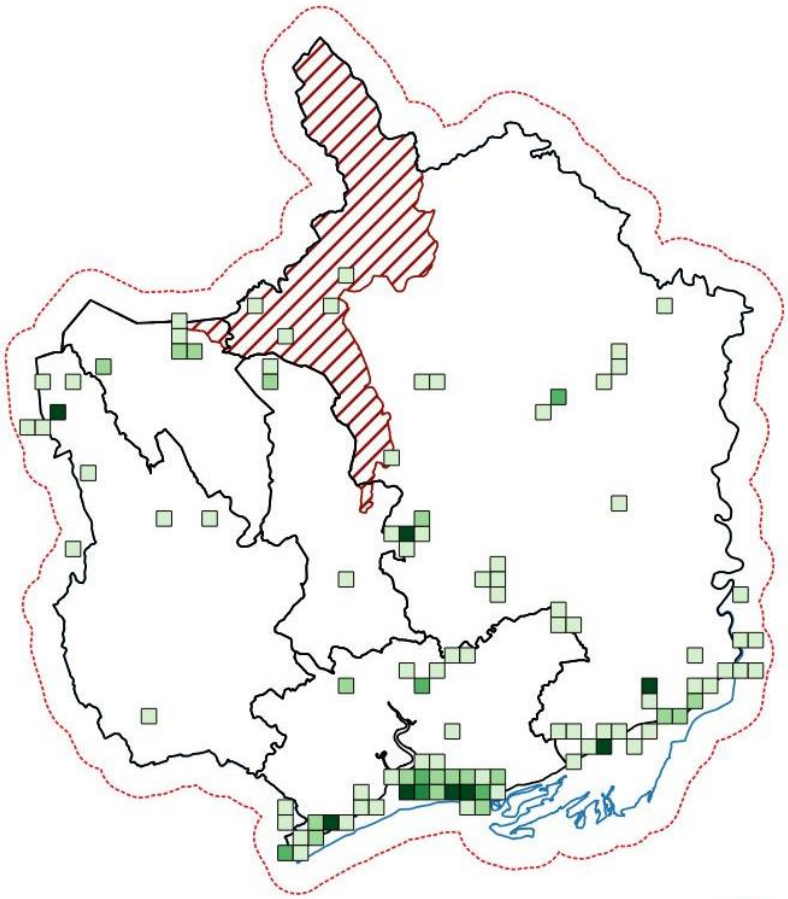
Data Availability: Good (3,141 records)

Context: Wigeon is a common duck species within the UK as a wintering species, but perhaps one that people are less familiar with given their liking for wilder habitats and shy nature. They are by far at their commonest as a wintering bird, but also pass through on migration, although only very small numbers stay to breed. This means that Wigeon are vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[3] They are one of a whole host of duck species that winter in the UK in considerable numbers with only a relatively small number staying to breed. The Wigeon that breed in the UK are confined to central and northern Scotland and also in northern England.[62] Far greater numbers winter in the UK, with birds coming from more northerly climes such as Iceland, Scandinavia and Russia.[62] Wigeon have a vegetarian diet, obtaining much of their food by grazing.[63] Overall in the UK, there has been an increase of 146% in relation to wintering birds between 1975 and 2018.[11] The increase in wintering numbers may be a response to milder winters meaning more Wigeon wintering further north. Breeding population trends are hard to find, but part of the reason for the Wigeon being Amber listed is recent falls in breeding numbers and range. This would appear to be the case, with only an estimated 200 pairs in 2012–2017,[4] compared to 350 pairs in the late 1960s and 300–500 pairs in the early 1970s.[64]

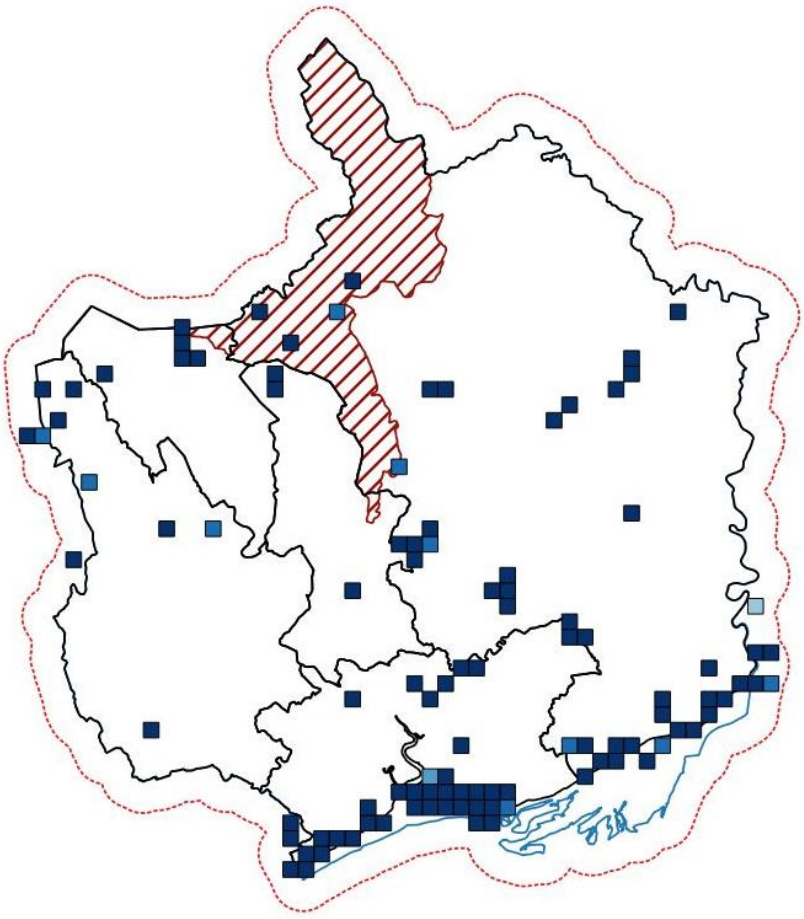
Outlook: Wigeon were not recorded breeding in the UK until 1834, when a nest was found in Scotland.[32] From then on it would appear that Wigeon spread southwards through the centre of Scotland until they had colonised the North Pennines by the 1930s. The southward spread halted there, and more southerly breeding records may be linked to escaped/released birds.[32] The estimated UK breeding population was never large, and was 200 pairs in 2012–2017.[4] This is apparently a reduction on the 300–500 pairs estimated in the early 1970s.[64] In contrast to the small and localised breeding population, the wintering population is considerably larger (450,000 in 2012/13–2016/17)[4] and has been subject to significant increases: 146% increase between 1975 and 2018 (described as 'weak increase'), with this continuing in more recent times with a 6% increase (described as 'weak increase') from 2013–2018.[11] The WeBS surveys[20] largely corroborate these increases, with a 12% increase in the UK as a whole (57% in Wales) from 1992/93 to 2017/18 and a small decrease of 3% in the UK from 2007/08 to 2017/18 (7% increase in Wales). This wintering population is widely distributed throughout the UK, utilising both the coast and to a lesser extent freshwater bodies. However, a considerable percentage of Wigeon are concentrated within a relatively small number of favoured sites: 50–60% of the UK's wintering population are found at ten or fewer sites.[63]

Greater Gwent range: The latest Gwent Bird Report (2018) records Wigeon as being a 'fairly common winter visitor'.[8] This has been the case for a long while, with the population increasing: the Birds of Gwent recorded Wigeon as being 'a common and increasing winter visitor and passage migrant; rare in summer'[65] in 2008 and as an 'winter visitor in considerable numbers' in 1977.[66] It should be noted that the Birds of Gwent 1977 mentions breeding in Gwent from 1965–1968,[66] however these breeding records were dismissed in the 2008 edition,[65] as they lacked hard evidence. The Severn Estuary has been noted to be of great importance for Wigeon, hosting populations of National Importance.[36] The Wigeon found within Gwent form a significant part of these populations, particularly those found on the saltmarsh at Goldcliff, which hosted 2,260 Wigeon in December 2005.[65] Lesser, but still important concentrations can be found at various other sites along the coast. The Gwent coast has always been a significant site for Wigeon, however Llandegfedd Reservoir used to be the most important site in Gwent and it has SSSI status due to its wintering wildfowl population. The reservoir was built in 1963 and, by winter 1967/68, had become the major site in Gwent.[65] This continued to be the case throughout the 1970s and much of the 1980s, with numbers peaking at 2,000 birds (the highest counts coinciding with severe weather).[65] Numbers at Llandegfedd Reservoir went in to a sharp decline after 1986/87[65] however, with WeBS counts being now typically around 200 birds.[24] Other inland waterbodies are utilised, with flooded fields adjacent to the Usk and a number of other reservoirs being quoted in Birds of Gwent 2008[65] and a series of waterbodies mentioned in the Gwent Bird Report 2018.[8] As previously stated, Wigeon are a common and important part of the Severn Estuary avifauna over winter. Numbers have generally increased in recent times, and this mirrors the situation in the UK as a whole and is possibly due to more birds wintering further north in the UK as a response to generally milder winters.

The main hotspots for records are at Peterstone Wentlooge and Goldcliff. Other well recorded sites are Newport Wetlands, Collister Pill, Nedern Brook Wetlands, Llandegfedd and Rhaslas Pond.



Distribution of Wigeon records across Greater Gwent (maximum≥100 records)



Records of Wigeon by decade

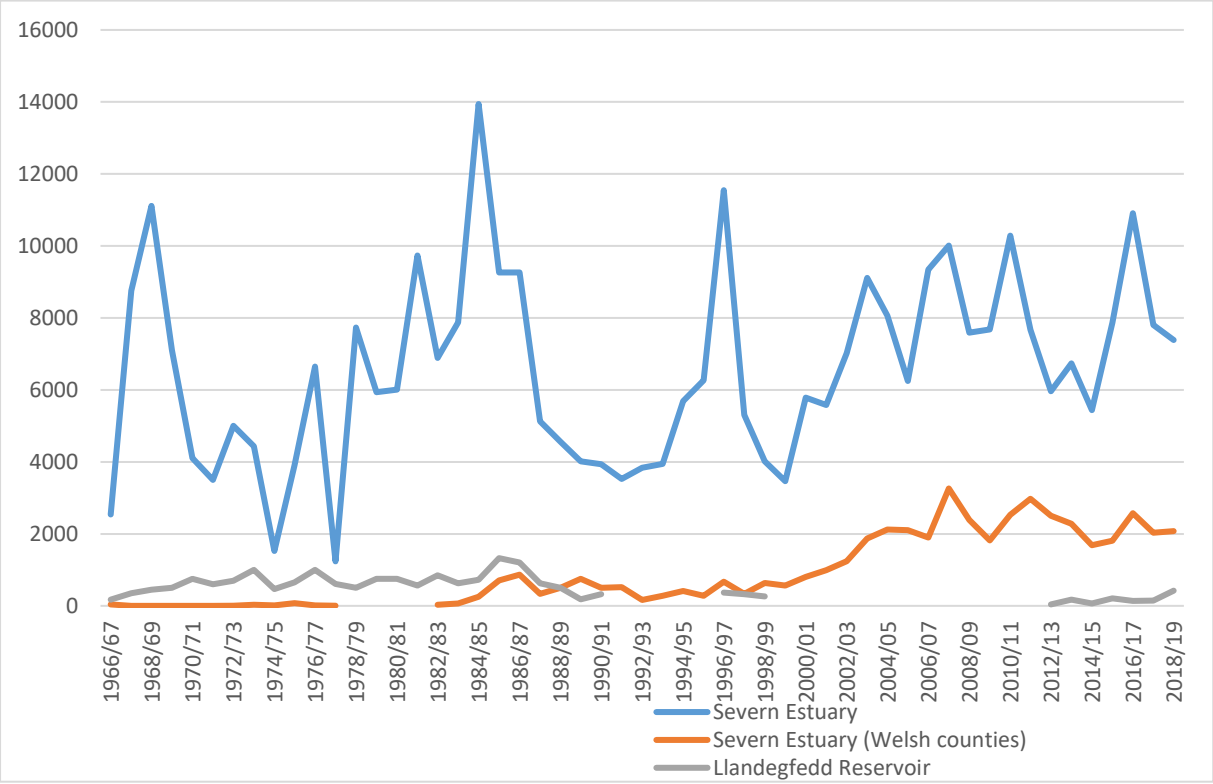
Habitats patterns: Wigeon are very much a bird of the Severn Estuary coast, however they are also present in good numbers at several inland sites, most notably Llandegfedd Reservoir.

Population trends: There have been noticeable increases in the Wigeon wintering populations within the UK; Gwent is no different. There have been identifiable increases in birds wintering, despite the numbers at the main wintering site (Llandegfedd Reservoir) falling in the late 1980s, as this has been more than compensated for by an increase in numbers at the Goldcliff saltmarsh (part of the Newport Wetlands complex). It would appear that the Wigeon population that winters in Gwent is currently secure and still of high importance as a significant part of the Nationally Important Severn Estuary population. Despite this, ongoing studies of trends are still of great importance to monitor the populations, particularly as investigations continue into Severn barrages, lagoons and tidal power. The potential impacts of these upon wintering Wigeon populations would have to be given great scrutiny.[38]

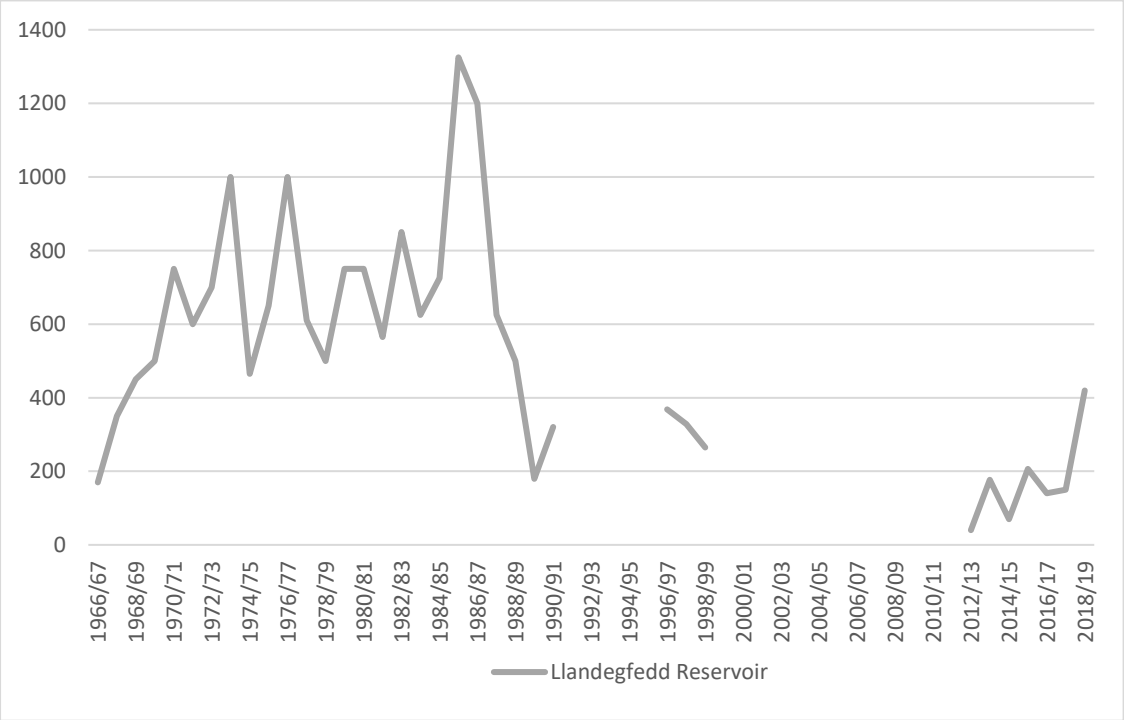
Details of the numbers wintering on the Severn Estuary through WeBS counts[24] are shown below. These show generally steady/increasing populations, although there are some dips. The increase in numbers following the creation of the Newport Wetlands at the beginning of the twenty-first century is clear to see. This represents the population at the most numerous recorded site (Severn Estuary), rather than in the whole of Greater Gwent. Llandegfedd Reservoir is also included for comparison and separately in its own figure and very clearly shows the sharp decline following winter 1986/87.

Note that some annual counts are given as a minimum number rather than a count/estimate.

Winter WeBS peak counts for Wigeon on the Severn Estuary and Llandegfedd Reservoir[2416]



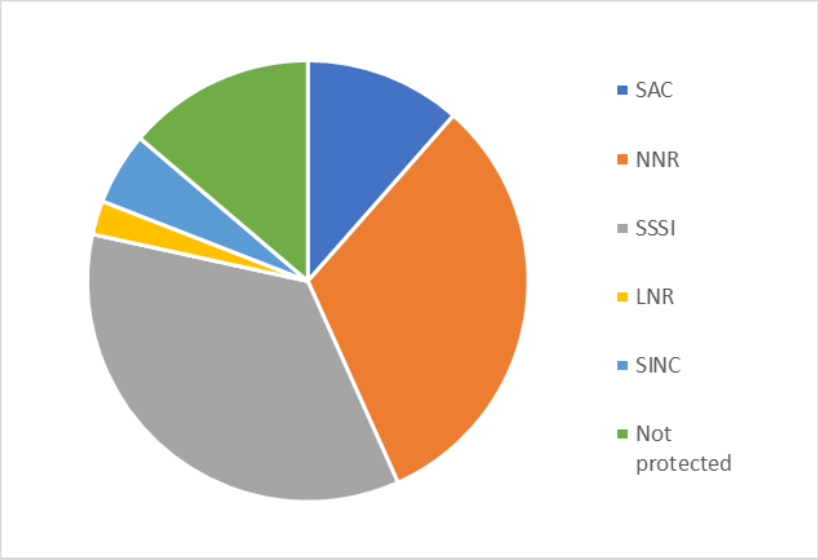
Winter WeBS peak counts for Wigeon at Llandegfedd Reservoir[24]



As previously stated, despite there being reports of breeding in the 1960s, it is now considered unlikely that Wigeon have bred, and there is no reason to suppose that they are likely to breed in Gwent, as the small UK breeding population is much further north.

Protection: 86% of records come from protected sites, with records from the Severn Estuary SAC, together with high numbers of records from the Newport Wetlands NNR and Gwent Levels and Llandegfedd SSSIs. LNR records come from St Julians, Garn Lakes, Beaufort Ponds and Parc Bryn Bach, and there are also some SINC records from places such as Rhaslas Pond, Ynys-y-Fro Reservoir, Parc Cwm Darren and Semtex Pond, as well as some on the edges of the River Usk.

Wigeon records from protected sites



References

1. Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. 2015. Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108: 708–746.
2. Johnstone I and Bladwell S. 2016. Birds of Conservation Concern in Wales 3: The Population Status of Birds in Wales. Birds in Wales 13(1): 3–31.
3. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/bittern/threats/
4. https://www.bto.org/sites/default/files/publications/apep4-population-estimates-birds-great-britain-uk-2020.pdf
5. https://community.rspb.org.uk/getinvolved/wales/b/wales-blog/posts/aderyn-y-bwn-wales-malltraeth-first-time-1984
6. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 119–120.
7. Gwent Bird Report 2016.
8. Gwent Bird Report 2018.
9. https://www.birdguides.com/news/bitterns-breed-in-south-wales-for-first-time-in-200-years/
10. https://app.bto.org/birdfacts/results/bob12200.htm
11. DEFRA. 2019. Wild Bird Populations in the UK 1970–2018.
12. https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf
13. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 261–262.
14. Tyler S and Ormerod S and Lewis J. 2009. The Post-Natal and Breeding Dispersal of Welsh Dippers Cinclus cinclus. Bird Study 37: 18–22. 10.1080/00063659009477032.
15. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 261–262.
16. BTO, JNCC & RSPB. 2019. The Breeding Bird Survey 2019 incorporating the Waterways Breeding Bird Survey 9.
17. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/little-egret/
18. https://www.wildlifetrusts.org/wildlife-explorer/birds/herons-egrets-and-spoonbill/little-egret
19. Robinson RA. 2005. BirdFacts: Profiles of Birds Occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 16 December 2020).
20. Frost TM, Calbrade NA, Birtles GA, Mellan HJ, Hall C, Robinson AE, Wotton SR, Balmer DE and Austin GE. 2020. Waterbirds in the UK 2018/19: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.
21. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society.
22. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society.
23. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 121–122.
24. Wetland Bird Survey (WeBS) data from Waterbirds in the UK 2018/19 © copyright and database right 2020. WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, in association with WWT, with fieldwork conducted by volunteers.
25. Pearce-Higgins JW and Crick HQP. 2019. One-third of English Breeding Bird Species Show Evidence of Population Responses to Climatic Variables over 50 years. Bird Study 66(2): 159–172. DOI: 10.1080/00063657.2019.1630360.

26. http://www.birdfieldguide.co.uk/Pintail.html
27. Robinson RA. 2005 BirdFacts: Profiles of Birds Occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 01 March 2021).
28. https://www.wildlifetrusts.org/wildlife-explorer/birds/waterfowl/pintail
29. https://www.bto.org/ai/pdfs/71move.pdf
30. https://monitoring.wwt.org.uk/2014/07/uk-waterbirds/webs/webs-highlights-decline-of-pintail/
31. https://rbbp.org.uk/wp-content/uploads/2020/11/2018-Report-summary-table.pdf
32. Holloway S. 1996. The Historical Atlas of Breeding Birds in Britain and Ireland: 1875–1900. Poyser, London
33. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/pintail/
34. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 78.
35. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 72.
36. http://publications.naturalengland.org.uk/publication/5601088380076032
37. Gwent Bird Report 2014.
38. Musgrove AJ, Rehfisch MM, Clark NA (BTO). 2010. Birds of the Severn Estuary and Bristol Channel: Their Current Status and Key Environmental Issues. Marine Pollution Bulletin 61: 115–123.
39. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/reed-warbler/
40. Woodward ID, Massimino D, Hammond MJ, Harris SJ, Leech DI, Noble DG, Walker RH, Barimore C, Dadam D, Eglington SM, Marchant JH, Sullivan MJP, Baillie SR and Robinson RA. 2018. BirdTrends 2018: Trends in Numbers, Breeding Success and Survival for UK Breeding Birds. Research Report 708. BTO, Thetford: www.bto.org/birdtrends
41. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 290–292.
42. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 121.
43. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 103.
44. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/shoveler/
45. Robinson RA. 2005. *BirdFacts:* Profiles of Birds Occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 15 December 2020).
46. Kirby JS and Mitchell C. 1993. Distribution and Status of Wintering Shovelers Anas clypeata in Great Britain. Bird Study 40(3): 170–180. DOI: 10.1080/00063659309477180.
47. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 166.
48. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 96–97.
49. Massimino D, Woodward ID, Hammond MJ, Harris SJ, Leech DI, Noble DG, Walker RH, Barimore C, Dadam D, Eglington SM, Marchant JH, Sullivan MJP, Baillie SR and Robinson RA. 2017. BirdTrends 2017: Trends in Numbers, Breeding Success and Survival for UK Breeding Birds. Research Report 704. BTO, Thetford: www.bto.org/birdtrends
50. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/snipe/
51. https://www.wildlifetrusts.org/wildlife-explorer/birds/wading-birds/snipe
52. https://www.gwct.org.uk/game/advice/shooting-season-dates/
53. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 170–172.
54. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 90.

55. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 55.
56. https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/farming/advice/helping-species/snipe/
57. Robinson RA. 2005. BirdFacts: Profiles of Birds Occurring in Britain and Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 17 December 2020).
58. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/water-rail/
59. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 142–143.
60. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 85.
61. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 45.
62. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/wigeon/
63. https://www.waterfowl.org.uk/wildfowl/true-ducks/eurasian-wigeon/
64. Myrfyn O and Mitchell C. 1988. Movements and Migrations of Wigeon Anaspenelope Wintering in Britain and Ireland. Bird Study 35(1): 47–59: DOI: 10.1080/00063658809476979.
65. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 72–73.
66. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 71.

Upland and heath birds

Hen Harrier *Circus cyaneus* (Linnaeus, 1766)

Pete Hadfield

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 1

Conservation status: Red (UK[1] & Wales[2]) Wales Section 7 Priority Species

Data availability: Poor (245 records)

Context: Hen Harriers are resident to the UK, with numbers being bolstered from the continent in the winter. It is a bird of upland heather moors during the breeding season, but is more frequently encountered in lowland areas near the coast in the winter.[3] They are birds of prey and the RSPB reports that 95% of their diet is made up of small mammals. They eat a smaller proportion of birds,[4] but it is possible that small birds make up a larger part of the diet than 5%. The fact that they take birds and are present on shoot days, deterring Red Grouse from taking flight, brings them into conflict with gamekeepers on grouse moors, making them one of our most persecuted bird species.[5] This, coupled with their vulnerability to predation as a ground nesting species,[5] has led to their population levels remaining low. Additionally, naturally fluctuating rodent populations also have an influence on Hen Harrier populations from year to year.

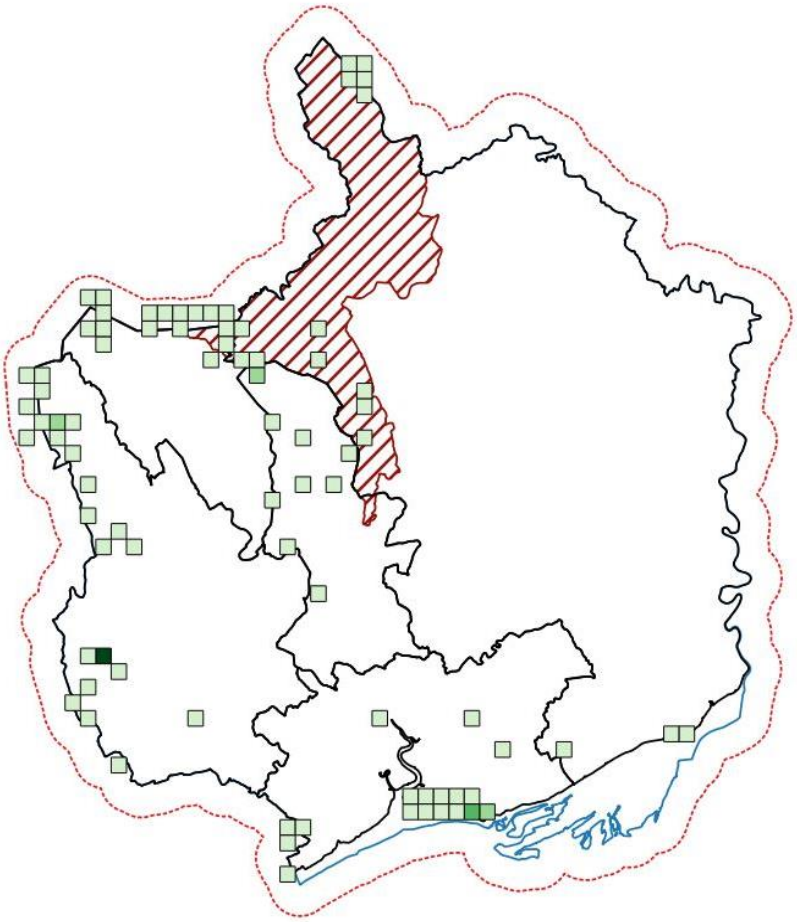
Outlook: The UK population up to approximately 1830 was quite widespread. However, habitat loss was responsible for losses by 1850 and, from then until the end of the nineteenth century, persecution by gamekeepers accelerated this, resulting in the breeding population being virtually confined to outlying islands by 1900.[6] Populations have made something of a recovery since 1940.[6] In the last 25 years the picture has been mixed, with both increases and contractions at regional and national levels, and an overall modest increase.[7] However, against this backdrop, Hen Harriers became virtually extinct in England.[8] It is only in the Outer Hebrides and the Orkneys that Hen Harriers have maintained a constant extant population.[6] The current (2016) breeding population is 545 pairs,[9] with a large proportion of these being in Scotland.

Greater Gwent range: The latest Gwent Bird Report (2018) records Hen Harriers as a 'scarce passage migrant and winter visitor',[10] and it would be fair to say this has been the case for a long while now: The Birds of Gwent in 2008 recorded Hen Harriers as being 'a scarce passage migrant and winter visitor'[11] and in 1977 as an 'uncommon winter visitor and passage migrant'.[11] This was not always the case however, with the 1963 Birds of Monmouthshire only listing four previous records.[11] Since the mid-1960s records have been virtually annual[11] and are indeed now annual, with for example 17 records in 2018, 7 in 2017, 28 in 2016 and 32 in 2015.[10] The fact that The Gwent Bird Report from 2007 stated that it was 'an excellent year for this species with six records' shows how numbers have generally increased in recent years.[12] Hen Harriers are virtually unknown as a breeding bird in Gwent however: proven breeding in 1975 may have actually been over the border in Powys; potential breeding was recorded on Mynydd Garn-clochdy in two consecutive years in the 1990s.[10] The

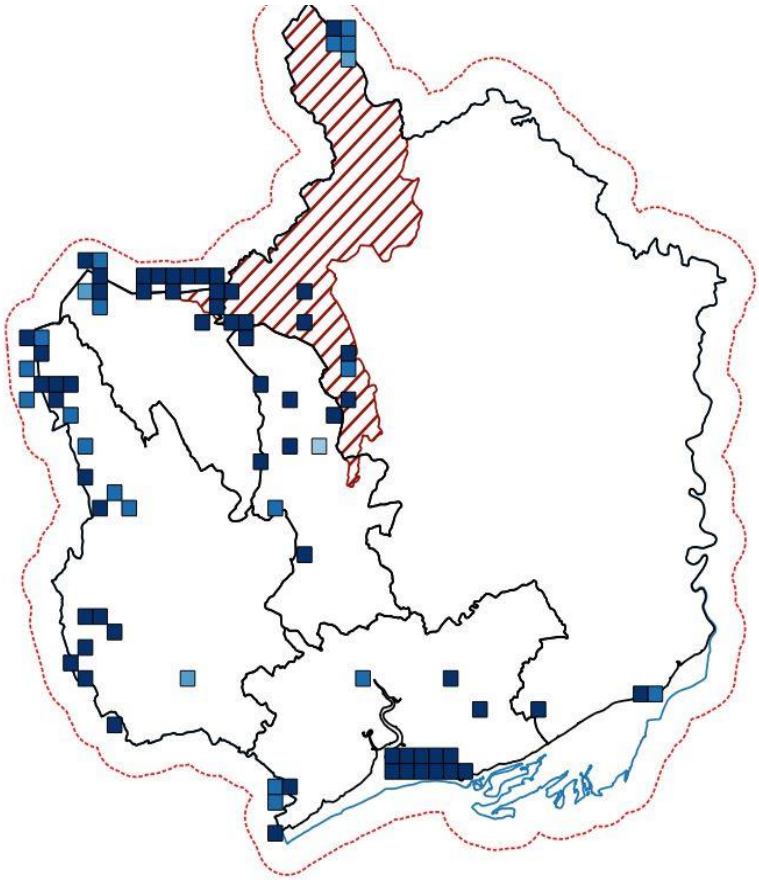
distribution of records in Gwent reflects the Hen Harrier's habitat preferences within the UK, with records generally from either upland moor/heathland or the coast. There is very much a westerly bias to records in Gwent and hardly a record from the administrative area of Monmouthshire (Monmouthshire records are from within the more upland parts within the Brecon Beacons Naitional Park (BBNP)); records come from the Newport coast and the more upland areas in the west of Gwent.

There is a dense hotspot on the uplands of Mynydd Eglwysian and numbers of records at Rhaslas Pond, Goldcliff Lagoons and Waunafon Bog, which reflects both habitat suitability and the fact that they are well watched.

Distribution of Hen Harrier records across Greater Gwent (maximum 42 records/km^2)



Records of Hen Harrier by decade

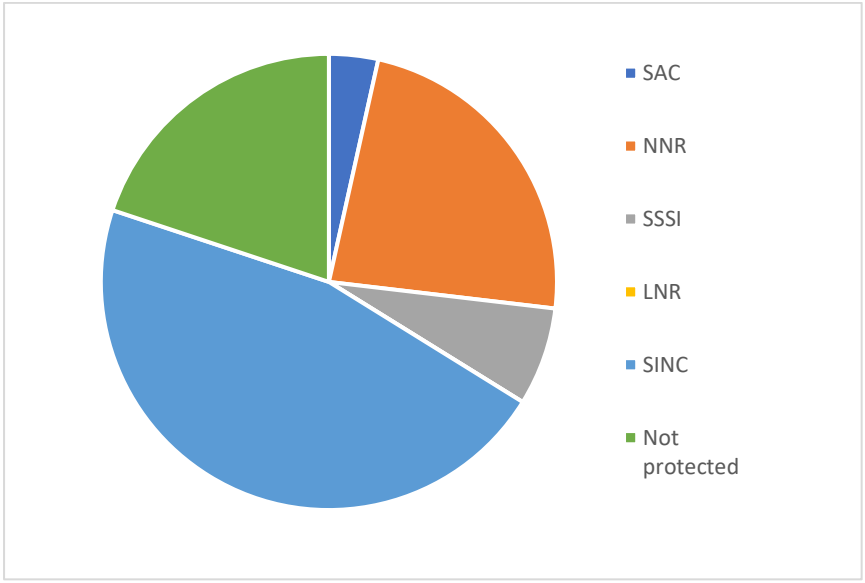


Habitats patterns: There are clear patterns to Hen Harrier distribution, with the coastal lowlands of the Gwent Levels and the upland heath/moorlands being the frequented sites.

Population trends: Whilst Hen Harrier numbers within Gwent are quite low, there is definitely a general trend towards more records in recent years. This may be partially attributable to more recorder effort, but is likely to be due to an increase in the UK population, with a general improvement in Welsh fortunes, populations having remained stable in the 80s/90s and increasing in the 2000s.[13] However in more recent years there has been downturn in the population, with a drop of one-third between the national surveys of 2010 and 2016.[14] There are certainly potential breeding sites for Hen Harriers within Gwent, and while the Welsh population is extant and Hen Harriers are being recorded yearly in Gwent there is the potential for Hen Harriers to breed within the county. For this to occur, there would need to be areas of upland heath with a good coverage of heath, maintained in a good condition. This is often the case on uplands where grouse shooting occurs, but they are also sites of potential conflict good relations need to be maintained between conservation bodies and the shooting community for breeding to be successful. This chapter should be cross-referenced with that for Red Grouse.

Protection: The SAC records are those falling in the Severn Estuary or Usk Bat SAC. The NNR is Newport Wetlands, with the SSSIs being those on the Gwent Levels and Black Mountains, with a few on the Blorenge and Mynydd Llangynidr. SINCs are very scattered across the uplands in Torfaen and Caerphilly, involving sites such as Coity, Mynydd James and Varteg, and Cefn Gelligaer.

Hen Harrier records from protected sites



Nightjar *Caprimulgus europaeus* (Linnaeus, 1758)

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Amber (UK[1] & Wales[2]) UKBAP, Wales Section 7 Priority Species

Greater Gwent data availability: Poor/moderate (344 records)

Context: The Nightjar is a summer visitor to the UK and spends its winter in scrubby grasslands to the south of the equator in Africa.[15] This means that the Nightjar is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source, both impacted by climate change.[16] They are our only representative of a whole host of 'nightjar' species that occur around the globe. They are an enigmatic bird, their nocturnal habitats, unearthly song and cryptic camouflage giving rise to much folklore. In the UK the Nightjar is a primarily a bird of heathland, bracken covered hillsides and open woods, with felled and young plantations more recently being an important habitat. Due to its great camouflage and nocturnal habits, it is rarely seen on migration. However, it gives away its presence on breeding sites with its distinctive churring call. Nightjars are insectivorous, relying on airbourne insects, with moths and beetles making up a large part of the diet.

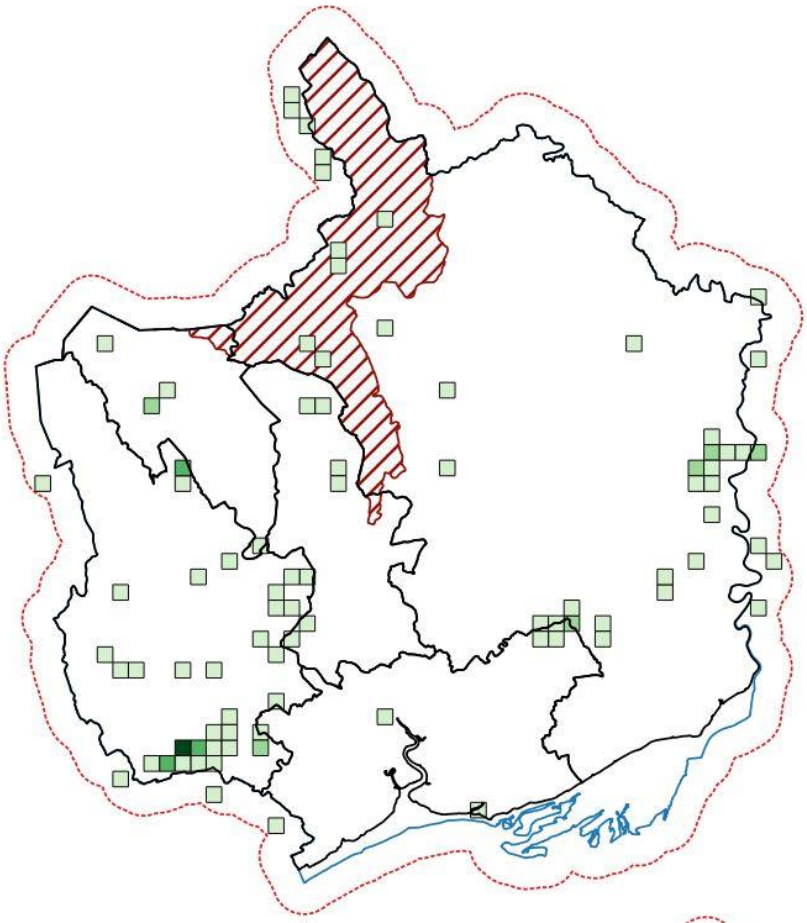
Outlook: The UK population was formerly (nineteenth century) widespread, with breeding occurring in every UK county apart from offshore islands and being particularly common in southern England, Wales and the Marches.[6] By the 1930s a general decline was underway as habitat loss continued and plantations matured.[6] Habitat destruction led to a major decline in Nightjars following the Second World War.[17] The loss was particularly marked in more western areas, with Nightjars being lost from some Welsh counties by the 1950s/60s.[6] By the time of the 1968–72 survey, Nightjars had lost even further range, disappearing from much of Scotland, Ireland, northern England and central Wales.[6] Dedicated Nightjar surveys have been undertaken at three points since 1980, and Nightjar numbers have increased greatly since the national survey in 1981, when the British population was estimated at only 2,100 churring males; the population was estimated to be 3,400 in 1992 and 4,606 in 2004.[18] Data cannot be found for a more recent breeding population, but it is likely to have increased further since 2004, with the utilisation of coniferous plantations and dedicated conservation work helping populations recover further.

Greater Gwent range: The latest Gwent Bird Report (2018) records Nightjars as an 'uncommon breeding summer visitor',[10] and it would be fair to say this has been the case for a long while, although numbers have fluctuated and strongholds within Gwent have shifted over time. Nightjars were not officially recorded in Gwent until 1926,[19] although soon after, the 1937 Birds of Monmouthshire described them as being 'a fairly common visitor, breeding rather locally on fern-covered hillsides, commons and heaths and in open woodlands or on sites of felled woods'.[20] However, by the time of the revised Birds of Monmouthshire in 1963, the Nightjar was 'a rather uncommon visitor, breeding very locally and thought possibly to be decreasing'.[20] There was an increase in records from 1965, and Wentwood was noted to be the main site, with eight pairs in 1970 (although this subsequently declined).[20] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 30 pairs, with the main breeding stronghold having transferred from Wentwood to the Wye Valley, where 23 singing males were recorded during the 1981 National census.[21] Subsequently, numbers increased further, although the stronghold shifted to some extent again, with the 1992 survey showing a good population in the Ebbw Forest (13 males), a reduced 11 males in the Wye

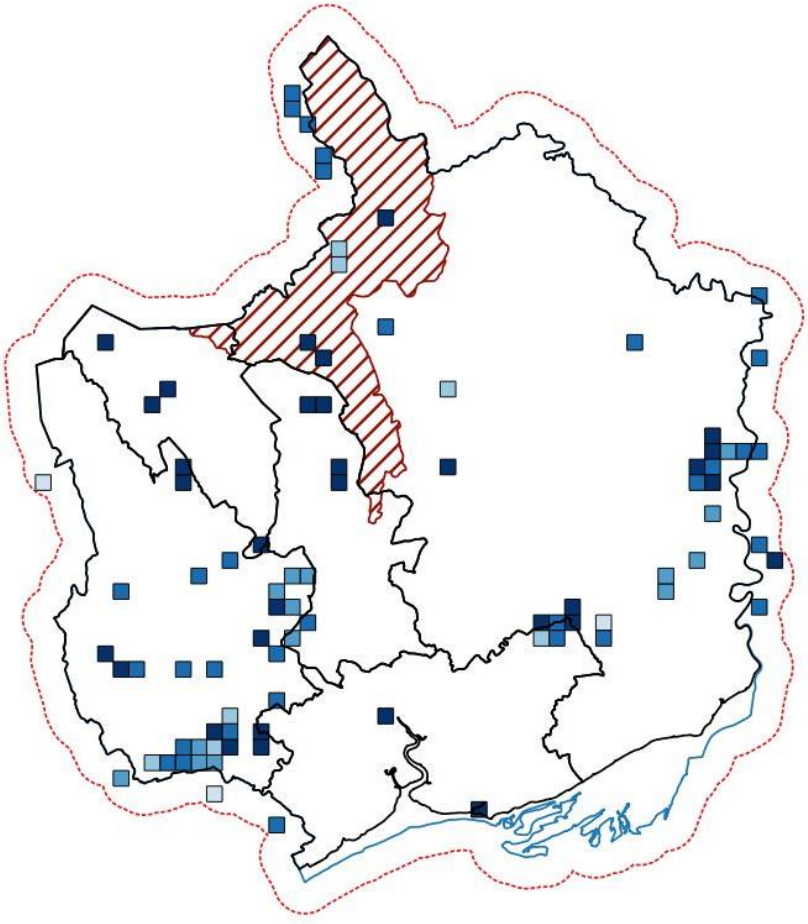
Valley, and only 4 males in Wentwood.[20] There was a further change in distribution in the mid-1990s when the Ebbw Forest and Wye Valley populations began to decline, and the Wentwood population became the stronghold once more.[20] By the time of the publication of the Birds of Gwent in 2007, the Nightjar was described as 'an uncommon summer visitor, now at the highest level ever recorded'.[20] Since then numbers have fluctuated , perhaps due to under-reporting, but the Nightjar has still been found at various sites in the Wye Valley (Beacon Hill and others), Wentwood and in the west of Gwent in places such as Machen Mountain, Abersychan and the Gwyddon Valley.[19] The distribution and success of Gwent's Nightjars is very much dependent on the availability of forestry plantation clearfells/restocks at suitably open stages, with populations dwindling and shifting when suitable areas become more forested. Unlike many other migrant species, which are often recorded near the coast, away from breeding sites, the well-camouflaged and nocturnal Nightjar is rarely recorded away from its breeding grounds.

The Nightjar is much more a lowland rather than upland heath species, particularly found on forestry clearfell areas. Hotspots around Broad Meend/Beacon Hill, Wentwood, Ruperra & Wern Ddu, with a smaller hotspot at Coed y Llanerch. Note the shrinkage of all the hotspots (particularly the Caerphilly one) over time.

Distribution of Nightjar records across Greater Gwent (max 43/km^2)



Records of Nightjar by decade



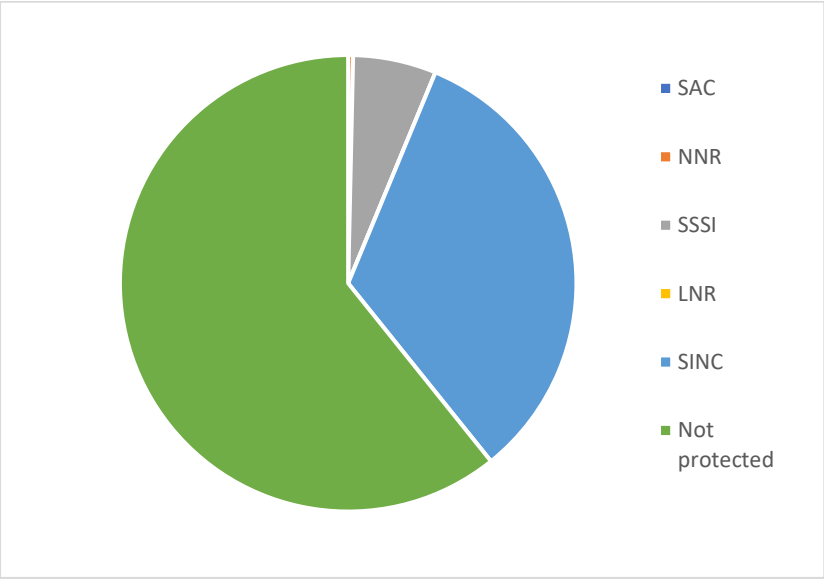
Habitat patterns: There is a clear pattern to the records, with concentrations in the forestry areas of Wentwood, Wye Valley and the western Valleys, where areas of clearfell/restocking are suitable for breeding Nightjars.

Population trends: The fluctuating but generally positive (in recent times) population in Gwent has been documented previously. With the population generally increasing across the UK (and Wales) – the conservation status has been reduced from red to amber for both – and the Gwent population seemingly quite stable, it would appear that the Nightjar is currently in quite a healthy situation in Gwent. With large areas of conifers being felled in recent years due to larch disease, it is possible that potential breeding sites for Nightjars will increase at least in the relatively short term, perhaps leading to an increased population. The longer-term management of these felled areas, how they are restocked and whether there will be regular felling operations opening up new areas in the future will play a large part in determining Nightjar numbers in the longer term. The availability of prey (principally nocturnal moths and beetles) will also be a factor, and it is well documented that invertebrate numbers, including of moths,[22] are much declined, and this could be a limiting factor.

Protection: 60% of records are from unprotected sites. However, it should be noted that a lot of records occur at the edge of protected sites, for example, to the east of Wentwood.

SSSI records are from Ruperra and Cleddon Bog, and a solitary record from the Blorenge. There are many SINC records: Wentwood, Beacon Hill, Broad Meend and Rudry Common, together with a scattering on upland SINCs like Mynydd Maen.

Nightjar records from protected sites



,

Red Grouse *Lagopus lagopus* (Linnaeus, 1758)

Pete Hadfield

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 2

Conservation status: Red (Wales[2]), Amber (UK[1]). UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Moderate (429 records)

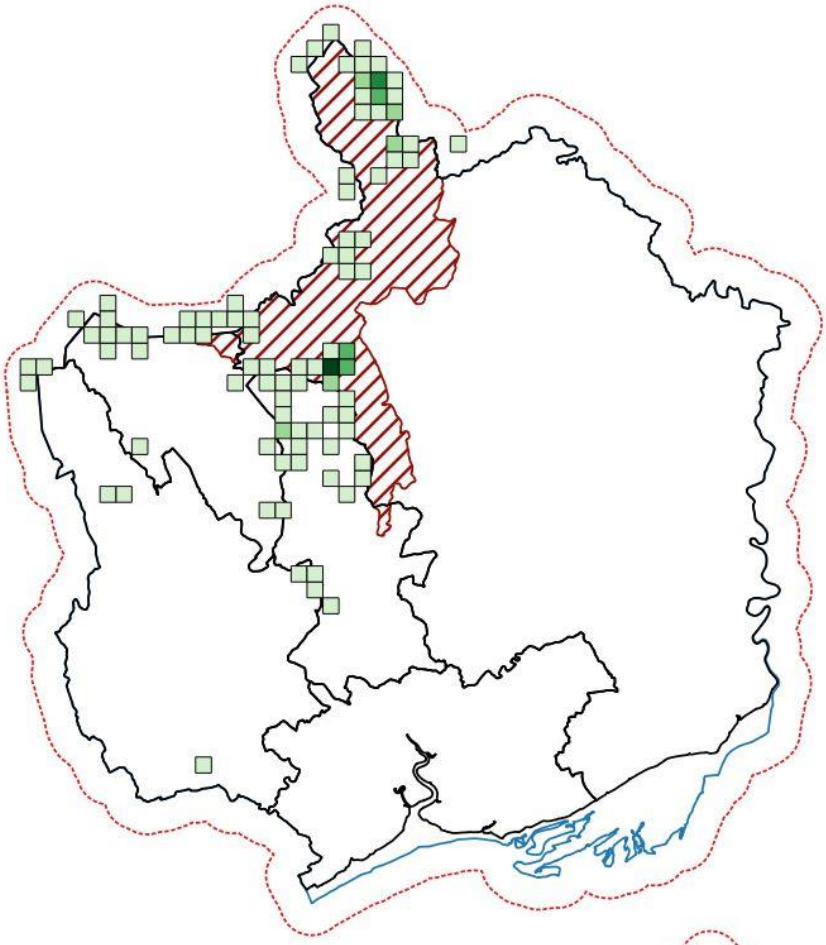
Context: A resident and sedentary bird, travelling very little during their lives.[23] The Red Grouse is very closely associated with upland heather moorland. The distinctive dark-winged race, *Scotica*, is endemic to the British Isles,[24] giving this species extra significance for conservation. The Red Grouse is vegetarian and has quite a limited diet; it relies on the shoots, seeds and flowers of heather, but may supplement this with items such as bilberries. [25] This limits their distribution to where a ready supply of heather is present. Insects are an important part of the diet for chicks.[25] In practice, this means they are confined to upland heather-clad moorland, so that their geographical distribution is strongly biased towards the north and west,[23] where this habitat is abundant. There has been a general loss in Red Grouse numbers in the twentieth century because of lack of heather moorland management and loss of habitat.

Outlook: Before concerted management of the moors began at the end of the eighteenth century, Red Grouse numbers were far lower.[6] The end of the nineteenth century and up to the First World War was the heyday of moorland management and grouse shooting, and Red Grouse were present throughout Ireland and on most heather moorland in Britain, although absent from lowland heath.[6] There was a decline in the management of sporting estates during the First World War which accelerated further during the Second World War, bringing about a degradation in habitat and therefore a reduction in numbers.[6] Particularly severe losses occurred in Scotland and Wales after the mid-1970s.[26] Planting of heather moors for coniferous forestry and degradation from sheep farming caused further loss of Red Grouse habitat and this, together with predation in the absence of predator control, saw Red Grouse numbers continue to fall.[26] Numbers have recently improved to some degree: there has been a 26% increase between 1970 and 2017 (described as 'little change'), largely driven by a 19% 'strong increase' in 2012–2017.[27] The more recent BTO Breeding Bird Survey,[28] further shows signs of recovery, recording an increase of 23% in 1995–2018 in the UK, although there was a 18% decrease in 2018–2019 perhaps reflecting fluctuations in population brought about by disease (Louping Ill spread by ticks and Strongylosis caused by a nematode worm can cause large levels of mortality)[26] and weather. Red Grouse are now only present in very low numbers in Wales.[26] The current (2016) breeding population is 256,000 pairs.[9]

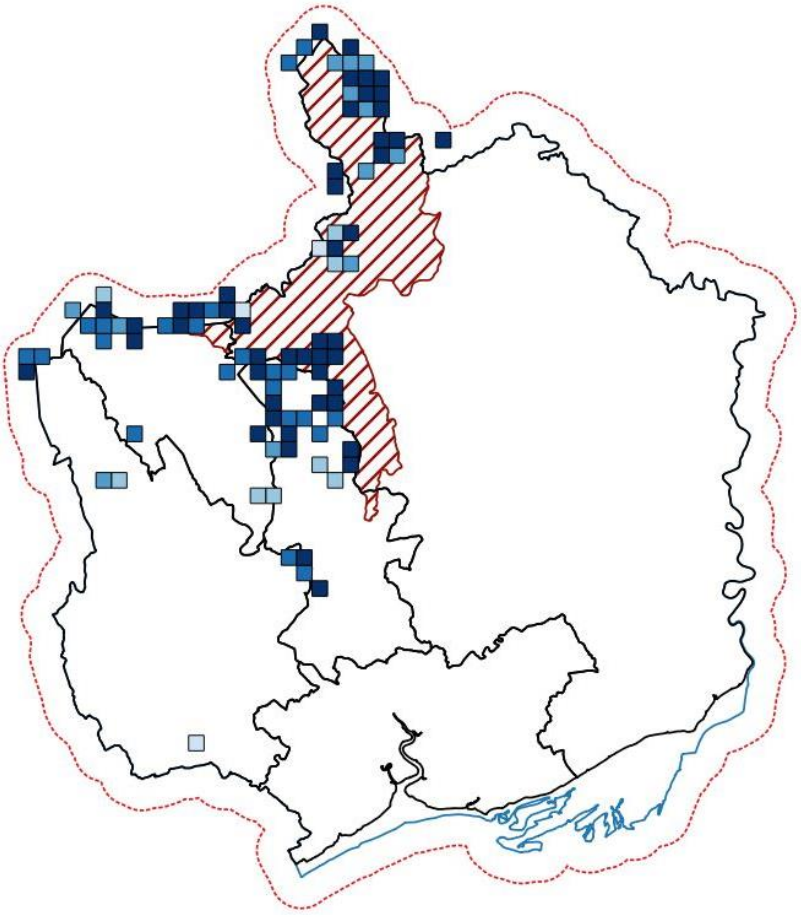
Greater Gwent range: The Gwent population and most specifically that on the Blorenge is the most southerly naturally occurring population in the UK.[29] The latest Gwent Bird Report (2018) records Red Grouse as an 'uncommon breeding resident; apparent decline in recent years',[10] and this has been the case for a while now: The Birds of Gwent in 2008 recorded Red Grouse as being 'an uncommon and declining resident on heather uplands'.[30] The 1977 Birds of Gwent described them as 'at present

widespread and regularly seen on the high ground in the north-west, though usually only in small numbers'. This publication however notes large declines, mirroring the UK's, with 1,000 birds on the Blaenavon moors in the late nineteenth century declining 10 pairs at most in 1960.[31] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimates a Gwent population of 650 pairs, although350 pairs may be more realistic.[21] This 1981–1985 population was subsequently revised downwards to 67–74 pairs, which is more in line with the population estimate of 60 pairs in the 1998–2003 census.[10]

The distribution of records in Gwent reflects the Red Grouse's preference upland heathland. There is very much a north and westerly bias to records in Gwent. Hotspots are on the Blorenge and in the Black Mountains, with some range shrinkage in Torfaen.



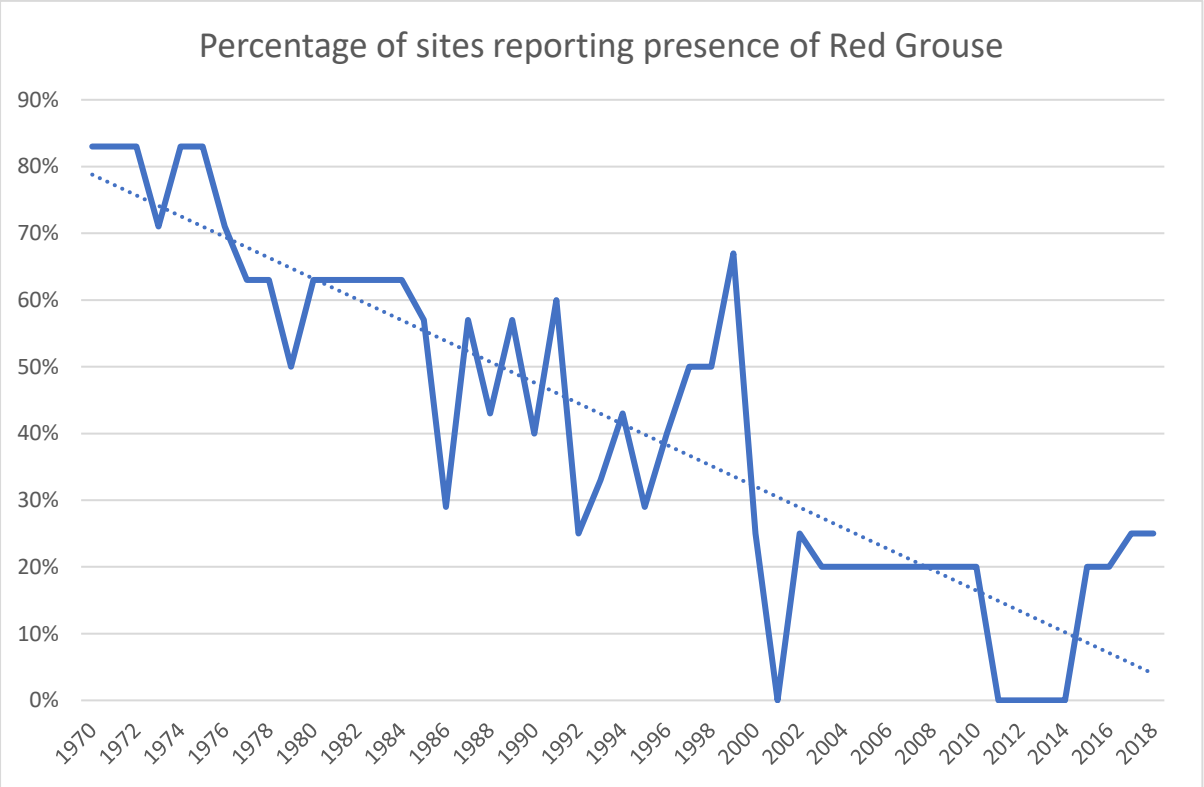
Distribution of Red Grouse records across Greater Gwent (maximum 46 records /km^2)



Records of Red Grouse by decade

Habitats patterns: The Red Grouse is very strongly associated with heather-clad uplands, so they are restricted to these sites in the north/west of Gwent.

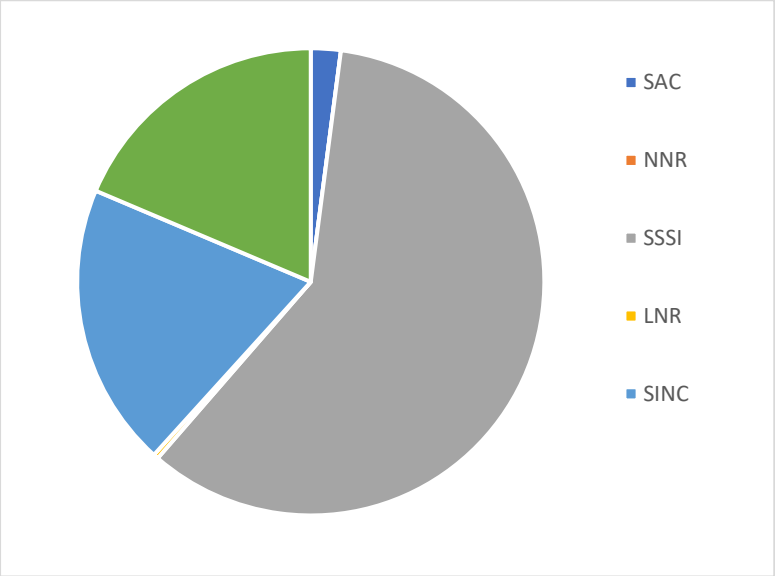
Population trends: Gamebag Census records for the study area (courtesy of the Game and Wildlife Conservation Trust) show a decrease in the percentage of sites reporting the presence of Red Grouse. Note that this is not a statistically significant trend as it is based on a low number of shoots reporting. Number of census returns varies between three and eight, with a general fall in numbers reporting since the 1970s and early 1980s. Also note that there is a bias in location of shoots (see data sources section for more information).



The area within the Blaenavon World Heritage Site is a stronghold, and surveys have been ongoing since 2007 with the aim of monitoring populations, informing management plans and increasing populations. During surveys in 2014, 110 birds were recorded – a 63% increase since 2008.[32] There was a moratorium on shooting in 2011, and it is predicted that with habitat enhancements the populations in this area have the potential to increase further. There are however unknowns that could affect the population: climate change could impact habitat quality, parasite loading and chick survival, with wet springs/summers generally being poor for Red Grouse.[33]

Protection: 81% of records come from protected sites, with a few records from Usk Bat SAC, but the vast majority (nearly 60%) from the Blorenge and Black Mountains SSSIs, with a few on Mynydd Llangynidr. The remainder are from across the Torfaen Upland SINCs, such as Coity, Mynydd James and Varteg, and Garn yr Erw.

Red Grouse records from protected sites



Ring Ouzel *Turdus torquatus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[1] & Wales[2]) UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Poor (201 records)

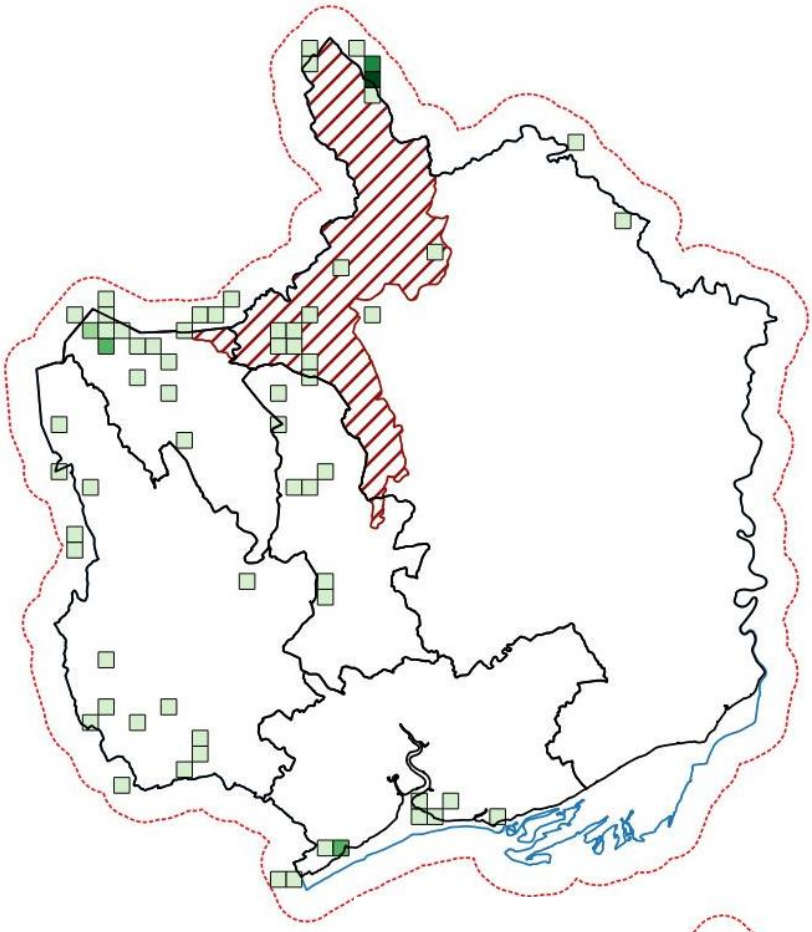
Context: A migrant bird that is a summer visitor to the UK, the Ring Ouzel spends its winter in the Atlas Mountains of north-west Africa.[34] This means that the Ring Ouzel is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source, both impacted by climate change.[16] A whole paper has been produced regarding the potential impacts of climate change on Ring Ouzels.[34] They are a member of the thrush family and most closely resemble the much more familiar Blackbird; the striking white gorget of the male, however, makes it easily recognisable if seen well. In the UK, it is primarily a bird of the uplands, breeding in steep-sided valleys, crags and gullies.[38] An alternate name is Mountain Blackbird. As such, the Ring Ouzel (at least as a breeding bird) is confined to where these more upland habitats occur and thus has a westerly and northerly bias to its distribution. It relies on invertebrate prey during the breeding season, taking a wide variety of items, with earthworms and leatherjackets appearing to be particularly important.[38] However, once the breeding season is over, berries are the main diet, with those that abound in our uplands, such as bilberry, crowberry and rowan, being utilised.[38] On migration, Ring Ouzels can turn up in more lowland habitats and recently arrived or departing birds can be found along the coast in particular.

Outlook: The UK population was formerly (nineteenth century) widespread across much of the UK, with a westerly and northerly bias.[6] A decline started in the twentieth century, with large declines reported in Scotland in 1900–1950.[36] A further 27% reduction in the British breeding range was apparent between the 1968–72 and 1988–91 national atlases, with losses particularly marked in Scotland and Wales.[38] A first national survey was undertaken in 1999 that highlighted a further range contraction and a probable 58% decline in population size since 1988–91.[37] The number of breeding pairs of Ring Ouzels decreased by 44–100% during 1979–2009 across 13 study areas throughout the UK.[38] Most recent population estimates show there to be perhaps a slowing or reversal of the decline, with a 37% increase from 2008–2018,[28] albeit from much reduced original numbers. The current (2016) breeding population is 7,300 pairs.[9]

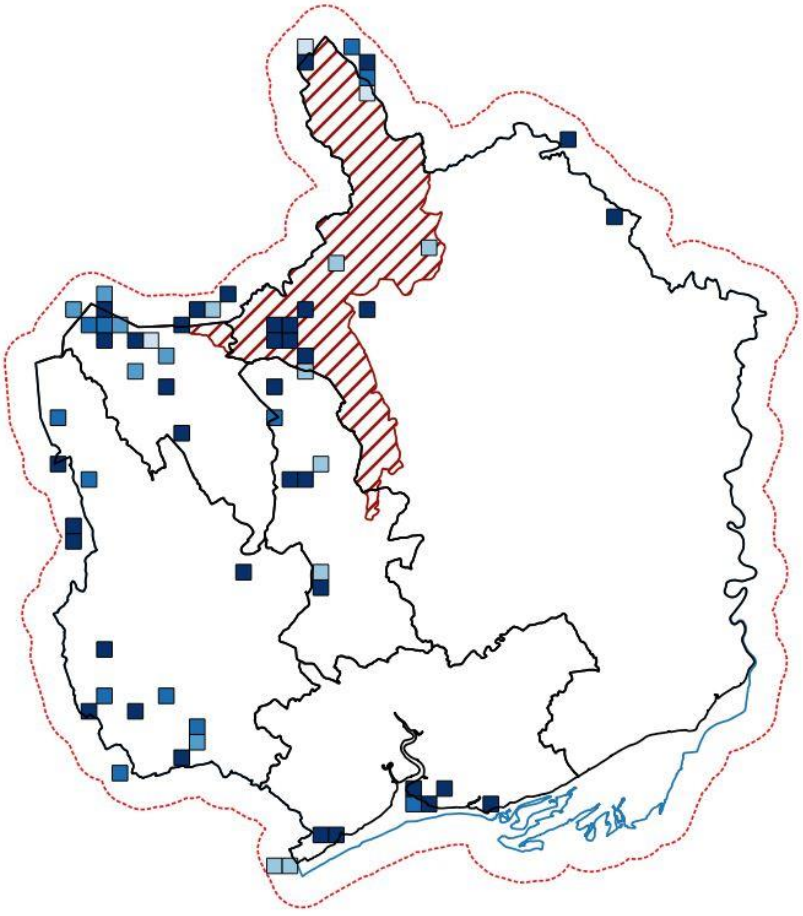
Greater Gwent range: As a breeding species, Ring Ouzels are effectively extinct within Gwent. The last remaining reliable breeding site was Trefil Quarries, where 3–4 pairs could be found up to 1997.[39] Birds have been recorded in small numbers there fairly regularly since, but it would appear they are lost as a breeding species. The latest Gwent Bird Report (2018) now records Ring Ouzels as a 'passage migrant; former rare breeding summer visitor'.[10] Historically (1970s), it was noted to be sparsely distributed in the wilder hill regions of the north and north-west but also breeding irregularly on high ground in the south of the coalfield, but numbers were noted to have been decreasing since 1970.[40] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimates a Gwent population

of 50 pairs, mentioning the Black Mountains, Trefil and the hills between Abergavenny, Ebbw Vale and Pontypool as breeding sites.[21] Subsequent to this, it is clear the population continued to fall sharply, resulting in its aforementioned extinction as a breeding bird in Gwent. Ring Ouzels are still recorded annually, often in upland sites with potential for breeding. However, the birds appear to no longer remain to breed. On migration, occasional birds also turn up at more lowland sites, principally at well-watched coastal sites.

Hotspots for records are upland sites at Trefil, Hatterall Ridge & Pwll Du, as well as the coastal, lowland Peterstone Gout, where there is much recording effort at migration times. More records are out of area – we have 201 study area records and just 110 in Greater Gwent – in Mynydd Llangattock and Craig y Cilau plus the Hereford side of Hatterall Ridge.



Distribution of Ring Ouzel records across Greater Gwent (maximum 27 records /km^2)



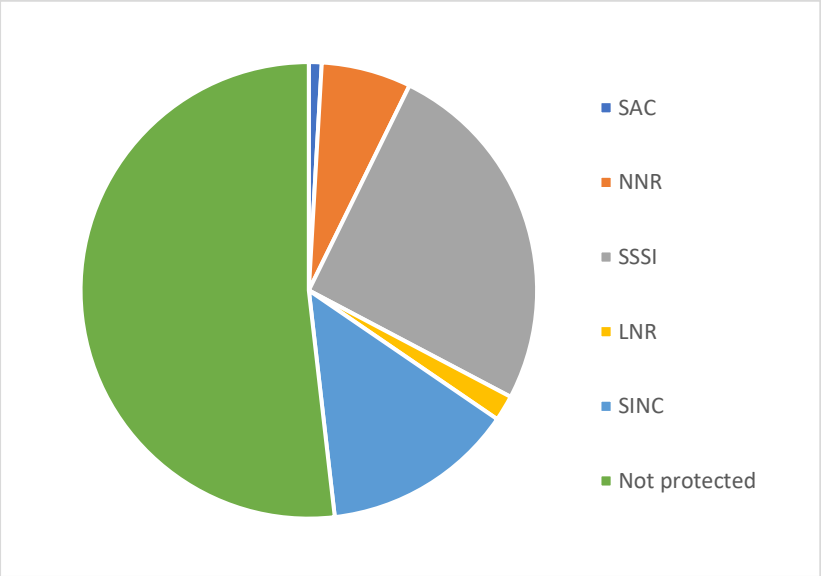
Records of Ring Ouzel by decade

Habitats patterns: There is a clear pattern to the records, with upland sites being favoured; those areas with berry-producing trees/dwarf shrubs will be of particular importance for autumn migrating birds. For breeding birds, sites that will be favoured for breeding birds will need, ideally, a mix of heather and bracken together with short turf for foraging.

Population trends: The decline in population to extinction in Gwent has been documented previously. With the population generally reduced across the UK, repopulation may seem unlikely. However, with Ring Ouzel still being recorded annually and quite often in potential breeding areas, it is conceivable that they may breed sporadically again or even establish regular breeding. If there is a determined desire to return Ring Ouzels to our list of breeding birds then there may need to be focused engagement with landowners in certain parts of our uplands, and appropriate habitat management to create suitable breeding conditions. Alongside this, however, the backdrop of climate change and general temperature increase may push breeding populations into even higher upland areas as Gwent's 'lower' uplands become unsuitable.

Protection: 48% of records come from protected sites, with Newport Wetlands NNR, then many records from the Black Mountains, Blorenge and Mynydd LLangynidr SSSIs. LNR records from Garn Lakes, and then scattered across the large upland SINCs within Torfaen and Caerphilly.

Ring Ouzel records from protected sites



References

1. Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. 2015. Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746.
2. Johnstone I and Bladwell S. 2016. Birds of Conservation Concern in Wales 3: The Population Status of Birds in Wales. Birds in Wales 13:1, 3–31.
3. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/hen-harrier/
4. https://www.rspb.org.uk/birds-and-wildlife/advice/wildlife-and-the-law/wild-bird-crime/hen-harrier
5. https://www.bto.org/about-bto/national-offices/scotland/our-work/selected-highlights/hen-harrier
6. Holloway, S. 1996. The Historical Atlas of Breeding Birds in Britain and Ireland: 1875–1900. Poyser, London
7. https://www.bto.org/about-bto/national-offices/scotland/our-work/selected-highlights/hen-harrier
8. https://www.bbc.co.uk/news/science-environment-40422732
9. https://www.bto.org/sites/default/files/publications/apep4-population-estimates-birds-great-britain-uk-2020.pdf
10. Gwent Bird Report 2018
11. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 129.
12. Gwent Bird Report 2007.
13. Whitfield D and Fielding A. 2009. Hen Harrier Population Studies in Wales.
14. http://ww2.rspb.org.uk/our-work/rspb-news/news/443191--uk-hen-harrier-population-suffers-decline-according-to-latest-figures
15. https://www.bto.org/our-science/topics/tracking/tracking-studies/nightjars
16. Pearce-Higgins W and Crick HQP. 2019. One-third of English Breeding Bird Species Show Evidence of Population Responses to Climatic Variables over 50 years. Bird Study 66:2, 159–172, DOI: 10.1080/00063657.2019.1630360
17. https://www.norfolkwildlifetrust.org.uk/wildlife-in-norfolk/species-explorer/birds/nightjar
18. Langston RHW et al. 2007. Nightjar Caprimulgus europaeus and Woodlark Lullula arborea–recovering species in Britain?
19. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 230–232.
20. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 118.
21. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 96.
22. http://www.mothscount.org/text/19/moths_in_decline.html.
23. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/red-grouse/
24. https://app.bto.org/birdtrends/species.jsp?year=2018&s=redgr
25. https://www.northyorkmoors.org.uk/discover/moorland/moorland-plants-and-wildlife/red-grouse
26. https://www.gwct.org.uk/game/research/species/red-grouse/
27. DEFRA. 2019. Wild Bird Populations in the UK 1970–2018
28. https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf

29. https://www.visitblaenavon.co.uk/en/Publications/WorldHeritageSite/ForgottenLandscapes/FL-Landscape-Character-Study.pdf
30. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 97–99.
31. Ferns P et al. 1977. Birds of Gwent, Gwent Ornithological Society, 84.
32. Blaenavon World Heritage Site, Wildlife Survey and Monitoring Review, November 2017.
33. https://www.scottishfield.co.uk/outdoors/wildlifeandconservation/nurturing-the-famous-four-scotlands-grouse-species/
34. https://www.bto.org/understanding-birds/species-focus/ring-ouzel
35. Colin M. Beale et. Al. (2006) Climate change may account for the decline in British ring ouzels Turdus torquatus. Journal of Animal Ecology 2006 75: 826–835.
36. Sim I, Rollie C, Arthur D, Benn S, Booker H, Fairbrother V, Green M, Hutchinson K, Ludwig S, Nicoll M, Poxton I, Rebecca G, Smith L, Stanbury A, Wilson P, Green B. 2010. The Decline of the Ring Ouzel in Britain. British Birds 103: 229–239.
37. Wotton SR, Langston RHW and Gregory RD. 2002. The Breeding Status of the Ring Ouzel Turdus torquatus in the UK in 1999. Bird Study 49(1): 26–34.
38. http://ww2.rspb.org.uk/our-work/conservation/conservation-projects/details/259965-diagnosing-the-causes-of-ring-ouzel-declines
39. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 276–277.
40. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 118.

Urban birds

House Sparrow *Passer domesticus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[1]), Amber (Wales[2]) UKBAP, Wales Section 7 List

Greater Gwent data availability: Moderate/Poor (they are, perhaps understandably, massively under-recorded) (7,785 records)

Context: A resident and sedentary bird, the House Sparrow is very closely associated with human habitation, including rural, suburban and urban settlements. It was and still is widespread throughout the UK, although populations have suffered falls in various areas. The House Sparrow has a diverse diet that includes seeds and invertebrates, and it will readily exploit food thrown out/provided by people. The House Sparrow's quite catholic diet and ability to adapt and exploit humans is behind its success; it is one of the most widely distributed species in the world.[3] They are loosely colonial, forming small colonies in the breeding season[4] and largely remaining in these groups over winter. House Sparrows are a hole-nesting species, readily exploiting gaps under the eaves of houses and occupying nest-boxes. However, they are adaptable enough to form nests in dense vegetation if suitable holes are not available.[4] Despite their widespread distribution and adaptability, they have suffered worrying declines in relatively recent times: a 71% decline between 1970 and 2017,[5] although this has improved more recently. Different factors are responsible for the declines, and these differ for rural and suburban populations. Rural populations have been affected by changes in agricultural practices, loss of nest sites and reduced food availability. Urban and suburban declines are more difficult to explain, but the presence of urban greenspace in the form of large gardens/allotments is important for their success, as are nesting opportunities, and the loss of invertebrates may be a cause of decline.[6]

Outlook: The UK population of House Sparrows increased substantially in the nineteenth century, in line with the human population.[7] Sparrow populations were such that they were a well-recognised nuisance, and 'Sparrow Clubs' were set up with the aim of eradicating them from every parish.[6] Despite this, numbers continued to rise through much of the twentieth century, until the 1970s, when declines became apparent.[6] As mentioned previously, the numbers have declined alarmingly. Although they are generally still well distributed, they are disappearing from city centres, are absent from the Scottish Highlands and thinly distributed in the uplands.[8] The best populations are now found across the Midlands, Southern and Eastern England.[9] The estimated UK breeding population in 2016 was 5,300,000 pairs.[10] There were longer term reductions of 71% between 1970 and 2017 (described as 'weak decline'); more recently there has been 'little change', with a small 2% decline from 2012–2017.[5] The more recent BTO Breeding Bird Survey[11] shows signs of recovery and cause for optimism, with an decrease of only 1% in 1995–2018 in the UK as a whole and a pleasing 92% increase in Wales

over the same period –although it must be remembered that these more recent increases are the coming back from considerable losses in the 1980s. So, while there were large drops in House Sparrow populations, there are signs of improvements, particularly in Wales.

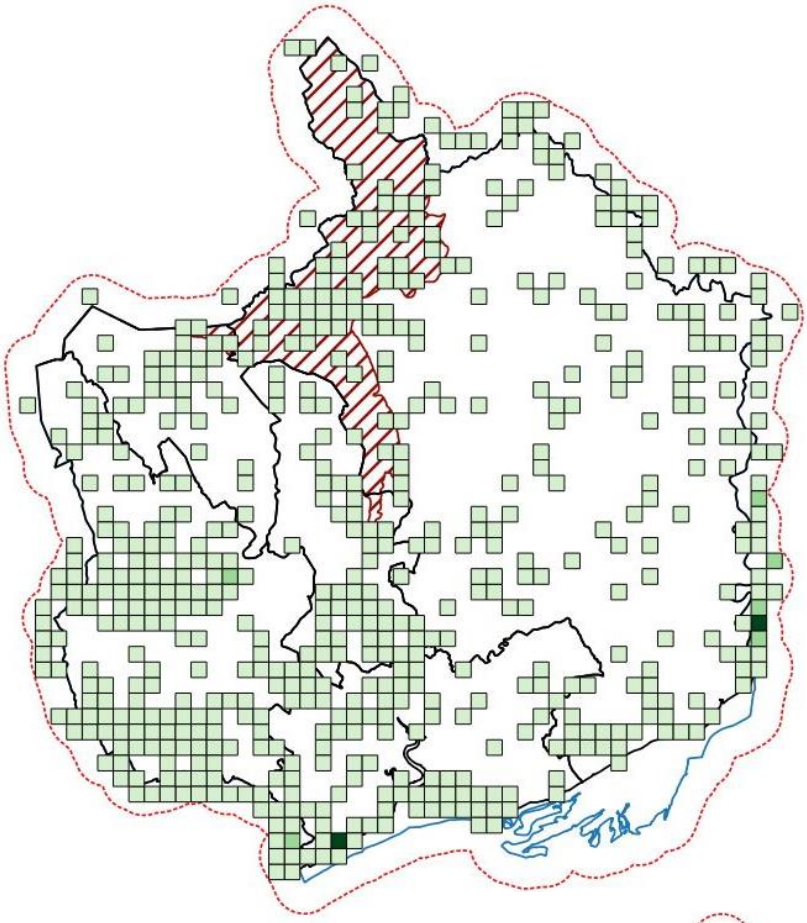
Greater Gwent range: The latest Gwent Bird Report (2018) records House Sparrows as an 'abundant breeding resident'[12] and, while their numbers may have fluctuated a bit, this has been the case for a long while now. The 1937 and 1963 Birds of Monmouthshire described them as being 'a common breeding resident', especially in and around towns and villages.[13] The Gwent Atlas of Breeding Birds for 1981–1985 estimated a Gwent population of 15,000–30,000 pairs, with House Sparrows being closely associated with human habitation and occurring in 92% of the tetrads within Gwent.[12] By the time of the publication of the Birds of Gwent in 2007, the House Sparrow was described as 'a fairly common resident' and its population estimated at 23,000–33,000 pairs.[12] This publication references the 2002 Bird of Wales, which noted significant declines in most parts of Wales during 1970–1990 but states that this may not have been the case in Gwent.[12] Indeed, the Gwent Bird Reports between 1975 and 2018 do not reveal any great loss in numbers, although some very localised declines and re-populations are recorded (it should be noted that the House Sparrow is generally a very under-recorded species). It can be concluded that House Sparrows are still a widespread (except in the uplands) and numerous species within Gwent. However, there is an impression that autumn–winter flocks in arable fields are not as large as they used to be.

Referring to records held by SEWBReC is complicated because the House Sparrow is so familiar it is rarely reported. Analysis of records is interesting as they are surely not a true representation. Hotspots are at Peterstone Gout (this is a birding hotspot so has more records) and on the Gloucestershire border, which is caused by centring of tetrad and hectad records.

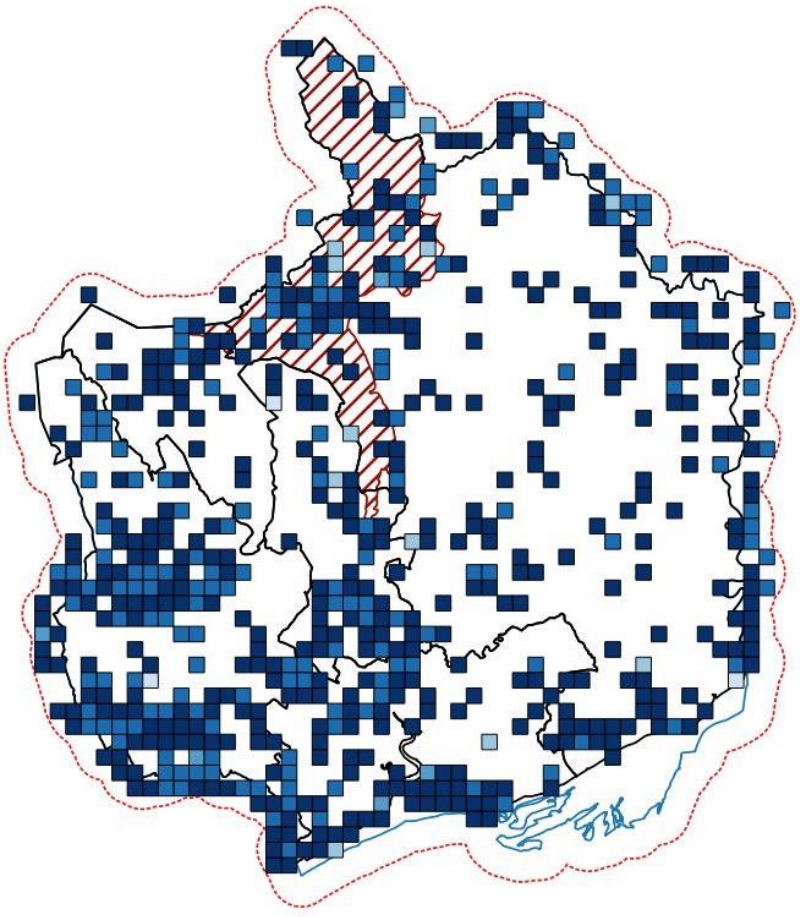
The reality is that, of the 1,916 1km squares, 1,324 (69%) have no records and 1,791 (93%) have 5 or less records in a period of 50 years. Just 125 (7%) squares have more than 5 records. There also is no great correlation with urban areas: Caerphilly perhaps has more records, but Newport, Chepstow, Cwmbran etc. have very few. This data should be compared to the tetrad maps for the Gwent Bird Atlases (1981–1985) and (1998–2003), which have records from 90%+ of the tetrads.[12]

Equally, the date map looks good until you realise that any area where there are no records of House Sparrow for a decade may be an issue. Again, it is likely to be the case that they simply are not recorded as they are so common. Recording of House Sparrows only really took off following recent media reports of declines: there were 17 records in the 1970s, 47 in the 1980s and 10 in the 1990s, but 1,124 in the 2000s and 3,047 in the 2010s.

Distribution of House Sparrow records across Greater Gwent (max. 1,099 records/km²)



Records of House Sparrow by decade

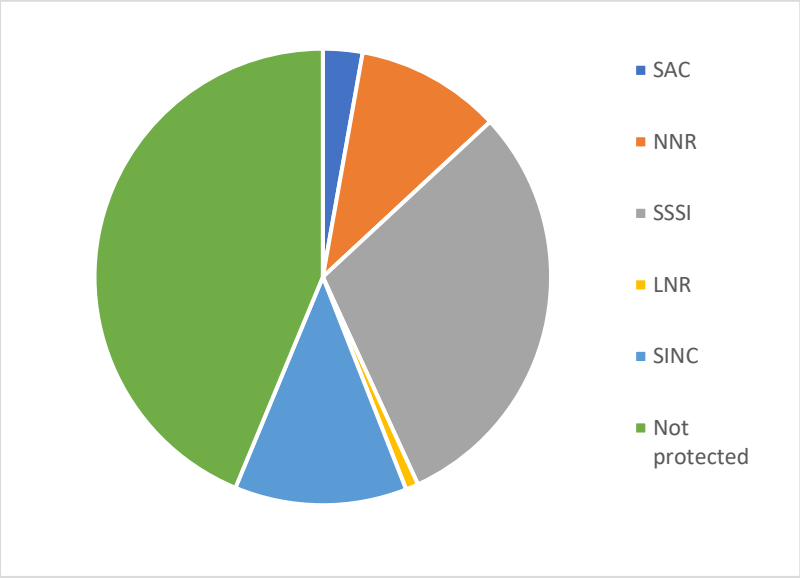


Habitats patterns: SEWBReC records may not clearly show this but there is a very clear correlation between House Sparrows and the presence of human habitation.

Population trends: As previously stated, quite large declines in House Sparrow populations were noted across the UK during the 1970s, 80s and 90s, with these declines slowing in more recent times and even reversing in areas such as Wales. Gwent appears to have been relatively unaffected by the national declines, and the House Sparrow population in Gwent would appear to currently be in good health.

Protection: 56% of records come from protected sites, with high numbers of records from Peterstone, within the Levels SSSIs and Newport Wetlands NNR, as these areas are visited often by birders. In reality you would expect far more records from unprotected areas (people's gardens), but as already stated such records are generally not submitted.

House Sparrow records from protected sites



Peregrine Falcon *Falco peregrinus* (Tunstall, 1771)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 1

Conservation Status: Green throughout UK.

Greater Gwent data availability: Moderate/Good (1,419 records)

Context: Peregine Falcons are resident in the UK and have the distinction of being the fastest bird species in the world. As a breeding bird, it has strongholds in the uplands of the north and west, as well as along rocky coastlines.[14] However, urban breeding peregrines are Increasingly a feature of many cities and towns throughout the UK.[15] They can be found more frequently in coastal areas during the winter. They are birds of prey, with their diet primarily being birds taken on the wing – feral pigeons are a favoured prey but a wide range of bird species will be taken.[16] The taking of birds has brought them into conflict with gamekeepers and the keepers of racing/carrier pigeons. This, coupled with young birds being taken by falconers and the effects of organochlorine poisoning, led to Peregrines falling to low levels, with the nadir being in the early 1960s. More recently, these negative impacts have reduced significantly, allowing Peregrine populations to bounce back, although they can still be subject to persecution, and habitat loss/degradation is an issue for most bird species.

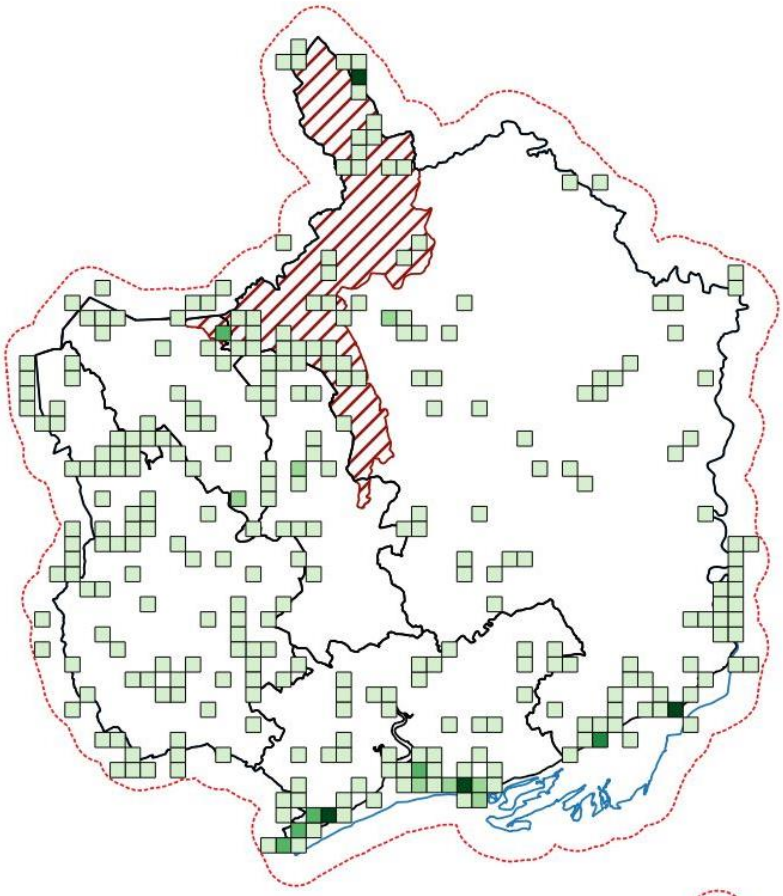
Outlook: The UK population started to decline in numbers during the nineteenth century as a result of an increase in game preservation and an improvement in the accuracy of firearms.[7] Reductions in Wales may not have been as noticeable because game-keeping was not so prevalent.[7] The advent of the First World War reduced game-keeper pressure, and numbers were high and stable by the advent of the Second World War.[7] This did not last, as an emergency order from 1940, and lasting until 1946) allowed for the destruction of Peregrines to protect Military Carrier Pigeons.[7] More severe declines were to come, with organochlorine pesticide poisoning halving populations between 1956–1963.[7] A voluntary moratorium in 1961, followed by bans in the 1970s & 1980s,[17] allowed Peregrine numbers to recover. A slow but strong recovery began in 1967, with numbers recorded in the late 1980s being probably higher than at any time to date in the twentieth century.[7] This is reflected in the 204% increase between 1970–2018 (rather curiously described as a 'weak increase'[5]) and an indication that population levels are now quite stable, with a 2% increase ('little change') from 2012 to 2017.[5] The current (2014) breeding population is 1,750 pairs.[10]

Greater Gwent range: The latest Gwent Bird Report (2018) records Peregrine as a 'resident and winter visitor',[12] and it would be fair to say that the recent fortunes of Peregrines within Gwent are good. The Birds of Gwent in 2008 recorded Peregrines as being a 'scarce or uncommon resident: more numerous now than ever recorded previously in the county',[18] and in 1977 as a 'fairly regular visitor, both in winter and on passage'.[20] This all indicates that numbers have increased over this period, particularly as the 1977 Birds of Gwent does not record them as a breeding species (indeed it mentions that the only confirmed breeding attempt in Gwent up to that point was in 1927).[20] However, other sources suggest a number of pairs in Gwent, with an average of three pairs and up to six sites used at least

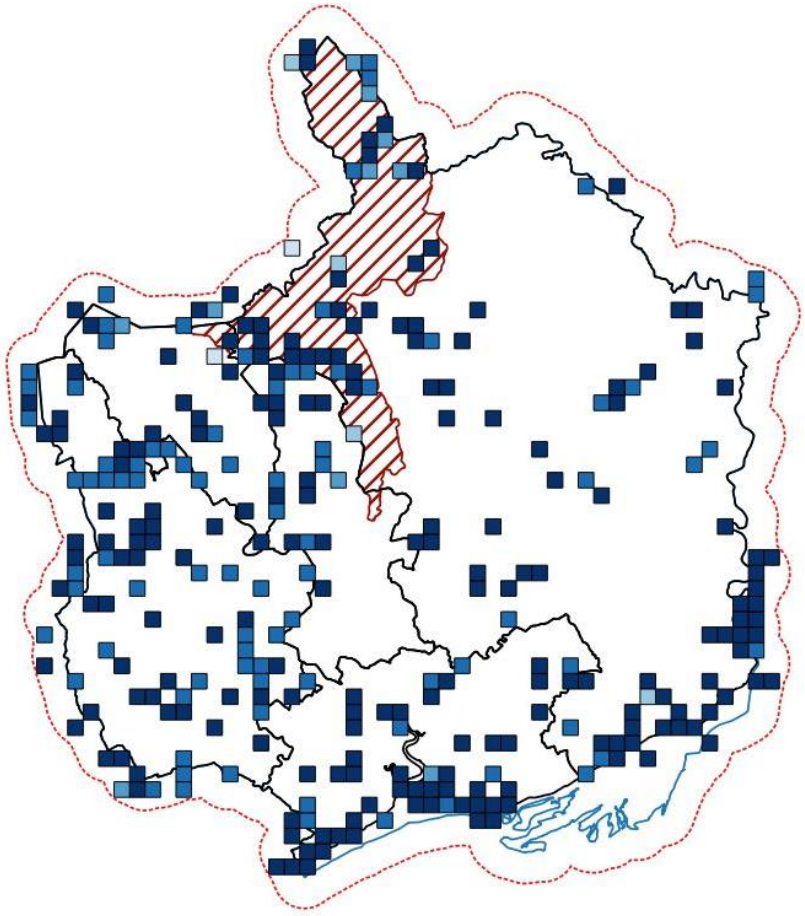
occasionally during the first half of the twentieth century.[18] Peregrines were however extinct as a breeding bird in Gwent by 1960. This situation continued until 1979, when a pair returned to Cwmyoy, although numbers recorded had been increasing prior to this.[18] By the time of the latest Gwent Bird Atlas (1998–2003), the population was at least 15 pairs, with the population concentrated in the western valleys and Black Mountains, although a number of more urban records and breeding on pylons were recorded in the Newport area.[18] The population is clearly doing well, with good food supplies and increased protection,[18] together with the ban on pesticides, cited as reasons for this. Persecution was/is still an issue however, with one site recording five different dead adults in one breeding season (1997).[18]

There are hotspots at Peterstone Gout and Newport Wetlands. This is undoubtedly due to increased observers at these bird-watching hotspots, but these areas are also likely to be well frequented by Peregrines as much potential prey is available. Smaller hotspots are at Hatterall Ridge (Black Mountains) and the Clydach Gorge, which more likely reflect breeding sites in these more rugged areas.

Distribution of Peregrine records across Greater Gwent (max >50)



Records of Peregrine by decade



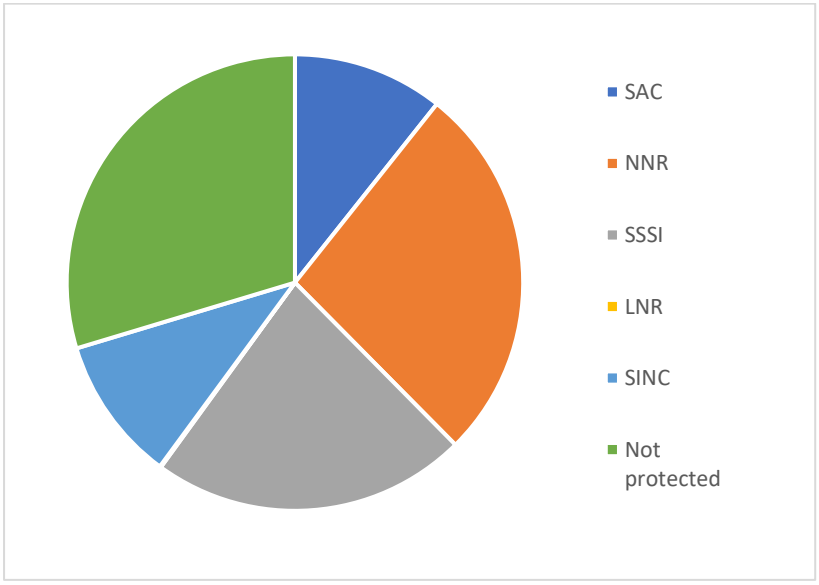
Habitats patterns: Breeding Peregrines still have a bias towards the more rugged west and north of Gwent, where rocky crags for nesting sites are present, although they can be found in the south of the county and in more urban environments, where structures such as pylons are utilised as nesting sites. Outside the breeding season, Peregrines can be found widely, particularly where there is ample prey, so that coastal sites with concentrations of birds such as Peterstone Wentlooge and Newport Wetlands are favoured sites.

Population trends: Reference to the BTO's latest Peregrine Survey (2014) shows that the overall increase in Peregrine populations in the UK between 2002 and 2014 was driven by increases in England and Northern Ireland.[19] Numbers in Wales and Scotland had actually fallen due to reductions in the upland Peregrine populations, with Grouse Management persecution being cited as a possible significant factor.[19] Numbers in lowland areas were actually increasing, driven by the Peregrine's exploitation of urban, feral pigeons as an abundant food source and the use of man-made structures as nest sites.[19] It may be that, over time, the Peregrine will become associated less with wild uplands and more with man-made structures in the lowlands.[20]

Within Gwent in recent years, the Peregrine population has been exploiting both the uplands of the north/west as well as the coast and open lowlands associated with the Gwent Levels. It is always a species that is likely to suffer some persecution, however Gwent's population is high and stable, and it is hoped this will continue.

Protection: 70% of records come from protected sites, with high numbers from SAC records along the Severn Estuary, plus a few at the Usk Bat Sites SAC. NNR records were from Newport Wetlands. The SSSI records were again from across the Levels, plus the Blorenge, Black Mountains and Llandegfedd Reservoir. SINCs from multiple sites across Caerphilly and Torfaen, plus a few Blaenau Gwent, generally associated with the more upland, western valleys, especially north of Caerphilly, around Parc Cwm Darren, northern Torfaen and around the Blaenavon area.

Peregrine records from protected sites



References

1. Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. 2015. Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108: 708–746.
2. Johnstone I and Bladwell S. 2016. Birds of Conservation Concern in Wales 3: The Population Status of Birds in Wales. Birds in Wales 13:1, 3–31.
3. https://www.nhm.ac.uk/discover/house-sparrow-passer-domesticus.html
4. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/house-sparrow/breeding/
5. DEFRA. 2019. Wild bird populations in the UK 1970–2018, 40.
6. https://www.bto.org/our-science/projects/gbw/gardens-wildlife/garden-birds/a-z-garden-birds/house-sparrow
7. Holloway S. 1996. The Historical Atlas of Breeding Birds in Britain and Ireland: 1875–1900. Poyser, London.
8. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/house-sparrow/
9. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/tree-sparrow/.
10. https://www.bto.org/sites/default/files/publications/apep4-population-estimates-birds-great-britain-uk-2020.pdf
11. https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf
12. Gwent Bird Report 2018.
13. Tyler S. et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 339–340.
14. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/peregrine/
15. https://urbanperegrines.co.uk/
16. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/peregrine/habitat-and-food/
17. https://nerc.ukri.org/latest/publications/planetearth/sum15-birds/
18. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 140–142.
19. https://www.bto.org/our-science/projects/peregrine-survey/results
20. https://www.bto.org/sites/default/files/peregrine-survey-results-spring-2018-bto-news.pdf

Waders

Black-Tailed Godwit *Limosa limosa* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[1]), Amber (Wales[2])

Data availability: Good (1431 records)

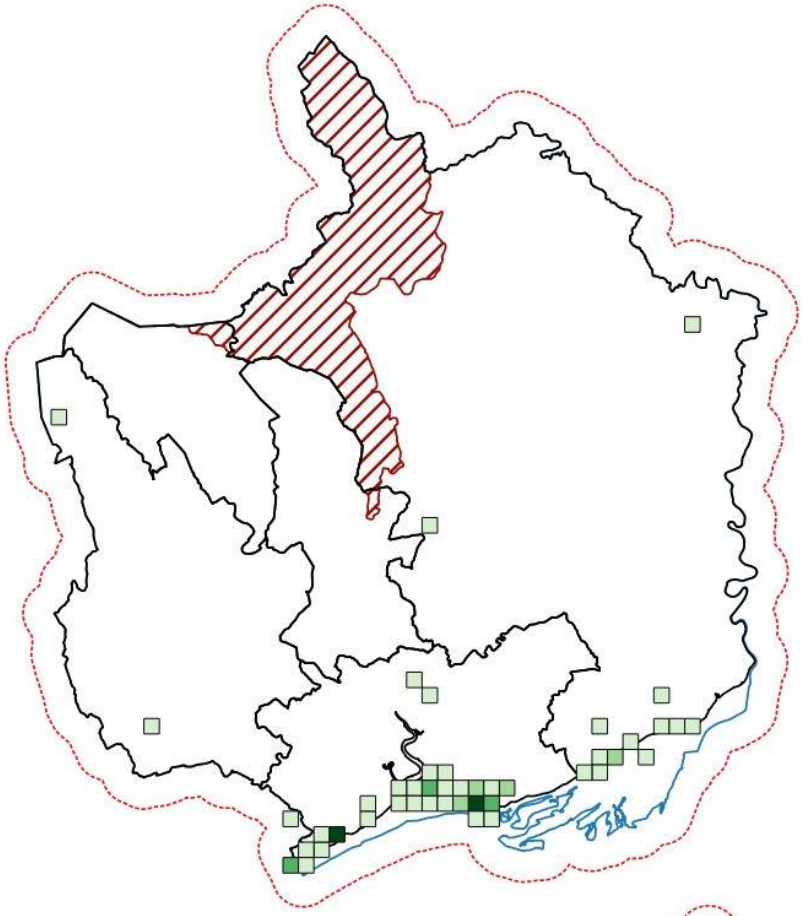
Context: The Black-Tailed Godwit is chiefly a passage migrant through the UK and a winter visitor, with a small number breeding in the east of England. This means that the Black-Tailed Godwit is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – both impacted by climate change.[3] They are one of a whole host of wader species that pass through the UK on both spring and autumn passage, with only a few staying to breed. However, significant numbers spend the winter in the UK. The Black-Tailed Godwits that remain to breed in the UK are on only a handful of marshy sites in eastern England, and this rarity is reflected in their Schedule 1 Protected status. The passage birds generally spend the winter in West Africa, whereas the substantial wintering population are made up of birds that bred further north, in Iceland.[4] They are one of two godwit species that regularly visit the UK, but the only one that breeds with us; its close cousin, the Bar-Tailed Godwit, is just a passage and wintering species. Black-Tailed Godwits largely feed on insects, worms and snails[4], making good use of their very long beak. Overall, in the UK there has been a huge increase (765%) in wintering birds between 1970 and 2017.[5] This is likely due to increases in the Icelandic population,[6] which winter in the UK. The breeding population has fluctuated but has remained broadly similar in recent times. The population is, however, susceptible to losses due to flooding and predation,[7] and its small size also makes it vulnerable.

Outlook: The Black-Tailed Godwit has seemingly never been widespread as a breeding bird in the UK. However, it did once breed abundantly on the East Anglian Marshes,[8] but was extinct as a regular breeding bird in the UK by the mid-nineteenth century, with drainage of the marshlands for agriculture largely to blame.[8] They did not return as a breeding species in that part of eastern England until the 1930s.[8] East Anglia remains their stronghold in the UK, with occasional breeding records in Scotland. A small population did develop on the Somerset Levels but was adversely affected by lowered water-tables.[8] The East Anglia population remains extant but is small and vulnerable to spring flooding. The estimated UK breeding population in 2013–2017 was 53 pairs.[9] It would appear that this population peaked at 65 pairs in the early 1970s, and was reduced by flooding to half that number by the late 1980s.[7] In contrast to the small and vulnerable breeding population, the wintering population has increased greatly: 765% increase between 1970–2017 (described as 'strong increase'), with this still being apparent more recently with a further 23% increase from 2012–2017.[5] The wintering population stood at 41,000 in 2017.[9]

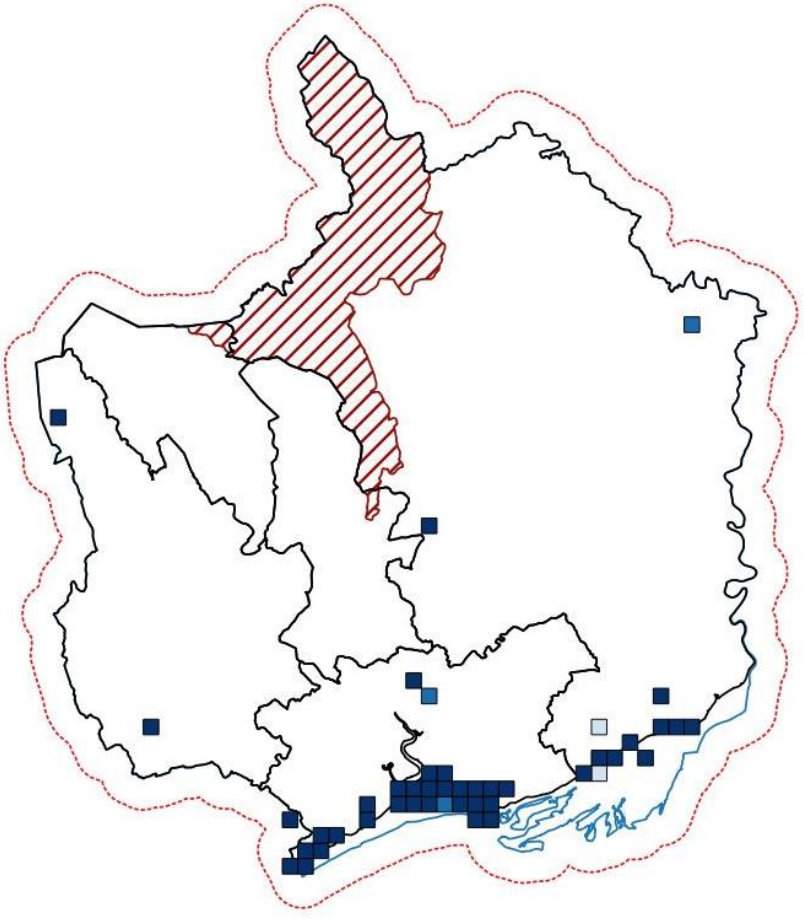
Greater Gwent range: The latest Gwent Bird Report (2018) records Black-Tailed Godwits as a 'passage migrant, summer and winter visitor',[10] and it would be fair to say this has been the case for a long while with numbers increasing over time. The Birds of Gwent in 2008 recorded Black-Tailed Godwits as 'a regular passage migrant and winter visitor in increasing numbers', noting that 'some birds stay through the summer';[11] in 1977 it was described as a 'regular spring and autumn passage migrant in small numbers, with occasional birds remaining during summer and winter'.[12] The dramatic increase in numbers of birds on both passage and wintering can be seen from the fact that the 1963 Birds of Monmouthshire only listed ten previous records,[11] whereas now flocks of hundreds of birds can be encountered. The reason for the increase is undoubtedly closely linked to the hugely increased breeding population in Iceland, which both passes through and winters here in Gwent. The impact of the creation of the Goldcliff Lagoons in both attracting additional birds and concentrating their numbers is also of great significance. The account in The Bird of Gwent 2008 provides a fuller idea of the dramatic increase in numbers. Black-Tailed Godwit have never bred in Gwent. However, with successful breeding having occurred on the Somerset Levels and potentially suitable habitat at the Goldcliff end of Newport Wetlands, this breeding in Gwent is a possibility.

Records are pretty much exclusively on the Gwent Levels. The recording hotspot is at Newport Wetlands, with 854 records within 1 km square. Lots of the records are recent.

Distribution of Black-Tailed Godwit records across Greater Gwent (max ≥100 records/km^2)



Records of Black-Tailed Godwit by decade



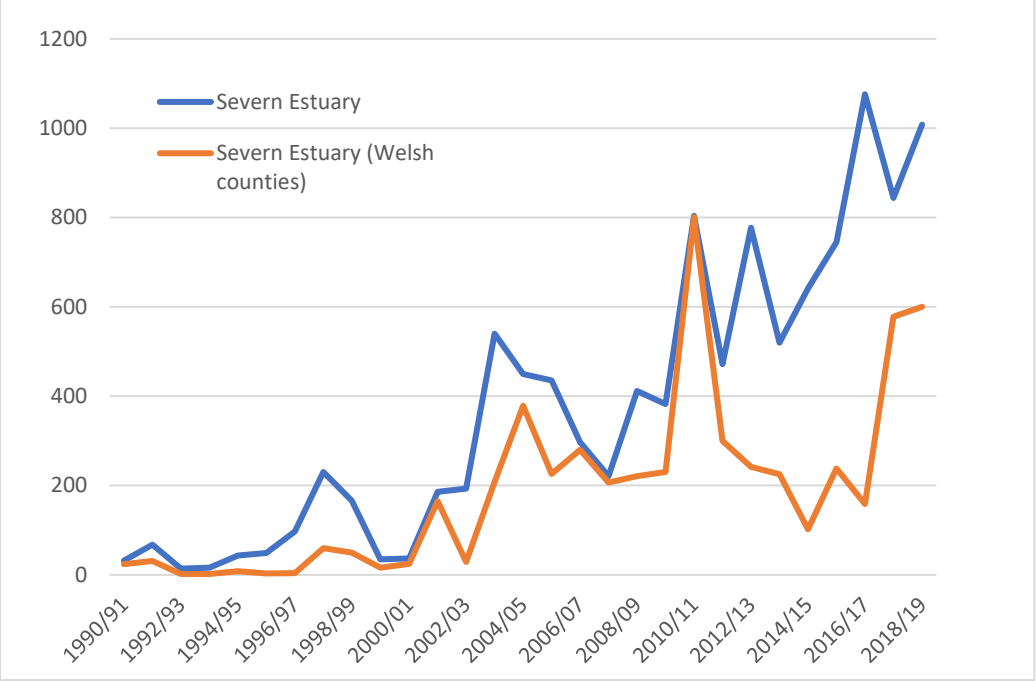
Habitats patterns: Very much a bird of the coast in Gwent.

Population trends: As previously stated, there have been great increases in passage and wintering populations of Black-Tailed Godwit within the UK. Gwent has been no different, with huge increases in birds passing through and wintering. These increases are driven by the hugely expanded Icelandic breeding population and are compounded more locally by the creation of the Goldcliff Lagoons, which both attract the Godwits and concentrate the numbers. It would appear the Black-Tailed Godwit population on migration and over winter is currently very secure in Gwent.

Details of the numbers wintering on the Severn Estuary through Wetland Bird Survey (WeBS) counts are shown in the chart below, which shows very clearly the increasing populations.

Note that some annual counts are given as a minimum number rather than a count/estimate.

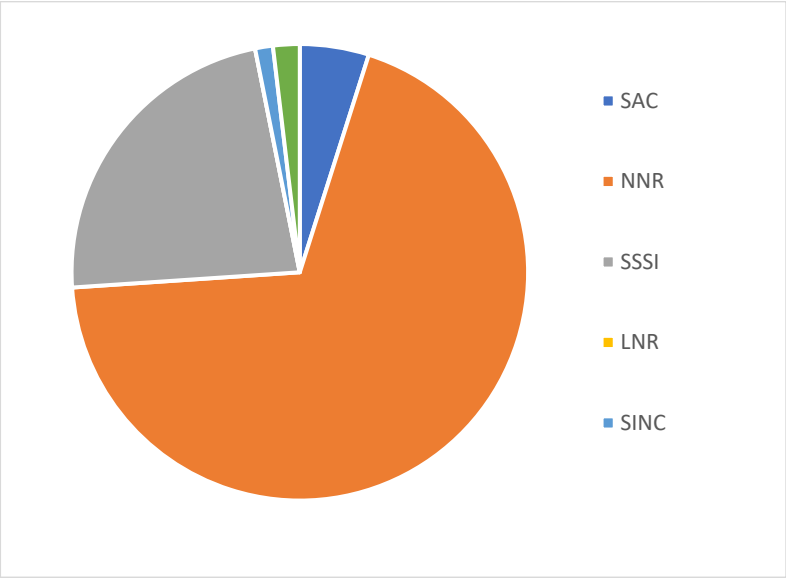
Winter WeBS Peak Counts for Black-Tailed Godwit on the Severn Estuary[13]



However, there is a real possibility of adding Black-Tailed Godwit to the Gwent (and Wales) breeding list. The Newport Wetlands complex has already added a number of species to the Gwent/Wales breeding bird fauna, with Avocet one notable example. Understanding hoow habitat is managed in East Anglia, at places such as Nene Marshes and Welney, and areas closer to home on the Somerset Levels would prove useful if encouraging Black-Tailed Godwits to breed in Gwent is desirable. However, great care would need to be taken to ensure that any alterations to habitat management that may encourage Godwits to nest do not have a harmful effect on the success of some of the other wader species already nesting there.

Protection: 98% of records come from protected sites, with high numbers of records from Newport Wetlands NNR (69%) and the Gwent Levels SSSIs.

Black-Tailed Godwit records from protected sites



Common Sandpiper *Actitis hypoleucos* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Amber(UK[1]), Green (Wales[2])

Data availability: Good (1354 records)

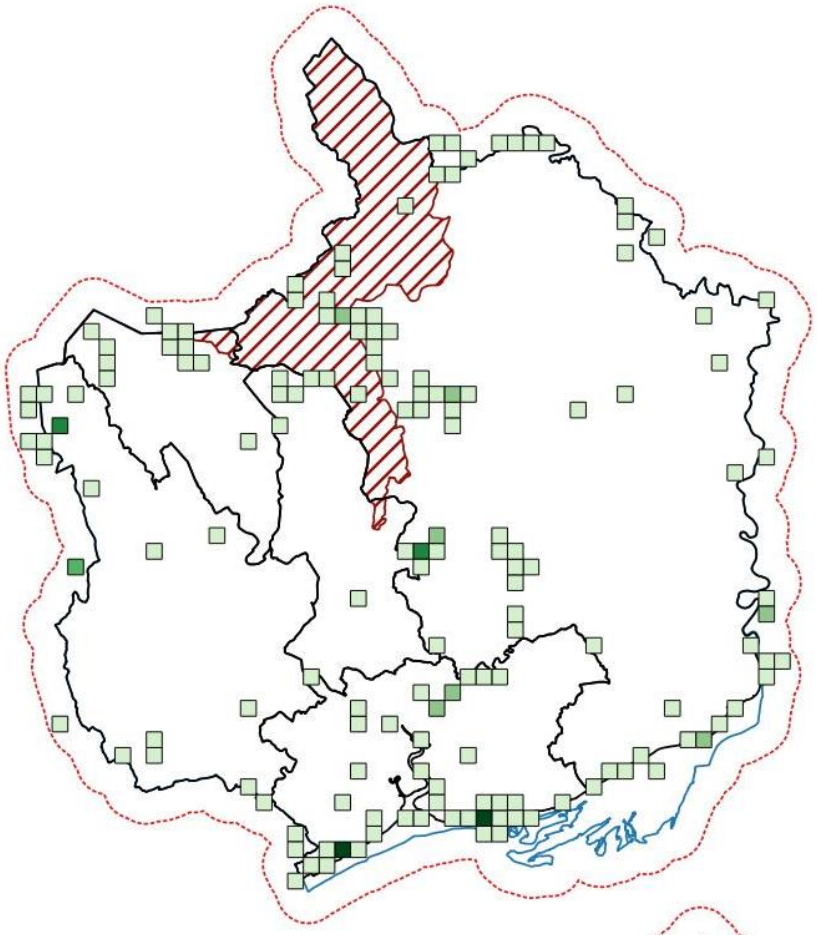
Context: The Common Sandpiper is a summer visitor and passage migrant to the UK, with a small number remaining with us for the winter. This wintering of birds is a more recent phenomenon, and numbers are small. This means that the Common Sandpiper is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] They are one of a whole host of wader species that pass through the UK on both spring and autumn passage, with a number staying to breed, albeit in smaller numbers than seen at the main breeding grounds further north. The Common Sandpipers that remain to breed in the UK have a generally northerly and westerly distribution, breeding 'along fast rivers and by lakes, lochs and reservoirs in Scotland, Wales, Northern Ireland and the north of England'.[14] 'It is easily identified by its habit of bobbing up and down and its rapid, stiff-winged flight low over the water'.[15] Common Sandpipers largely feed on insects but will also take worms and molluscs.[14] Overall in the UK, there has been a decline of 48% between 1970 and 2017.[5] While a few birds winter in the UK, most migrate long distances to Africa, and it is thought the main reason for these declines lies with their wintering grounds.[16]

Outlook: The Common Sandpiper is now considered more a bird of upland streams in the UK, but this was not always the case; they were also common in lowland areas in the nineteenth century.[8] This decline in lowland areas began at the end of the nineteenth century and was most marked (certainly in South Wales) in the late 1940s and 1950s.[8] The pollution of lowland rivers may have been a driver behind this change of range.[8] This contraction to more upland areas resulted in the now observed core northerly and westerly distribution in the UK. The estimated UK breeding population in 2016 was 13,000 pairs.[9] This is less than it was historically, with the decline brought about by the loss of much of the lowland population and more recent declines as follows: 48% reduction between 1970–2017 (described as 'weak decline'), with this still being apparent more recently with a further 5% decline from 2012–2017.[9] The BTO Breeding Bird Survey[17] further illustrates these declines, showing a 29% decline between 1995 and 2018 in the UK. Most recently there have been some signs of recovery, with a 9% increase,[18] albeit it in just over a single year (2018–2019). Only time will tell if this is the start of a recovery.

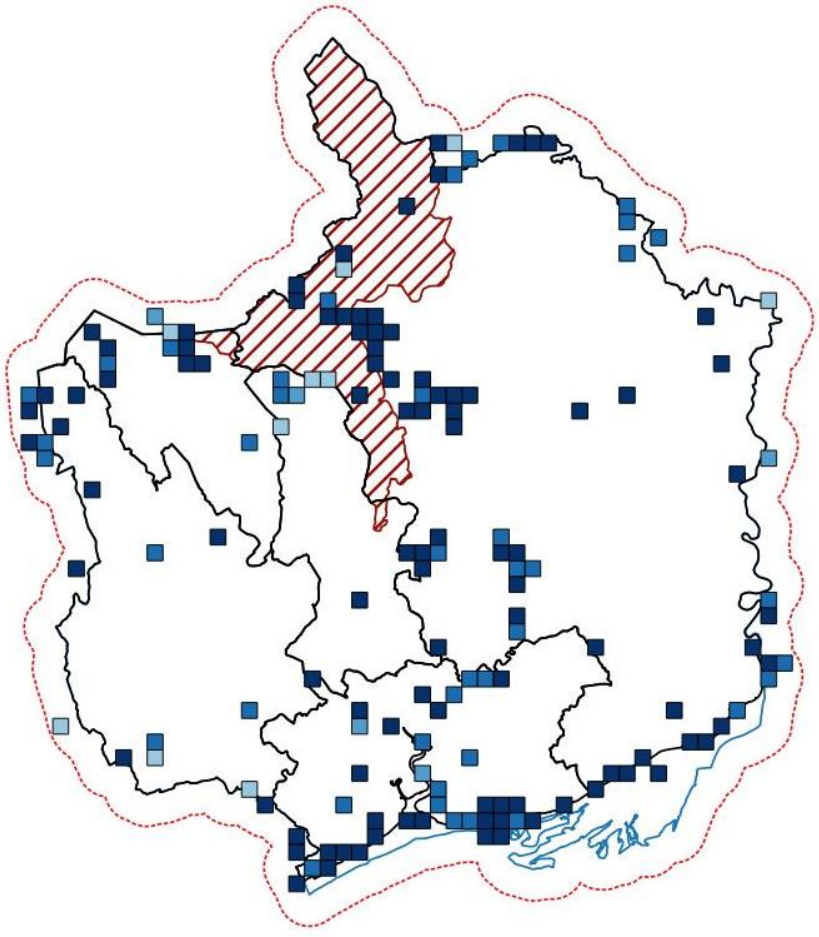
Greater Gwent range: Common Sandpipers can be found within Gwent as a breeding bird on several watercourses, with the Rivers Usk and Monnow being the best sites[18] and a number of standing waterbodies also being utilised. Stretches of river with gravel shoals are particularly favoured. On migration, they can be found more widely, but still associated with water, with many passage migrants on the coast and the occasional wintering bird there also. The latest Gwent Bird Report (2018) records Common Sandpipers as an 'uncommon passage migrant and breeder; uncommon winter visitor'.[10] The Birds of Gwent in 1977 recorded it as a 'regular breeder and passage migrant, occasionally remaining

to overwinter'.[19] However, the Birds of Gwent in 2008 recorded Common Sandpipers as being 'an uncommon passage migrant and scarce winter visitor. An uncommon breeder'.[18] This hints at a drop in population levels as has been seen in the UK in general. The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of fewer than 100 pairs,[20] with the second atlas covering 1998–2003 estimating a lower total of 25–40 pairs.[18] This again illustrates a decline through the 1980s and 1990s. As a whole, it would be fair to say that the breeding population has dropped but is being maintained at a new, lower level. Conversely, it is more frequent as a wintering bird – still in very small numbers – probably because of generally milder winters.

Records show distribution generally across the Levels coastline but also along the Usk, Wye, Monnow, as well as Llandegfedd reservoir and Rhaslas Pond. Recording hotspots at Goldcliff/Newport Wetlands (334 records) and Peterstone Wentloog (122 records).



Distribution of Common Sandpiper records across Greater Gwent (maximum ≥100 records/km^2)

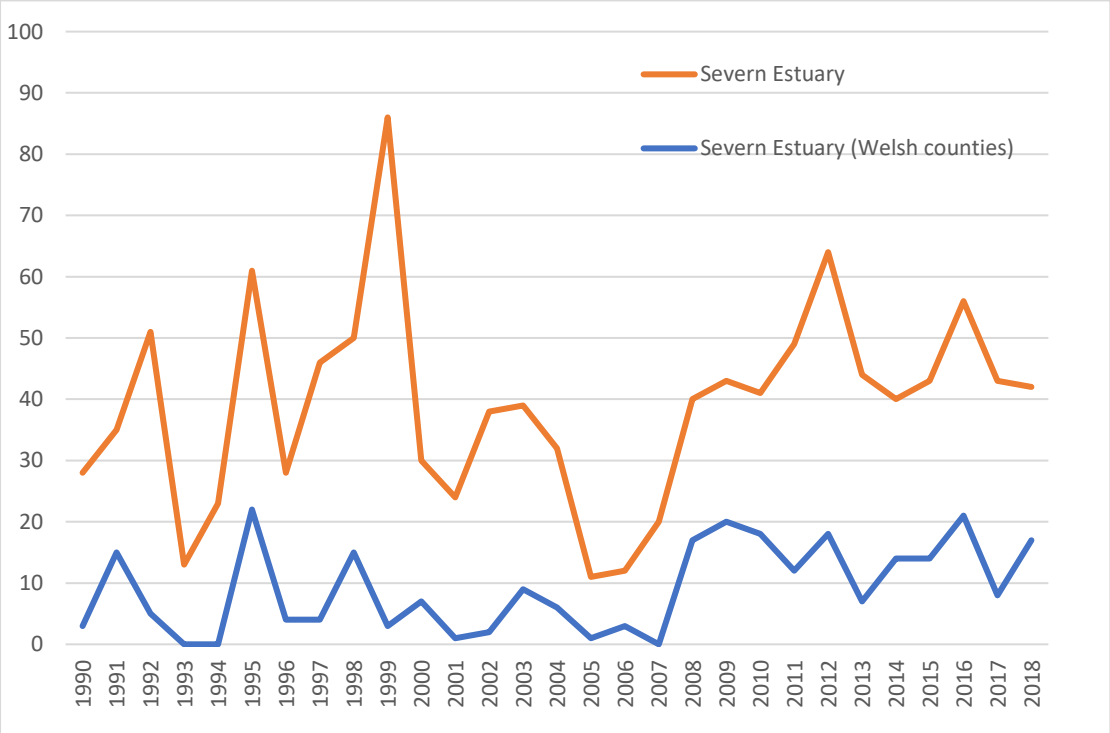


Records of Common Sandpiper by decade

Habitats patterns: Very much a bird associated with water, with breeding birds favouring rivers with gravel exposures and birds on passage more catholic in their choice of waterbodies, with many records from the coast also.

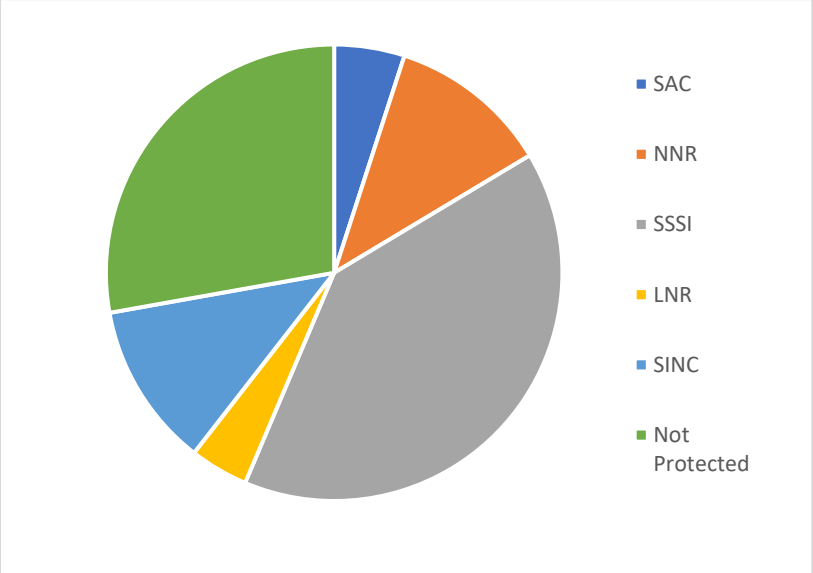
Population trends: As previously stated, there have been declines in Common Sandpiper populations across their range in the UK. Gwent has been no different, with drops in breeding numbers. The rate of these losses appears to have slowed, with Common Sandpipers in Wales actually being Green listed, thus of the lowest conservation concern, although it is still Amber in UK. It would appear that population losses are largely driven by issues on wintering grounds and on passage. This reflects the global issue of climate change, which makes the decline hard to address at the local level. However, habitats here in Gwent can be preserved and enhanced to maximise the potential available resources for breeding Common Sandpipers. Clean, unpolluted rivers with gravel shoals are the preferred habitat, so if these habitats can be retained and left undisturbed during the breeding season then the future of Common Sandpipers in Gwent should be reasonably assured. It should also be remembered that Common Sandpipers are now increasingly wintering in Gwent, with the Severn Estuary being the prime site. Details of the numbers wintering on the Severn Estuary through WeBS counts are shown in the following chart, which shows fluctuating, quite low numbers but with perhaps a very gentle increase over time.

Winter WeBS Peak Counts for Common Sandpiper on the Severn Estuary[13]



Protection: 72% of records come from protected sites, with high numbers of records from the Newport Wetlands and Gwent Levels SSSIs, as well as Llandegvedd Reservoir SSSI. SAC records are from the Severn (there are also records along the Usk and Wye SACs that are not registered within the protected site because it is such a narrow designation). LNR records are from Parc Bryn Bach, Garn Lakes, and St Julians Park, and SINC records from Rhaslas Pond and the River Usk at Caerleon.

Common Sandpiper records from protected sites



Dunlin *Calidris alpina* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Amber (UK[1]), Red (Wales[2])

Data availability: Good (2,792 records)

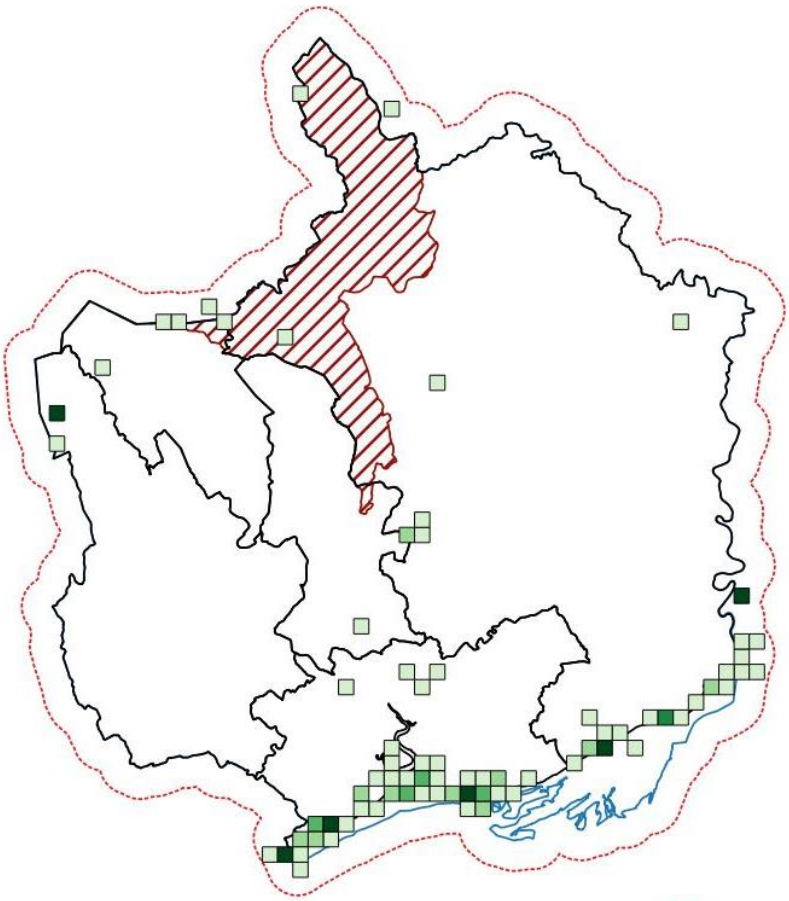
Context: Dunlins are one of the most familiar and common wading birds in the UK. They are by far the commonest as a wintering bird, but also pass through on migration, and smaller numbers stay to breed. Three different races of Dunlin visiting the UK. Only one of these races breeds and it is also a passage migrant; a second race only passes through on migration, nesting further north and wintering much further south in West Africa.[21] A third race nests further north but winters in the UK and it is this race that is by far the most numerous in the UK.[21] This means that the Dunlin is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] They are one of a whole host of wader species that pass through the UK on both spring and autumn passage. Only a relatively small number stay to breed, but significant numbers spend the winter in the UK. The Dunlin that breed in the UK are restricted to upland areas of England, Scotland and Wales and lower altitudes on Scottish Islands, such as the Western Isles, so there is a distinct northerly and westerly distribution.[22] The passage birds generally spend the winter in West Africa, whereas the substantial wintering population are made up of birds that bred in Western Siberia.[23] Dunlin largely feed on insects, snails and worms,[22] making good use of their long beak. Overall in the UK, there has been a decrease of 47% in wintering birds between 1970 and 2017.[5] The reduction in numbers may be down to a number of factors, with the spread of *Spartina anglica* (Cord Grass) within estuary feeding areas implicated.[24] Milder winters also mean that more birds are wintering further east in areas such as the Wadden Sea, and therefore not reaching the UK.[25] The breeding population has fallen to some degree with hedgehog predation on island strongholds and afforestation of upland areas two suggested causes.

Outlook: The Dunlin has seemingly always been far more familiar as a wintering bird than a breeding bird in the UK. It did once breed on more lowland sites, but many of these were lost to drainage/conversion to farmland.[8] The upland breeding populations generally fared better, but some sites were lost to afforestation.[8] Scotland remains the stronghold for the breeding population, but there are significant populations in the Pennines in northern England and smaller populations in the Welsh uplands; the most southerly breeding populations in the world are on Dartmoor.[26] The estimated UK breeding population in 2005–2007 was 8,600–10,500 pairs.[9] In contrast to the relatively small and quite localised breeding population, the wintering population is large (350,000 in 2016–2017) but has been subject to significant declines: 47% decrease in 1970–2017 (described as 'weak decline'), with this appearing to have stabilised recently with no change from 2012–2017.[5] This wintering population is widely distributed around the coast of the UK, but a considerable percentage is concentrated within a small number of favoured estuary systems.

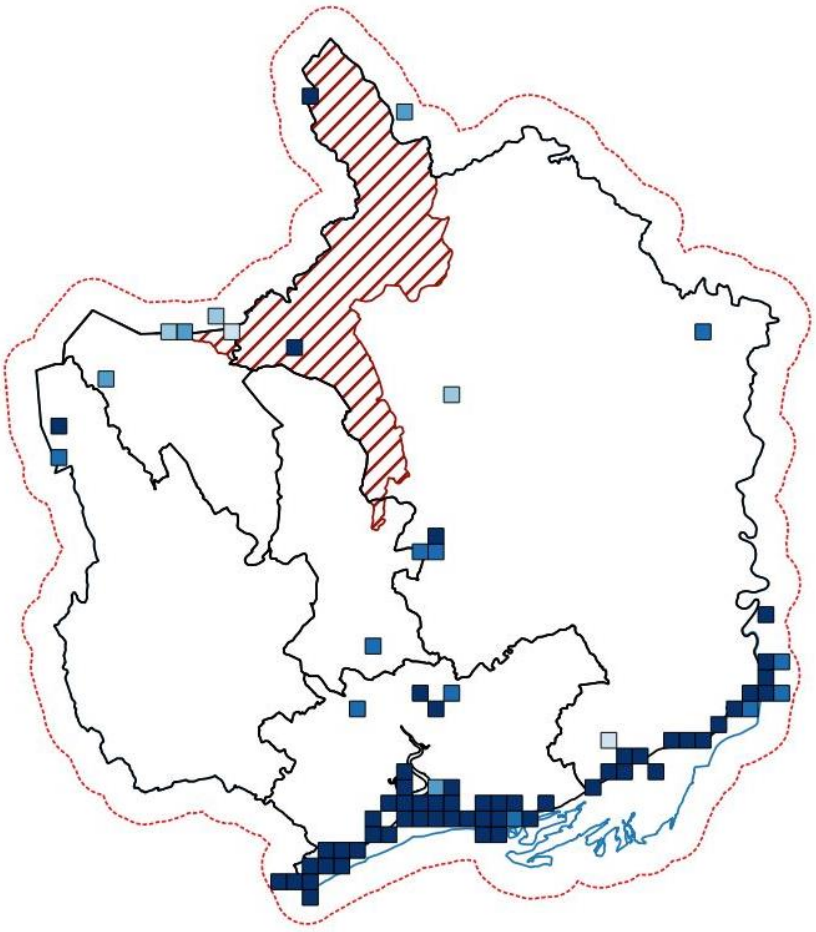
Greater Gwent range: The latest Gwent Bird Report (2018) records Dunlins as a 'common winter visitor/fairly common on passage on coast/very rare breeder'.[10] This has been the case for a long while, but wintering numbers have been decreasing to some extent over time: The Birds of Gwent in 2008 recorded Dunlins as being 'a winter visitor to the coast in large numbers, with some passage birds. Formerly an occasional breeder in very small numbers',[27] and in 1977 as an 'abundant winter visitor and passage migrant; a few pairs breed irregularly'.[28] The Severn Estuary and Gwent in particular have been noted to be of great importance for Dunlin: the Severn Estuary is of International Importance (the fifth most important in the UK) and the greatest density of Dunlins in the Severn Estuary is in the Peterstone-St-Brides shore area.[27] Inland in Gwent, Dunlins arrive annually but only in small numbers, with Llandegfedd Reservoir being the best site.[27] As previously stated, Dunlin are a common and important part of the Severn Estuary avifauna over winter, although numbers have dropped. This mirrors the situation in the UK as a whole and most likely for similar reasons. The most significant reason being that birds are wintering further east as a response to generally milder winters. Dunlin have never been remotely common and possibly never regular as a breeding species in Gwent; the occasional historical record may even be over the border in Powys. The focal point for previous breeding activity was the uplands in the north of the county, in the vicinity of Abergavenny and the Heads of the Valleys.[27] It is possible that Dunlin may breed again in these general localities, but there is nothing to suggest that this is likely to be anything more than a rare and irregular occurrence.

Records are largely focused along the Severn Estuary coast; occasional records are inland, with Llandegfedd Reservoir being a focus and some in the uplands.

Distribution of Dunlin records across Greater Gwent (maximum≥100 records/km^2)



Records of Dunlin by decade



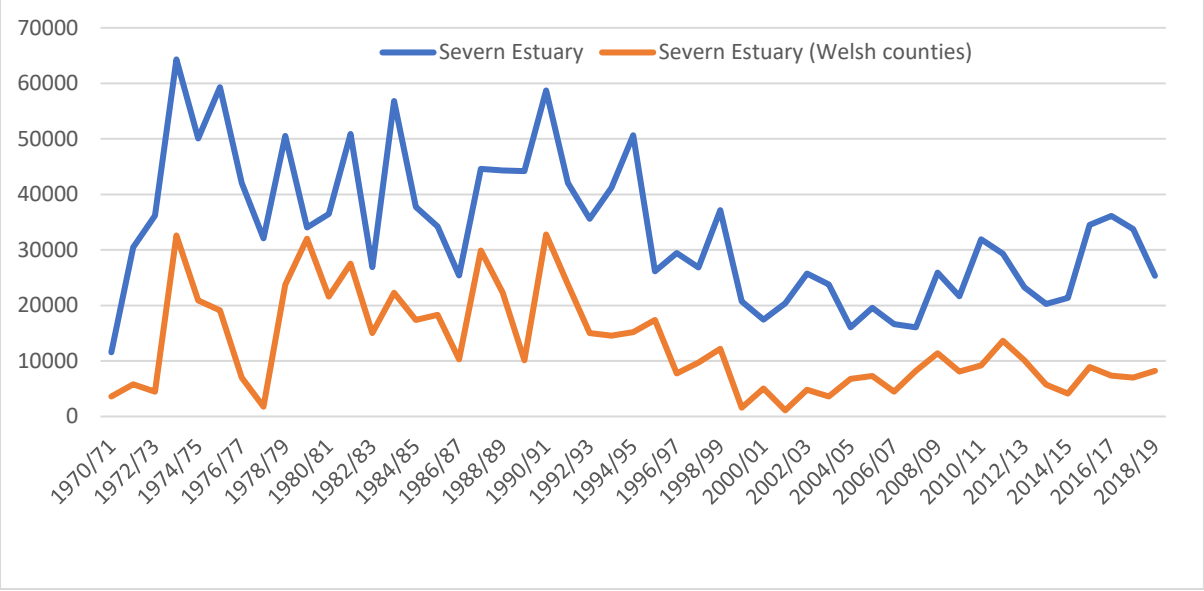
Habitats patterns: Dunlin are very much a bird of the muddy Severn Estuary coast, with small numbers inland at waterbodies and very occasionally recorded in the uplands on potential moorland breeding habitat.

Population trends: As previously stated, there have been noticeable decreases in the Dunlin wintering populations within the UK. Gwent has been no different, with identifiable decreases in birds wintering. These decreases are driven by generally milder winters allowing greater numbers to winter further east. It would appear currently that the Dunlin population that winters in Gwent is secure and still of high significance as part of the Severn Estuary Internationally important site. Despite this, ongoing studies of trends is still of great importance in monitoring the populations, although little can be done in terms of local conservation to influence the declines caused by birds wintering further east. However, the potential impacts of Severn barrages, lagoons and tidal power on wintering Dunlin populations would need careful scrutiny.

Details of the numbers wintering on the Severn Estuary through WeBS counts are shown in the following chart, which shows very clearly the gradually decreasing populations up to the turn of the century, since which the declining population has steadied. This represents the population at the most numerous recorded site (Severn Estuary) rather than the whole of Greater Gwent. Note that the Dunlin is one of the few birds with a continuous count since 1970 – a very impressive dataset.

Note that some annual counts are given as a minimum number rather than a count/estimate

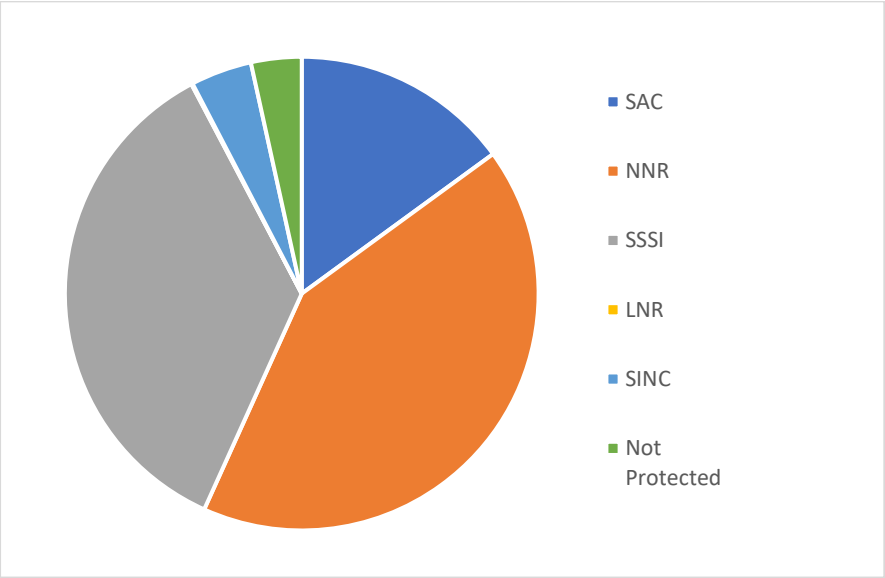
Winter WeBS Peak Counts for Dunlin on the Severn Estuary[13]



As previously stated, it is unlikely that the Dunlin will be anything more than a very rare breeding bird in Gwent, particularly as we are practically at the southern end of its world breeding range. Provided the uplands in the north of Gwent continue to be protected then this resource will remain available to them and may be utilised occasionally.

Protection: 97% of records come from protected sites, with high numbers of records from the Severn Estuary, Newport Wetlands and Gwent Levels SSSIs and some from Llandegfedd SSSI.

Dunlin records from protected sites



Little Ringed Plover *Charadrius dubius* (Scopoli, 1786)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Green (UK[1] and Wales[2])

Data availability: Good (775 records)

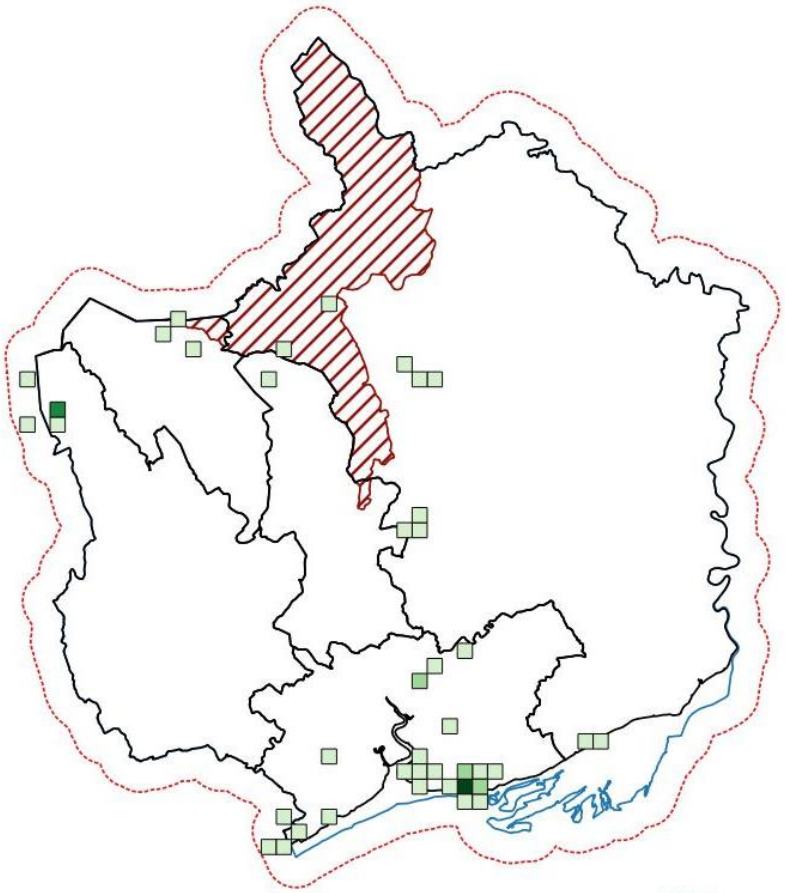
Context: The Little Ringed Plover is a summer visitor to and passage migrant through the UK. This means that it is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] Whereas many of our wader species are at their most numerous in the UK during the winter, the Little Ringed Plover only visits during spring/summer and leaves in late summer/autumn to spend the winter in Africa.[29] Little Ringed Plovers are a relatively recent addition to the UK's breeding avifauna, the first breeding was recorded as recently as 1938.[30] They breed on gravelly shores adjacent to water; they can be found along gravel shoals on rivers but particularly favour gravel pits and man-made reservoirs.[31] Their distribution is more southerly within the UK, with most of the population being in England and Wales.[30] Little Ringed Plovers largely feed on insects and aquatic invertebrates.[30] Overall in the UK, the population has increased since their first colonisation and has remained quite constant in recent years. This success has been attributed to an increase in suitable nesting habitat, with gravel pits, reservoirs and quarries created and, in some cases, abandoned, providing ideal locations.[32]

Outlook: The Little Ringed Plover was considered a very rare vagrant to the UK during the nineteenth century.[8] The first UK breeding record did not occur until 1938.[8] Breeding was then occasional for a few years. However, the breeding population increased 15% each year from 1948 to 1962.[8] This colonisation and increase has been attributed to the expansion of building in the UK during the twentieth century, which led to a rapid rise in the number of flooded gravel pits and other man-made environments, such as industrial tips, waste grounds, sewage farms, reservoirs and quarries, all of which have been exploited by Little Ringed Plovers.[8] By 1972, it was estimated that there were 400 pairs in the UK; by 1991 there were 825–1,070 pairs.[8] The latest estimated UK breeding population in 2007 was 1,250 pairs.[9] Reference to BTO trends shows there was a 'large increase' from 1940–1969, a 'moderate increase' from 1969–1995' and 'no overall change' from 1996–2020.[32]

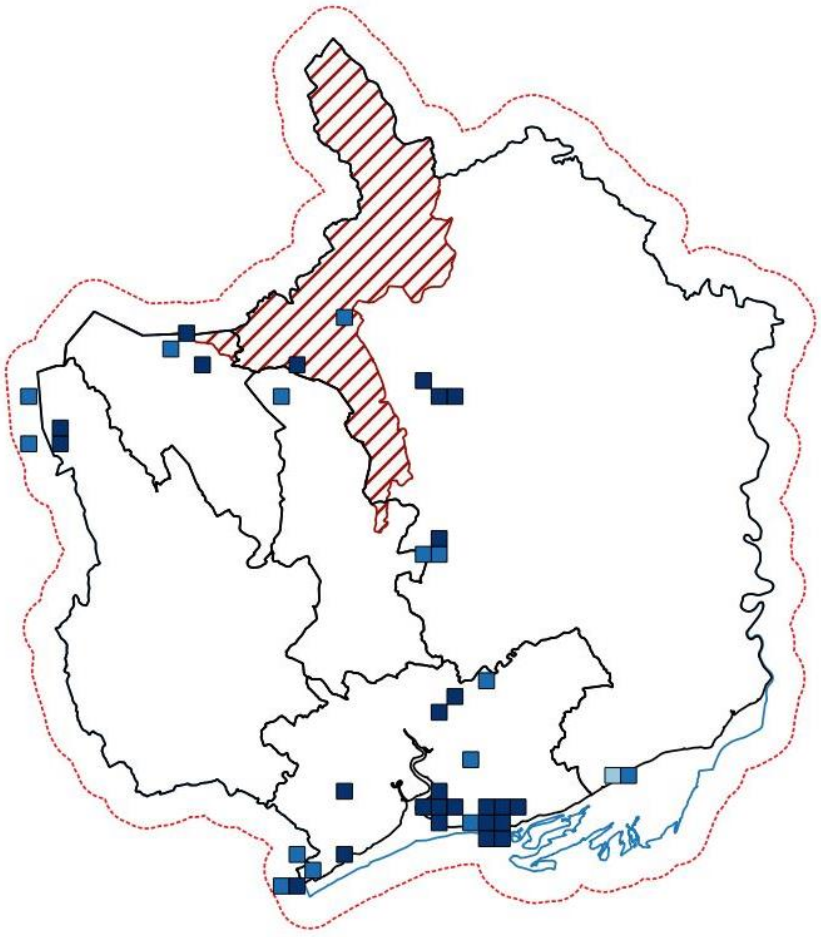
Greater Gwent range: The latest Gwent Bird Report (2018) records Little Ringed Plovers as an 'uncommon passage migrant and scarce breeder'.[10] The Birds of Gwent in 1977 recorded it as an 'uncommon passage migrant' with only 16 previous records (13 of these since 1970) and predicted that it would not be long before they bred in Gwent.[33] The Birds of Gwent in 2008 recorded Little Ringed Plovers as being 'an uncommon passage migrant and scarce summer visitor',[34] this clearly shows that the numbers of Little Ringed Plovers have increased and that they have become established as a breeding bird in Gwent. The Gwent Atlas of Breeding Birds covering 1981–1985 shows a Gwent population of 3 pairs (the first breeding being in 1984);[35] the second atlas, covering 1998–2003, estimates a lower total of 8–12 pairs.[33] This again illustrates the increase in Little Ringed Plovers in Gwent from the 1970s onwards and their establishment as a breeding species from the 1980s

onwards. There appears to be some confusion over where the first pairs in Gwent nested, with both dried-up reservoir banks[35] and gravel shoals on the River Usk[34] being mentioned. What is clear is that, while sites like this are still utilised, the lagoons at Goldcliff (Newport Wetlands) are now the main focal point of breeding activity in Gwent. On passage birds are recorded at the coast, principally Goldcliff Lagoons, but it is difficult to distinguish passage migrants from the breeding population; the inland Llandegfedd Reservoir would appear to be the most reliable site for migrants.

The main hotspots are Goldcliff (440 records) and Rhaslas Pond. Smaller spots are at Llandegfedd, and along the River Usk. There are also hotspots on the borders of the study area at Ystrad Quarry and Lisvane reservoir (not shown).



Distribution of Little Ringed Plover records across Greater Gwent (maximum≥100 records/km^2)



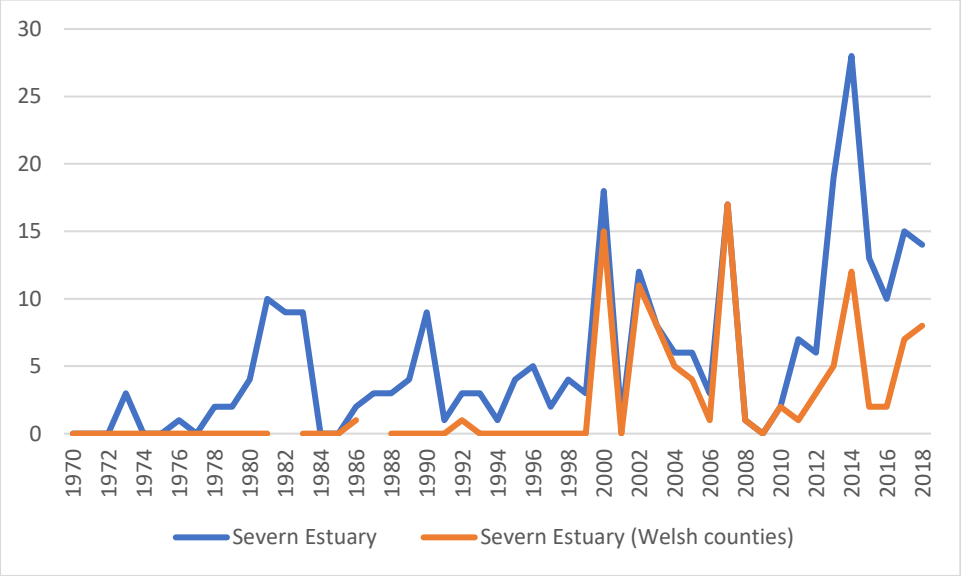
Records of Little Ringed Plover by decade

Habitats patterns: Little Ringed Plovers are very much a bird associated with the gravelly shores of waterbodies, so certain sections of the River Usk, reservoirs and particularly the lagoons at Goldcliff are favoured sites.

Population trends: As previously stated, the Little Ringed Plover has only relatively recently colonised and subsequently established populations across large parts of the UK. Gwent has been no different; the first breeding was reported in 1984 and breeding has been noted in every year since, with numbers increasing particularly since the establishment of Newport Wetlands in 1999. These increases are due in large part to the increased availability of suitable breeding habitat. The WeBS counts in the following graph clearly show the increase post-1999, and while numbers have fluctuated from year to year, this population is now clearly well established. With their quite specific breeding requirements, numbers of Little Ringed Plover are likely to remain relatively low in Gwent, however their long-term future would appear well assured, particularly with the levels of protection and management given to their stronghold at Goldcliff Lagoons. Away from Goldcliff, breeding attempts and success could perhaps be aided to some degree my trying to keep disturbance of sites to a minimum during the breeding season.

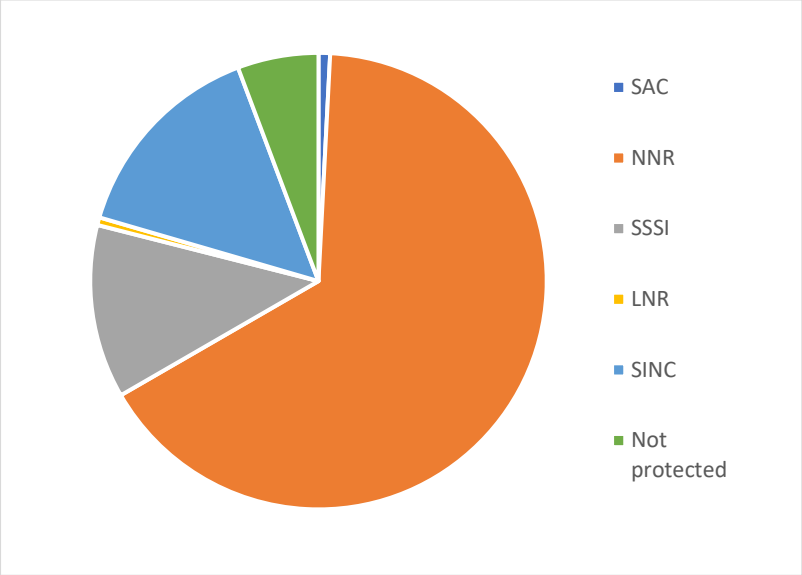
Note that some annual counts are given as a minimum number rather than a count/estimate. Little Ringed Plover did appear in WeBS counts for three other sites – Llandegfedd Reservoir, Warrage Lakes and Machine Pond – but only occasionally and usually a single bird. So, this represents the population at the most numerous recorded site (Severn Estuary) rather than in the whole of Greater Gwent.

Winter WeBS Peak Counts for Little Ringed Plover on the Severn Estuary[13]



Protection: 94% of records come from protected sites, with high numbers of records from the obvious sites of Newport Wetlands, Gwent Levels SSSIs and Llandegfedd SSSI. There were also high numbers from Rhaslas Pond SINC.

Little Ringed Plover records from protected sites



Redshank *Tringa totanus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Amber (UK[1]) Red (Wales[2])

Data availability: Good (3,693 records)

Context: Redshanks are one of the most familiar and common wading birds in the UK. They are by far the commonest as a wintering bird, but also pass through on migration, and reasonable numbers stay to breed. This means that the Redshank is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] Redshank breed in damp places like saltmarshes, flood meadows and around lakes.[36] While distributed relatively widely around the UK as a breeding bird, there is a northerly bias, with greatest concentrations in parts of Scotland and north-west England.[36] The wintering birds are boosted by many birds from further north, with large influxes from the Icelandic breeding population.[37] Redshank diet changes with season and habitat; they prey on invertebrates, especially earthworms and cranefly larvae, when inland and crustaceans, molluscs and marine worms in estuaries,[38] making good use of their long beaks. Overall, in the UK there was a 60% decline in breeding numbers between 1970 and 2017.[5] In contrast, there has been little alteration in the wintering population, with only a very minor 3% decline between 1970 and 2017.[5] The reduction in breeding numbers is down to a number of factors, with drainage of farmland and over-grazing of saltmarshes highlighted as being of particular significance.[37]

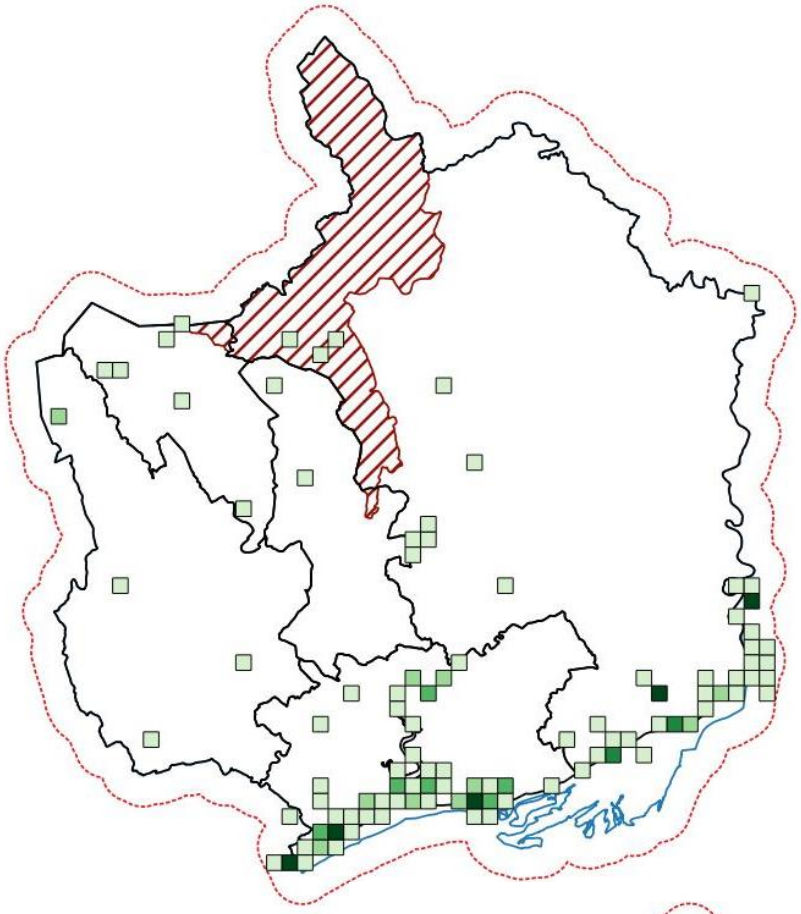
Outlook: Redshanks suffered a decline in the first half of the nineteenth century due to increased cultivation and drainage of farmland.[8] However, their fortunes reversed, and breeding populations increased in the second half of the nineteenth century and into the twentieth century.[8] There was to be a further decline after 1940 however, which was attributed to further habitat loss. The estimated UK breeding population in 2016 was 22,000 pairs.[9] This is less than it was historically, with declines brought about by the loss and degradation of wetland habitats through drainage and over-grazing. As outlined previously, more recent declines have occurred: 60% reduction between 1970–2017 (described as 'weak decline'), with this being less severe more recently, with a further 4% decline from 2012 to 2017.[5] The BTO Breeding Bird Survey[17] further illustrates these declines, showing a 42% decline between 1995 and 2018 in the UK. Most recently, there have been some signs of recovery, with a 14% increase[17] in 2018–2019. Only time will tell if this is the start of a recovery.

This wintering population is larger (100,000)[9] and is quite distributed around the coast of the UK, with many of the UK breeding Redshank being resident. However, there are significant influxes, many from the Icelandic population[37], and a considerable percentage of these are concentrated within a relatively small number of favoured estuary sites. The wintering population has been more stable than the breeding population, with only very minimal declines: 1% decrease between 1970 and 2017 (described as 'little change'), with this still being the case in more recent years, with a small 3% increase noted in 2012–2017.[5] This pattern might be more complicated however, as BTO data suggests an increase from the 1970s but a decline setting in from 2001 that has slowed or reversed in most recent years.[37]

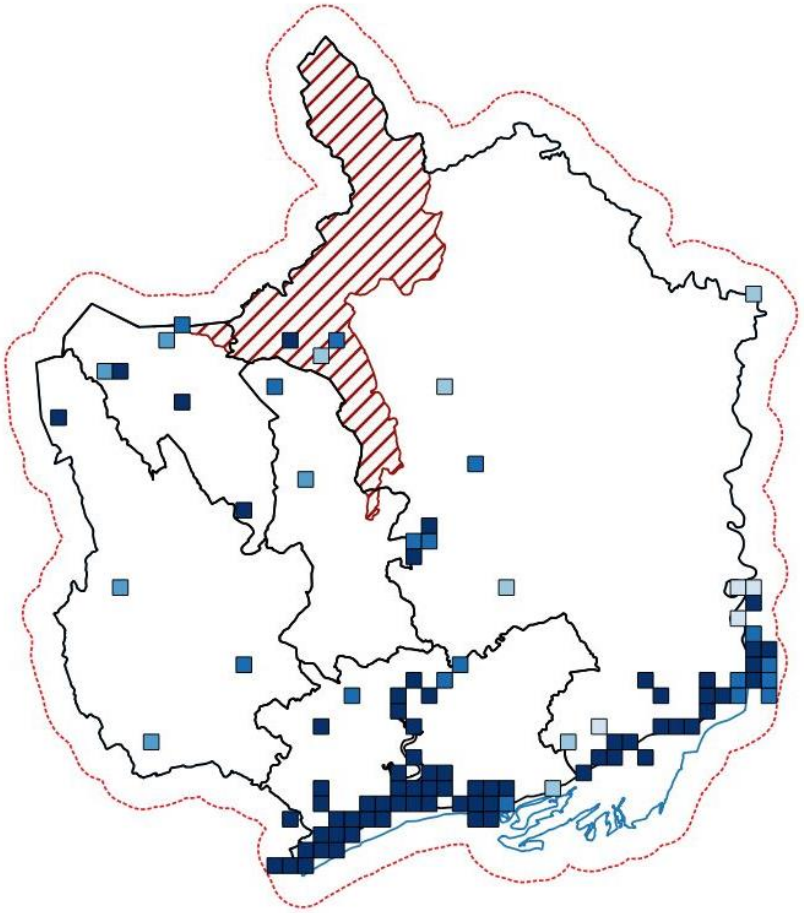
Greater Gwent range: The latest Gwent Bird Report (2018) records Redshank as a 'common winter visitor and passage migrant, uncommon breeder'.[10] It would be fair to say this has been the case for a long while, although its numbers are possibly decreasing over time: the Birds of Gwent in 2008 record Redshanks as being 'breeds in small numbers, mainly on the coast. Also a passage migrant and winter visitor in moderate numbers';[39] in 1977 it called it a 'breeding resident in moderate numbers; passage migrant and winter visitor in larger numbers'.[40] The Gwent Atlas of Breeding Birds covering 1981–1985 estimated a Gwent population of 40–50 pairs,[41] with the second atlas, which covers 1998–2003, estimating a lower total of 15–30 pairs.[39] This indicates a decline in population. Gwent breeding is now almost entirely confined to the coast, with previous inland populations adjacent to the Usk and the Olway largely lost to agricultural intensification.[39] Upland populations have always seemingly been a rare occurrence in Gwent, although pairs have bred in the Heads of the Valleys area in the past.[39] At other times of the year, the Severn Estuary has been noted to be of great importance for Redshank; it is of international importance for Redshanks wintering and of national importance on passage (autumn migration).[42] Inland in Gwent, Redshanks are annual but only in small numbers.[39] As previously stated, Redshanks are an important part of the Severn Estuary avifauna over winter; numbers appear to be relatively stable, and this largely mirrors the situation in the UK as a whole.

The main recording hotspots are Peterstone Wentlooge (1,272 records) and Goldcliff. Also spots at Nedern Brook, Collister Pill, Caldicot Pill, the Moorings, Rumney Great Wharf. The Gloucestershire hotspot is likely to be false and due to centring of low-resolution records.

Distribution of Redshank records across Greater Gwent (maximum≥100 records/km^2)



Records of Redshank by decade

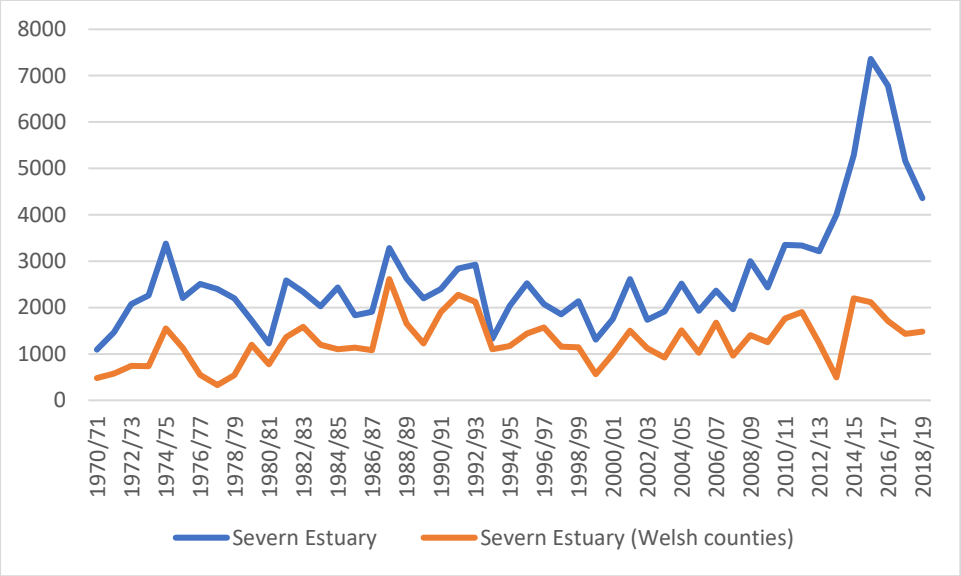


Habitats patterns: Redshanks are very much a bird of the Severn Estuary coast, with significant numbers there over winter and small breeding populations on the immediately adjacent Levels in a few areas.

Population trends: As previously stated, the UK wintering population, while fluctuating to some degree, is broadly stable. This is also true within Gwent, and our passage wintering populations are secure. Despite this, monitoring the populations through ongoing studies of trends is important, so that appropriate action can be taken. The potential impacts of Severn barrages, lagoons and tidal power on wintering Redshank populations, and other waders and wildfowl, would need to be carefully scrutinised.[43]

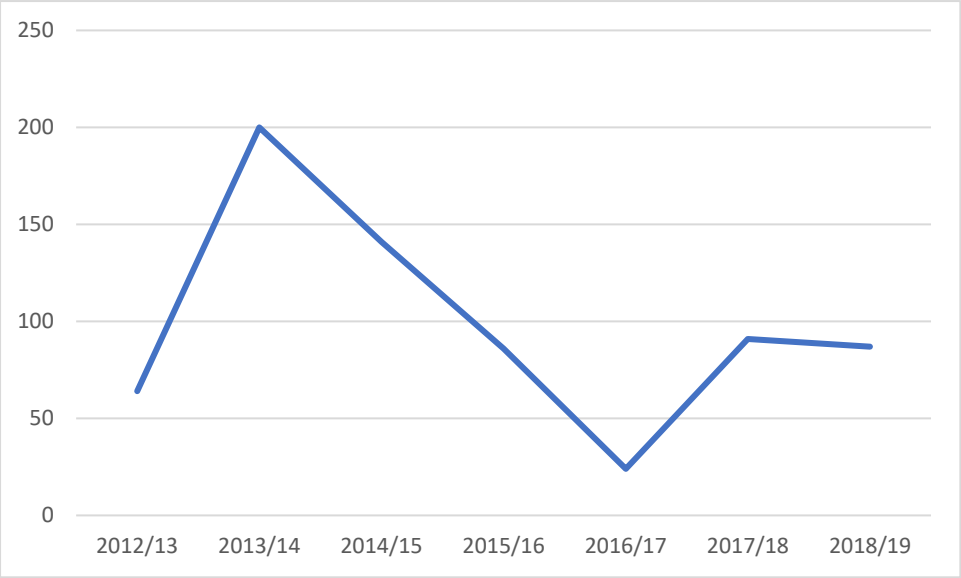
Note that some annual counts are given as a minimum number rather than a count/estimate. So, this represents the population at the most numerous recorded sites (Severn Estuary and Nedern Brook) rather than in the whole of Greater Gwent.

Winter WeBS Peak Counts for Redshank on the Severn Estuary[13]



Nedern Brook has continuous data since 2012/13 as well as some isolated counts in the 1990s. Although not really a long enough dataset to determine a trend, it shows the significance of the site for Redshank as well as the variation between seasons

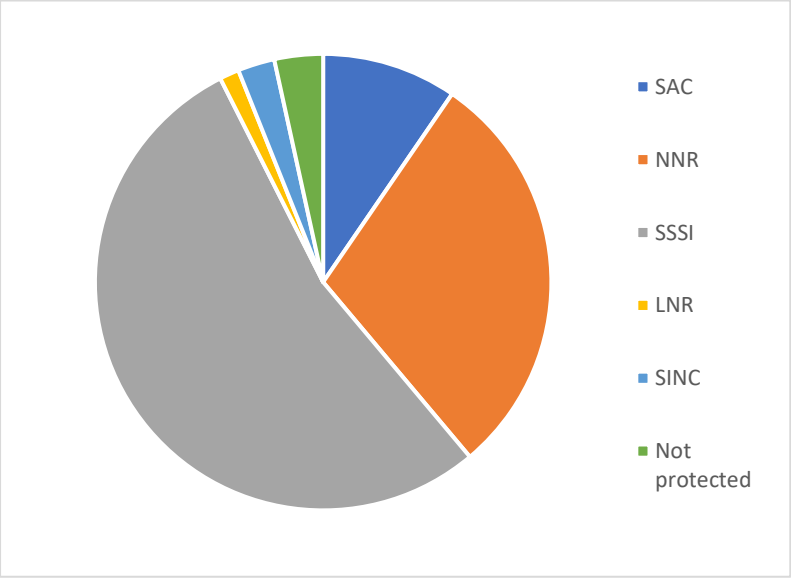
Winter WeBS Peak Counts for Redshank at Nedern Brook[13]



Redshank breeding numbers seem to have stabilised within Gwent, with Goldcliff Lagoons now the focal point. If numbers were to increase within Gwent, there would need to be a change of management within potentially suitable sites. There would need to be reductions in grazing, reclaiming of arable fields and re-wetting of habitats in former sites inland adjacent to the Usk and Olway. There is also the potential for more pairs on the Gwent Levels, but this would need a concerted change in management, with grazing reduced.

Protection: 97% of records come from protected sites, with high numbers of records from the the Newport Wetlands, and Gwent Levels and Nedern Brook SSSIs. LNR records come from St Julians and Garn Lakes. Scattered SINC records.

Redshank records from protected sites



Ringed Plover *Charadrius hiaticula* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife and Countryside Act (1981 as amended)

Conservation status: Red (UK[1] and Wales[2]) recently moved from Amber to Red on both lists.

Data availability: Good (1,268 records)

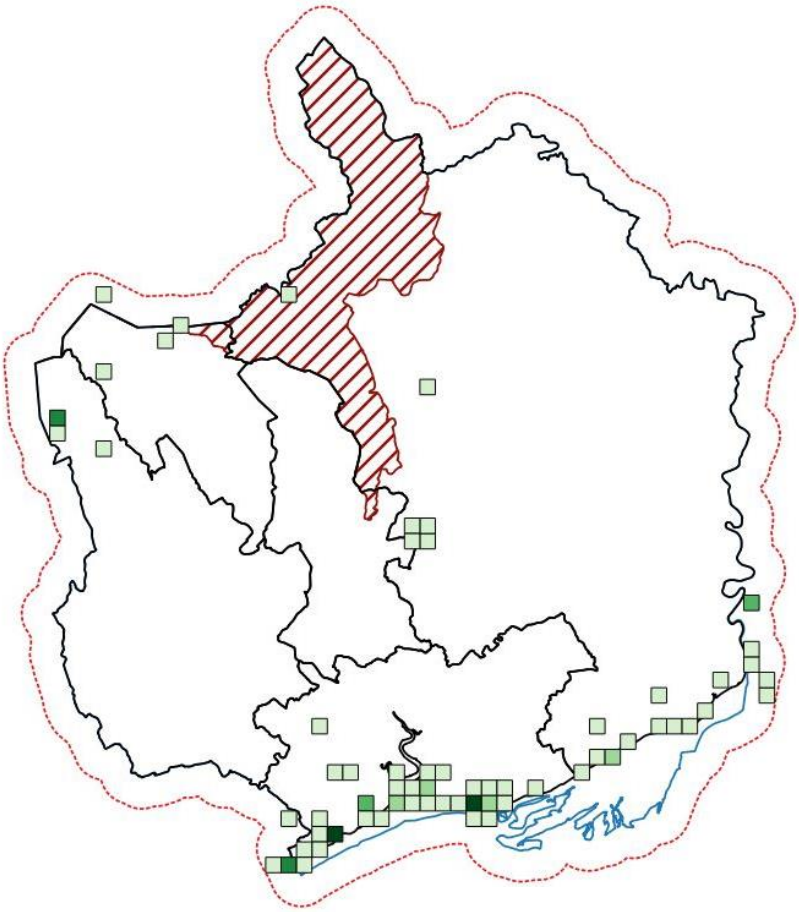
Context: Ringed Plovers are one of the commoner and more familiar wading birds in the UK. They are commoner as a wintering bird, but also pass through on migration, and smaller numbers stay to breed with some birds resident all year round.[44] This means that the Ringed Plover is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] The Ringed Plover that breed in the UK are distributed widely around the coast, with further records at inland sites such as gravel pits and former industrial sites.[44,5] The passage birds breed in areas such as Greenland,[44] wintering much further south, as far as Africa. The substantial wintering population is made up of birds that bred in mainland Europe.[44] This population is of particular conservation significance for the UK, as it forms a significant percentage of the distinct race *hiaticula*. Ringed Plover largely feed on invertebrates in the summer and marine worms, crustaceans and molluscs in the winter.[38] Overall, in the UK there has been a decrease of 36% in wintering birds between 1970 and 2017.[5] The reduction in numbers may be down to a number of factors; the most significance is that climate change is resulting in higher winter temperatures that mean fewer birds are pushed this far west – this has been implicated for falls in a whole range of wintering waders of which Ringed Plover is one.[43] The breeding population has also fallen with hedgehog predation on island strongholds[37] and human disturbance[45,37] being two of the causes suggested.

Outlook: At the end of the nineteenth century, Ringed Plovers bred on the coastline of just about every British county; the shoreline of Monmouthshire, interestingly, was the notable exception.[8] It was noted that a widespread decline occurred between the two World Wars, with the heightened disturbance caused by increased recreational use and development of the coast with, for example, caravan parks and sea defences heavily implicated.[8] The estimated UK breeding population in 2007 was 5,450 pairs.[9] BTO surveys noted increases in breeding populations between 1974 and 1984, driven by an increase at inland sites.[37] After this however, there was a decline in the breeding population of 37% between 1984 and 2007, with hedgehog predation on Western Isles strongholds and general increased disturbance being implicated. The greatest losses were at inland sites, although there were increases at wet meadow sites.[37] In contrast to the relatively small breeding population, the wintering population is much larger (42,500 in 2016) but has been subject to noticeable declines: 36% decrease between 1970–2017 (described as 'little change', but would appear to be fairly significant), with this appearing to have stabilised recently with a 3% decline in 2012–2017.[5] This wintering population is widely distributed around the coast of the UK, with many of the UK breeding Ringed Plover being resident. However, there are significant influxes and a considerable percentage of these are concentrated within a relatively small number of favoured sites.

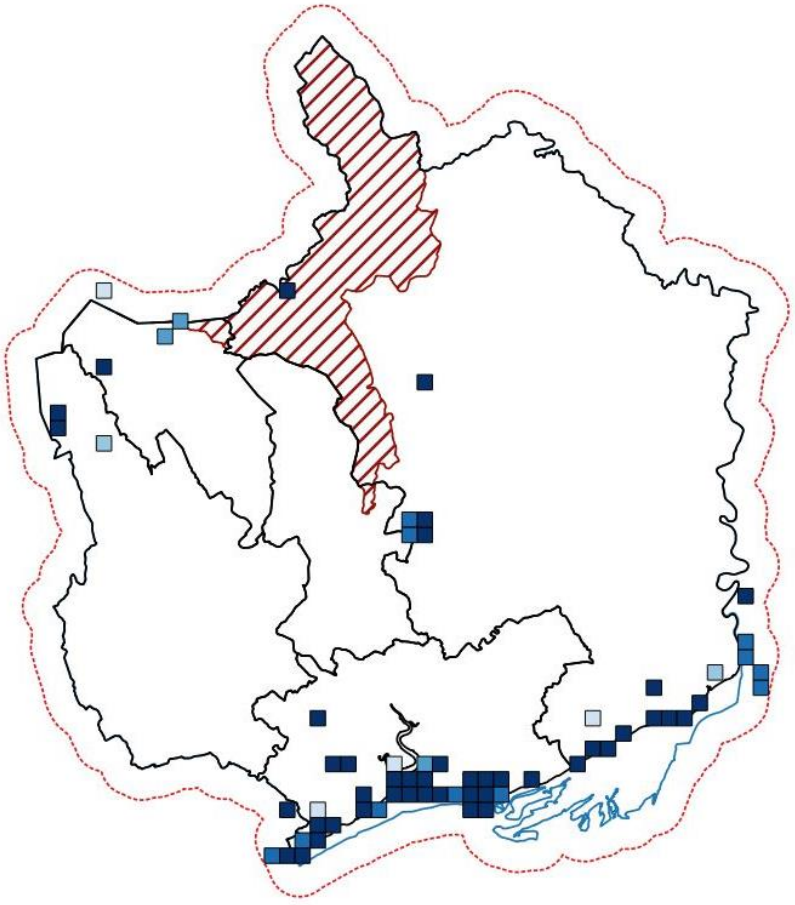
Greater Gwent range: The latest Gwent Bird Report (2018) records Ringed Plovers as a 'fairly common passage migrant; scarce breeder; uncommon in winter.'[10] This has been the case for a long while, with wintering numbers decreasing to some extent over time. The Birds of Gwent in 2008 recorded Ringed Plovers as 'mainly a passage migrant but some birds stay through the year. Has bred sporadically, becoming regular in recent years';[46] in 1977, it called it 'predominately a passage migrant with a small wintering population and an occasional breeding pair'.[33] The small breeding population is of little surprise, as the Gwent coast is largely devoid of the sandy/shingle beaches that are their favoured breeding habitat.[46] At other times of the year however, the Severn Estuary has been noted to be of great importance for Ringed Plover. The Severn Estuary is of national importance for Ringed Plovers both wintering and on passage (particularly autumn migration).[42] Inland in Gwent, Ringed Plovers are annual but only in small numbers, with Llandegfedd Reservoir being the best site.[46] As previously stated, Ringed Plover are an important part of the Severn Estuary avifauna over winter, although numbers have dropped. This mirrors the situation in the UK as a whole and is likely due to similar reasons, the most significant of which being birds wintering further east as a response to generally milder winters.[46] Ringed Plover have never been remotely common and until recently never regular as a breeding species in Gwent. Indeed, as previously stated, at the end of the nineteenth century, the Monmouthshire coast was noted to be the only stretch in Britain without Ringed Plover breeding.[3] Up until the formation of Newport Wetlands in 1999, there had only been seven previous breeding records for Gwent;[46] they are now recorded annually in small numbers, with Goldcliff Lagoons being the focal point. It is likely Ringed Plover will continue to breed at Newport Wetlands but, with much of the rest of the Gwent coast generally unsuitable, numbers will remain low.

The main hotspot is at Goldcliff (540 records). There are also noticeable concentrations at Peterstone Wentlooge, Rhaslas Pond and Rumney Great Wharf. The Gloucestershire hotspot is likely a false one due to centring of low-resolution records.

Distribution of Ringed Plover records across Greater Gwent (maximum≥100 records/km^2)



Records of Ringed Plover by decade

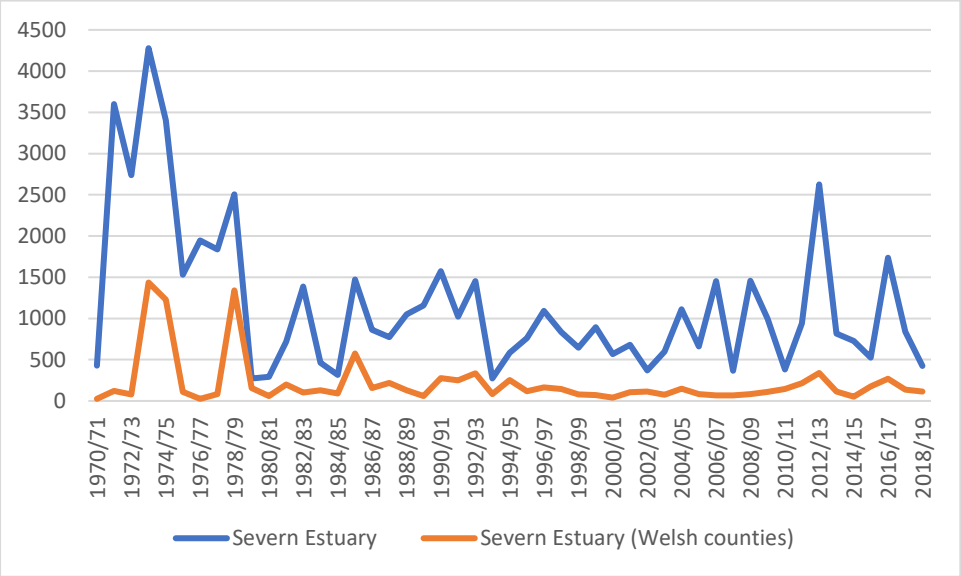


Habitats patterns: Ringed Plovers are very much a bird of the Severn Estuary coast, with small numbers inland at waterbodies such as Llandegfedd Reservoir.

Population trends: As previously stated, there have been noticeable decreases in the Ringed Plover wintering populations within the UK. Gwent has been no different, with identifiable decreases in birds wintering. These decreases are driven by generally milder winters allowing greater numbers to winter further east. It would appear that the Ringed Plover population that winters in Gwent is currently secure and still of national significance as part of the overall Severn Estuary population. Despite this, ongoing studies of trends are still important, although little could be done in terms of local conservation to influence the declines caused by birds wintering further east. The potential impacts of Severn barrages, lagoons and tidal power on wintering Ringed Plover populations, and other waders and wildfowl, would need to be carefully scrutinised.[43]

Note that some annual counts are given as a minimum number rather than a count/estimate. So, this represents the population at the most numerous recorded site rather than in the whole of Greater Gwent. In this case, the count exclusively refers to the Severn Estuary. A reduction in numbers through the late-1970s into the 1980s can be clearly seen.

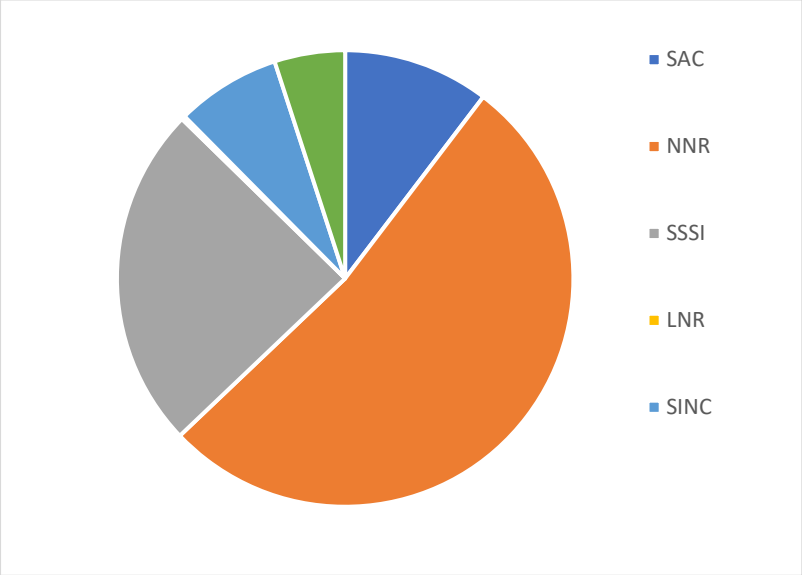
Winter WeBS Peak Counts for Ringed Plover on the Severn Estuary[13]



As previously stated, it is unlikely that the Ringed Plover will be anything more than an uncommon breeding bird in Gwent, as much of the coast is unsuitable. The continued management of the lagoons at Goldcliff should retain them as a regular breeding species.

Protection: 95% of records come from protected sites, with high numbers of records from protected sites on the coast, notably the Newport Wetlands and Gwent Levels. There are also many records from Llandegfedd SSSIs and some SINC records from Rhaslas Pond.

Ringed Plover records from protected sites



References

1. Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. 2015. Birds of Conservation Concern 4: The Population Status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108: 708–746.
2. Johnstone I and Bladwell S. 2016. Birds of Conservation Concern in Wales 3: The Population Status of Birds in Wales. Birds in Wales 13(1): 3–31.
3. Pearce-Higgins JW and Crick HQP. 2019. One-Third of English Breeding Bird Species Show Evidence of Population Responses to Climatic Variables over 50 years. Bird Study 66(2): 159–172, DOI: 10.1080/00063657.2019.1630360
4. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/black-tailed-godwit/
5. DEFRA. 2019. Wild Bird Populations in the UK 1970–2018, 40.
6. https://archive.uea.ac.uk/~b026515/icelandic.html.
7. https://projectgodwit.org.uk/black-tailed-godwits
8. Holloway S. 1996. The Historical Atlas of Breeding Birds in Britain and Ireland: 1875–1900. Poyser, London
9. https://www.bto.org/sites/default/files/publications/apep4-population-estimates-birds-great-britain-uk-2020.pdf
10. Gwent Bird Report 2018.
11. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 175.
12. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 92.
13. Wetland Bird Survey (WeBS) data from Waterbirds in the UK 2018/19 © copyright and database right 2020. WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, in association with WWT, with fieldwork conducted by volunteers.
14. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/common-sandpiper/
15. https://app.bto.org/birdfacts/results/bob5560.htm
16. https://www.birdguides.com/news/common-sandpiper-wintering-grounds-established/
17. https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf
18. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 188–190.
19. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 93.
20. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 59.
21. https://www.rspb.org.uk/birds-and-wildlife/natures-home-magazine/birds-and-wildlife-articles/migration/migratory-bird-stories/dunlin-migration
22. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/dunlin/
23. https://app.bto.org/birdfacts/results/bob5120.htm
24. Goss-Custard JD, and Moser ME. 1988. Rates of Change in the Numbers of Dunlin, Calidris Alpina, Wintering in British Estuaries in Relation to the Spread of Spartina Anglica. Journal of Applied Ecology 25 (1): 95–109: www.jstor.org/stable/2403612. (Accessed 24/11/2021).
25. http://www.cheshireandwirralbirdatlas.org/species/dunlin-wintering.htm
26. https://www.dartmoor.gov.uk/__data/assets/pdf_file/0021/78222/Dunlin-Delivery-Plan.pdf
27. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 166.
28. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 96–97.

29. https://www.birdwords.co.uk/bird-factsheets/little-ringed-plover-charadrius-dubius/
30. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/little-ringed-plover/
31. https://www.wildlifetrusts.org/wildlife-explorer/birds/wading-birds/little-ringed-plover
32. Robinson, R.A. (2005*)* BirdFacts: profiles of birds occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 07 December 2020).
33. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 88.
34. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 152–153.
35. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 50.
36. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/redshank/
37. Massimino D, Woodward ID, Hammond MJ, Harris SJ, Leech DI, Noble DG, Walker RH, Barimore C, Dadam D, Eglington SM, Marchant JH, Sullivan MJP, Baillie SR and Robinson RA. 2017. BirdTrends 2017: Trends in Numbers, Breeding Success and Survival for UK Breeding Birds. Research Report 704. BTO, Thetford: www.bto.org/birdtrends
38. Robinson RA. 2005. BirdFacts: Profiles of Birds Occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed 04/12/2020).
39. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 182–184.
40. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 93–94.
41. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 58.
42. Severn Estuary SPA citation: http://publications.naturalengland.org.uk/publication/5601088380076032
43. Musgrove AJ, Rehfisch MM, Clark NA (BTO). 2010. Birds of the Severn Estuary and Bristol Channel: Their Current Status and Key Environmental Issues. Marine Pollution Bulletin 61: 115–123.
44. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/ringed-plover/
45. Liley D and Sutherland WJ. 2007. Predicting the Population Consequences of Human Disturbance for Ringed Plovers *Charadrius hiaticula*: A Game Theory Approach. Ibis 149 (S1): 82–94.
46. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 153–154.

Woodland birds

Brambling *Fringilla montifringilla* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended) Schedule 1

Conservation status: Amber (was Green) (Wales[1]) Green (UK[2])

Data availability: 791 (Good)

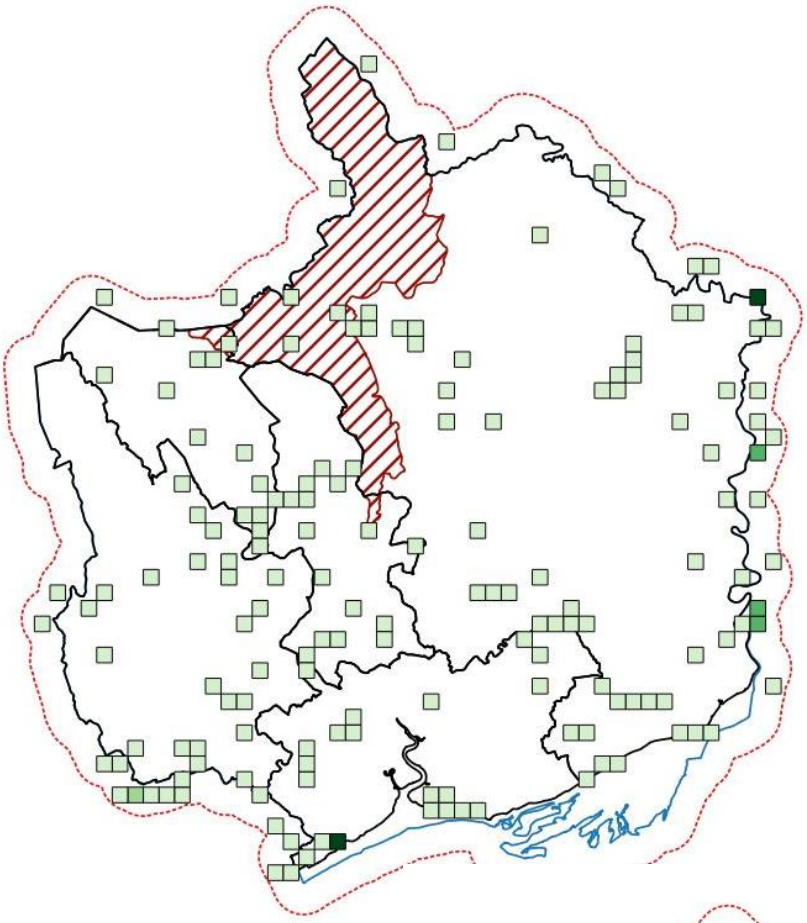
Context: Bramblings are widespread within the UK as a wintering species, but are unfamiliar to many people, as they do not frequent gardens anywhere near as frequently as their close cousin the Chaffinch. They are by far at their commonest as a wintering bird, also passing through in good numbers on migration, and only breeding extremely rarely. This means that Bramblings are vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] They are one of many finch species whose numbers in the UK are boosted in winter. However, they differ from most in that very few, if any, remain to breed. The large wintering population arrives from further north, in Fennoscandia.[4] Brambling eat seeds and berries, with a particular liking for Beech mast; during the breeding season, their diet changes to invertebrates.[5] The number of Brambling wintering in the UK varies considerably from year to year in relation to the Beech mast crop on the continent and the severity of the winter.[6] Breeding populations have always been very low, with none confirmed in many years and virtually all records from Scotland.[7] The current UK breeding population is quoted as 0–1 pairs in the period 2013–2017.[8]

Outlook: Brambling have always been a very rare breeding bird in the UK. The first confirmed record did not occur until 1920, and they have only been recorded breeding in very low numbers irregularly since.[9] In contrast to the very small, irregular and localised breeding population, the wintering population is considerably larger (45,000–1,800,000 in 1981–84).[10] The numbers quoted are over a large range as the numbers vary hugely from year to year for reasons outlined above. Perhaps because of the huge fluctuations from year to year, it is difficult to find any wintering population trend data for the UK, but the wintering population has been noted to have suffered a moderate decline in Europe between 1980 and 2013.[11] Brambling were Amber listed in the original UK Birds of Conservation Concern, but they have been Green listed in the three iterations since, which indicates there are no current concerns regarding the UK population.[8] It should be noted that they have moved from Green to Amber on the latest Welsh Birds of Conservation Concern[1] due to their European Importance, as recognised by their listing on the European Red List of Birds (ERLoB), albeit as a species of 'Least Concern'. The State of Birds in Wales 2018 notes the special significance of the Welsh Brambling population in a UK context, with 33% of the UK wintering population being in Wales.[12]

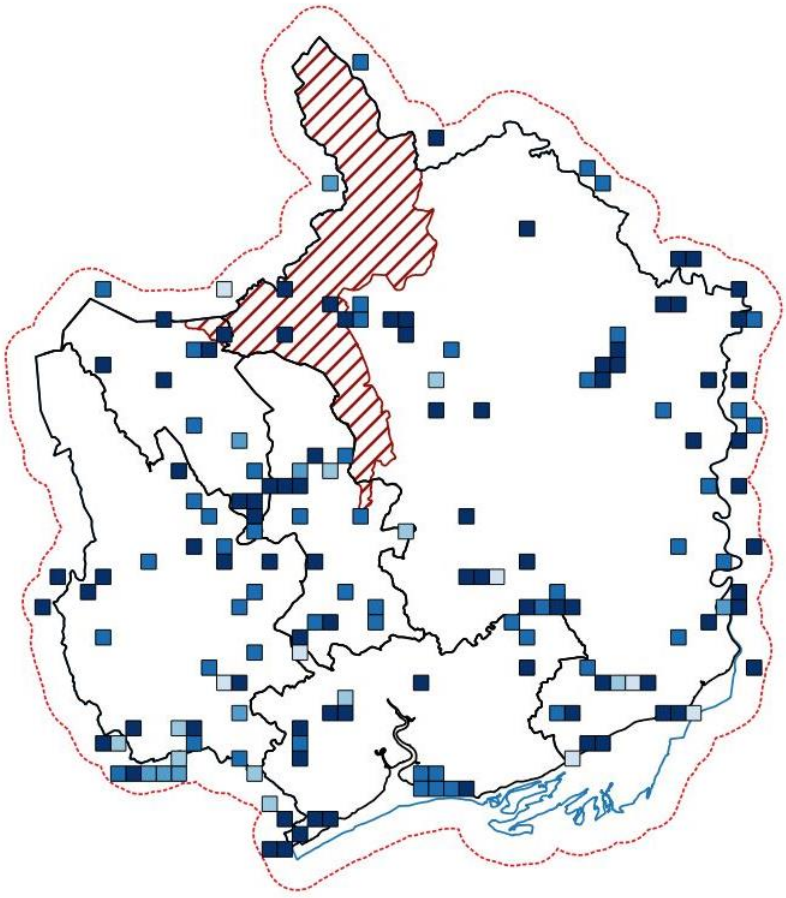
Greater Gwent range: The latest Gwent Bird Report (2018), records Bramblings as being a 'fairly common winter visitor and passage migrant'.[13] This has been the case for quite a while, with the Birds of Gwent recording Brambling as being 'a fairly common but local winter visitor and passage migrant'[14] in 2008 and as a 'regular winter visitor, usually in small numbers. Once it was considered rare, appearing only in hard weather' in 1977.[15] However, prior to the 1970s it would appear that Bramblings were a rarer and more irregular occurrence. Bramblings can turn up throughout Gwent, with migration records at the coast and small numbers visiting gardens. However, the largest flocks are generally associated with woodland, particularly where Beech is found.

Record hotspots are at Peterstone (popular migration/birding hotspot), Fforest Ganol (in buffer zone, nr. Cardiff) Dingestow, Newport Wetlands, Wentwood. There are also false hotspots along the Gloucestershire border, but there are likely to be high numbers of sightings from the Forest of Dean and Tidenham Chase.

Distribution of Brambling records across Greater Gwent (max 86 records/km^2)



Records of Brambling by decade



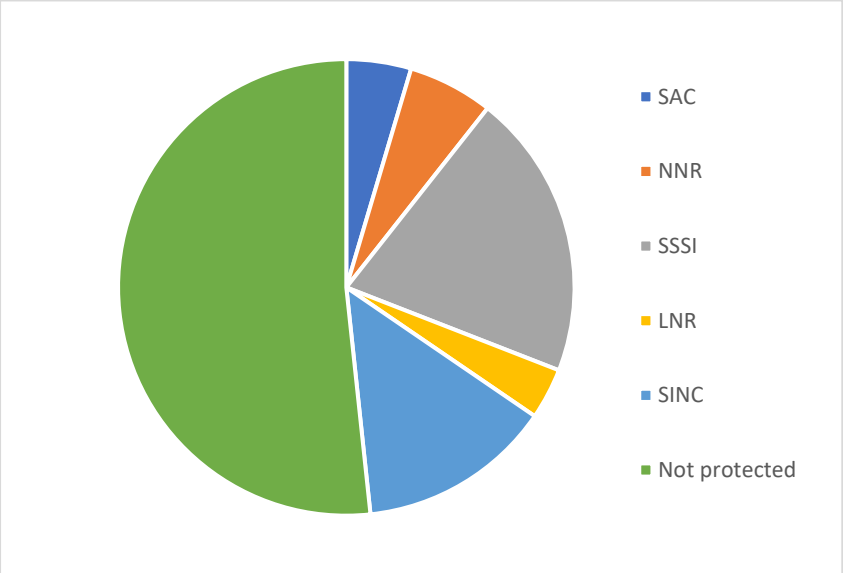
Habitats patterns: The best sites in Gwent are woodlands, particularly Beech woods. Brambling may also be found in stubble fields and, particularly if winters, in gardens.

Population trends: As previously stated, the number of Brambling arriving in the UK each winter varies greatly from year to year, largely driven by the size of the Beech mast crop in southern Scandinavia (if this is large then far fewer birds need to migrate to the UK). According to The Birds of Gwent 2008, 'this fluctuation occurs in microcosm within Gwent with maximum annual flock sizes ranging from three individuals to five hundred'.[14]

It may be difficult to accurately document Brambling population trends in Gwent due to the naturally large fluctuations in population. It seems entirely possible that numbers may have dropped to some degree, reflecting moderate decreases in European breeding populations.[11] It was also postulated in the Birds of Gwent 2008 that 'with a milder climate due to global warming occurring in Northern Europe, good Beechmast crops may be produced more regularly in Scandinavia, causing British numbers to decrease as birds are able to find food further north'. Conservation efforts in Gwent can do little to directly influence this, but work can be done to ensure that our woodlands, particularly our Beech woods, are conserved in good condition in the long term. Retaining weedy stubble fields on farmland where possible would also benefit Bramblings, together with a host of other seed-eating farmland birds, many of which are suffering declines.

Protection: 48% of records come from protected sites, with high numbers of records from the following. SAC records come from the erroneous records in the Severn, plus a few along the sea wall. NNR records from Newport Wetlands. SSSI records from Gwent Levels, Silent Valley, Nedern Brook and Brockwells Meadows. LNR records from St Julian's Park, The Moorings and Silent Valley. SINC records are scattered across numerous sites, including Wentwood, Beacon Hill, Rudry Common, Treowen, Torfaen uplands such as Blaenserchan and The British.

Brambling records from protected sites



Hawfinch *Coccothraustes coccothraustes* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[2]) Amber (Wales[1]) UKBAP Priority Species, Wales Section 7 List

Data availability: Poor (362 records)

Context: The Hawfinch is the UK's largest finch, but is a shy bird, difficult to see and therefore easily overlooked.[16] It is largely a resident and sedentary bird, although some quite limited migration has been noted.[17] The unprecedented influx of birds from the continent in winter 2017/2018 was truly exceptional.[18] The Hawfinch is renowned for its exceptionally strong beak, which it uses to crack open various seeds, including cherry stones. It distribution is linked to areas where favoured trees, such as Cherry and Hornbeam are present in numbers. Its diet varies throughout the year, with invertebrates being of great importance during the breeding season.[19] In the UK, the majority of the population now has a more westerly distribution, with four main strongholds in the Forest of Dean/Wye Valley, New Forest, North Wales and Cumbria.[20] The loss of English Elm in eastern Britain (in the 1970s) may have contributed to declines in the east. The more westerly distribution of Wych Elm ensures food availability in late winter (when other seed sources are depleted). There has been a worrying loss in both Hawfinch numbers and range in the UK, and work is being undertaken to ascertain why this is the case, with predation and late winter food availability being investigated.[21]

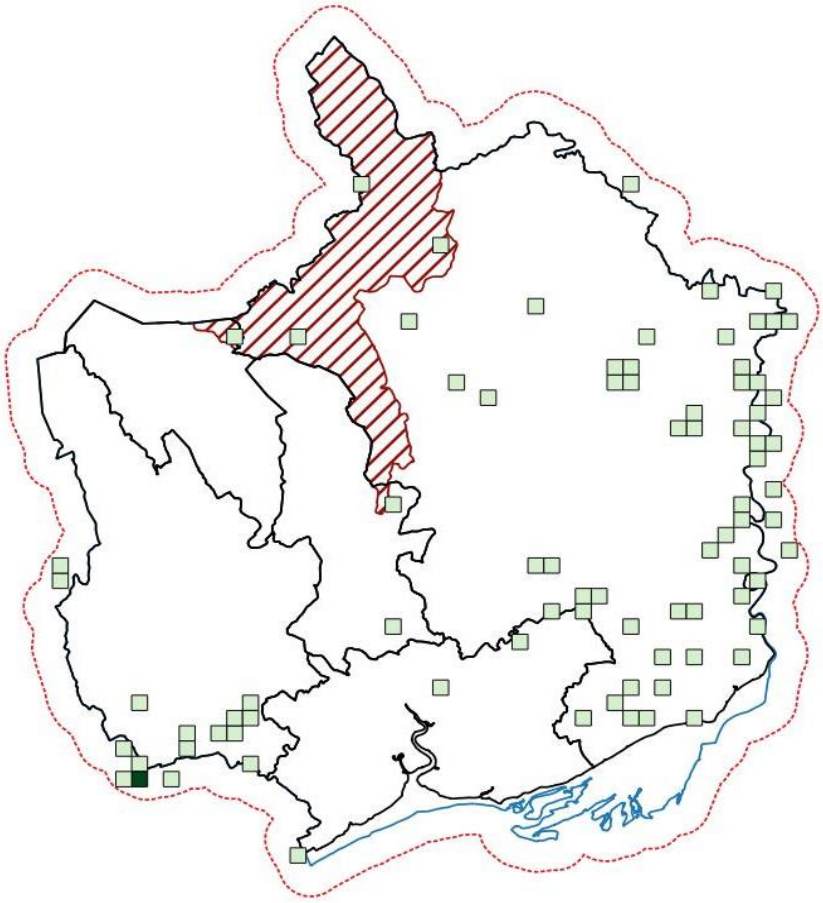
Outlook: The history of the Hawfinch in the UK is an interesting one. It was not known to have bred in the UK until the early nineteenth century, and while it is an easy species to overlook, its absence would appear to be genuine.[9] It originally started nesting in south-east England from 1835, and its numbers rapidly expanded into the twentieth century until it had colonised most of England and Wales and made it into Scotland.[9] The increase in food supplies by the planting of extensive orchards, the increase in suburban gardens and legal protection given in the 1880s are all thought to have aided this expansion.[9]

However, in recent years the population has very much gone into rapid decline (both numbers and range), so that it is now too scarce to be covered by national annual monitoring schemes.[22] Breeding bird atlases were published in 1976, 1993 and 2013, and showed a 76% reduction in the number of occupied 10 km squares between 1976 and 2013, the majority of this occurring between 1993 and 2013.[22] As outlined above, Hawfinches are now limited to a small number of geographical locations, with just 4% of 10 km squares in Britain occupied.[22] The current (2011) breeding population is 500–1,000 pairs.[10] The new Birds in Wales (in prep) suggests: 'The decline of c.40% in the British breeding population between the mid 1980s and the late 1990s was not evident in Wales, but the increased numbers now recorded in Wales are due to dedicated monitoring rather than to an increased population.'

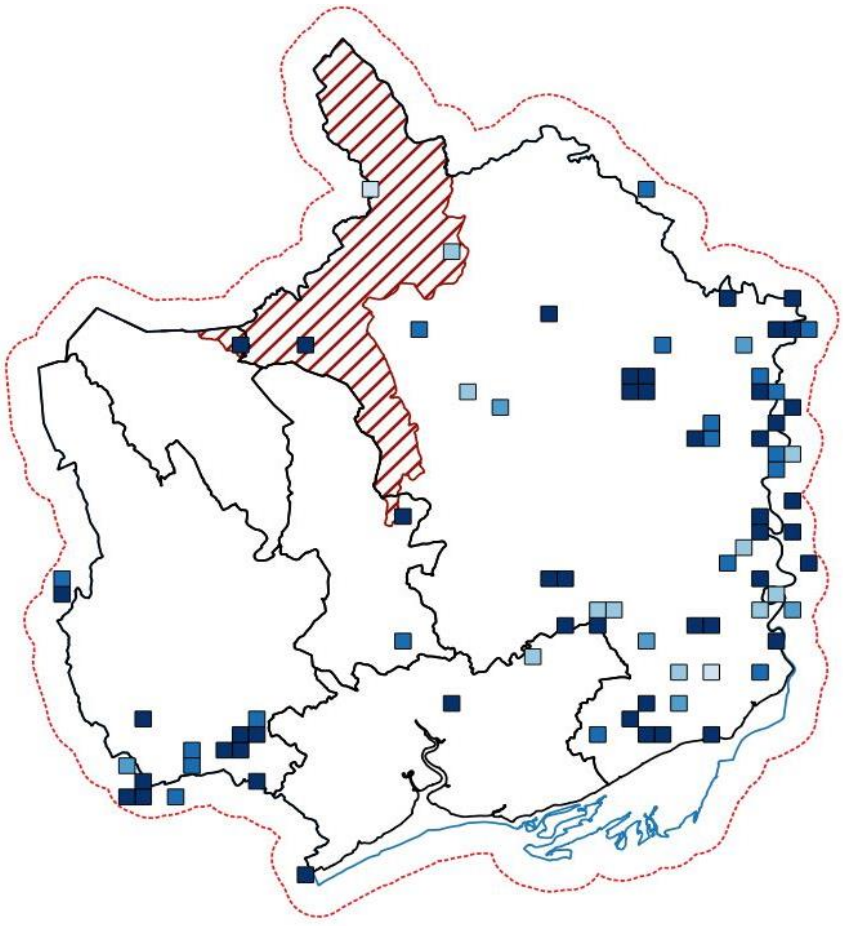
Greater Gwent range: The latest Gwent Bird Report (2018) records Hawfinch as a 'uncommon breeding resident and very rare passage migrant'.[13] This has been the case in Gwent for quite some time, as it is one of the few places in the UK that has retained its Hawfinch population (as part of Forest of Dean/Wye Valley stronghold). The Birds of Gwent in 2008 recorded Hawfinch as 'an uncommon and local resident' and noted that 'the Hawfinch is one of the least known and possibly under-recorded of Welsh Birds. Most Welsh breeding records come from Gwent.'[23] In 1977, Birds of Gwent noted the Hawfinch was a 'very local breeding resident in small numbers.'[24] This would indicate that numbers have generally remained relatively similar over this period and indeed longer, with the Birds of Monmouthshire in both 1937 and 1963 recording it as a 'somewhat local resident breeding species found in the central and southern portions of the county'.[23] The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 50–100 pairs,[25] with the second atlas, which covers 1998–2003, estimating 30–100 pairs but stressing that it was likely nearer the lower end of this, which perhaps indicates some reduction in numbers.[23] However, more recent ringing studies in the Forest of Dean/Wye Valley suggest that the population estimates for both Gloucestershire and Gwent (based on tetrad occupancy) were too low, as in excess of 100 adult birds have been caught in the breeding season annually since 2010. An analysis of recaptures and survival rates suggests a Forest of Dean/Wye Valley population of 650 pairs,[28] with some 250–300 of these in Gwent.

The main hotspot is at Fforest Ganol (which is just outside of Greater Gwent). Smaller hotspots are at Penallt, Slade Wood/Minnetts & Gwern Ddu. Hawfinches are not a common species, but they are undoubtedly overlooked due to their secretive habits. The population extends into Gloucestershire/Forest of Dean.

Distribution of Hawfinch records across Greater Gwent (max 155)



Records of Hawfinch by decade

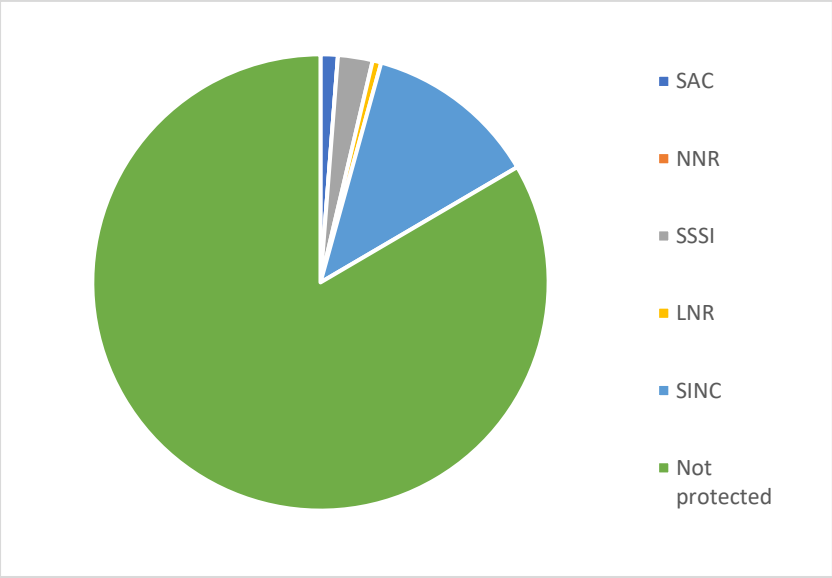


Habitat patterns: Hawfinch are very much birds of semi-natural broadleaved or mixed woodland, but in recent years they have been visiting garden feeding stations more frequently in late winter/early spring.

Population trends: As previously outlined, the UK Hawfinch population has fallen and contracted in range in recent times. Here in Gwent we are part of one of the last four remaining strongholds within the Forest of Dean/Wye Valley population. Recoveries of ringed birds and radio tracking studies show that birds are highly mobile in late winter/early spring, ranging throughout the area and further afield. There is much research being undertaken to ascertain the reasons for the population declines. Nest predation was suspected to be a significant driver of losses, but research has shown that this was not as significant as suspected.[26] It has been found however that, while Hawfinches generally nest within larger areas of continuous broadleaved woodland, the actual nest sites are often near openings in the canopy. It is also possible that food shortages at other times of the year may be a factor.[21] Birds of Gwent notes that Gwent is a well wooded county, with a good variety of suitable seeding/fruiting trees, so that if one species fails to seed, there will always be an alternative food source, thus ensuring the species continued presence.[23] Future woodland management will need to take into account the findings of this ongoing research to help arrest and reverse the losses. Faecal analysis has identified a wide variety of vegetation matter being taken in Gwent, and forest managers could improve food availability by including small patches of 'non-timber' trees (Hornbeam, Wild Cherry, Holly, Field Maple, Lime, Hawthorn, Yew and especially Wych Elm) in any restocking/planting.

Protection: Only 17% of records come from protected sites. SSSI records were from Coombe Valley Woods, Gilwern Hill, and the edges of the Gwent Levels. SINC records from Coed Cefn Pwll-Du, Kemeys Inferior (Wentwood) and scattered woods along the Wye Valley.

Hawfinch records from protected sites



Marsh Tit *Poecile palustris* (Linnaeus, 1758)

Pete Hadfield

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[2] & Wales[1]), UKBAP Priority Species, Wales Section 7 List

Data availability: Moderate (750 records)

Context: The Marsh Tit is a resident and sedentary bird. Despite its name, it is more a bird of broadleaved woodland, copses, parks and gardens.[28] It is very similar in appearance to its close cousin the Willow Tit, and was only recognised as a separate species around 1897.[9] Unlike the Willow Tit, the Marsh Tit does not excavate its own nest hole, but exploits existing holes in trees.[29] It is found in England and Wales, with the population extending into southern Scotland, the best populations are however in South Wales and southern and eastern England.[28] Its distribution and numbers within this range have recently declined considerably.[30] In common with many other UK songbirds and all our other tit species, the Marsh Tit's diet is largely invertebrates, particularly during the breeding season, although seeds are exploited more over the winter.[29] As outlined above, Marsh Tits have suffered considerable declines in relatively recent times: a 77% decline between 1970 and 2017.[31] However, unlike for the Willow Tit, predation or competition for nest sites are not considered significant factors in Marsh Tit declines.[32] However, it has been noted that they have very specific habitat requirements, needing mature, largely unmanaged broadleaved woodland with a good understorey.[33] They also need an exceptionally large territory for such a small bird and have very poor dispersal and movement between geographically separate woods, so that large areas of contiguous woodland in suitable condition are needed.[32] This could limit populations.

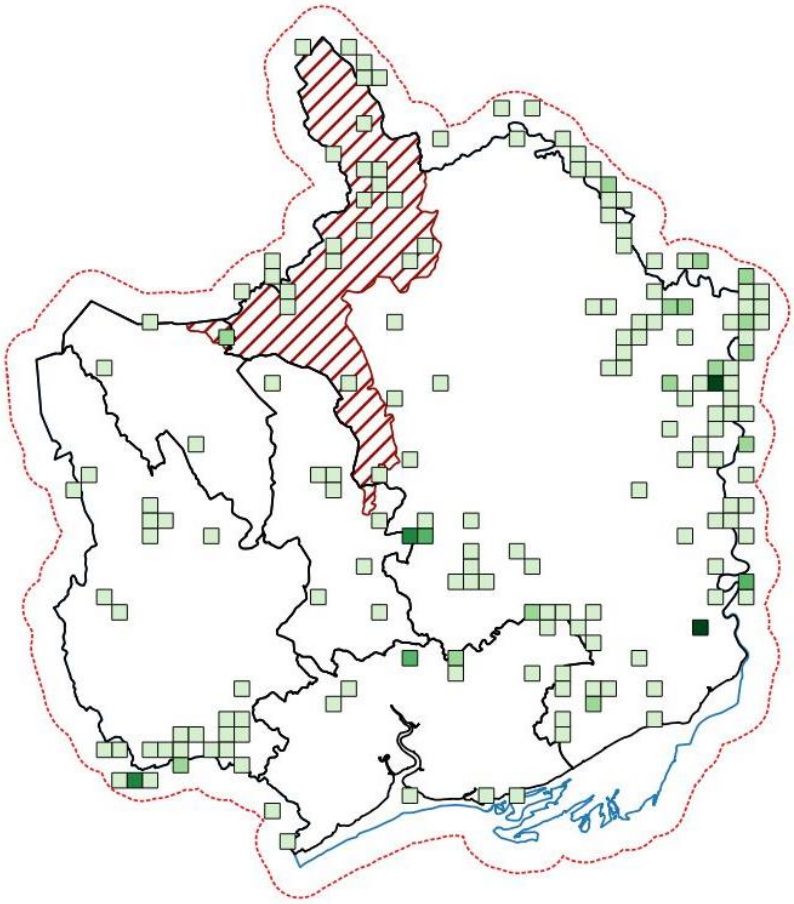
Outlook: The history of the Marsh Tit in the UK is clouded by the fact that it was not recognised as a separate species separate until 1897, and for a while after this records would still be confused. In the nineteenth century Marsh/Willow Tits nested throughout most of England and Wales, albeit locally in many counties.[29] These populations remained broadly similar throughout much of the twentieth century, but there has been a decline since at least the late 1960s.[9] There were longer-term 77% reductions in 1970–2017 (described as 'strong decline'), and there has been continued 'strong decline' more recently, with a 22% decline from 2012–2017.[31] The more recent BTO Breeding Bird Survey shows a continuation of the decline, with a decrease of 24% between 2008 and 2018 in the UK. There was an increase of 4%, albeit only over a single season, in 2018–19.[33] The current (2016) breeding population is 28,500 pairs.[10]

Greater Gwent range: The latest Gwent Bird Report (2018) records Marsh Tit as a 'fairly common, but declining resident',[13] this decline is in line with the population declines seen across the UK but may not have been occurring for such a long time. Marsh Tits seem to be well distributed across Gwent, although there are obvious biases away from upland areas and towards areas of considerable broadleaved woodland cover, i.e. the Wye Valley. The Birds of Gwent recorded Marsh Tit as being 'a scarce resident' in 2008[34] and as a 'breeding resident, widely but thinly distributed' in 1977.[35] This would indicate that numbers are currently declining but have not necessarily been declining over this

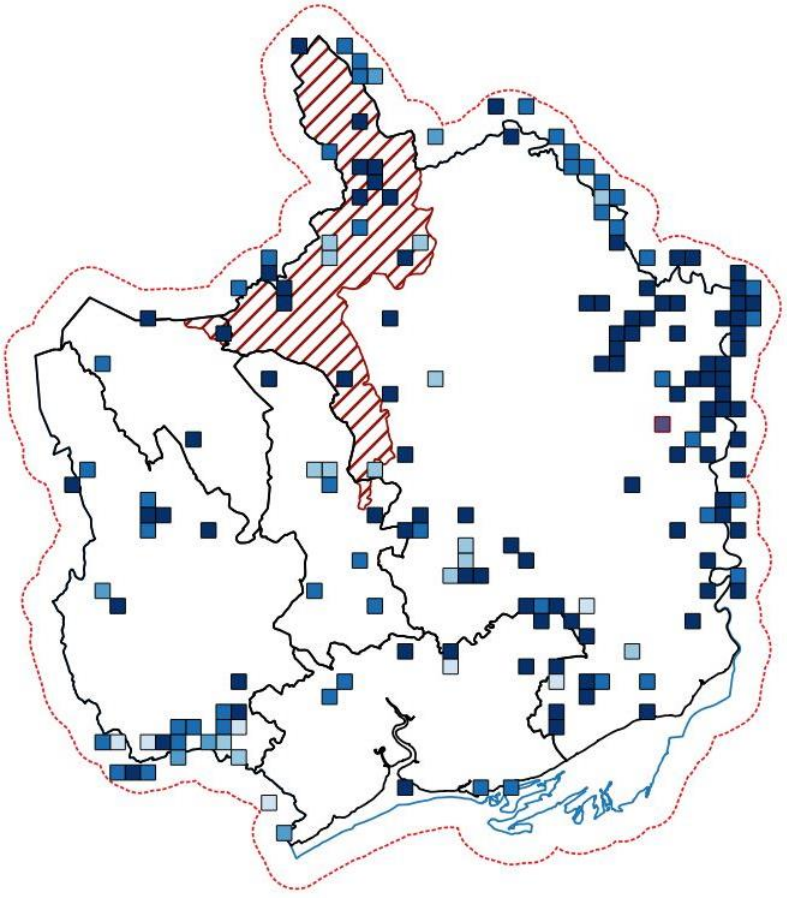
entire period. The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 500 pairs, with this possibly being an underestimate;[36] the second atlas, which covers 1998–2003, estimated 510–1,200 pairs (this figure should be treated with caution, due to small sample size).[34] It is perhaps difficult to ascertain from these figures how populations have changed, although a noticeable drop in the number of tetrads occupied and ringing records between 1974–2003 indicate a general decline in numbers.[34] It is clear from reference to recent Gwent Bird Reports that numbers are currently declining, although the Marsh Tit is not in such a perilous state as a Gwent bird as the Willow Tit.

Hotspots are at Penallt (perhaps due to many records from one observer), Great Barnet Wood, Llandegfedd and Lodge Wood (Caerleon), plus Fforest Ganol and an unknown location in Gloucestershire, both of which are just outside Greater Gwent.

Distribution of Marsh Tit records across Greater Gwent (max 38 records/km^2)



Records of Marsh Tit by decade

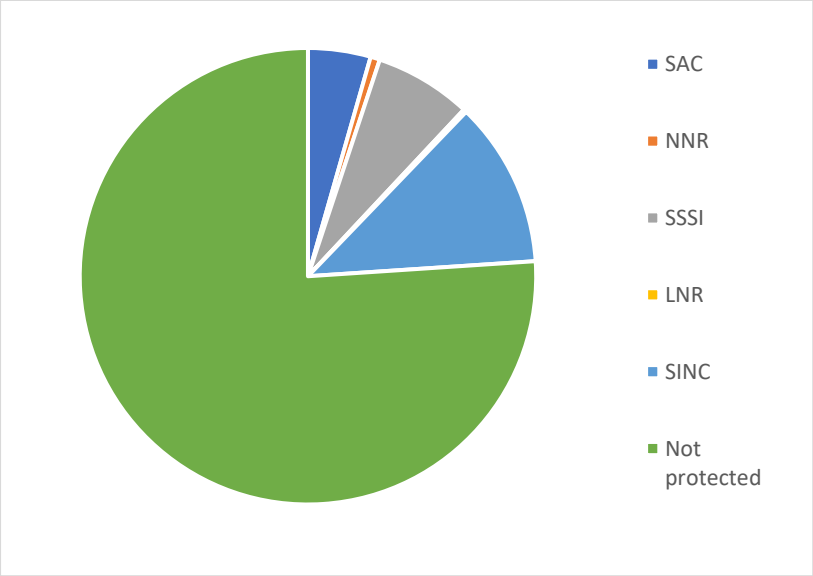


Habitats patterns: Marsh Tits are a bird closely associated with extensive areas of mature broadleaved Woodland.

Population trends: As previously stated there have been declines in Marsh Tit populations across the UK. Gwent has also had declines, although it would appear there is still a reasonable population in Gwent. This should not be a cause for complacency, as it needs to be ensured that population levels do not drop as low as those of the Willow Tit. Preserving and enhancing the extensive woodland areas required by this species should be a priority, and this also needs to take into account that Marsh Tits prefer woodland with little management and that this may run contrary to conservation plans for other species.

Protection: 66% of records come from protected sites, with SAC records from the Usk Bat SAC, SSSI records from the Gwent Levels and Llandegfedd. SINC records from various woodlands throughout south Caerphilly and the Wye Valley.

Marsh Tit records from protected sites



Pied Flycatcher Ficedula hypoleuca (Pallas, 1764)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[2] & Wales[1]), Wales Section 7 List

Data availability: Poor (344 records)

Context: A migrant bird that is a summer visitor to the UK, the Pied Flycatcher spends winter in western Africa.[37] This means that the Pied Flycatcher is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food source – all impacted by climate change.[3] They are one of a whole host of small passerines that breed in the UK and make long-distance migrations to distant wintering grounds. They are insectivorous, catching most of their prey on the wing with darting flights from perches. They are a bird of 'upland deciduous woods in parts of western and northern Britain'.[38] Overall, in the UK there has been a large decline of 42% between 1970 and 2017.[31] 'The reasons for this decline is unknown, but there is good evidence that they lie at least partly outside the breeding season and are thought to be linked to changing conditions on wintering grounds and migration.'[38] Additionally the well-publicised reduction in invertebrates in the UK and indeed farther afield is likely to have had an impact on breeding productivity, and wetter summers will certainly impact any species that largely relies on flying insects. There are also studies that suggest increasingly early springs mean that migrant species such as Pied Flycatchers are now breeding at mismatched times with the peak abundance of prey, with reduced productivity the result.[39]

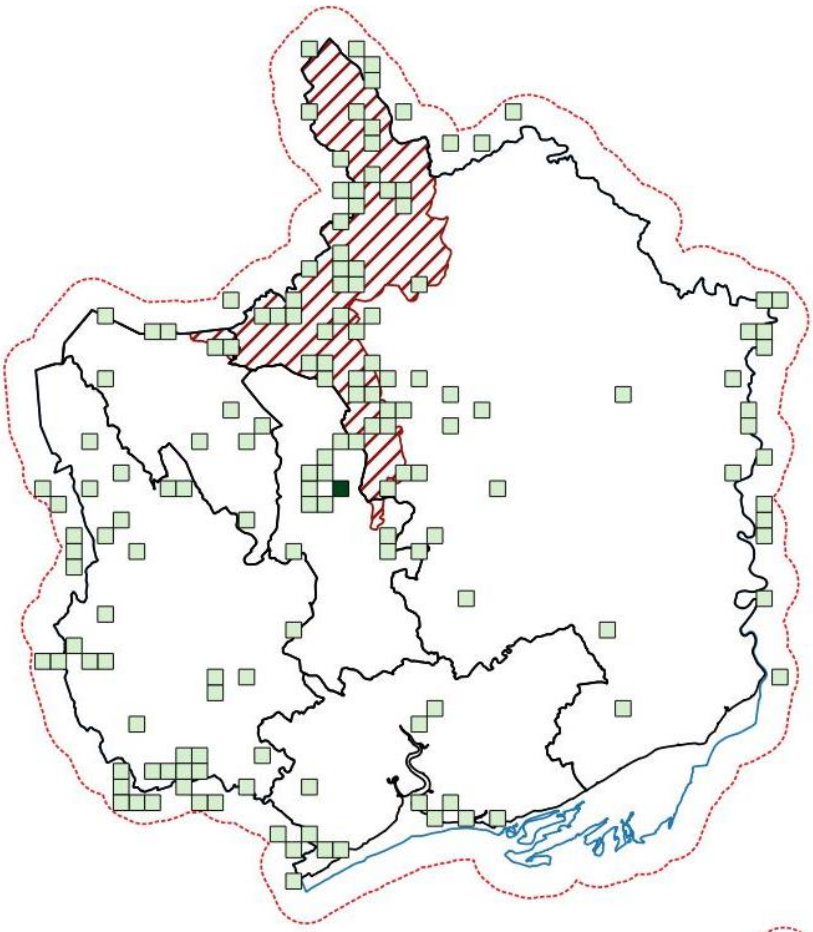
Outlook: It would appear that Pied Flycatchers were scarce in the UK in the first half of the nineteenth century.[9] It was apparent that numbers increased towards the end of the nineteenth century and gradually spread and consolidated in Wales, western England, northern England and parts of Scotland through the first part of the twentieth century.[9] However, declines were noted in the second half of the twentieth century. There was a 42% reduction between 1970 and 2017 (described as 'weak decline'); this reversed to some extent more recently, with a 10% 'weak increase' from 2012–2017.[31] The BTO Breeding Bird Survey[33] further illustrates these declines and possible partial recover with a considerable 43% decline in 1995–2018 in the UK as a whole. Most recently, there have been some signs of recovery, with a 18% increase, although this is just over a single year (2018–2019), so only time will tell if this is the start of a recovery.[33] The estimated UK breeding population in 2016 was 22,000–25,000 pairs.[10]

Greater Gwent range: As a breeding bird, Pied Flycatchers are generally found in the more upland deciduous woodlands of north-west Gwent and to a lesser extent in the Wye Valley in the east.[40] On migration they may be encountered more widely, with some records from more coastal areas. The latest Gwent Bird Report (2018) records Pied Flycatcher as a 'fairly common breeding summer visitor/passage migrant'.[13] The Birds of Gwent recorded Pied Flycatcher as being 'a fairly common passage migrant and summer visitor' in 2008[40] and as a 'summer visitor, fairly frequent locally' in 1977i, noting it 'was a lot scarcer prior to 1960's, the provision of nest-boxes being the cause of

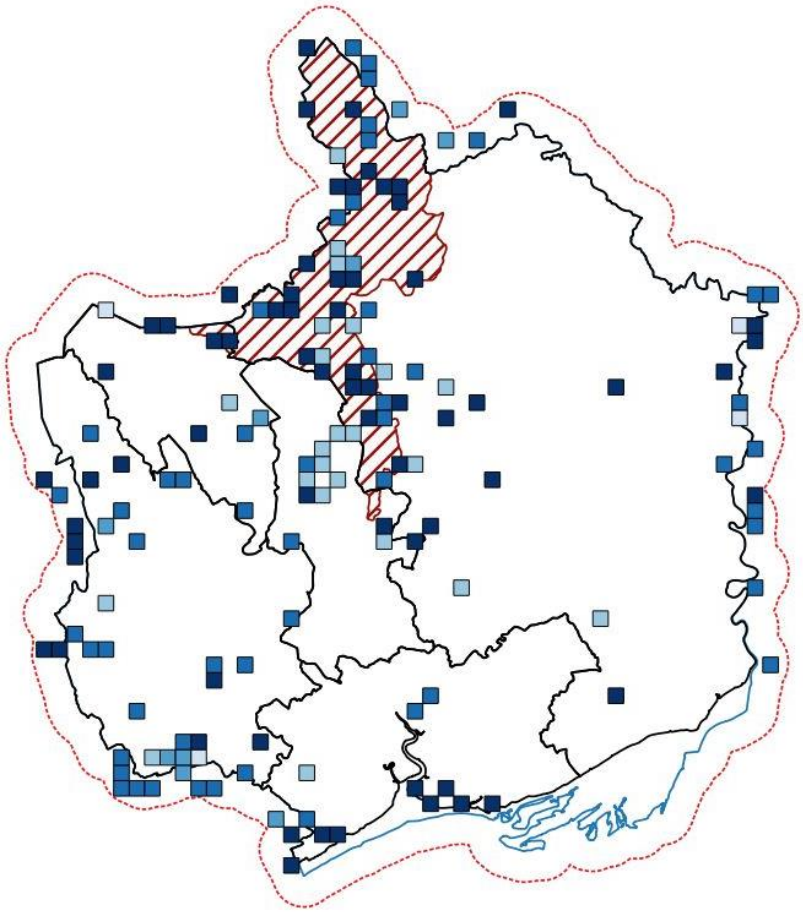
noticeable increases'.[41] This indicates that the declines within the UK as a whole may not have been so noticeable in Gwent, although there have been some (see below). It also highlights the importance of nest-boxes. The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 500 pairs,[42] with the second atlas, which covers 1998–2003, estimating a lower 400–450 pairs.[40] This shows some degree of a decline, mainly in the population present in the east of the county.[40] The fluctuating fortunes of various nest-box schemes is clearly laid out in the second Gwent Atlas.[40]

The main hotspot is at Lasgarn Woods; smaller (>10 records) hotspots are at Parc Cwm Darran, Penallt, Strawberry Cottage Woods and an unknown site outside the region (in Herefordshire).

Distribution of Pied Flycatcher records across Greater Gwent (max 75 records/km^2)



Records of Pied Flycatcher by decade



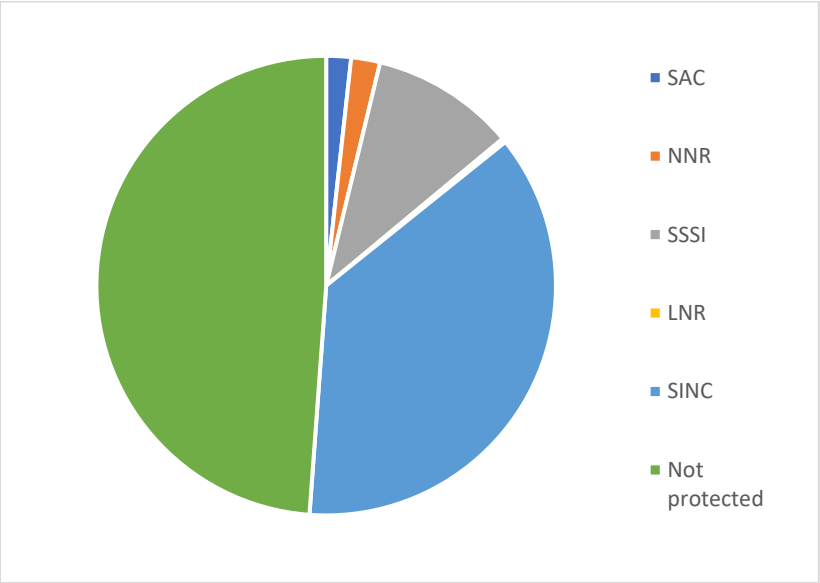
Habitats patterns: Strongly linked to more upland deciduous woodlands, particularly where sheep grazing controls the understorey. Also found along riparian woods in more upland areas (i.e. Honddu) and deciduous woodland in the Wye Valley.

Population trends: As previously stated, there have been significant declines in Pied Flycatcher populations across the UK. Gwent has also been affected but perhaps to a lesser extent than many other areas. The rate of these losses has generally slowed, and Pied Flycatchers can still be found in suitable habitats within their range, with Wales being a stronghold. If the cause of these losses is being largely driven by issues on wintering grounds and on migration then this is a global issue of climate change and more difficult to address through local conservation initiatives. However, habitats in Gwent can still be preserved and enhanced in such a condition so as to maximise the potential available resources for breeding Pied Flycatchers; ensuring productivity rates are high will all help population levels.[43] The importance of maintaining next boxes and creating new nest-box schemes for Pied Flycatchers will remain a very important factor.

Protection: 51% of records come from protected sites, with high numbers of records from the following places:

SSSI records scattered across the Gwent Levels, Blorenge, Black Mountains, Llandegfedd & Nelson Bog. SINC records across central Torfaen, South Caerphilly sites such as Nant Fawr, and with a few across northern Caerphilly and Blaenau Gwent.

Pied Flycatcher records from protected sites



Spotted Flycatcher *Muscicapa striata* (Pallas, 1764)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[2] & Wales[1]), UKBAP Priority Species, Wales Section 7 List

Data availability: Poor (434 records)

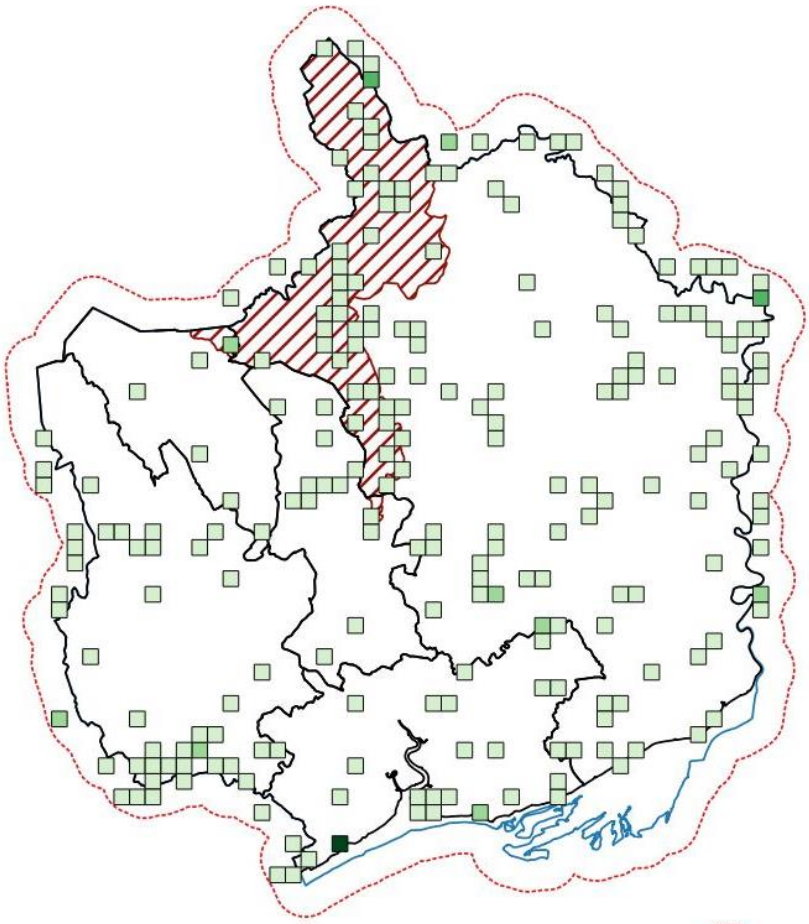
Context: A migrant bird that is a summer visitor to the UK, the Spotted Flycatcher spends its winter in sub-Saharan Africa.[44] This means that the Spotted Flycatcher is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] They are one of a whole host of small passerines that breed in the UK and make long-distance migrations to distant wintering grounds. They are insectivorous, catching most of their prey on the wing with sallying flights from favoured perches. They are still widespread across the UK, favouring wooded glades, orchards cemeteries, parks and large gardens.[45] Sadly, they cannot now be regarded as particularly common, as populations have fallen dramatically in recent times. Overall, in the UK there has been a staggering decline of 87% between 1970 and 2017.[31] Research has found the declines to be widespread across the UK and not linked to nest survival but to the survival of fledged birds in their first year of life.[46] Other studies have, however, implicated nest predation in significantly reducing productivity.[47] The well-publicised reduction in invertebrates in the UK and indeed farther afield is likely to have had an impact on breeding productivity, and wetter summers will certainly impact any species that largely relies on flying insects. There does, however, appear to be a consensus that the greater impact is caused by factors outside the UK, on migration and on the wintering grounds.[48]

Outlook: At the end of the nineteenth century the Spotted Flycatcher was distributed almost universally throughout Britain and was generally considered to be one of the commonest summer migrants.[9] It was noted that up to the late 1960s/early 1970s the population had remained much the same.[9] However, there were large declines from then on. The estimated UK breeding population in 2016 was 41,600 pairs.[10] This is still a reasonable number of birds, albeit much reduced, as illustrated by recent declines: 87% reduction in 1970–2017 (described as a 'strong decline'), with this lessening more recently with a small 5% increase, noted as 'little change', from 2012 to 2017.[31] The BTO Breeding Bird Survey[33] further illustrates these declines with a considerable 51% decline between 1995 and 2018 in the UK as a whole. Most recently there have been some signs of recovery, with a 15% increase, although this is just over a single year 2018–2019 from much depleted levels, so only time will tell if this is the start of a recovery.[33]

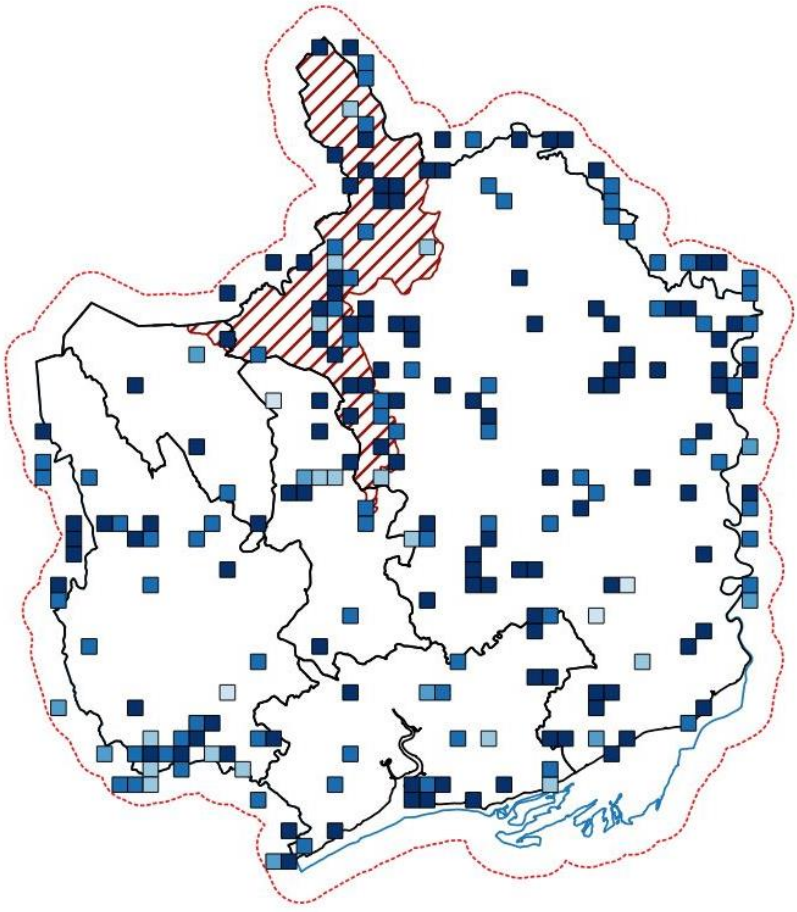
Greater Gwent range: As a breeding bird, Spotted Flycatchers can be found widely throughout Gwent in suitable habitats, they are however absent from barren uplands and generally scarcer on the Levels. Despite being widespread, they are now sadly far from common, with distribution patchy and at low levels where they do occur. On migration they may also be encountered widely, with considerable numbers of records from more coastal areas. The latest Gwent Bird Report (2018) records Spotted Flycatcher as a 'uncommon breeding summer visitor'.[13] The Birds of Gwent recorded Spotted

Flycatcher as being ‘a passage migrant and fairly common summer visitor, now declining’ in 2008’[49] and as a ‘summer visitor that is ‘fairly common and breeds widely’ in 1977.[41] This clearly indicates that the declines seen over much of the UK have also affected the Gwent populations. The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 1,250 pairs, which it considered to be an underestimate;[50] the second atlas, covering 1998–2003 estimated a much lower 490–830 pairs.[31] This again clearly illustrates a decline, indeed it is described as a ‘significant decline in both range and population density’.[31]

The main hotspot is at Peterstone Gout (recording hotspot), with smaller ones along the Herefordshire border.



Distribution of Spotted Flycatcher records across Greater Gwent (max 34 records/km^2)



Records of Spotted Flycatcher by decade

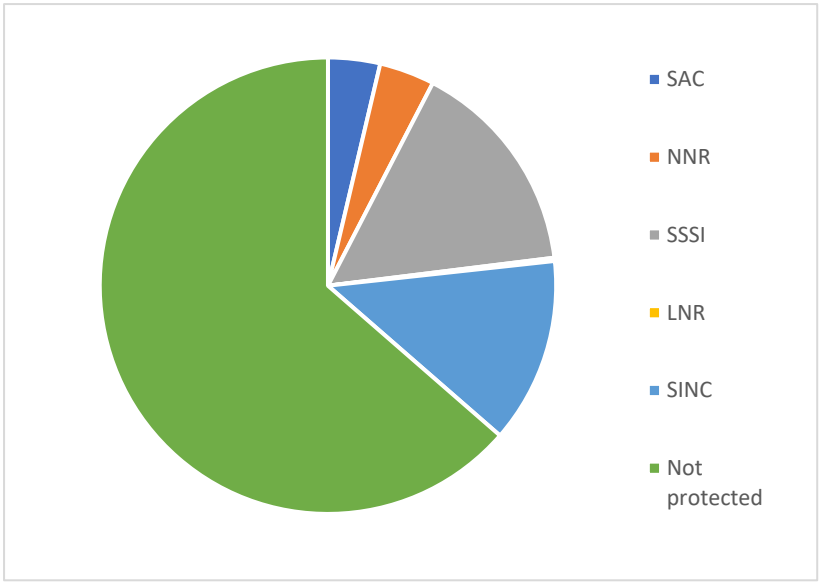
Habitat patterns: Open wooded areas such as glades, orchards cemeteries, parks and large gardens.

Population trends: As previously stated, there have been significant declines in Spotted Flycatcher populations across the UK. Gwent has been no different, with large losses in populations. The rate of these losses has generally slowed, and Spotted Flycatchers are still a widespread species across the UK and within Gwent. However, they are still of considerable concern, and localised extinctions and fragmented distributions are very possible. If the cause of these losses is being largely driven by issues on wintering grounds and on migration, this is more a global issue of climate change and difficult to address through more local conservation initiatives. However, habitats in Gwent can be preserved and enhanced in such a condition as to maximise the potential available resources for breeding Spotted Flycatchers, ensuring productivity rates are high, which will help population levels.[43]

Protection: 36% of records come from protected sites, with high numbers of records from the following:

SAC records from the Severn Estuary due to centring; NNR records from Newport Wetlands; SSSI records scattered across the Gwent Levels and Llandegfed, plus a few from the Blorenge and Black Mountains. SINC records across central Torfaen, south Caerphilly, with a few across northern Caerphilly and Blaenau Gwent.

Spotted Flycatcher records from protected sites



Willow Tit *Poecile montanus* (Conrad von Baldenstein, 1827)

Pete Hadfield

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Red (UK[2] & Wales[1]), UKBAP Priority Species, Wales Section 7 List

Data availability: Poor (190 records)

Context: A resident and sedentary bird, the Willow Tit is constrained in its distribution by its need for decaying, standing timber to us for hollowing out nest sites.[51] This is because, unlike our other tit species, which utilise existing holes, the Willow Tit excavates its own; due to its tiny beak, it can only do so in rotten wood.[52] They are very similar in appearance to their close cousin the Marsh Tit, in fact they were only recognised as a different species as recently as 1897.[9] The Willow Tits occurring in the UK are of a distinct endemic sub-species,[52] which makes them of particular importance for conservation. They are found in England and Wales, with the population extending into southern Scotland.[53] Its distribution and numbers within this range have recently been much reduced, and it the second fastest declining bird species in the UK after the Turtle Dove.[54] In common with many other UK songbirds and all our other tit species, the Willow Tit's diet is largely invertebrates, particularly during the breeding season, although seeds are exploited more over the winter.[55] As outlined above, they have suffered severe and worrying declines in relatively recent times: a 94% decline between 1970 and 2017.[31] Different factors are considered as possible reasons for the declines, with competition for nest sites from other tit species, predation (particularly by Greater Spotted Woodpeckers) and habitat loss (damp scrub is essential habitat) being cited.[56] Deer browsing reducing habitat quality and climate change drying out wet woodlands are also touched upon in literature.[57]

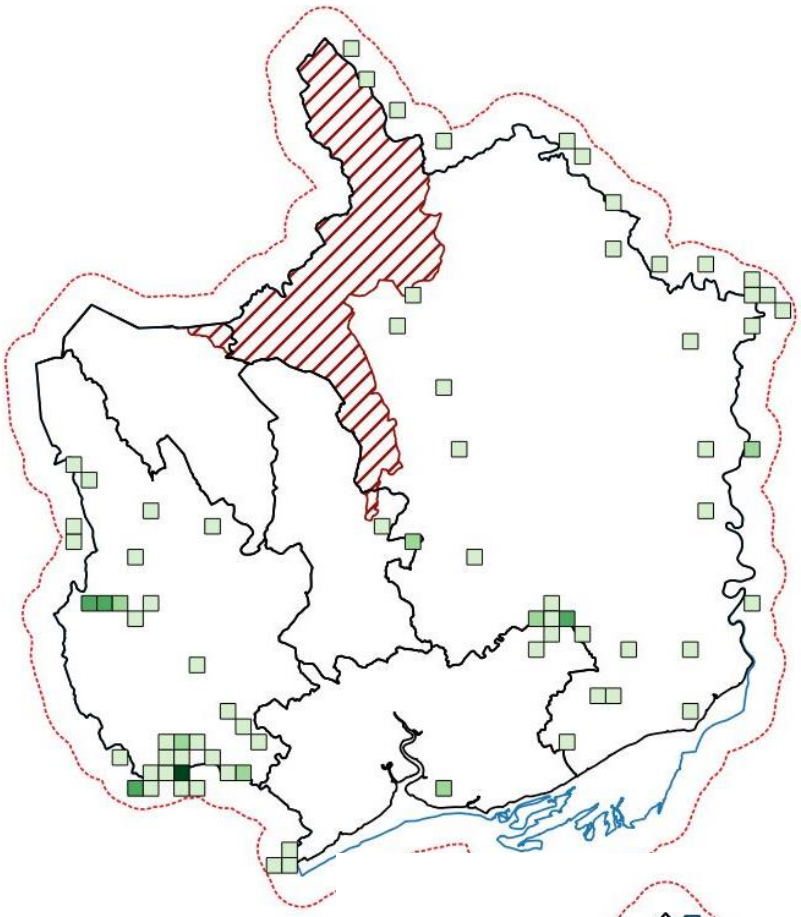
Outlook: The history of the Willow Tit in the UK is clouded by the fact it was not recognised as a species separate from the Marsh Tit until 1897; for a while after this, records would still be confused. In the nineteenth century Marsh/Willow Tits nested throughout most of England and Wales, albeit locally in many counties.[9] These populations remained broadly similar throughout much of the twentieth century, but there has been a decline since at least the late 1960s.[9] There were longer-term 94% reductions between 1970 – 2017 (described as 'strong decline') and there has been continued 'strong decline' more recently, with a 17% decline from 2012–2017.[31] The more recent BTO Breeding Bird Survey, perhaps shows some slowing of the decline (albeit from numbers already hugely reduced), with a decrease of only 3% in 2008–2018 in the UK and an increase of 20% in the 2018–19 season.[12] The current (2016) breeding population is 2,750 pairs.[10]

Greater Gwent range: The latest Gwent Bird Report (2018) records Willow Tit as a 'very scarce breeding resident'.[13] This is the culmination of an ongoing decline, in line with the population declines seen across the UK. The Birds of Gwent recorded Willow Tit as being 'a scarce and declining resident' in 2008[58] and as a 'breeding resident, widely but thinly distributed' in 1977.[35] This would indicate that numbers have declined over this period. The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 300–450 pairs,[59] with the second atlas, which covers

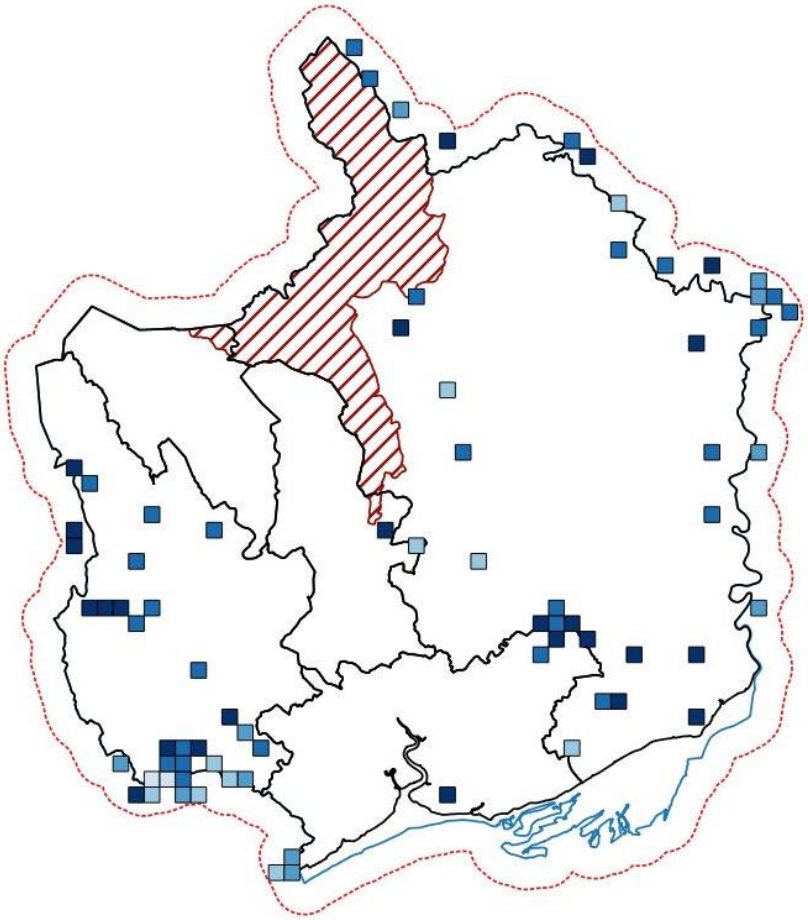
1998–2003, estimating 70–125 pairs.[10] The population is now sadly much lower than this. Indeed, it would appear to be barely hanging on: the Gwent Bird Report stated that 'sadly there were no records away from Wentwood this year; one pair of bred there'[60] in 2016 and that 'just two records were received of this rapidly declining species… Disappointingly no records were received from Wentwood' in 2018.[13]

Hotspots for records are at Nelson Bog/Nelson Wern, Wernddu Woods and Wentwood. Also Fforest Ganol, which is just outside Greater Gwent.

Distribution of Willow Tit records across Greater Gwent (max 15 records/km^2)



Records of Willow Tit by decade

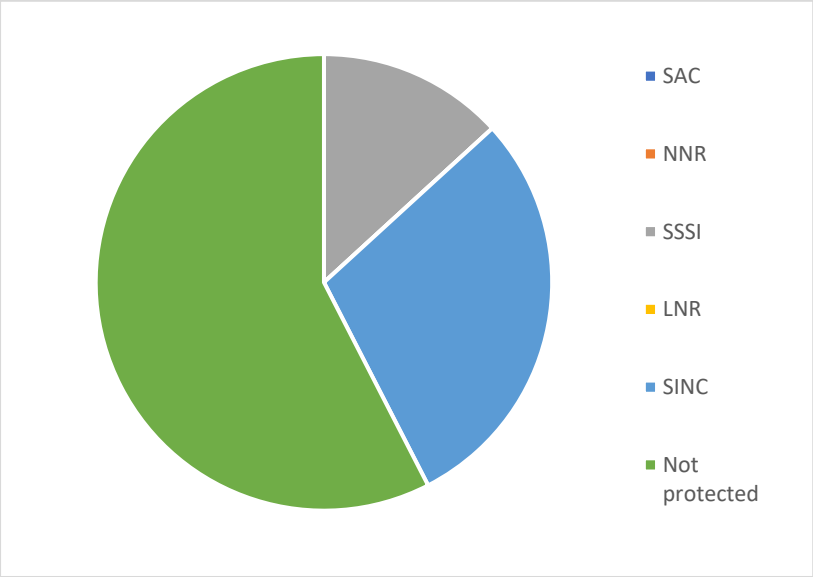


Habitats patterns: Willow Tits are very much a bird of wet scrubby woodland.

Population trends: As previously stated, there have been declines in Willow Tit populations across the UK. Gwent has been no different, with the species not far from local extinction. It is possible the Willow Tit may continue to hang on in a few localised sites. However, if we want to make sure the Willow Tit is not lost, concerted conservation effort will be needed. A priority would be to preserve and enhance their few remaining sites and provide additional sites containing suitable habitat in close proximity for the populations to colonise. Issues such as predation and competition are more difficult to address. The latest research should be consulted to inform management.

Protection: 42% of records come from protected sites. SSSI records were from Nelson Bog, plus a few scattered across the Gwent Levels. SINC records were from Nelson Wern, Wernddu Woods and Wentwood.

Willow Tit records from protected sites



Willow Warbler *Phylloscopus trochilus* (Linnaeus, 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation status: Amber (UK[2]) Red (Wales[1])

Data availability: Good (2911 records)

Context: A migrant bird that is a summer visitor to the UK, the Willow Warbler spends its winter in sub-Saharan Africa.[61] This means that the Willow Warbler is vulnerable to changes in summer, winter and migration stepping-stone habitats, and changes in food source – all impacted by climate change.[3] They are one of a whole host of warblers that breed in the UK, most of which migrate to long-distant wintering grounds. They are largely insectivorous, but will take fruits and berries in the autumn.[62] They are widespread across the UK, wherever suitable woodland/scrub with ground cover for nesting is present.[63] However, populations have altered significantly in recent times, with more northerly Scottish populations generally faring well, while those in England, particularly the south and east, have suffered sharp declines.[64] Overall, in the UK there has been a decline of 45% between 1970 and 2017.[31] Several possible factors for the declines have been suggested, including issues on wintering grounds and migration stop-offs (with Scottish and English birds perhaps utilising different areas, thus explaining the differences).[64] This is further expanded upon by reference to poor adult survival in wintering quarters to the south of the Sahara.[63] The general drying out of the countryside, making habitats less suitable, and browsing deer removing nest sites is also implicated.[64]

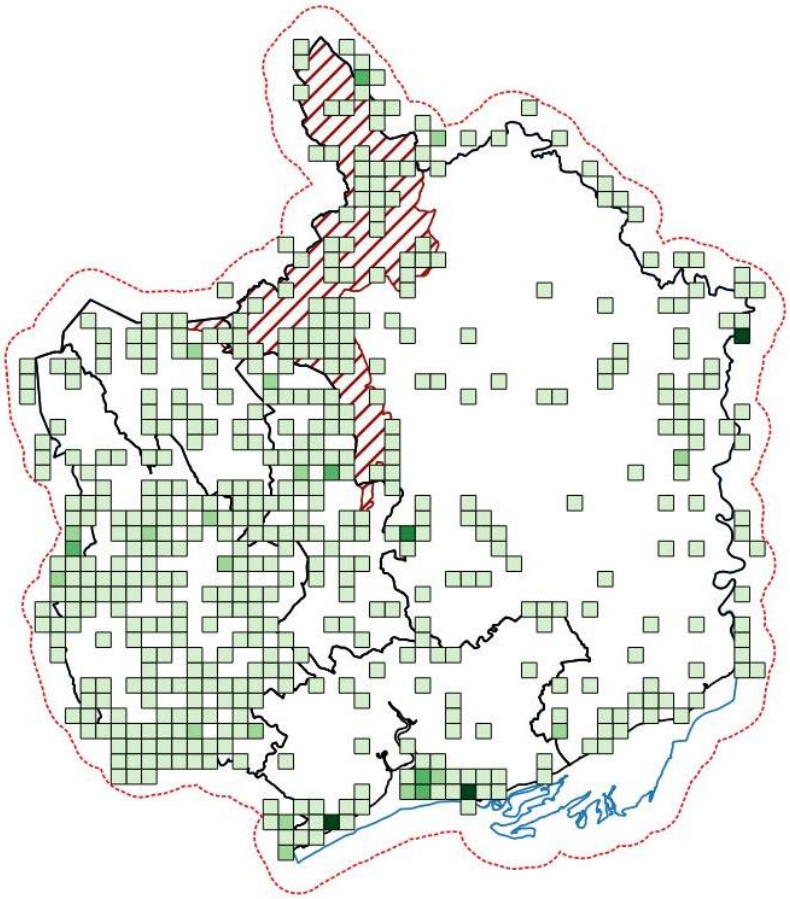
Outlook: It would appear that the Willow Warbler has been a common, well distributed species within the UK with little fluctuations in population for a long time.[9] It is interesting to note that there were inferences that it was absent from Wales in the mid nineteenth century.[9] This seems unlikely to be true. It was noted that in the second half of the twentieth century, the Willow Warbler took advantage of young plantations to colonise areas of upland where it had been previously absent.[9] This long-standing population stability has not been so apparent in more recent times, however (at least away from Scotland). The estimated UK breeding population in 2016 was 2,300,000 pairs.[10] This is still a considerable number of birds, but is nonetheless much reduced, as is illustrated by the recent declines: 45% reduction between 1970 and 2017 (described as 'weak decline'), and further 'weak declines' of 13% from 2012–2017.[31] The BTO Breeding Bird Survey[33] further illustrates these declines, with a huge 82% decline between 1995 and 2018 in the UK as a whole, and a worrying but less steep decline of 16% in Wales over the same period. Most recently there have been some signs of recovery, with a 66% increase (UK) and 29% increase (Wales),[33] although this is only over a single year (2018–2019), so only time will tell if this is the start of a recovery.

Greater Gwent range: Willow Warblers can be found throughout most of Gwent in suitable habitats (open woodland and scrub), although breeding densities are lower on the coastal levels., Conversely, greater numbers may be encountered on migration on the coastal levels. The latest Gwent Bird Report

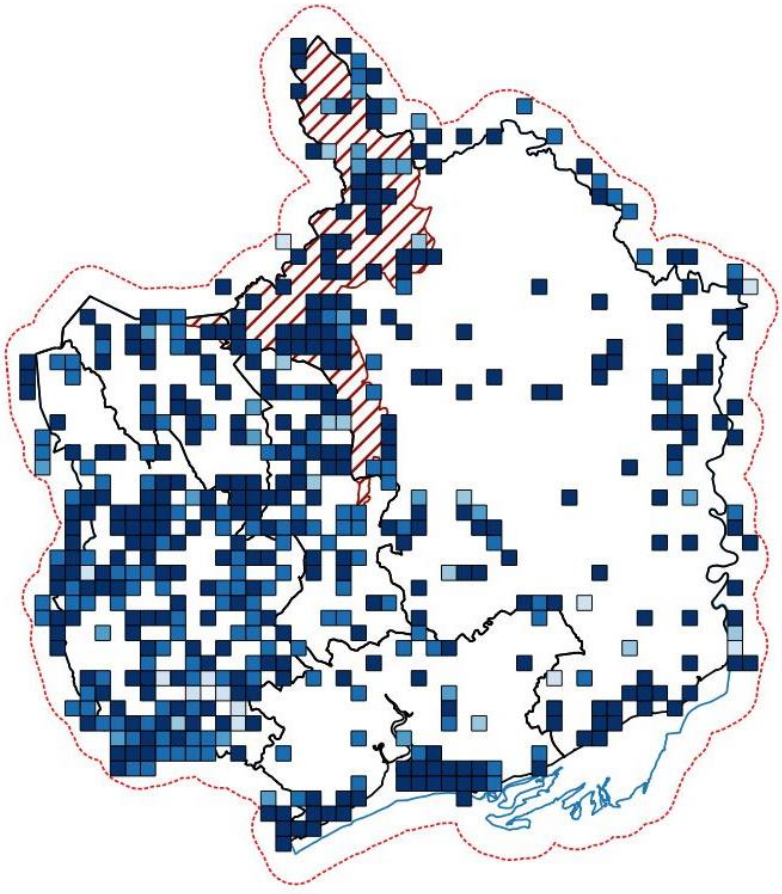
(2018) records Willow Warbler as a 'common breeding summer visitor and passage migrant'.[13] This on its own could paint a rosy picture for the Willow Warbler in Gwent, particularly as The Birds of Gwent in 1977 recorded it as a 'common breeding summer visitor', calling it, 'the most numerous and widely distributed of the warblers.'[65] However The Birds of Gwent in 2008 recorded Willow Warbler as being 'a common summer visitor and passage migrant; much declined in recent years',[63] clearly indicating that the declines seen over much of more southerly UK have also affected the Gwent populations. The Gwent Atlas of Breeding Birds that covers the period 1981–1985 estimated a Gwent population of 55,500 pairs;[66] the second atlas, which covers 1998–2003, estimated a much lower 5,600–21,000 pairs.[63] This again clearly illustrates a decline; indeed, it is described as a 'calamitous drop in the population'.[63]

Hotspots for records are at Peterstone Gout (recording hotspot) Newport Wetlands & Goldcliff, plus Llandegfedd, Garn Lakes, Lasgarn Woods, The British, Parc Taf Bargoed, Hendre Lake, Broad Meend, Magor Marsh, Pen y Fan Pond, Treowen and the Wye Valley Woodland in Herefordshire (outside of Greater Gwent).

Distribution of Willow Warbler records across Greater Gwent (max >100)



Records of Willow Warbler by decade



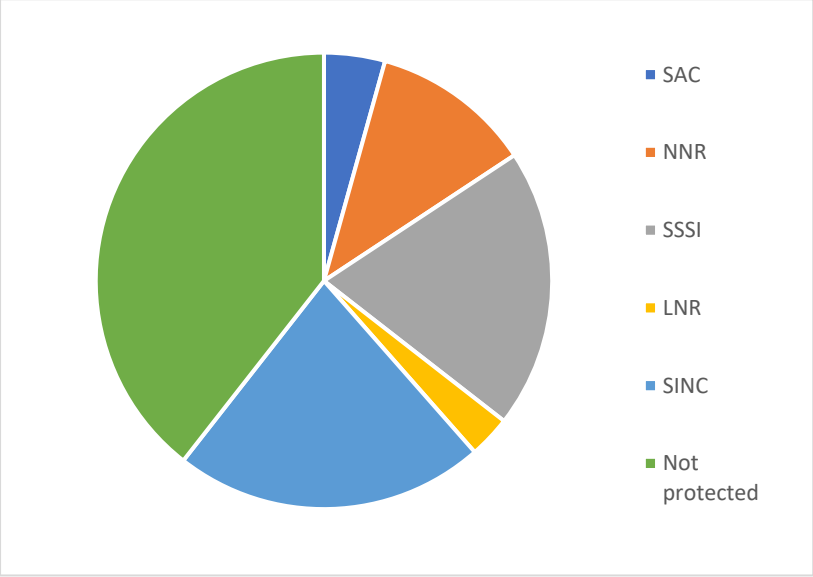
Habitat patterns: Willow Warblers are birds of more open woodland (avoiding areas with closed canopies) and scrub for breeding. They are also likely to be found in similar habitats on migration, although concentrations at these times have a more coastal bias.

Population trends: As previously stated, there have been significant declines in Willow Warbler populations across large parts of the UK, with only Scotland escaping these. Gwent has been no different, with large losses in populations, particularly in the 1990s. The rate of these losses has generally slowed, and Willow Warblers are still a common bird species across the UK and within Gwent. However, they are still of concern, particularly in Wales, where they are now Red listed. If the cause of these losses is being largely driven by issues on wintering grounds south of the Sahara, then this is more a global issue of climate change and more difficult to address through local conservation initiatives. However, habitats in Gwent can still be preserved and enhanced in such a condition as to maximise the potential available resources for breeding Willow Warblers, ensuring productivity rates are high, which have been shown to be an important factor in population levels.[43] Deer browsing in woodlands and loss of young growth in cleared and developing plantations are potential impacts on local populations, and these could be addressed in future conservation measures.

Protection: 60% of records come from protected sites, with high numbers of records from the following.

SAC records from the Severn Estuary, Usk Bat SAC, and Aberbargoed. NNR records from Newport Wetlands. SSSI records from the Gwent Levels, Blorenge, Llandegfedd and Silent Valley. LNR from Silent Valley, Parc Bryn Bach and scattered across others in Blaenau Gwent and Torfaen County Borough Council (CBC). SINC records are too numerous to specify – lots from across Caerphilly CBC and Torfaen CBC.

Willow Warbler records from protected sites



Cuckoo *Cuculus canorus* (Linnaeus 1758)

Andy Karran

Protection: Wildlife & Countryside Act (1981 as amended)

Conservation Status: Red (UK[2] & Wales[1]) UK BAP Priority Species, Environment (Wales) Act Section 7 Species.

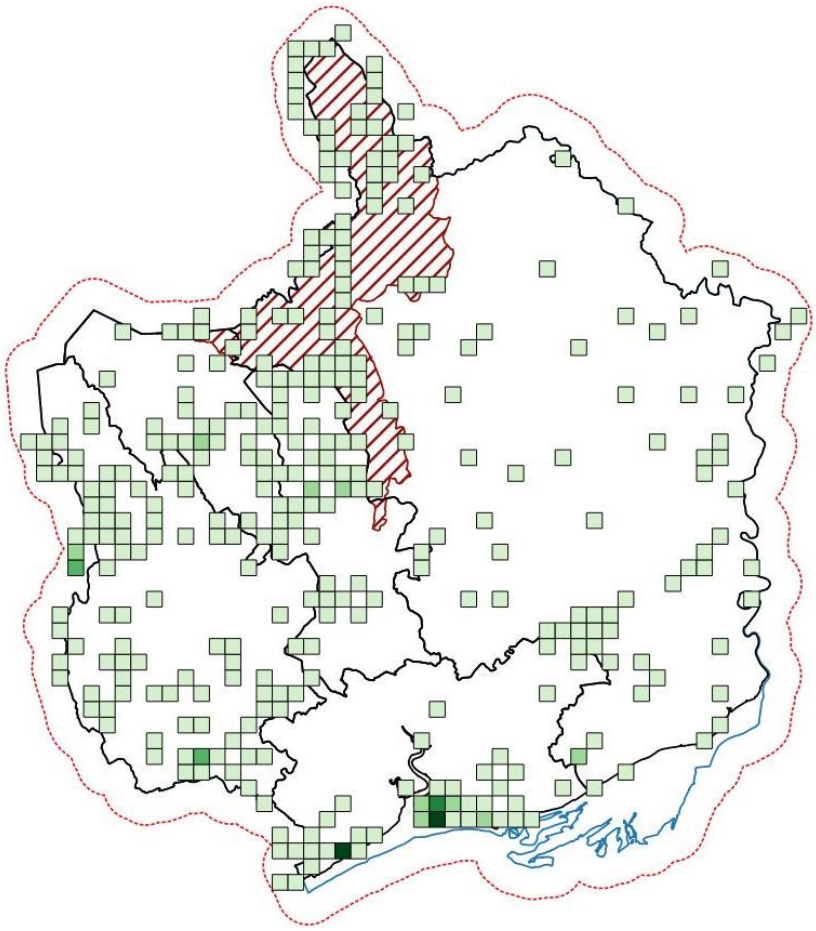
Data Availability: Good (1,317 records)

Context: Cuckoos are a migrant brood parasite, spending a short time in the UK in early summer to breed and the rest of the year in the Congo rainforest in Africa.[67] This means that the cuckoo is vulnerable to changes in summer, winter and migration stepping-stone habitats and changes in food sources, both impacted by climate change.[3] Cuckoos were added to the BAP Priority Species list in 2007, and the Birds of Conservation Concern Red List in 2009. Between the early 1980s and mid-2000s, Cuckoo numbers dropped by 65% in the UK.[68] The exact reasons for this decline are not known, but it has been suggested that declines in its hosts or climate-induced shifts in the timing of breeding of its hosts could have reduced the number of nests that are available for cuckoos to parasitize. The main hosts in Gwent are the Dunnock, Meadow Pipit and Pied Wagtail.[14] The British Trust of Ornithology have been satellite tracking Cuckoos since 2011 to try and understand more about their decline.[67]

Outlook: Currently the UK population and range is predicted to continue to decline, which would be reflected in the Greater Gwent population and range. Further research is needed to understand the ecology and the impacts of climate change on cuckoos in Wales and Greater Gwent.

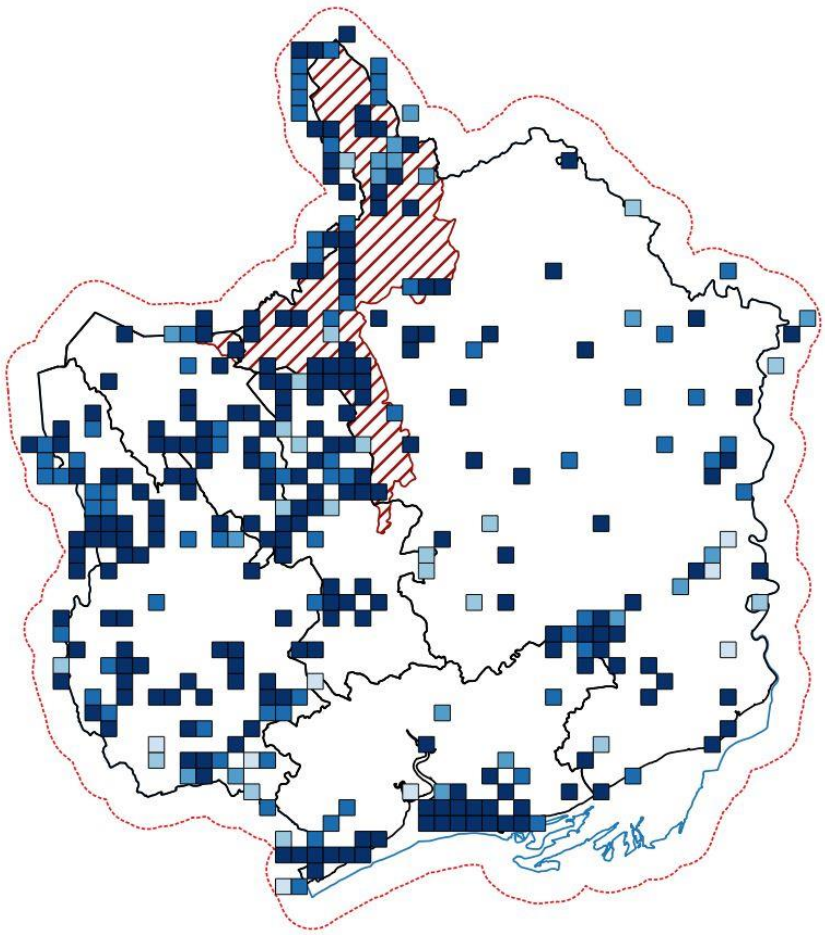
Greater Gwent range: Cuckoo are found across Greater Gwent, with distribution broadly corresponding to upland and lowland semi-natural areas. It can utilise a broad range of habitats including grassland, woodland edge and reedbed habitats. There is a higher proportion of records present in the Gwent Levels, Eastern Valleys and Brecon Beacons National Park area of Monmouthshire, with recording hotspots occurring at Newport Wetlands and Peterstone Wentlooge.

There has been some historic loss, particularly in the south and east of the study area. This corresponds with the findings within Birds of Gwent[14], where it is thought that there have been more marked losses from farmland areas.



Distribution of Cuckoo records across Greater Gwent (max 72 records/km^2)

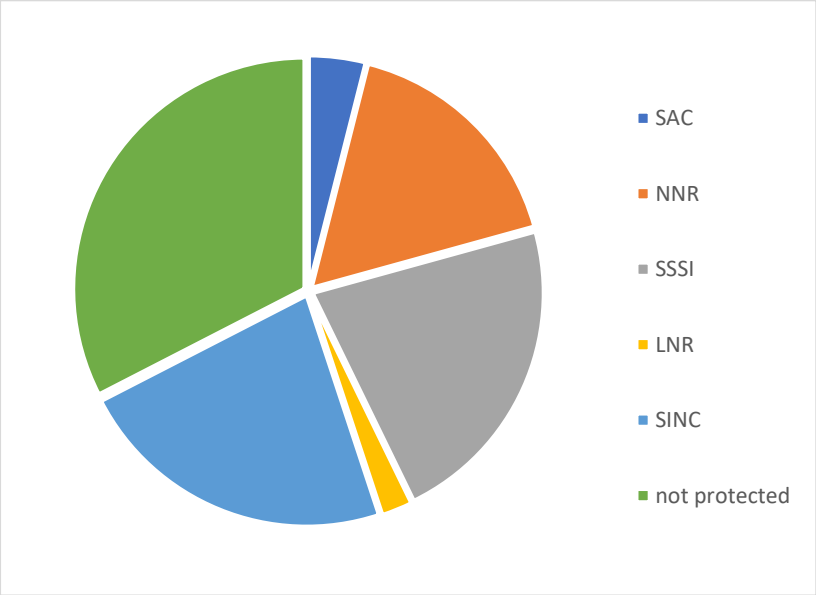
Records of Cuckoo by decade



Population trends: The UK Cuckoo population fell by 38% between 1995 and 2018.[33] Although the presence of cuckoos is easy to detect, thanks to their loud calls, evidence of breeding is much more difficult, so local population estimates are more difficult to calculate. In Gwent, the percentage of occupied tetrads fell from 87% in the 1980s to 67% at the time of the latest atlas (1998–2003). The Gwent population was estimated at 240–360 pairs in 1998–2003.[14]

Protected Sites: Two thirds (67%) of records come from protected sites, with a third (33%) coming from non-protected sites. This could be due to recording effort being concentrated at protected sites, or the higher quality of habitat and associated diversity often found within protected sites compared to the wider landscape.

Cuckoo records from protected sites



References

1. Johnstone I and Bladwell S. 2016. Birds of Conservation Concern in Wales 3: The Population Status of Birds in Wales. Birds in Wales 13(1): 3–31.
2. Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. 2015. Birds of Conservation Concern 4: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108: 708–746.
3. Pearce-Higgins JW and Crick HQP. 2019. One-third of English Breeding Bird Species Show Evidence of Population Responses to Climatic Variables Over 50 Years. Bird Study 66(2): 159–172. DOI: 10.1080/00063657.2019.1630360
4. https://www.bto.org/our-science/projects/gbw/gardens-wildlife/garden-birds/a-z-garden-birds/brambling
5. Robinson RA. 2005. BirdFacts: Profiles of Birds Occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 02/03/2021).
6. https://www.wildlifetrusts.org/wildlife-explorer/birds/finches-and-buntings/brambling
7. https://rbbp.org.uk/explore-reports/
8. Robinson RA. 2005. BirdFacts: Profiles of Birds Occurring in Britain & Ireland. BTO, Thetford: http://www.bto.org/birdfacts (accessed on 01/03/ 2021).
9. Holloway S. 1996. The Historical Atlas of Breeding Birds in Britain and Ireland: 1875–1900. Poyser, London
10. https://www.bto.org/sites/default/files/publications/apep4-population-estimates-birds-great-britain-uk-2020.pdf
11. BirdLife International. 2021. Species Factsheet: Fringilla montifringilla: http://www.birdlife.org (downloaded 02/03/2021).
12. https://www.bto.org/sites/default/files/publications/state-of-birds-wales-2018.pdf
13. Gwent Bird Report 2018.
14. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 343.
15. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 133.
16. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/hawfinch/
17. https://www.birdguides.com/articles/species-profiles/focus-on-hawfinch/
18. https://www.telegraph.co.uk/science/2017/12/01/hawfinch-invasion-rare-birds-flock-britain-thousands-crop-failures/
19. https://www.birdwatching.co.uk/birdspecies/2018/3/8/hawfinch
20. https://www.gwct.org.uk/wildlife/species-of-the-month/2018/hawfinch/
21. https://community.rspb.org.uk/ourwork/b/biodiversity/posts/investigating-hawfinch-declines-project-update
22. Kirby WB, Bellamy PE, Stanbury AJ, Bladon AJ, Grice PV and Gillings S. 2015. Breeding Season Habitat Associations and Population Declines of British Hawfinches Coccothraustes coccothraustes. Bird Study 62(3): 348–357. DOI: 10.1080/00063657.2015.1046368
23. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 358–360.
24. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 130.
25. Tyler S. et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 139.

26. Kirby WB et al. 2018. Nest Survival, Causes of Failure and Productivity of British Hawfinches Coccothraustes coccothraustes. Bird Study 65: 3.
27. Lewis J. 2018. The Hawfinch Population in the Forest of Dean/Wye Valley. British Birds 111: 168–169.
28. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/marsh-tit/
29. https://www.wildlifetrusts.org/wildlife-explorer/birds/tits-crests-and-warblers/marsh-tit
30. https://app.bto.org/birdtrends/species.jsp?year=2018&s=marti
31. DEFRA. 2019. Wild Bird Populations in the UK 1970–2018, 40.
32. https://www.birdguides.com/articles/ornithology/marsh-tit-mysteries
33. https://www.bto.org/sites/default/files/publications/bbs-report-2019.pdf
34. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 315–316.
35. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 115.
36. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 115.
37. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/pied-flycatcher/
38. https://app.bto.org/birdtrends/species.jsp?year=2018&s=piefl
39. https://www.bou.org.uk/woodland-birds-response-to-climatic-change/
40. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 309–311.
41. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 125.
42. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 113.
43. Morrison CA, Robinson RA, Clark JA, Risely K and Gill JA. 2013. Recent Population Declines in Afro-Palaearctic Migratory Birds: The Influence of Breeding and Non-breeding Seasons. Diversity and Distributions 19: 1051–1058.
44. https://www.gwct.org.uk/wildlife/research/birds/songbirds/spotted-flycatcher/
45. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/spotted-flycatcher/
46. Freeman S and Crick H. 2003. The Decline of the Spotted Flycatcher Muscicapa striata in the UK: An Integrated Population Model. Ibis 145: 400–412.
47. https://www.gwct.org.uk/wildlife/research/birds/songbirds/spotted-flycatcher/
48. http://www.wbrc.org.uk/WORCRECD/issue_29/JohnClarke_a.html
49. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 308–309.
50. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 112.
51. https://www.bto.org/understanding-birds/species-focus/willow-tit
52. https://naturebftb.co.uk/2017/11/07/what-is-the-willow-tit/
53. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/willow-tit/
54. https://www.birdguides.com/news/can-you-help-to-monitor-britains-declining-willow-tits/
55. https://www.wildlifetrusts.org/wildlife-explorer/birds/tits-crests-and-warblers/willow-tit
56. Lewis AJG et al. 2009. The Decline of the Willow Tit in Britain. British Birds 102: 386–393.
57. Siriwardena GM. 2004. Possible Roles of Habitat, Competition and Avian Nest Predation in the Decline of the Willow Tit Parusmontanus in Britain. Bird Study 51(3): 193–202. DOI: 10.1080/00063650409461354
58. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 314–315.
59. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 116.

60. Gwent Bird Report 2016
61. https://www.bto.org/understanding-birds/species-focus/willow-warbler
62. https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/willow-warbler/
63. Venables WA, Baker AD, Clarke RM, Jones C, Lewis JMS, Tyler SJ, Walker IR and Williams RA. 2008. The Birds of Gwent, 303–305.
64. https://www.bto.org/understanding-birds/species-focus/willow-warbler
65. Ferns P et al. 1977. Birds of Gwent. Gwent Ornithological Society, 123.
66. Tyler S et al. 1987. The Gwent Atlas of Breeding Birds. Gwent Ornithological Society, 110.
67. https://www.bto.org/our-science/projects/cuckoo-tracking-project/what-have-we-learnt
68. Douglas DJT et al. 2010. How Important are Climate-Induced Changes in Host Availability for Population Processes in an Obligate Brood Parasite, the European Cuckoo? Oikos, Early View doi: 10.1111/j.1600–0706.2010.18388.x

Reptiles and Amphibians

Reptiles and amphibians, collectively known as herptiles, are one of the most threatened taxonomic groups, yet we know very little about their status and distribution. The European Red List of Reptiles estimates that a fifth of European reptile species are threatened, with a further 13% considered Near Threatened. This compares with 23% of European amphibian species and is more than either birds or mammals.[1] This is within a context of alarming global decline for both amphibians[2] and reptiles.[3]

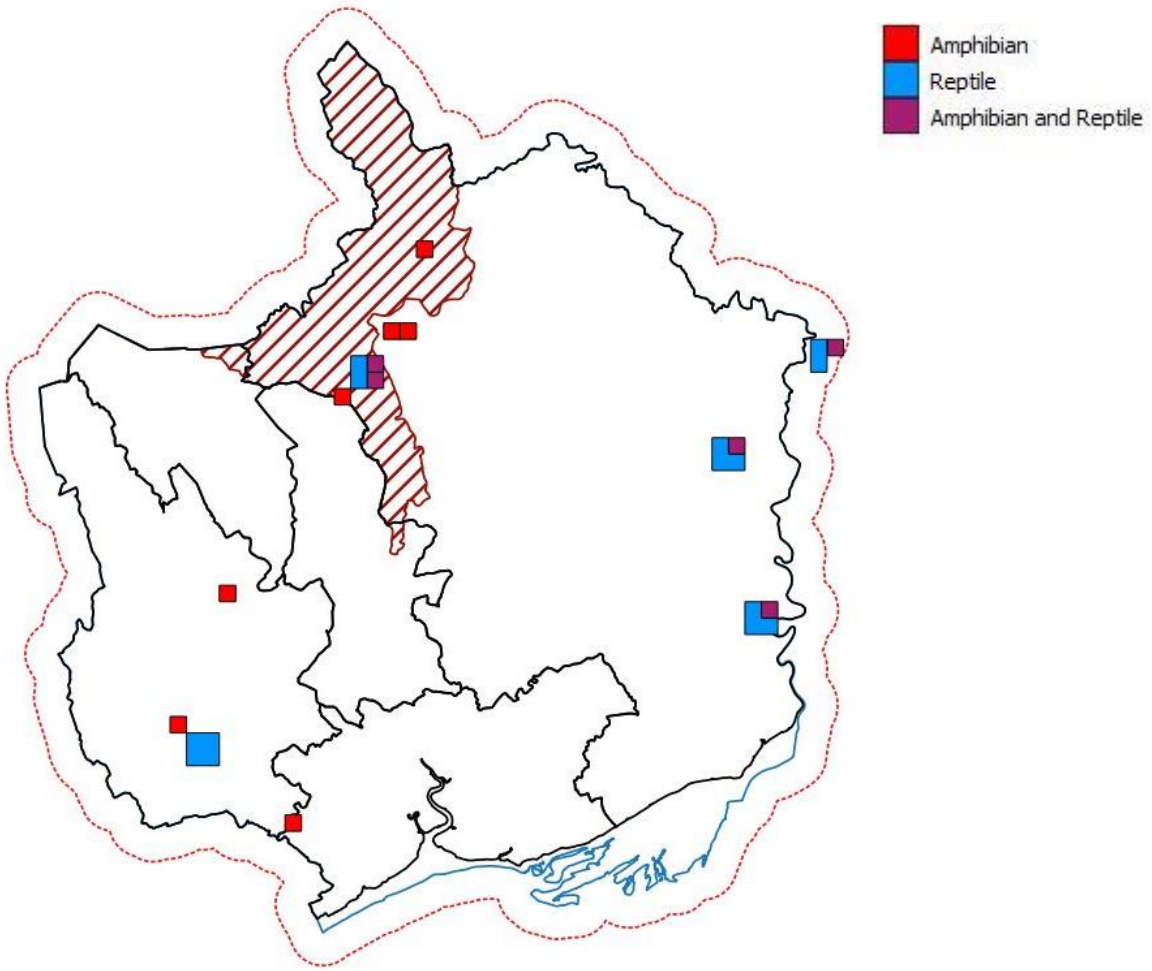
Threats to amphibians and reptiles are similar: habitat loss and degradation, persecution, pollution, disease, introduced invasive species and climate change.[2,3] These factors may interact with one another,[2] making reversing these declines difficult.

In the UK, there are seven native species of amphibian, and six native species of terrestrial reptile. Five herptiles are European Protected Species, and all reptiles are protected from intentional killing and injury through the Wildlife and Countryside Act. It is possible that Britain once had more herptiles, and there are some who would like to reintroduce species such as the Common Tree Frog (*Hyla arborea*).[4]

Herptiles are less well recorded than other groups. Indices for herptiles are absent from the UK 'State of Nature' reports – the first 'State of Nature' report was able to include a trend for just one amphibian[5], with the latest report able to include two.[6] The National Amphibian and Reptile Recording Scheme (NARRS) focuses on widespread herptiles but only began in 2007, making it comparatively new compared to other schemes. Initial analysis from the first six years of recording indicate that the currently level of recording is sufficient to detect change among widespread amphibians and Common Lizard, but not among Great Crested Newts or other reptiles.[7] There are now additional monitoring schemes in place, such as Make the Adder Count (MTAC). Schemes for monitoring ponds, from the National Pond Surveys (NPS) carried out in the 1980s to the recent PondNet, also contribute amphibian data. Data availability is also improving, with access to national datasets via the UK Records Pool (managed by ARG-UK and ARC) and the Wales Online Amphibian and Reptile Atlas, managed by ARC and the Welsh Local Environmental Record Centres (LERCs).

In Greater Gwent, there are five amphibian and four reptile species. As with the national picture, recording of herptiles is poor compared to other groups. There are just four NARRS reptile squares, and eleven NARRS amphibian squares in Greater Gwent, plus one of each within the buffer zone. All except one only have one year of data. It may be that the cryptic nature of reptiles means that recording is limited to experienced surveyors, but it should be possible to engage more people in pond surveys for amphibians in the future, if resources allow.

NARRS squares coverage for amphibians (monads) and reptiles (tetrads)



Adder *Vipera berus* (Linnaeus, 1758)

Gary Welsby

Protection: Wildlife & Countryside Act (1981 as amended) Schedule 5 (Section 9(5) only)

Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species. Red List[1]: LEAST CONCERN (Europe)

Data availability: Poor (181 records)

Context: Adders are Britain's only venomous reptile but are shy creatures and very difficult to survey: the NARRS only detected Adders in 7% of survey squares.[7] Because of this, and the variation in recording effort, a population estimate and measures of conservation status have only recently become possible.[8] By comparing recent and historic records, the reduction in English Adder range has been estimated at 39% by comparing pre-2006 (historic) records with those from 2006 to 2011. More than three quarters of vice-counties analysed had lost more than 30% of occupied monads.[8] Initial results from the MTAC programme has shown that this decline is particularly significant in smaller populations with less than ten individuals.[9]

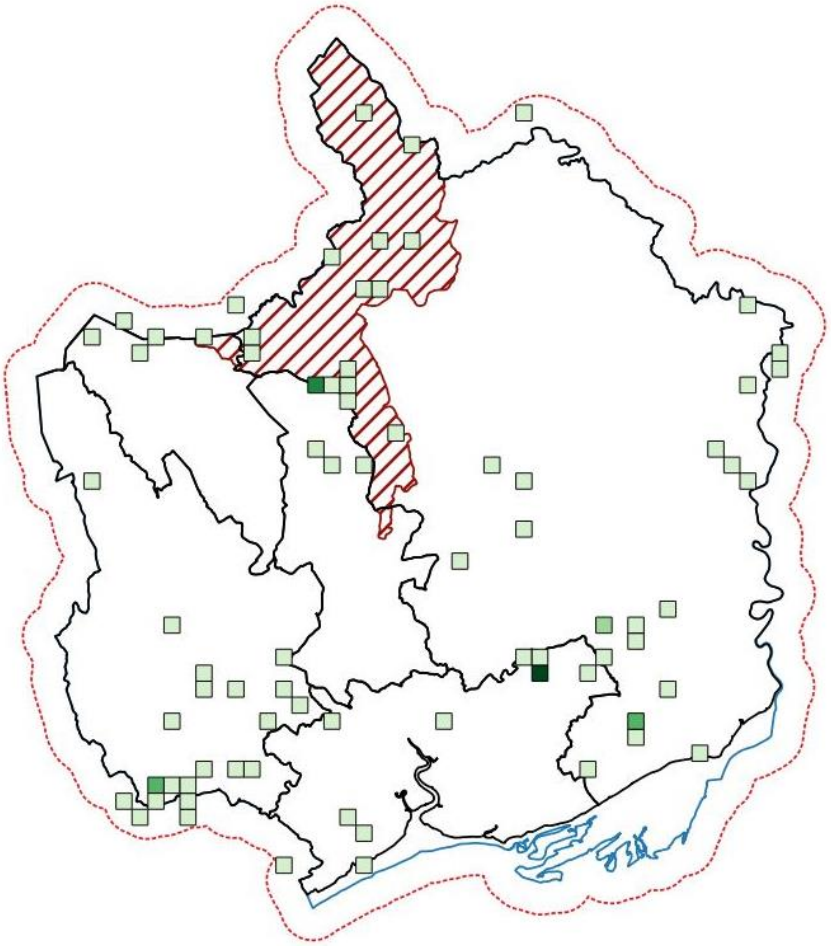
Outlook: Adders appear to be particularly vulnerable to inbreeding depression caused by habitat fragmentation,[9] as well as disturbance, persecution and poor habitat management.[8,9,10] In some cases, habitat management for conservation of other species has a negative impact on Adders.[8]

This is of serious concern, as site managers responding to a questionnaire in England reported that 28% of adder sites were 'isolated', and where a population estimate was possible, 33% supported less than ten individuals.[10] At current rates of decline, small (<10 individuals) Adder populations are predicted to become extinct within 10–15 years, leaving Adders restricted to a small number of larger sites.

For Greater Gwent, only the population at Wentwood has recorded more than ten individuals.

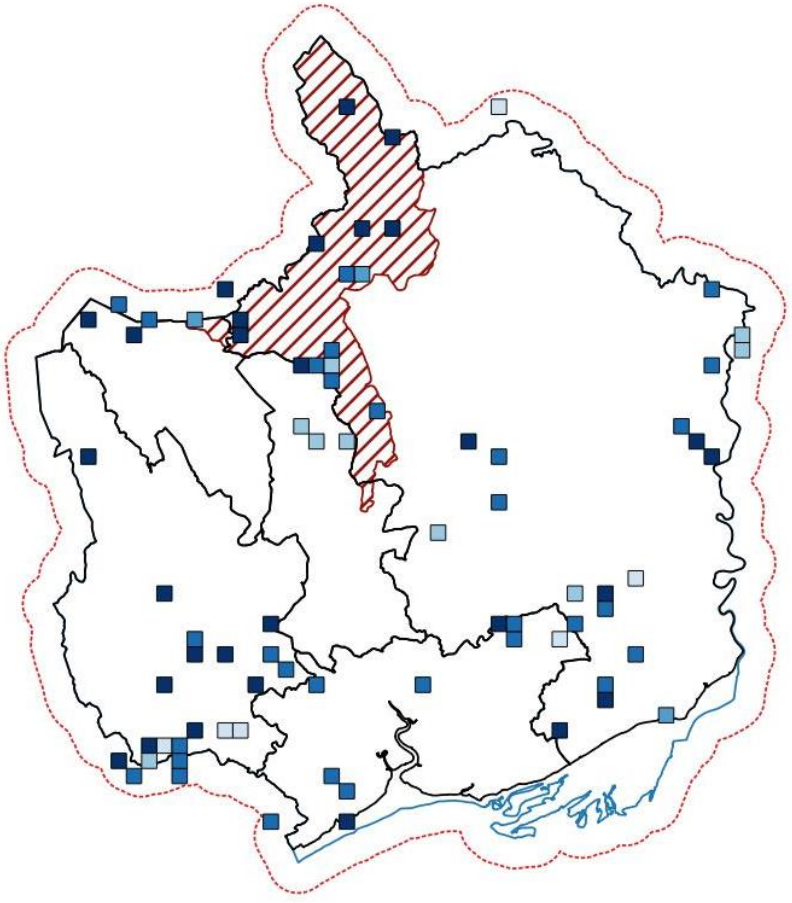
Greater Gwent range: Distribution of Adder records across Greater Gwent is very fragmented. Hotspots of higher numbers of more recent records occur at just four locations: Wentwood, The Blorenge, Minnets and Wernddu. Although there are scattered recent records in several other locations, the numbers of records are much lower – usually less than five records throughout the study period.

Note that the patchy distribution may also be a result of recording effort and the cryptic nature of Adders. Only Wentwood and Wernddu/Caerphilly Common appear to have been subject to regular recording.

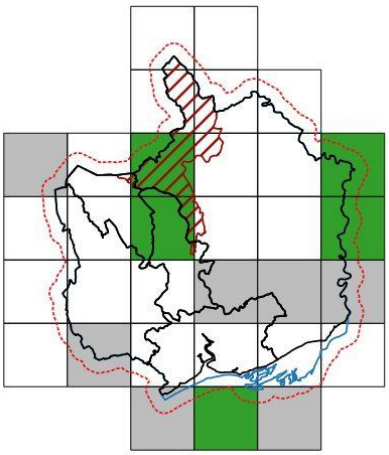


Density of Adder records (max density 27 records/km^2)

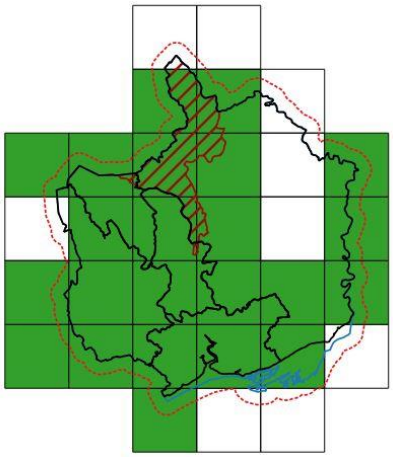
Adder records by date



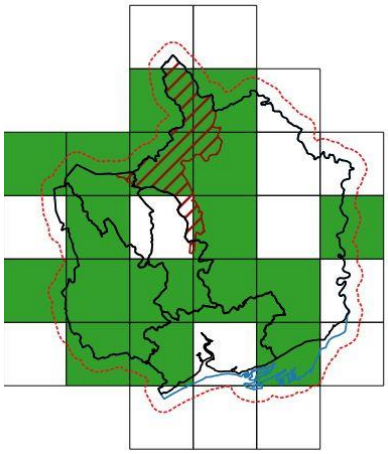
Trends: Although it is likely that Adders are under-recorded, it appears that the range of Adders in Greater Gwent is reducing: scattered areas have no recent records. Of more concern is that many of the sites where there are Adders have few records, and mostly of low numbers. Of 123 records where abundance was noted, just 16 (13%) were for more than 5 individuals. Of these, only one is within the most recent decade. The five NARRS squares within the study area recorded no Adders.



Adder presence (green) from the National Common Reptile Survey (1990).[11] Grey indicates surveyed squares where no records were found.



Adder presence (green) from 1970 to 2019, from local records centres and NBN Atlas.



Adder presence (green) from 2010 to 2019, from local records centres and NBN Atlas.

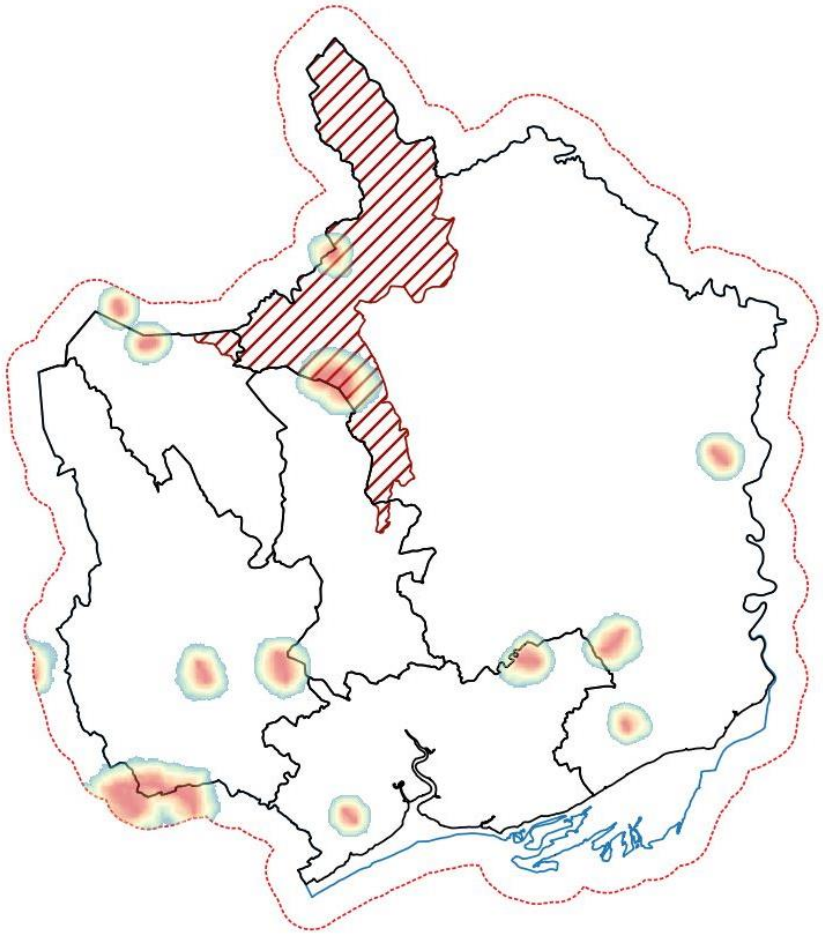
Comparison with the findings of the National Common Reptile Survey[11] shows an increase in Adder recording. The survey, carried out through questionnaires sent to local recorders in 1990, returned ≤10 records for VC35. There were positive records for just 5 hectads (16%) although one may be the result of records from the English side of the Severn Estuary. There are records within 23 (72%) hectads from the last 50 years, but just 17 (53%) having records from the most recent decade. This demonstrates that our recording of Adders has certainly improved. However, this should be treated with caution, as each hectad may only contain small numbers of records.

Adder habitat patches: The Amphibian and Reptile Trust have produced least-cost corridors around known Adder populations, giving 12 areas of focus within (or partly within) the study area. The Cilfynydd area is not included as it does not extend into Greater Gwent. Statistics for each are given below. Records without abundance are assumed to be single individuals.

Name	LA	Approximate area (ha)	Records (1970–2019)	Average abundance	Recent records (2010–2019)	Average abundance
Mynydd Llangynidr	BG/Powys (BBNP)	600	1	1	0	0
Rassau	BG	650	4	1.3	2	1
Sugarloaf	M (BBNP)	650	3	1	2	1
Blorenge	M/T (BBNP)	1700	28	1	1	1
Beacon Hill	M	750	2	1	1	1
Wentwood (west)	M/N	900	31	4.1	1	1
Wentwood (east)	M	1050	8	1.5	1	1
Minnetts	M	600	18	1.6	1*	1*
St Brides	N	550	2	1	0	0
Crosskeys	C	1100	2	1	1	1
Mynydd Islwyn	C	950	2	1	1	1
Wernddu[+]	C/Cardiff	4100	29	1.4	15	1.5

*uncertain record

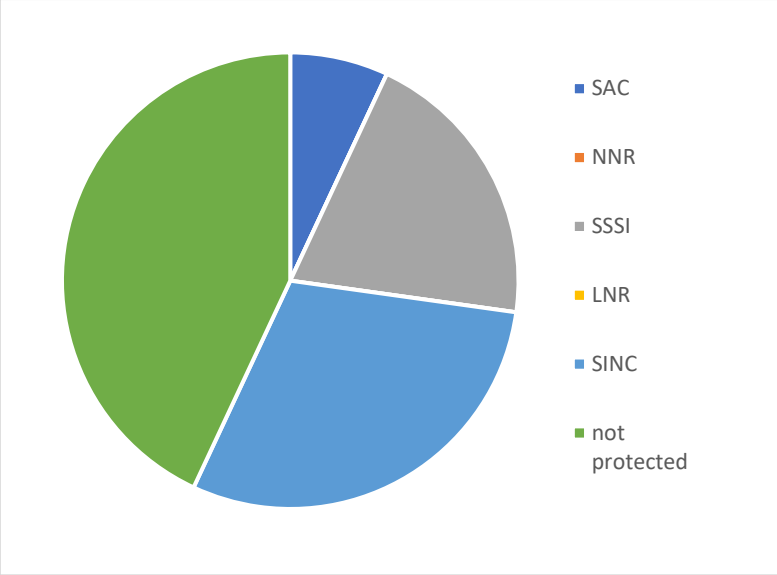
[+]Note that this area extends considerably beyond the study area, where there may be additional records.



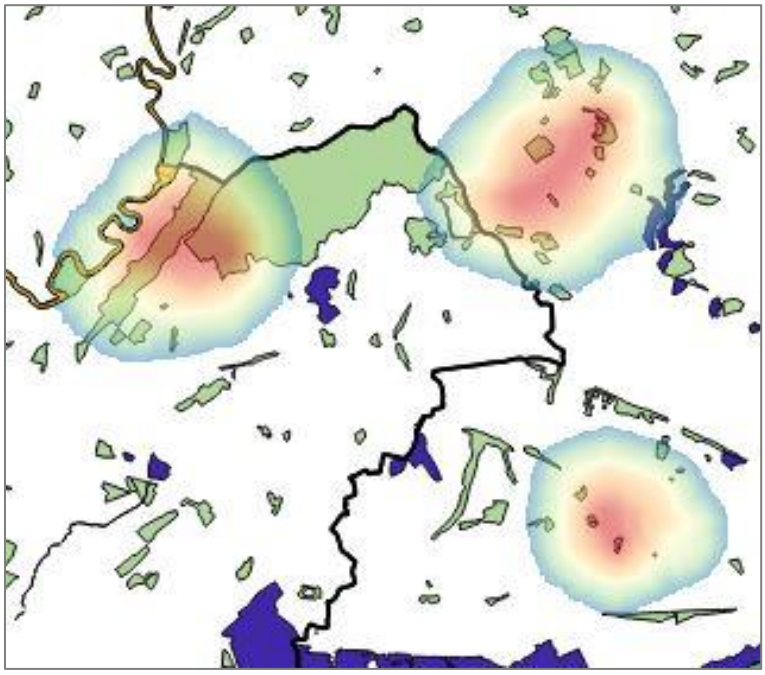
Least-cost corridors for Adder within the study area (courtesy of ARC)

Protection: Around 57% of Adder records are from protected sites: the Usk Bat Sites and Sugarloaf Woodlands SACs, The Blorenge SSSI and parts of the Gwent Levels SSSIs, and many SINCs sites. It is important to note that these are unlikely to be designated for their Adder (or indeed any reptile interest). The 'Wildlife Sites Guidelines' suggest that any site supporting a 'good' population of Adders should be considered for designation.[12] However, measuring population is difficult and requires considerable survey effort.

When the focus areas are considered, it is apparent that very little of the Adder's potential range is protected. The Blorenge, St Brides and Mynydd Llangynidr focus areas fall mostly within large SSSIs, but the remainder contain small areas of SINC habitats, as shown below.



Adder records from protected sites



Protected sites within the Adder focus areas at Wentwood (east and west) and Minnetts. SSSIs are shown in blue, SINCs shown in green.

Common (Viviparous) Lizard *Zootoca vivipara* (Jacquin, 1787)

Pete Hill

Protection: Wildlife & Countryside Act (1981 as amended) Schedule 5(Section 9(5) only)

Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species. Red List[1]: LEAST CONCERN (Europe)

Data availability: Moderate (417 records)

Context: Common Lizards were added to the UK BAP list in 2007 due to population declines,[13] although research on status and population trends appears limited. Bowles[14] reported that lizards were 'disappearing fast' from the lowlands of Scotland in the 1990s, suggesting that pesticide use may be a factor. In general terms, reptiles across Europe are threatened by habitat loss, invasive species, persecution and climate change,[11] and Common Lizards are unlikely to be an exception.

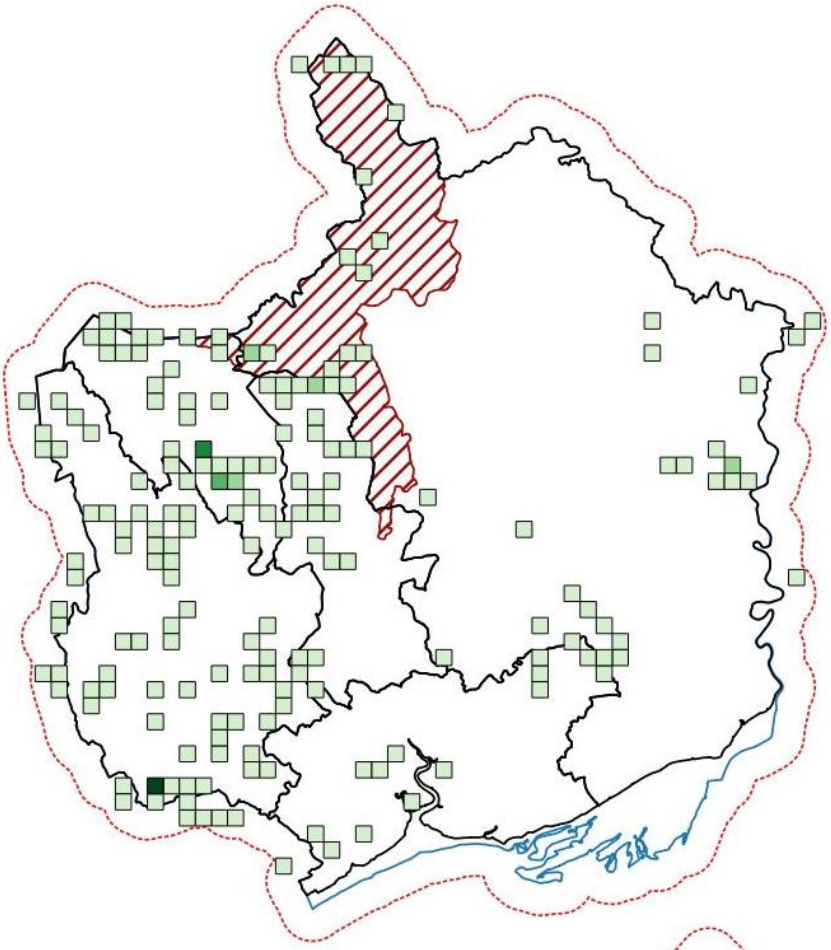
The latest NARRS results for 2007–2012[7] indicate an occupancy rate of 35% for Common Lizards across the UK, and 27% in the Wales and Central region.

Outlook: The outlook for Common Lizard in Greater Gwent is not clear.

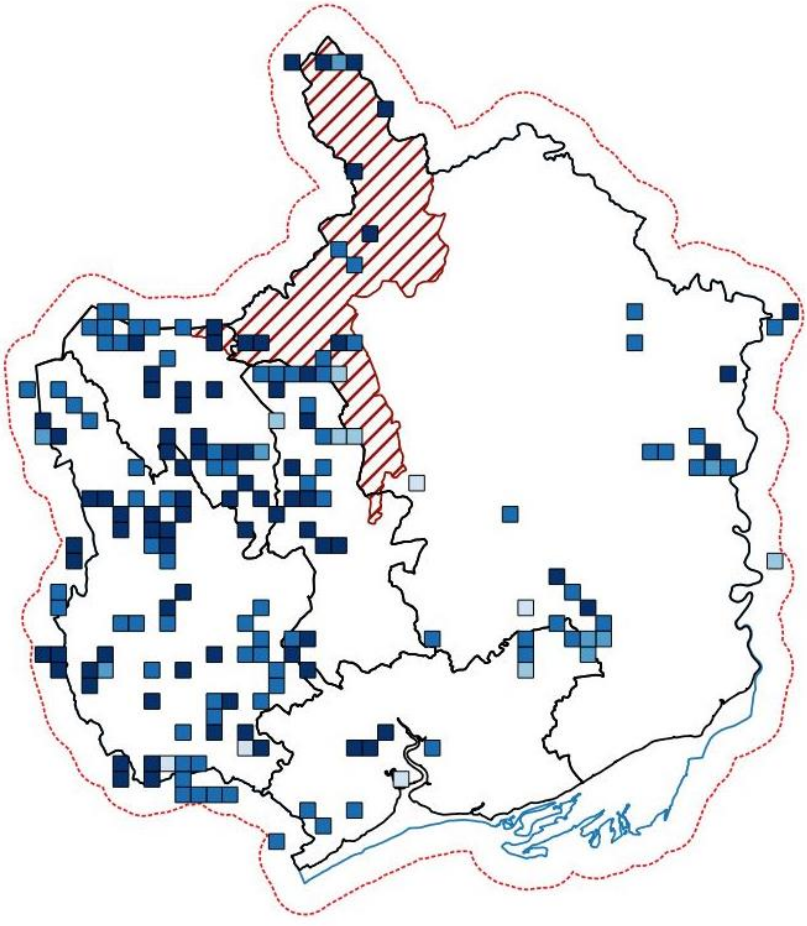
Greater Gwent range: Common Lizard records are mainly distributed across the north and west of the study area, in Caerphilly, Blaenau Gwent and northern Torfaen. Recording hotspots occur at Silent Valley SSSI/LNR, Hafod y Dafal, Caerphilly Mountain, with the Monmouthshire and Newport records loosely clustered around Beacon Hill and Wentwood. There are recent records for most areas.

It is not clear whether the lack of records in the east and south of the study area is due to lack of suitable habitat and actual absence of Common Lizards, or under recording.

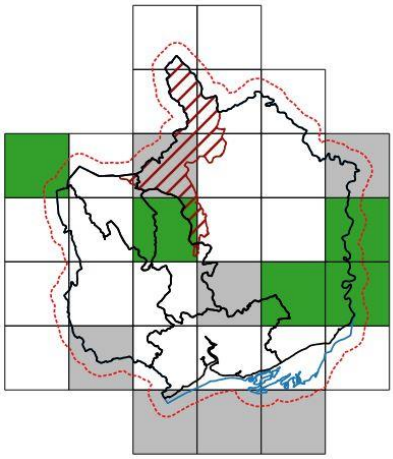
Density of Common Lizard records (max density 31 records/km^2)



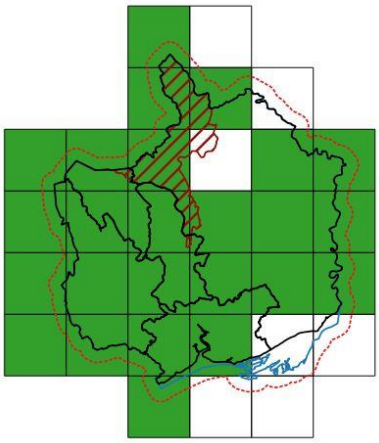
Common Lizard records by date



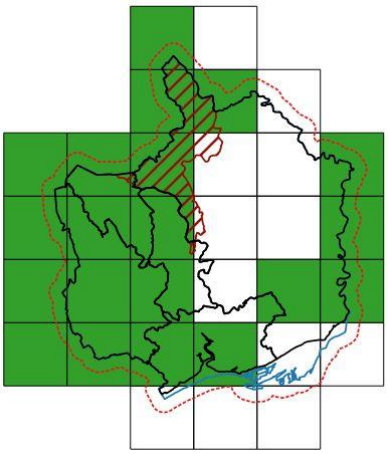
Trends: It is not possible to give trends for Common Lizards. Two of the five NARRS sites within the study area have recorded Common Lizards. A large number of records are recent: 42% of records are from the last decade, meaning that recording of lizards is increasing.



Common Lizard presence (green) from the National Common Reptile Survey (1990).[11] Grey indicates surveyed squares where no records were found.



Common Lizard presence (green) from 1970 to 2019, from local records centres and NBN Atlas.

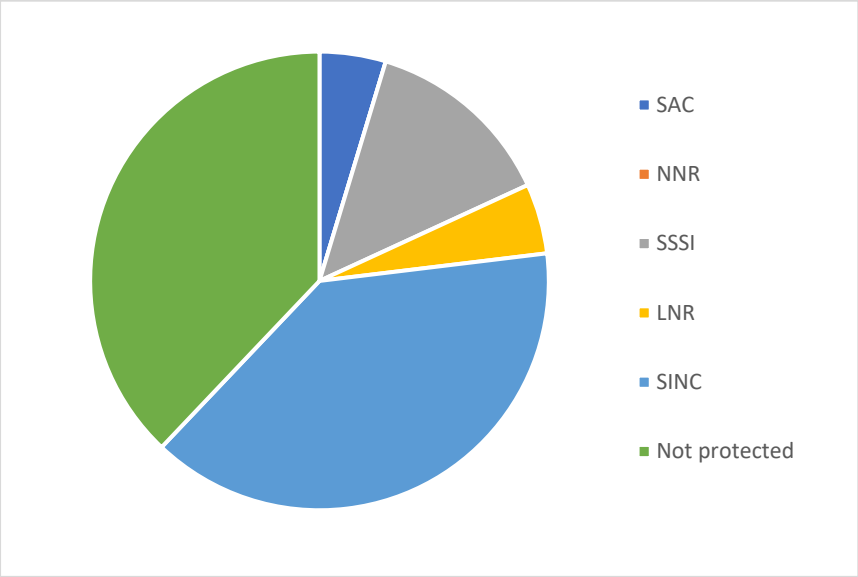


Common Lizard presence (green) from 2010 to 2019, from local records centres and NBN Atlas.

Comparison with the findings of the National Common Reptile Survey[11] shows a significant increase in Common Lizard recording. The survey, carried out through questionnaires sent to local recorders in 1990, returned ≤10 records for VC35. There were positive records for just 5 hectads (16%), whereas now there are records within 25 (78%) hectads from the last 50 years, with 20 (63%) having records from the most recent decade. This demonstrates a considerable increase in recording, although the recent absence from central Monmouthshire could be cause for concern. Further survey work would be needed to ascertain whether this is caused by reduced recording effort or loss of populations.

Protection: Around 62% of Common Lizard records are from protected sites: the Usk Bat Sites and Aberbargoed Grasslands SACs, The Blorenge and Silent Valley SSSIs, as well as LNRs in Blaenau Gwent and Torfaen and many SINCs sites, particularly the large upland SINCs. It is important to note that these are unlikely to be designated for their Common Lizard (or indeed any reptile interest). The 'Wildlife Sites Guidelines' suggest that any site supporting a 'good' population of Common Lizards should be considered for designation.[12] However, measuring population is difficult and requires considerable survey effort.

Common Lizard records from protected sites



Common Toad *Bufo bufo* (Linnaeus, 1758)

Andy Karren

Protection: Wildlife & Countryside Act (1981 as amended) Schedule 5(Section 9(5) only)

Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species. Red List[1]: LEAST CONCERN (Europe)

Data availability: Moderate (417 records)

Context: Despite being categorised as Least Concern in the European Red List[1], Common Toads are experiencing serious declines in the UK. Declines can be dated back as far as post-war agricultural intensification[15] and are attributed to disease, climate change, invasive species, habitat change from loss, damage or management change, and traffic mortality.[16]

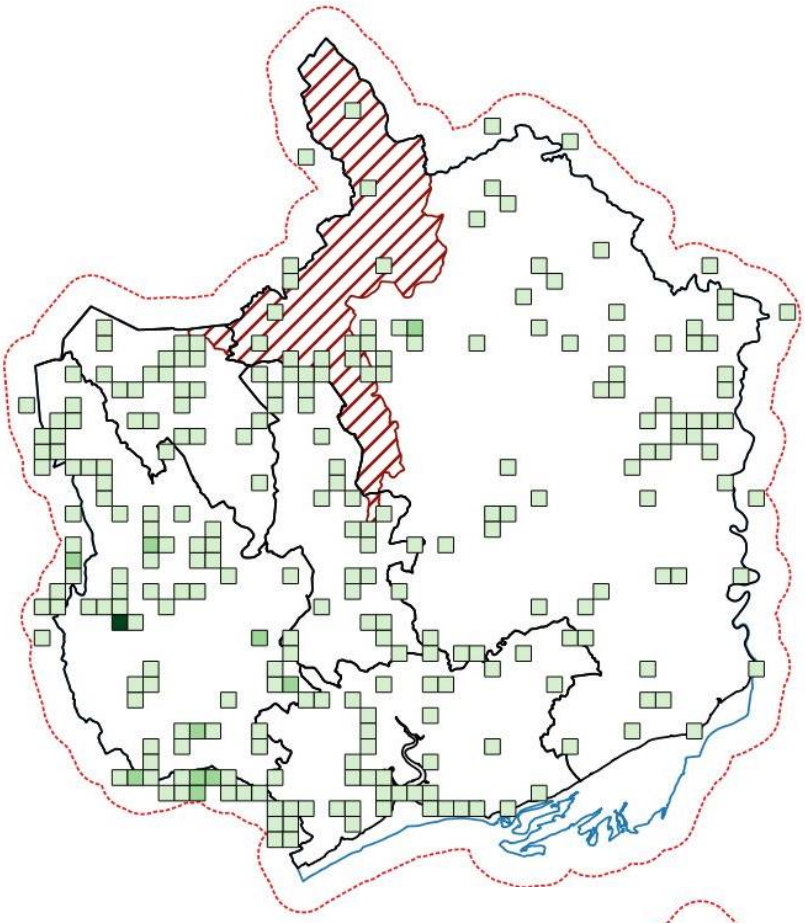
Recent research based on the numbers of toads at crossing patrols found that toad numbers had declined every decade since the 1980s, albeit to a lesser extent in western regions. The authors argue that if this decline were to continue, the population would reduce by 30% in a decade, justifying a 'Vulnerable' classification using the International Union for Conservation of Nature (IUCN) criteria.[17]

The latest NARRS results for 2007–2012[7] indicate an occupancy rate of 33% for Common Toads across the UK, and 35% in the Wales and Central region.

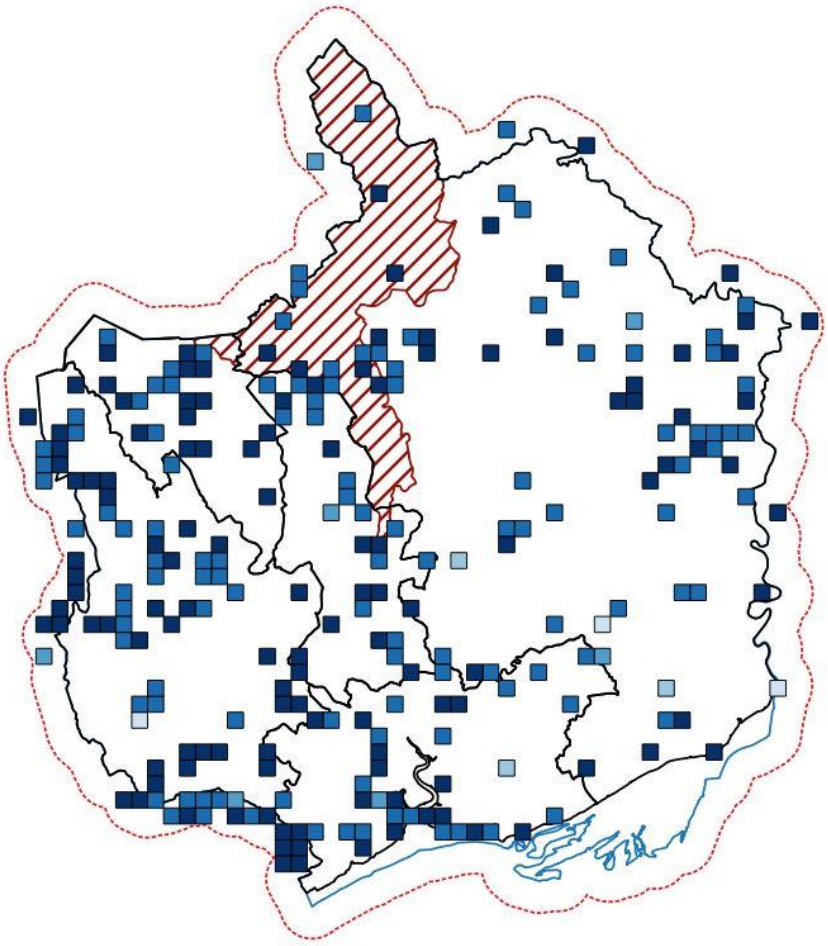
Outlook: The outlook for Common Toad is not clear.

Greater Gwent range: Common Toad records are quite thinly spread for a species that is considered common and widespread, although most records are relatively recent. There appear to be fewer records in central and south Monmouthshire, east Newport and south Caerphilly. The hotspot at Tredomen is the result of increased survey effort due to roadworks, otherwise record distribution may be a factor of either habitat suitability or recording effort or both.

Density of Common Toad records (max density 44 records/km^2)



Common Toad records by date



Trends: It is not possible to give trends for Common Toads. Two of the thirteen NARRS sites within the study area have recorded Common Toads. Numbers of toads at crossing patrols can be a good indicator of population trends[17], but there is only one active patrol in Greater Gwent, with no associated records (see below). The UK trend is one of long-term and continued decline.[1]

Road mortality: One conservation initiative is the Toad Crossing Patrol, managed by Froglife, where volunteers help toads to cross roads safely during the breeding season. There are three toad crossing patrols registered with Froglife in Greater Gwent, at Llanelly Hill (active), Usk and Caerleon (both inactive), and one just outside the study, at Lisvane Reservoir (inactive). Apart from Lisvane, none of the crossings have any records of numbers of toads.

Analysis of records where road crossings or road mortalities are mentioned gave three hotspots:

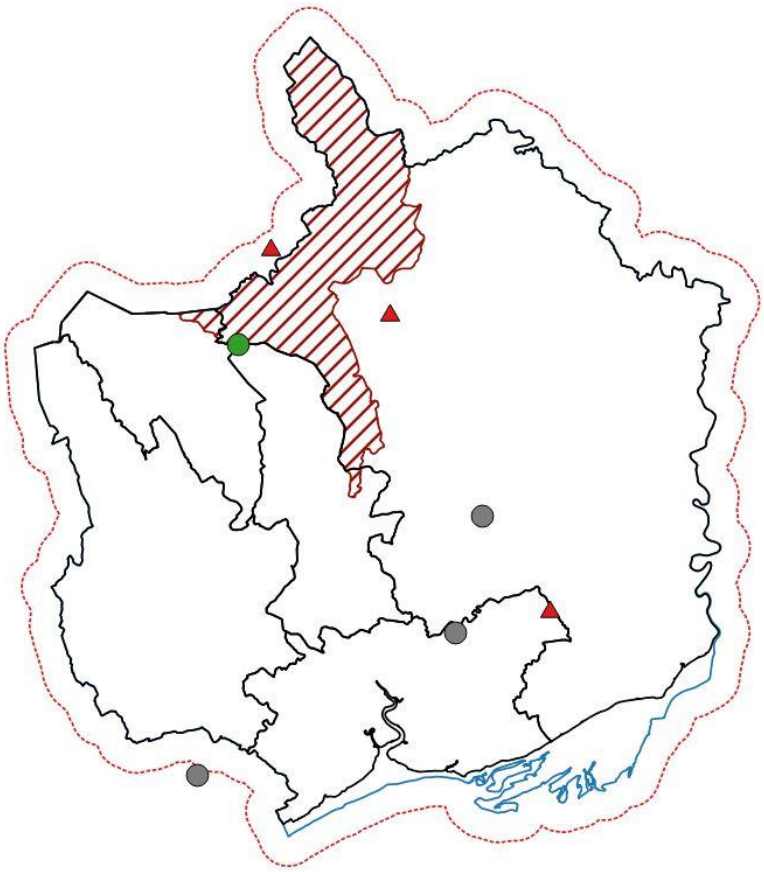
- Llangenny: 2 records in two consecutive years (2007–2008), one for approximately 20 casualties.
- Wentwood Reservoir: 7 records of toad counts from 1972–1997, varying from 23 to 400. Unclear how many were casualties.
- Skirrid Fach: 9 records of single casualties from 2014–2016.

It is possible that these records are too dated to direct any mitigation actions. Populations may have already been lost or adapted to use other routes or other terrestrial habitats. If recording were increased, more hotspots could potentially be identified.

It is important to note that although Toad Crossing Patrols helped over 100,000 toads in 2019[18], numbers of toads at many patrolled crossings are still declining.[17] This is thought to be because toad crossing patrols generally only operate in spring when toads are migrating to ponds and miss the less predictable dispersal of adults and juveniles in the summer. In addition, other factors such as habitat management may also be affecting individual populations.[16]

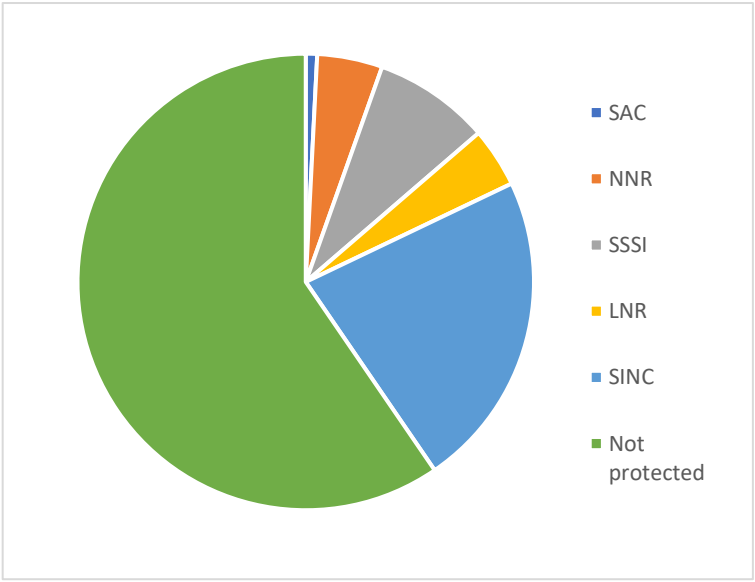
Toad Patrol Crossings (data from Froglife[19]) and road crossing hotspots

Active toad patrol
Inactive toad patrol
Toad crossing record hotspot



Protection: Around 40% of Common Toad records are from protected sites: Newport Wetlands NNR, and the Gwent Levels SSSIs, and Beaufort Ponds LNR. Records from SINCs are small numbers of records from a large number of different sites. There are at least 60 pond SINCs, some of which have toad records, such as Pen y Fan Pond, Tredomen Pond and Coity Pond. The 'Wildlife Sites Guidelines' suggest that any site supporting an 'exceptional' (>500 adults) population of Common Toads should be considered for designation, and toads can also be a contributing factor where ponds are designated for their amphibian assemblages.[12] It is important to note that toads, like other amphibians, require terrestrial habitat for foraging and hibernation, in addition to their breeding pond.

Common Toad records from protected sites



Grass Snake *Natrix helvetica* (Lacépède, 1789)

Protection: Wildlife & Countryside Act (1981 as amended) Schedule 5 (Section 9(5) only)

Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species. Red List[1]: LEAST CONCERN (Europe)

Data availability: Moderate (372 records)

Pete Hill

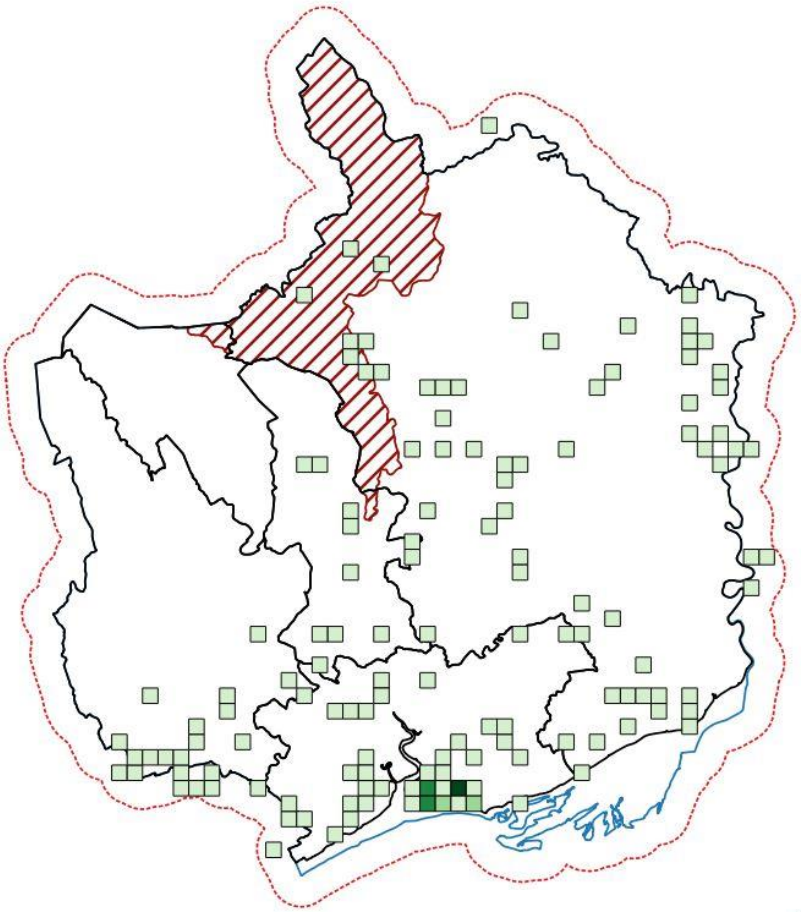
Context: Grass snakes were added to the UK BAP list in 2007, due to population declines[13], although research on status and populations trends appears limited. Work by Reading et al.[20] has shown that, in contrast to many other species, the Grass Snake population at a UK site remained stable over a long period of time, but this cannot be taken to be representative of the UK population.

Grass Snakes are threatened due to the loss of their pond and wetland habitats and declines in their amphibian prey species. Wetlands are declining globally at an alarming rate[21] as they are threatened by drainage, nutrient enrichment, development, invasive species and climate change. Changes in farming practices are also leading to declines in nest sites, as Grass Snakes prefer man-made compost and manure heaps, particularly in colder climates. Loss of these warm nest sites can lead to decreased hatching success.[22]

The latest NARRS results for 2007–2012[7] indicate an occupancy rate of 22% for Grass Snakes across the UK, and 13% in the Wales and Central region. In 2017, genetic research on Grass Snakes across Europe led to the *Natrix natrix helvetica* subspecies being recognised as a species in its own right: *Natrix helvetica.*[6]

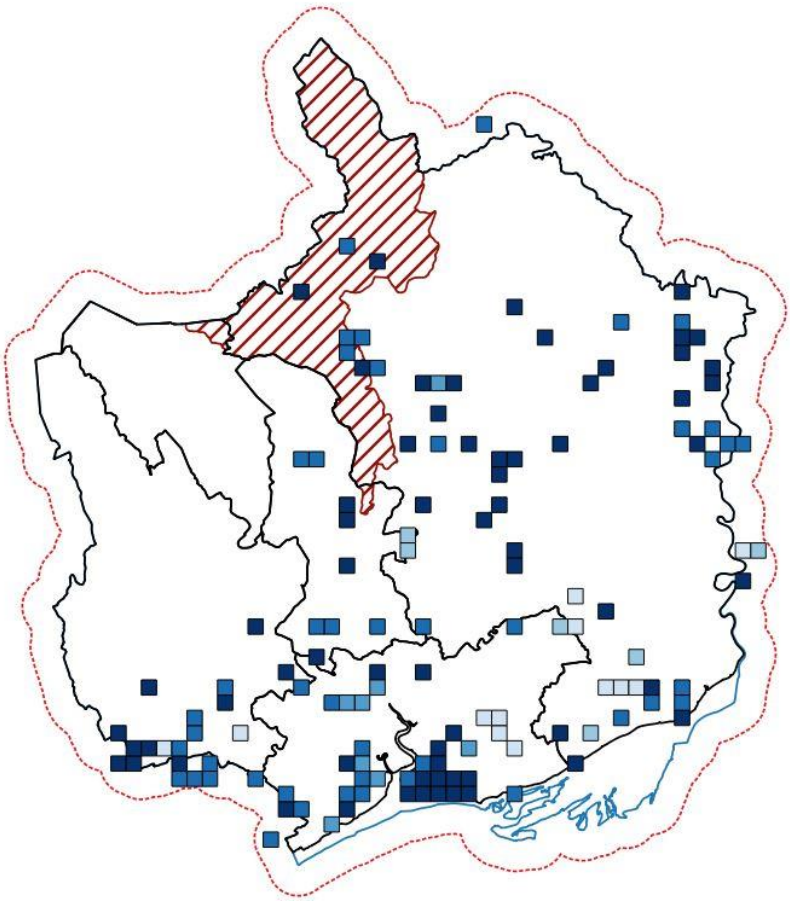
Outlook: The outlook for Grass Snakes in Greater Gwent is unlikely to be positive, due to the threats to their habitat and prey. As wetlands continue to decline in both area and quality, and as impacts from climate change increase, continued losses are likely.

Greater Gwent range: Grass Snake records are concentrated in the south and east of the study area, closely associated with the Gwent Levels and main watercourse. The clear recording hotspot is at Newport Wetlands NNR, with much fewer records elsewhere, although there are small concentrations of records at Magor Marsh SSSI, Celtic Lakes, Caerphilly Common, and for some reason, Caerleon Comprehensive School. This distribution shows the Grass Snake's habitat preference for lowland wetlands, ponds and watercourses, but is also likely to be due to under recording in places.

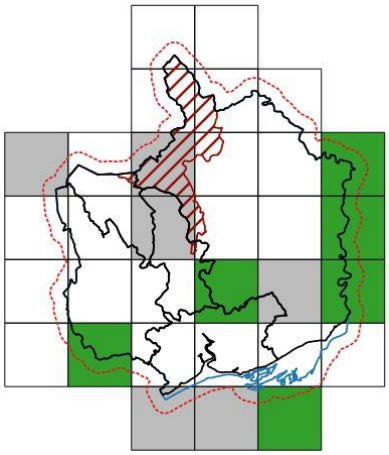


Density of Grass Snake records (max density 44 records/km^2)

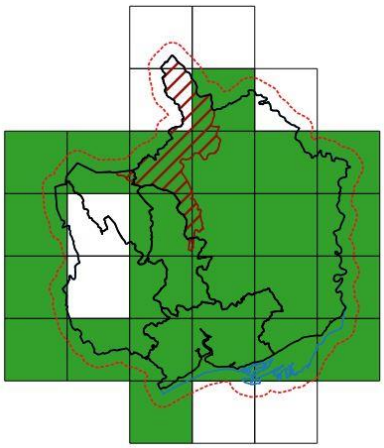
Grass Snake records by date



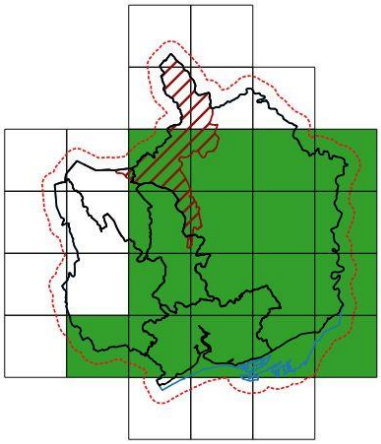
Trends: Although it is not possible to give a reliable trend for Grass Snake populations, recording of Grass Snakes appears to be increasing. Comparison with the findings of the National Common Reptile Survey[11] shows a significant increase in Grass Snake recording. The survey, carried out through questionnaires sent to local recorders in 1990, returned ≤10 records for VC35. There were positive records for just 6 hectads (9%), although one of these is likely to refer to records on the English side of the Severn Estuary. Now there are records within 24 (75%) hectads from the last 50 years, and 17 (53%) have records from the most recent decade. Losses from the west and north are more likely to be due to very small numbers of records from these areas over the study period, as there is very little potential Grass Snake habitat in these, mainly upland, areas.



Grass Snake presence (green) from the National Common Reptile Survey (1990).[23] Grey indicates surveyed squares where no records were found.



Grass Snake presence (green) from 1970 to 2019, from local records centres and NBN Atlas.

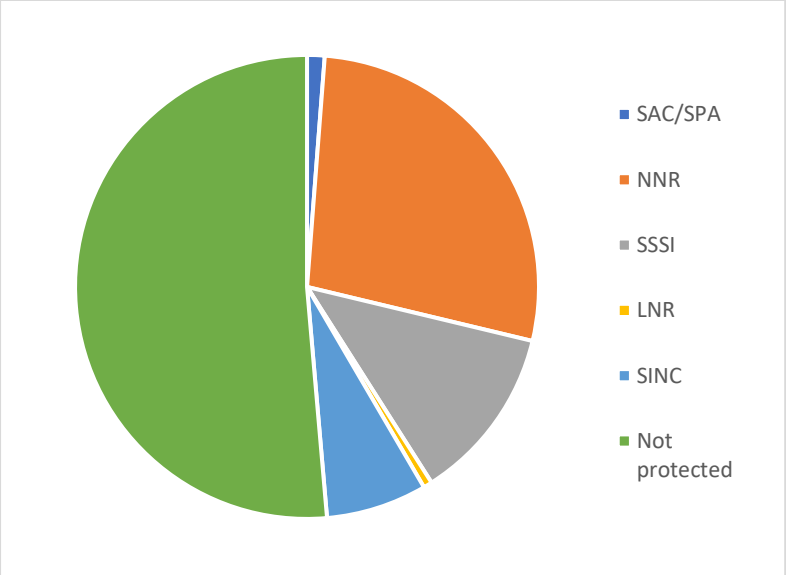


Grass Snake presence (green) from 2010 to 2019, from local records centres and NBN Atlas.

Protection: Just under 49% of Grass Snake records are from protected sites, and most of these (41% of Greater Gwent records) are from the Newport Wetlands NNR and Gwent Levels, showing the importance of this wetland landscape for Grass Snakes.

The 'Wildlife Sites Guidelines' suggest that any site supporting a 'good' population of Grass Snakes should be considered for designation.[12] Grass Snakes can also be a contributing factor in sites designated for their reptile diversity. However, measuring population is difficult and requires considerable survey effort.

Grass Snake records from protected sites



Great Crested Newt *Triturus cristatus* (Laurenti, 1768)

Protection: Conservation of Habitats & Species Regulations (2017) Schedule 2, Wildlife & Countryside Act (1981, as amended) Schedule 5

Conservation status: LEAST CONCERN (global)[24] UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Poor (522 records)

Andy Karran

Context: It is difficult to quantify the decline of Great Crested Newts – there is a lack of historic records, so little is known of previous population levels or range. A 50% loss was estimated in the 1960s, and the losses continued at around 2% every five years.[25] These losses have led to the Great Crested Newts being designated as a European Protected Species and one of the first tranche of UK BAP species.

In Wales, a significant body of work has been recently undertaken by Natural Resources Wales, Amphibian and Reptile Conservation and the Welsh LERCs to map and quantify the Welsh Great Crested Newt Population. The Welsh population is now estimated at 3,271 occupied ponds,[26] spread along the eastern side of Wales and Anglesey. The stronghold is in north-east Wales, where several SACs are designated for their significant Great Crested Newt populations.

The greatest threat to Great Crested Newts is the ongoing deterioration and loss of breeding ponds, caused by both human action and natural succession. This decline is caused by loss of both terrestrial and aquatic habitats, degradation and isolation, inappropriate management, agricultural intensification, and the introduction of fish, waterfowl and invasive non-native species.[25] NARRS data for Wales and Central England estimates that just 24.75% of ponds are high quality habitat (HSI>0.7),[7] equivalent to just 810 ponds in Wales.

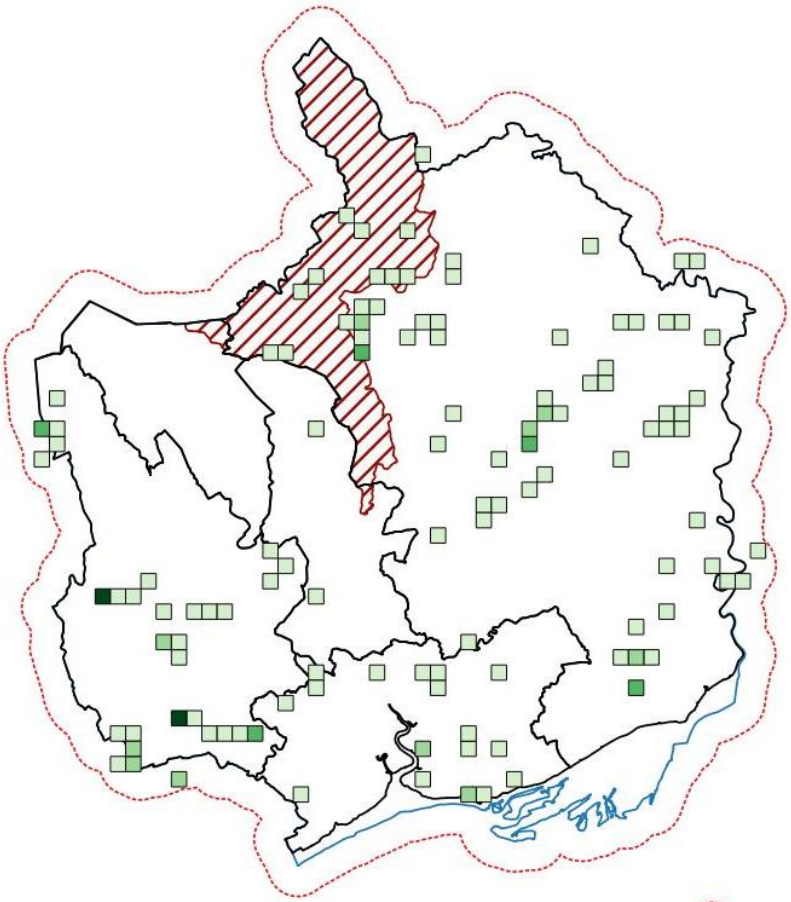
Outlook: Currently the UK population range and population is thought to be stable, although the area and quality of suitable habitat is decreasing and unable to maintain the population.[27] In Wales, the population is thought to be declining, with insufficient data regarding habitat.[28] Recording and monitoring are improving with the establishment of the Online Great Crested Newt Monitoring Database (managed by Cofnod) and improvements in survey techniques, such as the use of eDNA.

In Greater Gwent, more than 200 high quality ponds would need to be created to mitigate for historic losses.[29] This is a challenging figure, given the increasing levels of development and inavailability of suitable sites for pond creation. Fletcher et al. (2005)[29] suggest that an integrated, cross-boundary or regional approach would be required to restore and maintain Great Crested Newt populations.

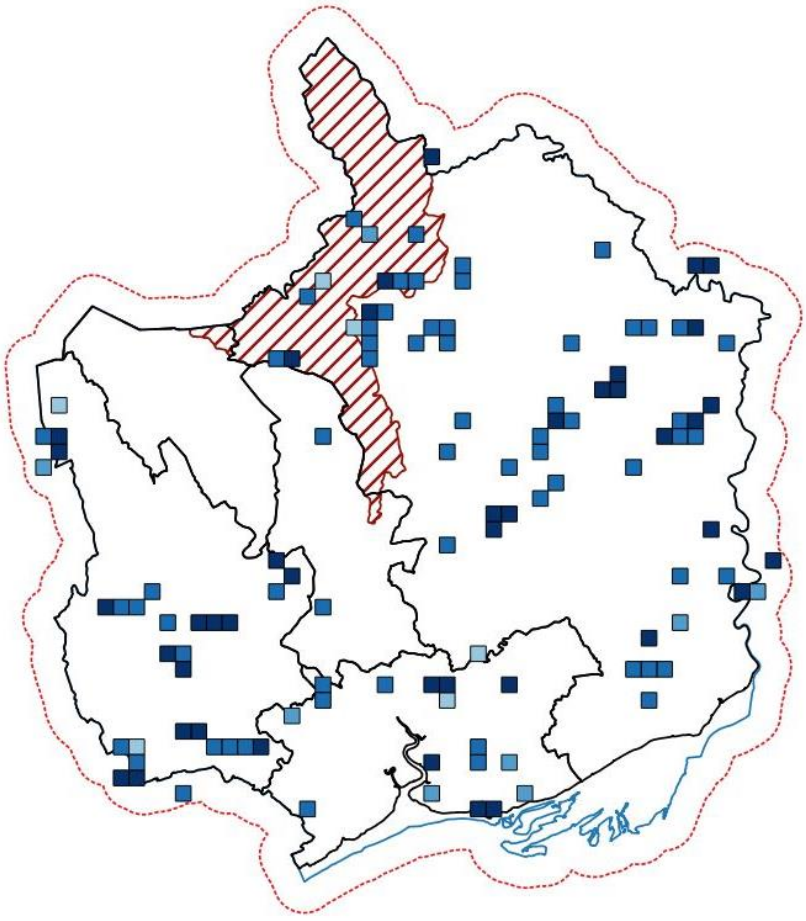
Greater Gwent range: Great Crested Newts are thinly spread across Greater Gwent and largely limited to lowland areas. Hotspots occur at Rudry, Tredomen, Merthyr Common, Raglan, Usk, Llanfoist and Caerwent. The patchiness of recent records indicates that recording has probably been historically sporadic: Fletcher et al. (2005)[29] suggest that the region is very under-recorded, and modelling by French et al. (2014)[26] indicates that there are additional areas of suitable habitat, such as the Heads of the Valleys, where there are very few, if any, records.

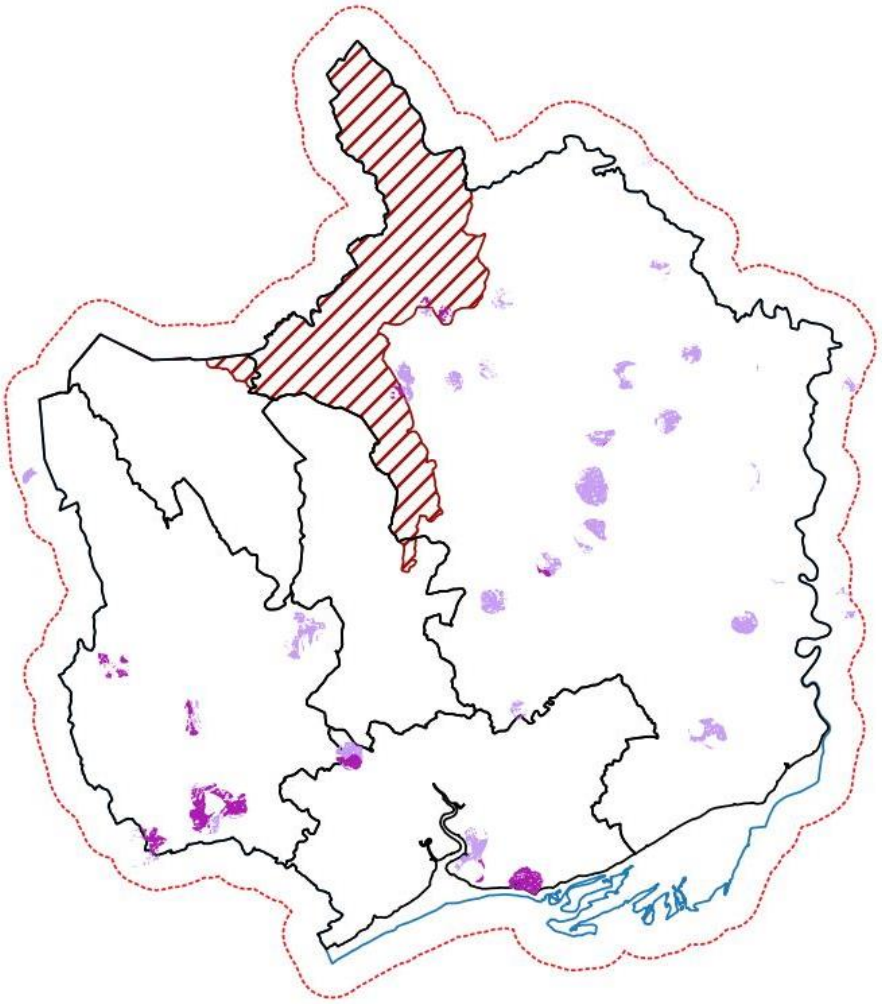
Modelling work carried out by Natural Resources Wales and ARC shows discrete pond clusters across Greater Gwent, with poor connectivity between clusters. The model shows cost-weighted buffers around recorded sites, which were then further analysed for their potential for the creation of new ponds (shown below). It is intended that these models be used in forward planning, to protect Great Crested Newt sites and inform local conservation action.

Distribution of Great Crested Newt records across Greater Gwent (maximum 33/km^2)



Records of Great Crested Newt by decade





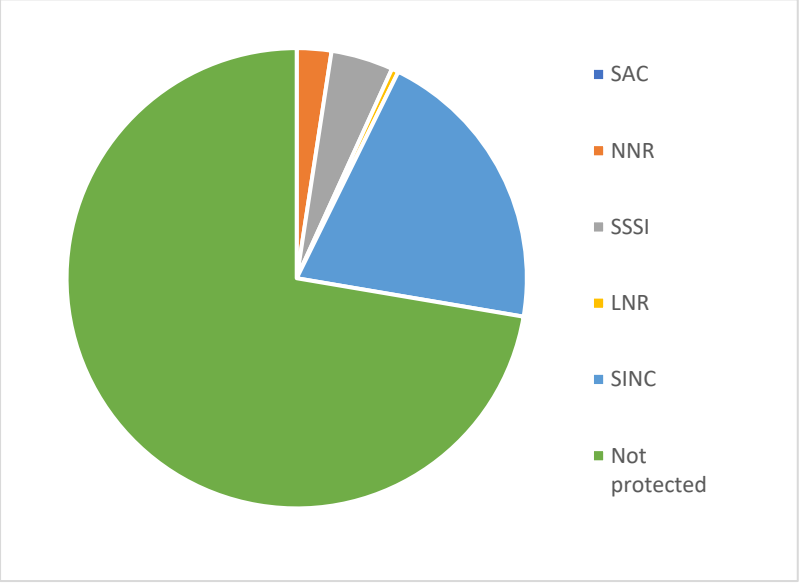
Potential pond creation areas within cost-weighted buffers (~1000m) of existing Great Crested Newt sites (from Fletcher et al.,[29] GIS data provided by ARC and NRW[30])

Population trends: There is not enough data to determine a local population trend for Great Crested Newt, although it is probably declining in line with national trends.[28] Data from the Online Great Crested Newt Monitoring Database for the ponds in North Wales demonstrates that it is possible to show population changes at the site level, but also that the data available is hugely variable in both quality and quantity.[25]

Protection: 28% of records come from protected sites, with SINCs providing the most number of records. Many ponds have been designated as SINCs, with the presence of Great Crested Newt being the main reason or a contributing factor. As Great Crested Newts and their breeding sites are highly protected through the Conservation of Habitats & Species Regulations (2017), designation as a SINC or above can be used as a vehicle to engage landowners and promote positive management.

There are several records that meet the SINC criteria[12] of ten or more adults that are not protected, and these sites should be a priority for further investigation. Note that designation must also include terrestrial habitat, and that a landscape approach, encompassing several ponds, may be more appropriate in maintaining a viable population.

Great Crested Newt records from protected sites



Slow-Worm *Anguis fragilis* (Linnaeus, 1758)

Protection: Wildlife & Countryside Act (1981 as amended) Schedule 5 (Section 9(5) only)

Conservation Status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species. Red List[1]: LEAST CONCERN (Europe)

Data availability: Good (713 records)

Andy Karran

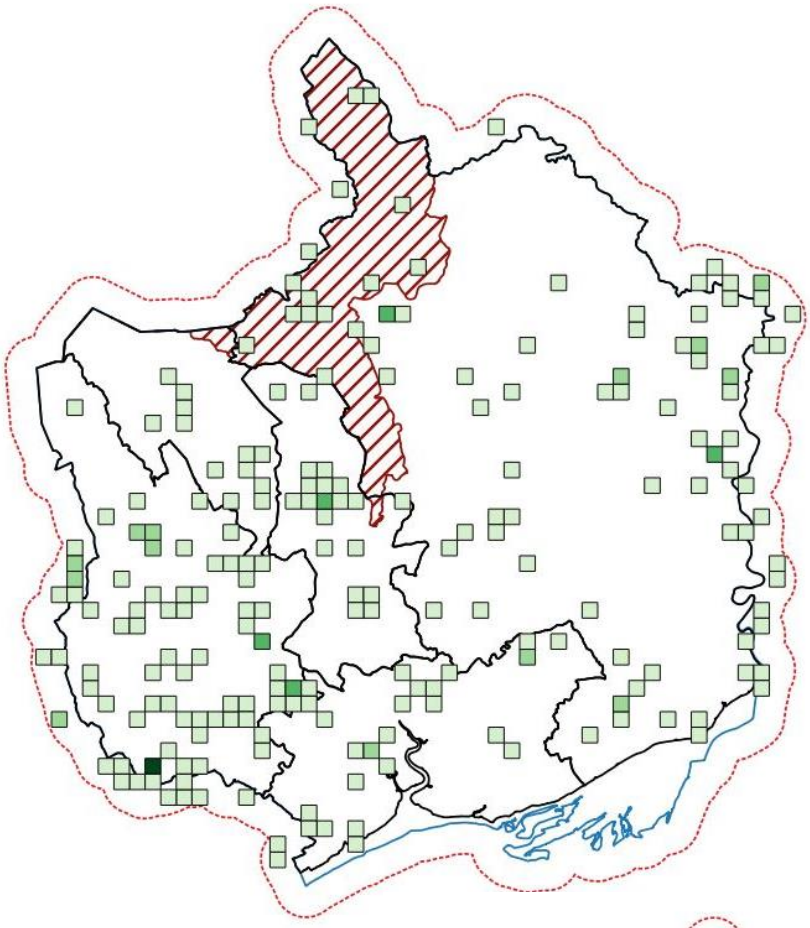
Context: Slow Worms were added to the UK BAP list in 2007, due to population declines,[13] although research on status and populations trends appears limited. Work carried out in England in 2004 concluded that the status of Slow Worms was 'not favourable', although long-term declines appeared to have abated.[10] Slow Worms are frequently associated with grasslands, gardens[11] and brownfield sites,[10] and so are often threatened by development.

The latest NARRS results for 2007–2012[7] indicate an occupancy rate of 22% for Slow Worms across the UK, and 11% in the Wales and Central region.

Outlook: The outlook for Slow Worms in Greater Gwent is not clear. They are likely to continue to be negatively affected by habitat loss, especially from development, and current mitigation methods, such as translocation, do not appear to be compensating for this loss.[31] Recording of Slow Worms has increased significantly over the study period, which can only be positive for their future conservation.

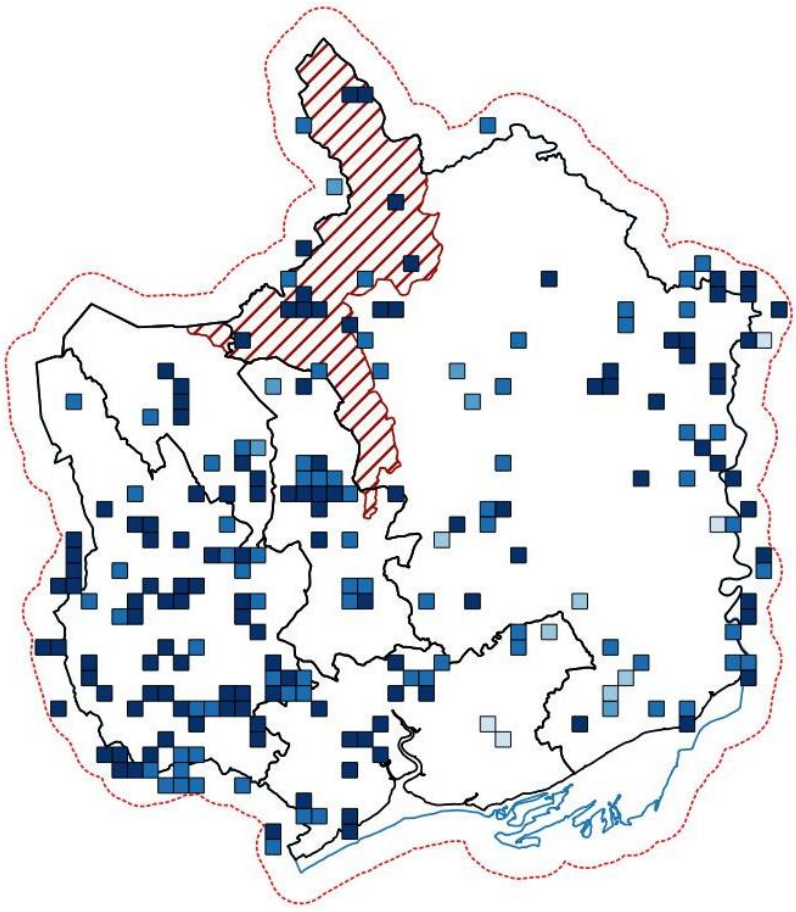
Greater Gwent range: Slow Worm records are widely distributed across the study area, with fewer records in central and south Monmouthshire and eastern Newport. Recording hotspots occur at Abergavenny and Caerphilly Common (both, possibly, the result of development surveys), as well as Snatchwood, Gaer Fort, Cwmcarn, Moriah Hill and Beacon Hill.

It is not clear whether the study's lack of records for parts of Monmouthshire and Newport is due to lack of suitable habitat and actual absence of Slow Worms or under recording.

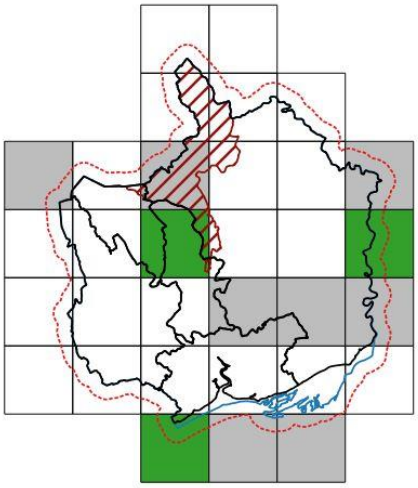


Density of Slow Worm records (max density 35 records/km^2)

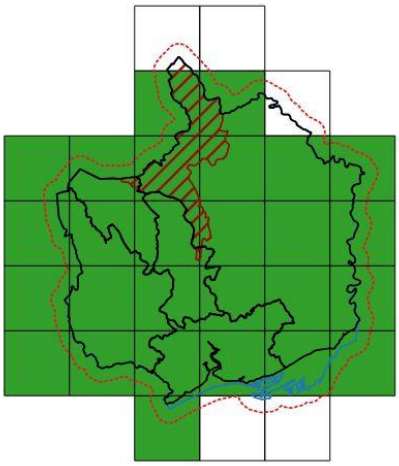
Slow Worm records by date



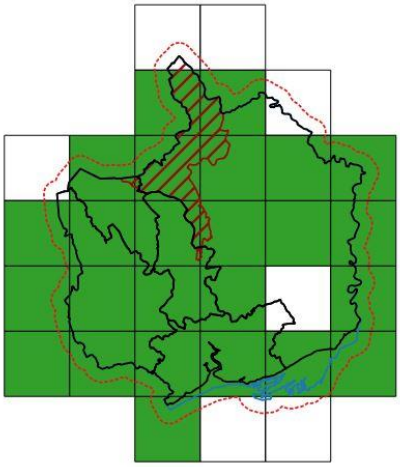
Trends: Although it is not possible to give a reliable trend for Slow Worms, recording of Slow Worms is certainly increasing. Almost half (49%) of Slow Worm records within the study area are from the last decade.



Slow Worm presence (green) from the National Common Reptile Survey (1990).[11] Grey indicates surveyed squares where no records were found.



Slow Worm presence (green) from 1970 to 2019, from local records centres and NBN Atlas.

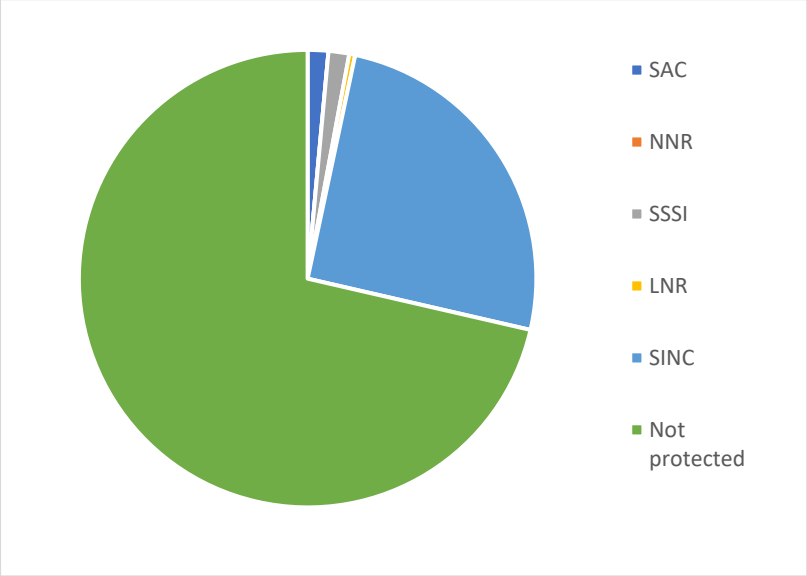


Slow Worm presence (green) from 2010 to 2019, from local records centres and NBN Atlas.

Comparison with the findings of the National Common Reptile Survey[11] shows a significant increase in Slow Worm recording. The survey, carried out through questionnaires sent to local recorders in 1990, returned ≤10 records for VC35. There were positive records for just 3 hectads (9%), whereas now there are records within 29 (91%) hectads from the last 50 years, and 27 (84%) have records from the most recent decade. This remarkable increase can be attributed to improvements in our understanding of Slow Worm ecology (i.e. looking in the right places) and increased recording effort, as well as the possibility of range and population increase.

Protection: Only 29% of Slow Worm records are from protected sites, and most of these are from SINCs, with many records from Gaer Fort, Beacon Hill and Caerphilly Common. This is indicative of the fact that Slow Worms are often found in habitats that are less likely to be protected (75 records mention 'garden' in the comments) and that many of the Slow Worm records come from development projects, which are unlikely to be on protected sites. It is important to note that protected sites are unlikely to be designated for their Slow Worm interest (or indeed any reptile interest). The 'Wildlife Sites Guidelines' suggest that any site supporting a 'good' population of Slow Worms ('exceptional' in Monmouthshire) should be considered for designation.[12,32] Slow Worms can also be a contributing factor in sites designated for their reptile diversity. However, measuring population is difficult and requires considerable survey effort.

Slow Worm records from protected sites



References

1. Cox NA and Temple HJ. 2009. European Red List of Reptiles. Luxembourg: Office for Official Publications of the European Communities.
2. Beebee TJC and Griffiths RA. 2005. The Amphibian Decline Crisis: A Watershed for Conservation Biology? Biological Conservation 125 (3): 271–285.
3. Whitfield Gibbons J, Scott DE, Ryan TJ, Buhlmann KA, Tuberville TD, Metts BS, Greene JL, Mills T, Leiden Y, Poppy S, Winne CT. 2000. The Global Decline of Reptiles, Déjà Vu Amphibians: Reptile Species are Declining on a Global Scale. BioScience 50(8): 653–666.
4. Snell C. 2006. Status of the Common Tree Frog in Britain. British Wildlife 27(3): 152–160.
5. Burns F, Eaton MA, Gregory RD, Al Fulaij N, August TA, Biggs J, Bladwell S, Brereton T, Brooks DR, Clubbe C, Dawson J, Dunn E, Edwards B, Falk SJ, Gent T, Gibbons DW, Gurney M, Haysom KA, Henshaw S, Hodgetts NG, Isaac NJB, McLaughlin M, Musgrove AJ, Noble DG, O'Mahony E, Pacheco M, Roy DB, Sears J, Shardlow M, Stringer C, Taylor A, Thompson P, Walker KJ, Walton P, Willing MJ, Wilson J and Wynde R. 2013. State of Nature Report. The State of Nature partnership.
6. Hayhow DB, Eaton MA, Stanbury AJ, Burns F, Kirby WB, Bailey N, Beckmann B, Bedford J, Boersch-Supan PH, Coomber F, Dennis EB, Dolman SJ, Dunn E, Hall J, Harrower C, Hatfield JH, Hawley J, Haysom K, Hughes J, Johns DG, Mathews F, McQuatters-Gollop A, Noble DG, Outhwaite CL, Pearce-Higgins JW, Pescott OL, Powney GD and Symes N. 2019. The State of Nature 2019. The State of Nature partnership.
7. Wilkinson JW and Arnell AP. 2013. NARRS Report 2007 – 2012: Establishing the Baseline (HWM Edition). ARC Research Report 13/01.
8. Gleed-Owen C and Langham S. 2012. The Adder Status Project: A Conservation Condition Assessment of the Adder (Vipera berus) in England, With Recommendations for Future Monitoring and Conservation Policy. Report to Amphibian and Reptile Conservation. ARC, Bournemouth, UK.
9. Gardner E, Julian A, Monk C and Baker J. 2019. Make the Adder Count: Population Trends from a Citizen Science Survey of UK Adders. Herpetological Journal 29: 57–70.
10. Baker J, Suckling J and Carey R. 2004. Status of the Adder (Vipera Berus) and Slow-worm (Anguis fragilis) in England. English Nature Research Report Number 546. English Nature, Peterborough.
11. Swan MJS and Oldham RS. 1993. Herptile Sites: National Common Reptile Survey Final Report. English Nature Research Report No.39. English Nature, Peterborough.
12. Gwent Wildlife Trust. 2004. Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership.
13. Biodiversity Reporting and Information Group (BRIG). 2007. Report on the Species and Habitat Review. JNCC, Peterborough.
14. Bowles FD. 1995. Observations on the distribution of the Common Lizard (Lacerta vivipara) in Scotland. British Herpetological Society Bulletin 54: 32–33.
15. Cooke AS. 1972. Indications of Recent Change in Status in the British Isles of the Frog (Rana temporaraia) and the Road (Bufo bufo). Journal of Zoology 167(2): 161–178.
16. Beebee T. 2012. 'Decline and Flounder of a Sussex Common Road (Bufo bufo) Population. Herpetological Bulletin 121: 6–16.

17. Petrovan SO and Schmidt BR. 2016. Volunteer Conservation Action Data Reveals Large Scale and Long-Term Negative Population Trends of a Widespread Amphibian, the Common Toad (Bufo bufo). PLOS ONE 121(10).
18. Froglife. 2020. https://www.froglife.org/what-we-do/toads-on-roads/facts-figures/ (accessed 1/7/2020).
19. Froglife (2020) https://www.froglife.org/what-we-do/toads-on-roads/tormap/ (accessed 1/7/2020).
20. Reading CJ, Luiselli LM, Akani GC, Bonnet X, Amori G, Ballouard LM, Filippi E, Naulleau G, Pearson D and Rugiero L. 2010. Are Snake Populations in Widespread Decline? Biology Letters 6: 777–780.
21. Dixon JR, Loh J, Davidson NC, Beltrame C, Freeman R, Walpole M. 2016. Tracking Global Change in Ecosystem Area: The Wetland Extent Trends Index. Biological Conservation 193: 27–35.
22. Löwenborg K, Kärvemo S, Tiwe A and Hagman M. 2012. Agricultural By-Products Provide Critical Habitat Components for Cold-Climate Populations of an Oviparous Snake (*Natrix natrix*). Biodiversity and Conservation 21(10): 2477–2488.
23. Kindler C, Chèvre M, Ursenbacher S, Böhme W, Hille A, Jablinski D, Vamberger M and Fritz U. 2017. Hybridization Patterns in Two Contact Zones of Grass Snakes Reveal a New Central European Snake Species. Scientific Reports 7: 7378.
24. Arntzen JW, Kuzmin S, Jehle R, Beebee T, Tarkhnishvili D, Ishchenko V, Ananjeva N, Orlov N, Tuniyev B, Denoël M, Nyström P, Anthony B, Schmidt B and Ogrodowczyk A. 2009. Triturus cristatus. The IUCN Red List of Threatened Species 2009: https://dx.doi.org/10.2305/IUCN.UK.2009.RLTS.T22212A9365894.en (Last accessed 26/07/2020).
25. Haysom K, Driver D, Cartwright M, Wilkinson J and Foster J. 2018. Great Crested Newt in Wales, With Specific References to its Long-Term Prospects and within its Stronghold in North-East Wales. NRW Science Report Series 259: 113. Natural Resources Wales, Bangor.
26. French GCA, Wilkinson JW, Fletcher DH and Arnell AP. 2014.Quantifying the Status of Great Crested Newts Wales. NRW Science Report Series 31: 24. NRW, Bangor.
27. Conservation Status Assessment for the Species S1166 Great Crested Newt (Triturus cristatus) UK. European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC). Fourth Report by the United Kingdom under Article 17 (January 2013–December 2018). JNCC.
28. Conservation Status Assessment for the Species S1166 Great Crested Newt (Triturus cristatus) Wales. European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC). Fourth Report by the United Kingdom under Article 17 (January 2013–December 2018. JNCC.
29. Fletcher DH, Arnell AP, French GCA and Wilkinson JW. 2014. Spatial Conservation Status Modelling of the Great Crested Newt in South Wales. NRW Science Report Series 30: 36. NRW, Bangor.
30. GIS data from ARC and Natural Resources Wales - Contains Natural Resources Wales information © Natural Resources Wales and database right. All rights reserved.
31. Nash DJ, Humphries N and Griffiths RA. 2020. Effectiveness of Translocation in Mitigating Reptile-Development Conflict in the UK'. Conservation Evidence 17: 7–11.
32. Gwent Wildlife Trust. 2009. Revised Criteria for the Selection of Wildlife Sites in South Wales, to give special regard for Monmouthshire. Gwent Wildlife Trust.

Fish

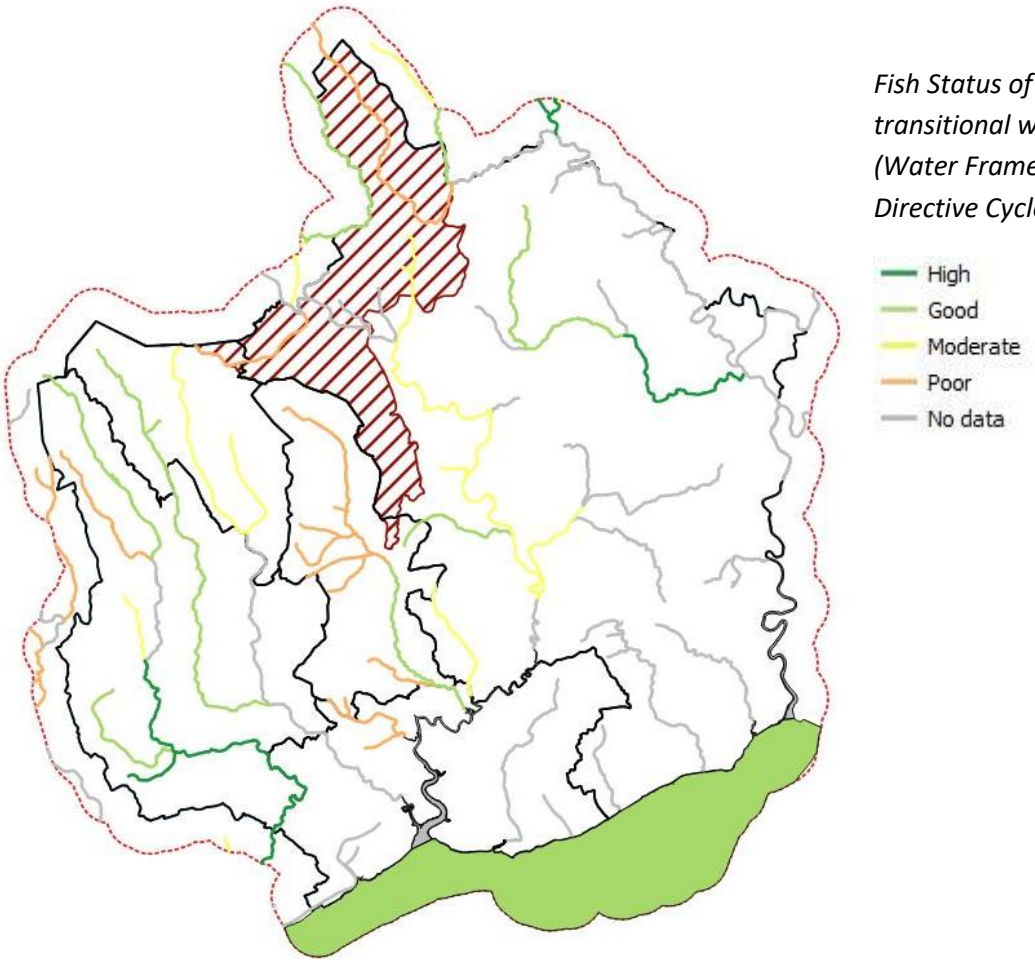
Fish differ from other species in this report, as many fish species have a commercial value. The Welsh angling industry is worth around £200million per annum, and it is thought that this could be increased.[1] This figure does not include any added value in terms of health and wellbeing that angling provides.

Knowledge of fish populations is limited due to the patchiness of sampling and the translocation and stocking of species for commercial reasons. It is estimated that there are about 28 estuarine and inshore fish species in South Wales, with 14 of these thought to be of regional significance.[2]

Both the River Usk and River Wye are designated as SACs for their fish populations.[3,4] Annex II fish species listed as primary reasons for selection and qualifying features include Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax*), Allis Shad (*A.alosa*), Atlantic Salmon (*Salmo salar*) and Bullhead (*Cottus gobio*). This list includes both anadromous fish (fish that spawn in freshwater but spend part of their lifecycle at sea) and fish that spend their entire lifecycle in freshwater. Many other watercourses, including all the main rivers within the study area, are designated as SINCs, although they may not qualify for their fish populations.

Only 35% of UK rivers are achieving Good Ecological Status under the Water Framework Directive.[5] In Greater Gwent, where fish populations have been assessed, 211km (21 sections) of riverbodies within the study area are classified as only moderate or poor, although it should be noted that there is uncertainty around some of the data.[19] Failing fish populations include Salmon, Bullhead, Brown Trout (*S. trutta*), European Eel (*Anguilla Anguilla*) and Stone Loach (*Barbatula barbatula*). Fish populations are threatened by loss of suitable habitat, pollution, barriers to migration and climate change. There are two river trusts within the study area: The Wye and Usk Foundation and the South East Wales Rivers Trust. Both carry out conservation work relating to habitat improvements, removal of both natural and artificial barriers, and water quality monitoring, as well as raising awareness of the value of river ecosystems.

In this section there are two species, one anadromous – Atlantic Salmon. and one catadromous – European Eel. It should be noted that many of the issues affecting these species are likely to affect other fish species in the area.



Fish Status of river and transitional waterbodies (Water Framework Directive Cycle 2)[19]

European Eel *Anguilla anguilla* (Linnaeus, 1758)

Andy Karran

Protection: Eels Regulations (2009)

Conservation status: Critically Endangered (Global)[6]

Data availability: Moderate (1,079 records)

Context: European Eels have a complex life cycle, starting as eggs in the Sargasso Sea. The Gulf Stream carries the larvae, or *leptocephali*, across the Atlantic towards Europe and North Africa. After 1–3 years, when they reach shallower waters, the larvae metamorphose into glass eels, which colonise coastal waters and estuaries. Most glass eels will migrate inland, usually at night, using tidal flows and actively swimming upstream to freshwater, although some remain in the estuaries and around the coast. Over the next 10–15 years, glass eels mature into elvers and eventually become adult, yellow eels. Finally, yellow eels metamorphose into silver eels, which migrate back to the Sargasso Sea to spawn. The exact location of the spawning grounds is unknown, and spawning behaviour has never been observed.

The European Eel population has shown a marked decline: glass eel recruitment in the North Sea in 2020 was 0.5% compared to that in 1960–1979.[7] For yellow eels, recruitment in 2019 was 17% compared to 1960–1979.[7] More locally, yellow eels in the Severn Estuary have declined by 15% every year since 1980 – abundance in 2009 was estimated at 1% of the 1980 levels[8] – one of the greatest population crashes of a fish population ever reported.

Both glass eels and yellow eels are fished commercially. The collapse of eel stocks led to an EU regulation and, subsequently, to the UK Eel Regulations, which require that eel management plans at catchment level are produced and restrict the catches of both glass eels and yellow eels, as well as making provision for eel passes at dams, weirs and similar structures.

This section includes Natural Resources Wales fish sampling data in addition to records from SEWBReC, HBRC, GERC and NBN. Records are for glass eels, elvers and adult eels (presumed to include both yellow and silver eels).

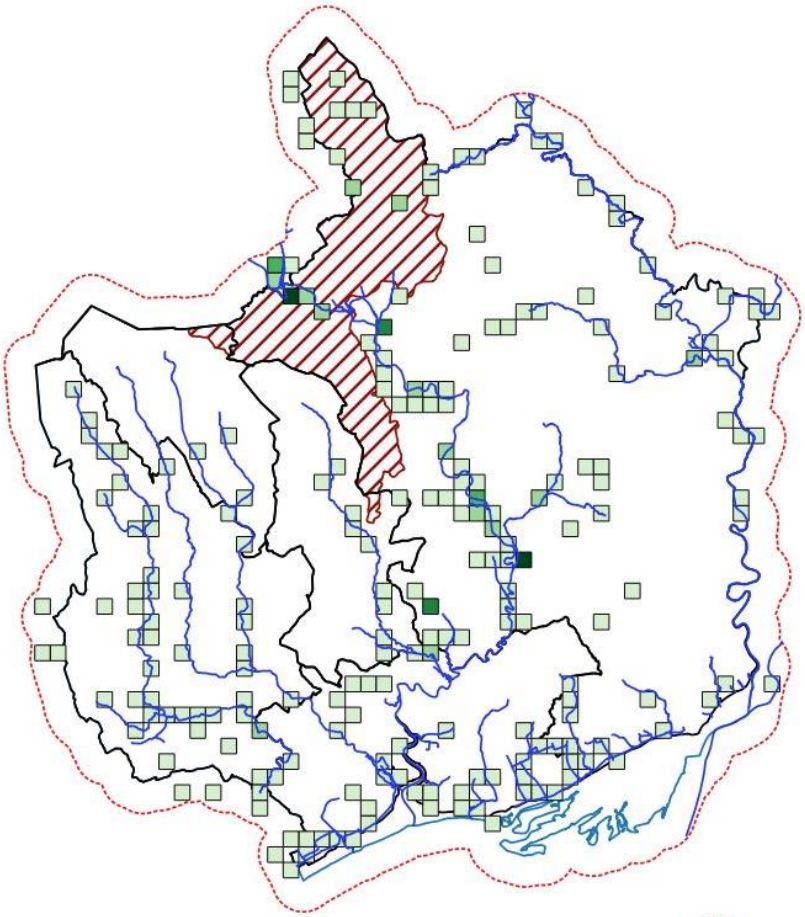
Outlook: Currently the Severn eel population is failing to meet its escapement targets.[9,10] However, there are difficulties around the target, which must be based on a theoretical output of a 'pristine' catchment. There is an extensive glass eel fishery throughout the Severn – most activity is on the Severn in England, although fishing was also carried out until this year on the Wye, and to a lesser extent, the Usk[9]. NRW took the decision to close the eel and glass eel fisheries in Wales in 2021 due to ongoing concerns about the overall status of the eel stock as well as uncertainties around the health of local populations.

The Severn Eel Management Plan identifies loss of habitat, through barriers to migration, as a 'major pressure' on European Eel populations. Over 400 barriers to migration were identified within the Severn catchment, with 62 on the Usk and Wye.[9] The tidal flaps that control drainage on the Gwent Levels are also identified as 'poorly accessible',[9] meaning that relatively few eels are able to reach the reens, which offer good eel habitat. Work is ongoing to remove or modify these barriers, as well as

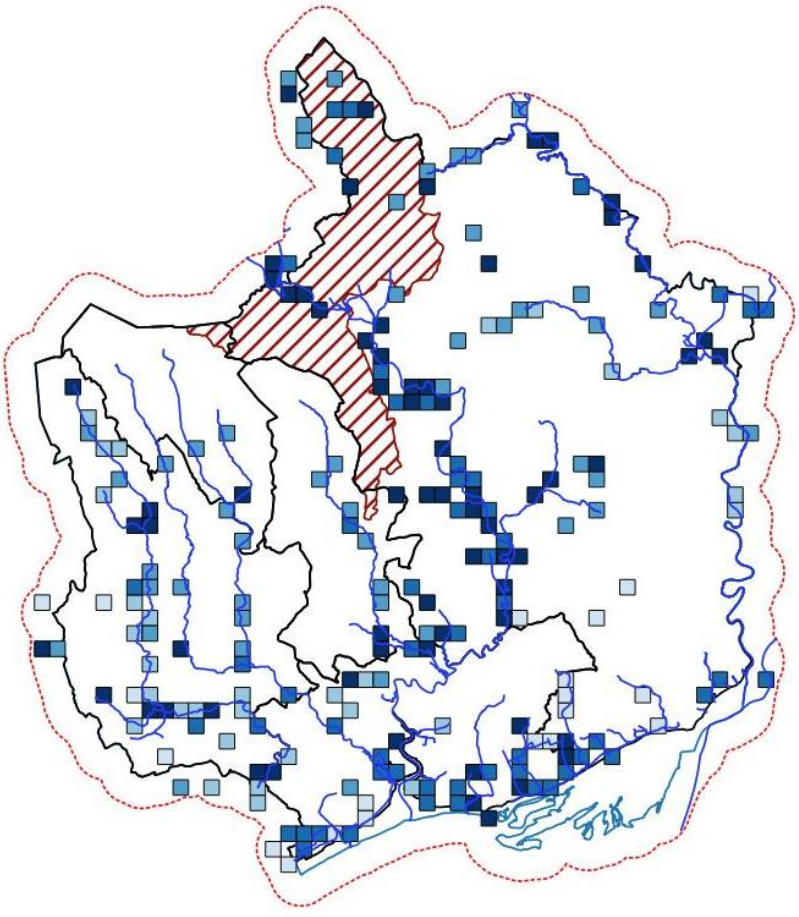
improving data collection and monitoring of fisheries.[9] Awareness-raising work is also taking place, with the South East Wales Rivers Trust (SEWRT) running an Eels in the Classroom project.[11]

Greater Gwent range: Records for European Eel are found across Greater Gwent and on all of the main rivers. Hotspots are related to sampling and recording effort, especially as Natural Resources Wales sampling is often repeated at the same locations. However, most records, especially from the eastern valleys (Rhymney, Sirhowy and Ebbw) are older, from before 2000. Most of the more recent records are concentrated on the Usk and the Gwent Levels. This pattern corresponds to the distribution shown by the Severn Eel Management Plan.[9] There is a surprising lack of records along the Wye; it is possible that the English Environment Agency holds additional records. Equally, there are few records from the Severn Estuary, probably due to the difficulties of sampling; most information from the Severn comes from dedicated studies or the monitoring of the cooling-water intake screens at Hinkley Point.[8]

Density of European Eel records, maximum 55 records/km^2 (main rivers[12] shown for clarity)

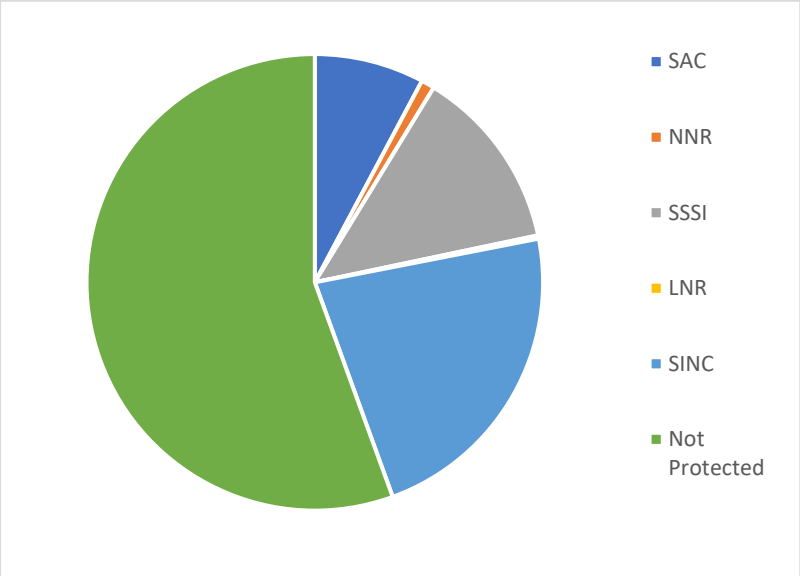


European Eel records by decade (main rivers[12] shown for clarity)



Protection: Just under half (46%) of records come from protected sites, with high numbers of records from the Wye and Usk SACs, Gwent Levels SSSIs and river SINCs. It is likely that more records are from protected sites and are falling outside of the narrow site boundaries due to centring of grid references. Most main rivers within Greater Gwent have some degree of protection.

European Eel records from protected sites



Atlantic Salmon *Salmo salar* (Linnaeus, 1758)

Andy Karran

Protection: Habitats Regulations (2017) Schedule 4, Salmon Act (1986), various byelaws

Conservation status: UKBAP Priority Species, Wales S7 Species

Data availability: Moderate (611 records)

Context: Atlantic Salmon are an iconic fish species, known for their spectacular leaps as they migrate from the ocean to their freshwater spawning grounds. Salmon are faithful to the river where they hatched and will migrate thousands of kilometres to breed. Young salmon (known as fry, then parr after the first year) hatch in spring and can remain in freshwater for up to seven years. These will change into smolts, which are able to survive in saltwater, before migrating downstream. They spend a year or more at sea, before returning to the river to breed.[13]

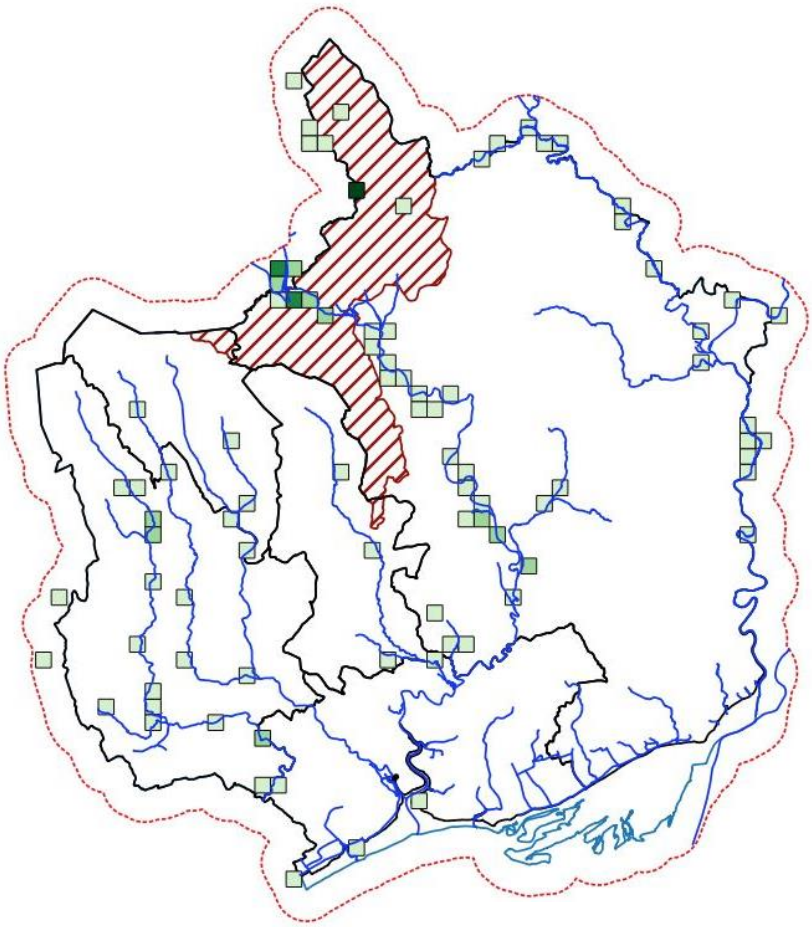
Atlantic Salmon are an important species culturally and economically, but numbers of salmon have fallen dramatically since the 1980s, reducing by more than half over a period of 33 years.[13] This was despite a reduction in salmon exploitation that followed the creation of a large protected zone free from targeted fisheries in the North Atlantic Ocean in 1983. The North Atlantic Salmon Conservation Organization (NASCO) was formed at the same time.

Threats to Atlantic Salmon populations include habitat degradation, pollution, barriers to migration, and diseases (often from farmed salmon). Climate change is also a concern. Salmon are sensitive to changes in water temperatures, and changes also affect their prey sources and timings of migration. Locally, both the Wye and Usk are designated as SACs for their Atlantic Salmon populations. Both have high quality habitat for spawning, with the Wye noted as the most productive salmon river in Wales, historically.[3,4]

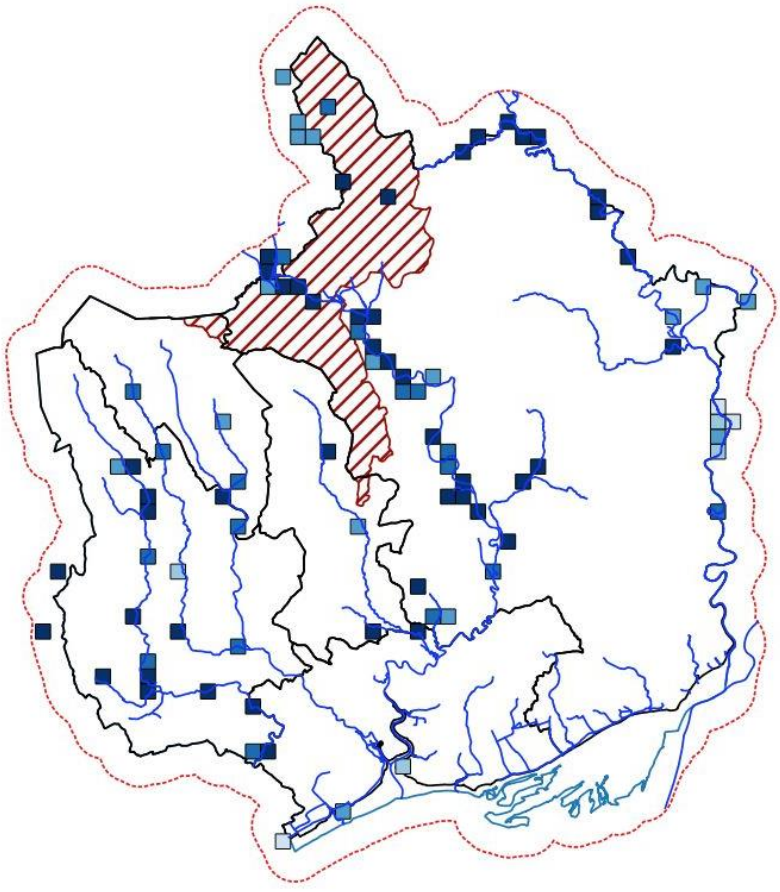
Outlook: Currently, the UK and Welsh populations are still declining.[14,15] There are additional concerns that the population has an abnormal age structure.[14] In Wales, the population is declining at each stage in its lifecycle, from low egg deposition rates and falling numbers of juveniles, to declines in returning adults.[15] Numbers of Salmon in the Usk and Wye vary considerably from year to year, but both are at very low levels following a population crash in 2018 (see below). Estimated egg deposition is currently below the conservation limit for both rivers, with stocks predicted to be 'probably at risk' in five years time. The population is predicted to continue to decline, although there is some uncertainty.[16,17]

Natural Resources Wales has produced a national action plan for Atlantic Salmon and Sea Trout (*Salmo trutta*)[1] which focuses on improving the evidence base, managing exploitation and improving water quality and salmon habitat. Local partners include the Wye Salmon Association and the Wye and Usk Foundation. Significant progress has been made in restoring habitat and removing migration barriers: the Wye and Usk Foundation estimate that they have restored access to over 800km of the Wye and Usk and their tributaries (some of this will be outside of the study area).[18]

Greater Gwent range: Most Greater Gwent records are concentrated along the River Usk, with a recording hotspot on the Grwyne Fawr, a tributary of the Usk. There are also recent records along the Monnow. There are fewer, older records within the Valleys, and surprisingly few records along the Wye. It is possible that there are additional Wye records held by English organisations.

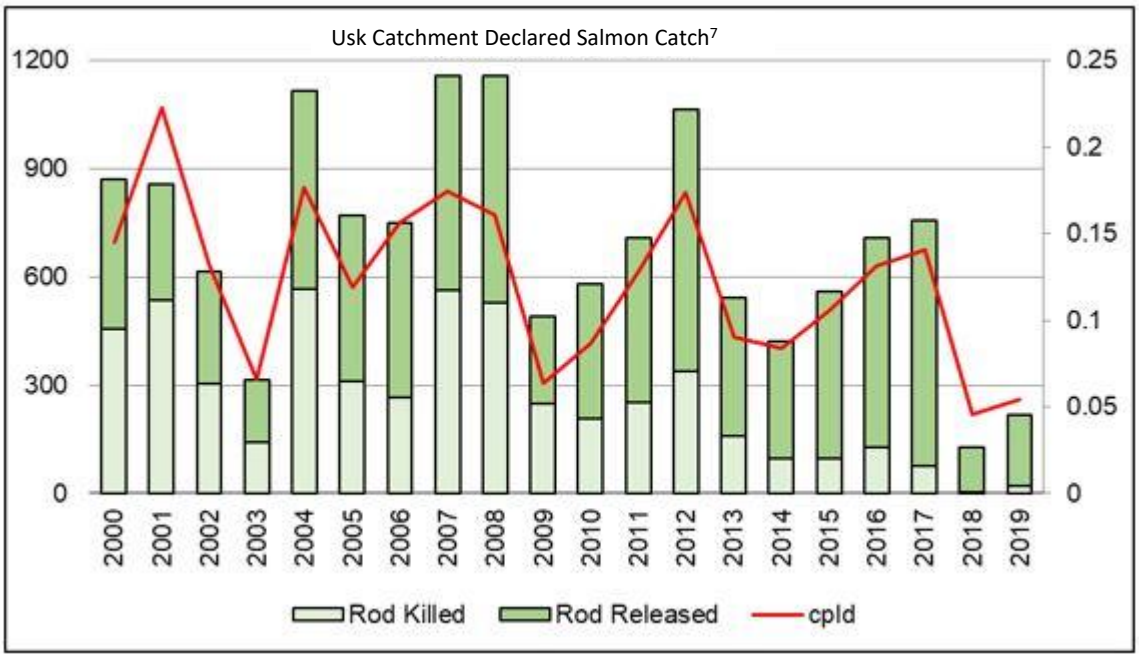


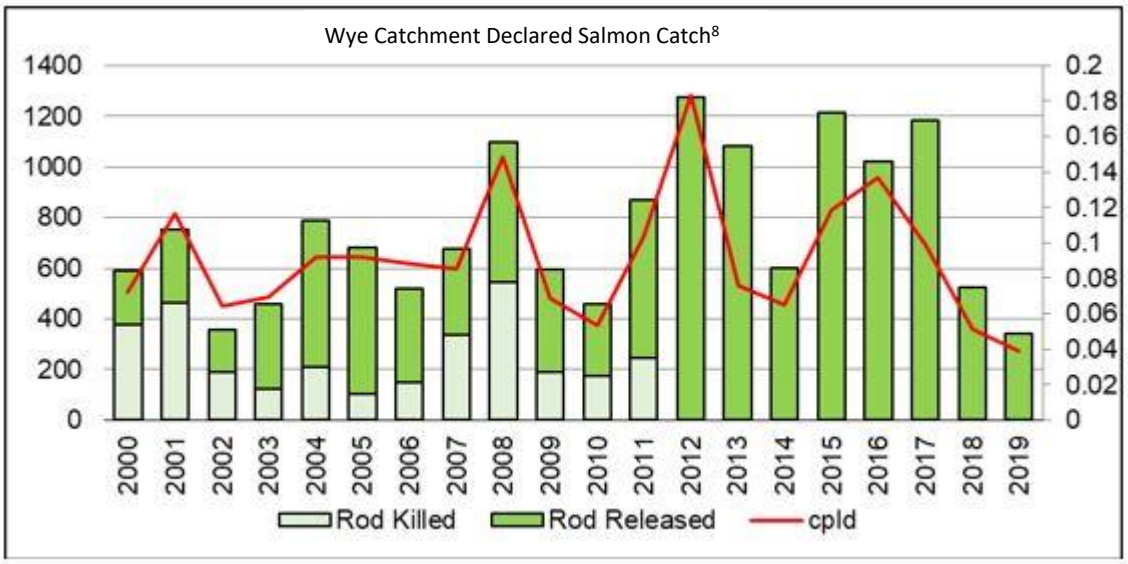
Density of Atlantic Salmon records, maximum 55 records/km^2 (main rivers[12] included for clarity)



Atlantic Salmon records by decade (main rivers[12] shown for clarity)

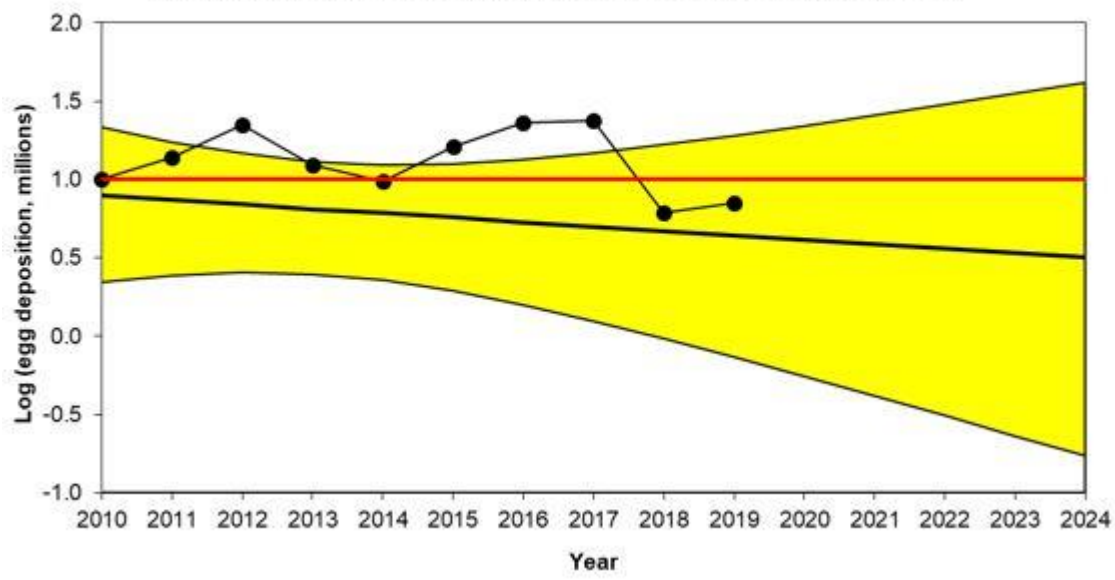
Population trends: Declared catches and the Catch Per Licence Day (CPLD) are available for the Usk and Wye catchments. Both show a large variation between years and a population crash in 2018.[16,17] A byelaw to release all rod-caught salmon was introduced on the Wye in 2012, and this now applies to all rivers in Wales.



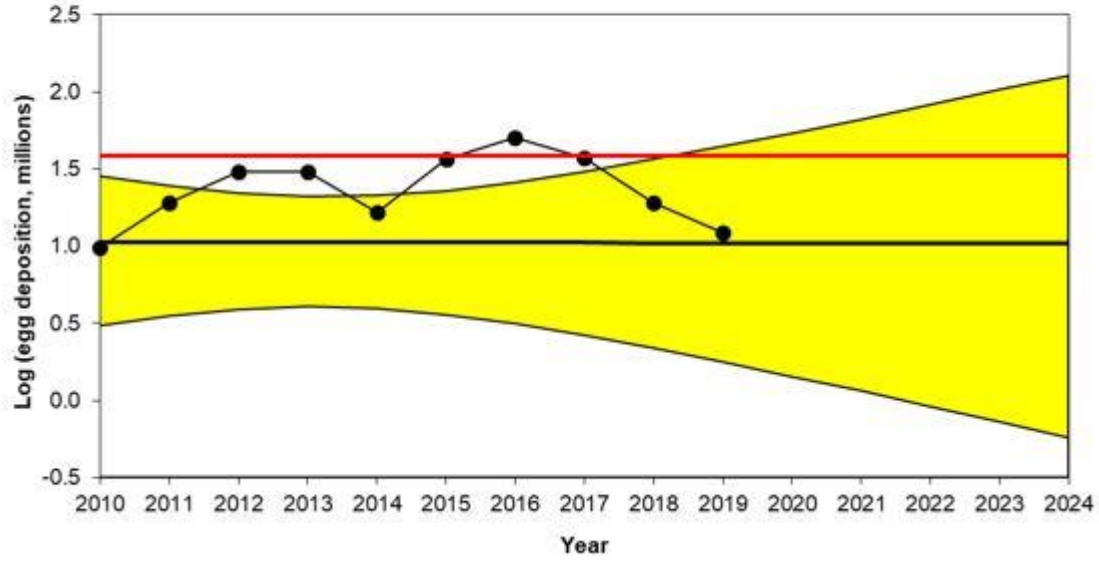


Estimates of egg deposition are also available for the Usk and Wye catchments. These also show the conservation limit, which aims to protect an optimum level of stock, i.e. the number of eggs needed each year in order to conserve salmon stocks for the future. Egg deposition estimates for both rivers are currently below their conservation limits.

River Usk estimates of egg deposition and compliance with conservation limit[17]

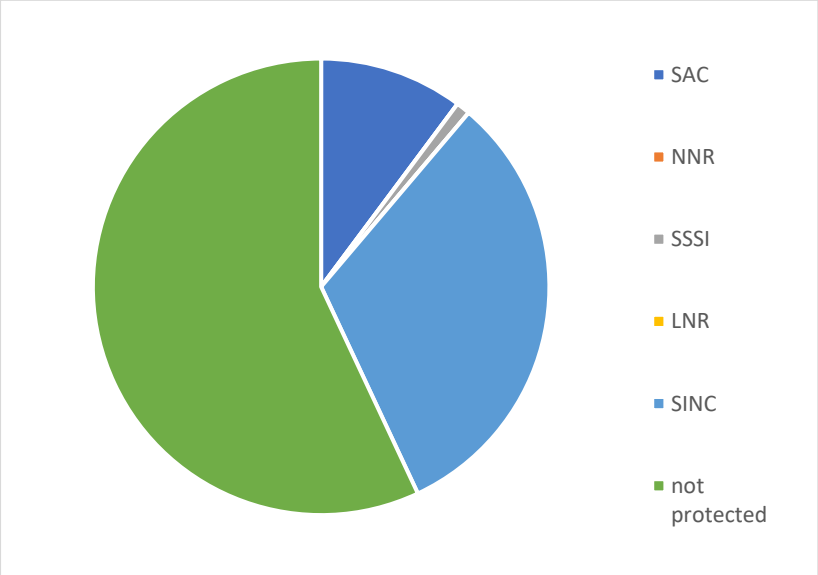


River Wye estimates of egg deposition and compliance with conservation limit[17]



Protection: Just under half (43%) of records come from protected sites, with high numbers of records from the Usk and Wye SACs and the rivers designated as SINCs, such as the Monnow, Trothy, Ebbw, Sirhowy, and Rhymney. The Afon Lwyd is also a SINC with some records, but the designation is currently expressed as a line, rather than a polygon, so records are not picked up in a search. It is likely that most records are within watercourses with some degree of protection, as most main watercourses are designated as SINC or SSSI/SAC. Some records will fall outside of the designated area due to centring of records and the narrow shape of the designated site.

Atlantic Salmon records from protected sites



References

1. Natural Resources Wales. 2020. A Plan of Action for Salmon and Sea Trout in Wales – Tackling the Salmonid Emergency. Natural Resources Wales, Bangor.
2. Gwent Wildlife Trust. 2004. Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership.
3. JNCC. River Usk SAC information. https://sac.jncc.gov.uk/site/UK0013007 (accessed 23/05/2019).
4. JNCC. River Wye SAC information. https://sac.jncc.gov.uk/site/UK0012642 (accessed 23/05/2019).
5. Hayhow DB, Eaton MA, Stanbury AJ, Burns F, Kirby WB, Bailey N, Beckmann B, Bedford J, Boersch-Supan PH, Coomber F, Dennis EB, Dolman SJ, Dunn E, Hall J, Harrower C, Hatfield JH, Hawley J, Haysom K, Hughes J, Johns DG, Mathews F, McQuatters-Gollop A, Noble DG, Outhwaite CL, Pearce-Higgins JW, Pescott OL, Powney GD and Symes N. 2019. The State of Nature 2019. The State of Nature partnership.
6. Pike C, Crook V and Gollock M. 2020. Anguilla anguilla. The IUCN Red List of Threatened Species 2020: e.T60344A152845178. https://dx.doi.org/10.2305/IUCN.UK.2020–2.RLTS.T60344A152845178.en. (accessed 11/05/2021).
7. ICES. 2020. Joint EIFAAC/ICES/GFCM working group on eels (WGEEL). ICES scientific reports. 2:85. http://doi.org/10.17895/ices.pub.5982.
8. Henderson PA, Plenty SJ, Newton LC and Bird DJ. 2011. Evidence for a Population Collapse of European Eel (Anguilla Anguilla) in the Bristol Channel. Journal of the Marine Biological Association of the United Kingdom 2012 92(4): 843–851. doi:10.1017/S002531541100124X.
9. DEFRA. 2010. Eel Management Plan for the Severn River Basin District. DEFRA, London
10. DEFRA. 2015. Report to the European Commission in line with Article 9 of the Eel Regulation 1100/2007 – Implementation of UK Eel Management Plans. DEFRA, London.
11. Eels in the classroom. SEWRT: https://sewrt.org.uk/eels-in-the-classroom/ (accessed 31/05/21).
12. Data from Lle.gov.uk Main Rivers Dataset - Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.
13. NASCO. 2019. State of North Atlantic Salmon. NASCO, Edinburgh.
14. JNCC. 2019. Article 17 Conservation Assessment for the Species S1106 Atlantic Salmon (Salmo salar) United Kingdom. JNCC, Peterborough.
15. JNCC. 2019. Article 17 Supporting Documentation for the Conservation Assessment for the Species S1106 Atlantic Salmon (Salmo salar) Wales. JNCC, Peterborough.
16. Natural Resources Wales. 2019. Know your River - Usk Salmon & Sea Trout Catchment Summary. Natural Resources Wales, Bangor.
17. Natural Resources Wales. 2019. Know your River - Wye Salmon & Sea Trout Catchment Summary. Natural Resources Wales, Bangor.
18. Access for Migrating Fish. The Wye and Usk Foundation. https://www.wyeuskfoundation.org/access (accessed 28/05/21).
19. Data from Lle.gov.uk Water Framework Directive (WFD) River and Transitional Water bodies Cycle 2. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.

Butterflies and Moths

There are 56 species of butterfly in Britain and Ireland,[1] and over 2,500 species of moth,[2] 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.[2] 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.[3] 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.[4]

Both butterflies and moths have undergone long term declines, and the abundance of larger moths has fallen by a third since 1968.[5] The UK butterfly indicators for habitat specialists and wider countryside have fallen by 45% and 25% respectively since the mid 1970s.[6] Of those species where a long-term trend could be calculated, 41% of moths[5] and 57% of butterflies[6] have declined in abundance. Causes of decline are complex and interactive, and include changes in land use, pollution and artificial lighting.[5] 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.[6]

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.[7] 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.[8] 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.[9] 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.[10] The Monmouthshire Moth and Butterfly Group (MMBG) was founded in 1999 (originally as the Newport Moth Recording Group) and is still active[11]; it publishes a regular newsletter, *The Silurian*. Recording is highest in Monmouthshire, but Newport also has a high number of records, especially

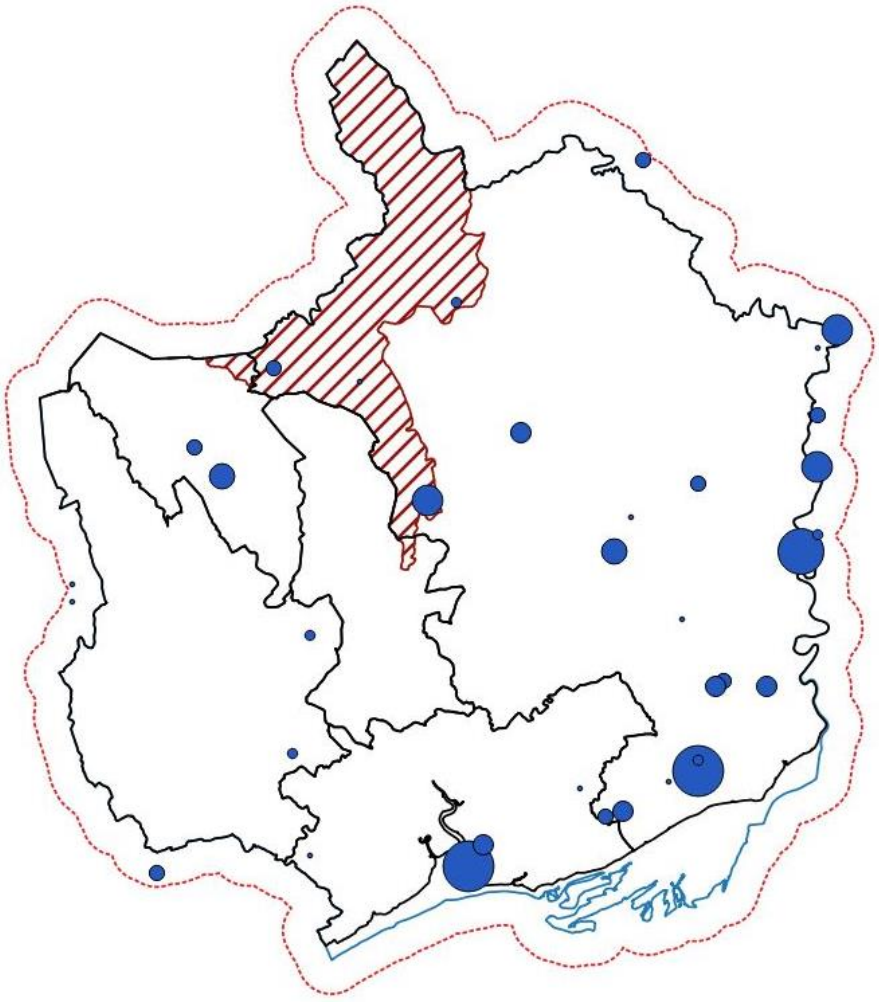
considering its size and large areas of urban habitat. Recording is lower in the north and west of Gwent, possibly due to the difficulties of recording in the uplands.

Records distribution by local authority (to Dec 2020)[12]

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

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*).[13]

UK BMS locations within the study area, size relative to number of years of data (1 to 10 years)[13]



Forester *Adscita statices* (Linnaeus, 1758)

Andy Karran

Protection: None

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

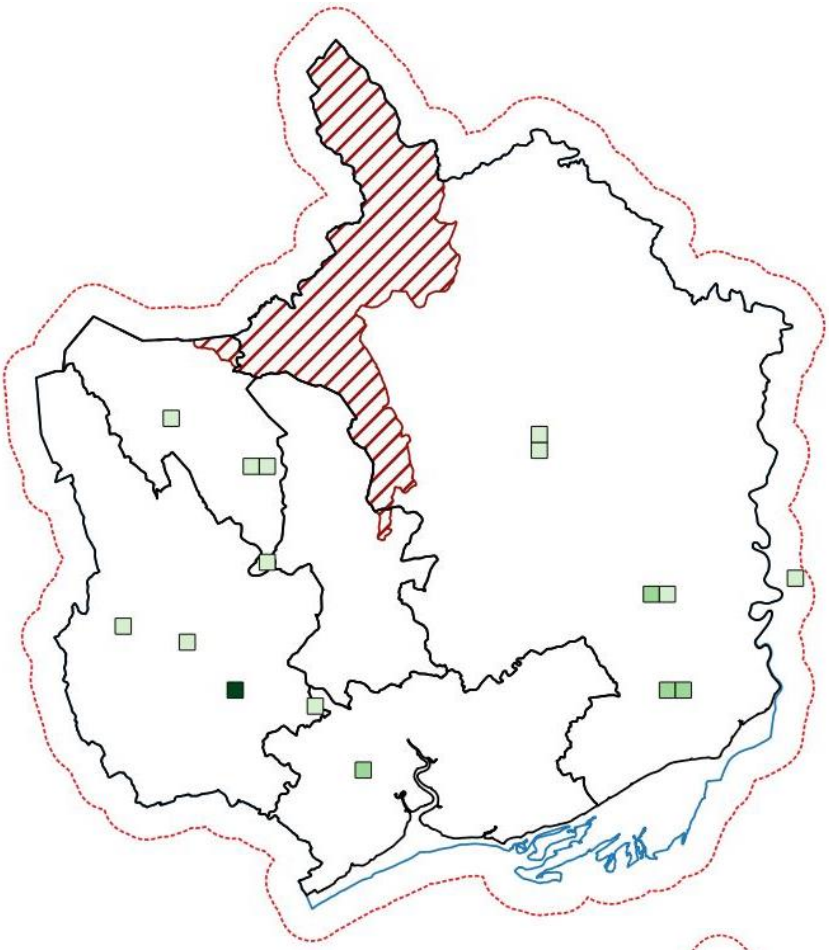
Data availability: Poor (39 records)

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 Sorrel (*Rumex acetosa*) or Sheep's Sorrel (*R. acetosella*).[14] 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.[15]

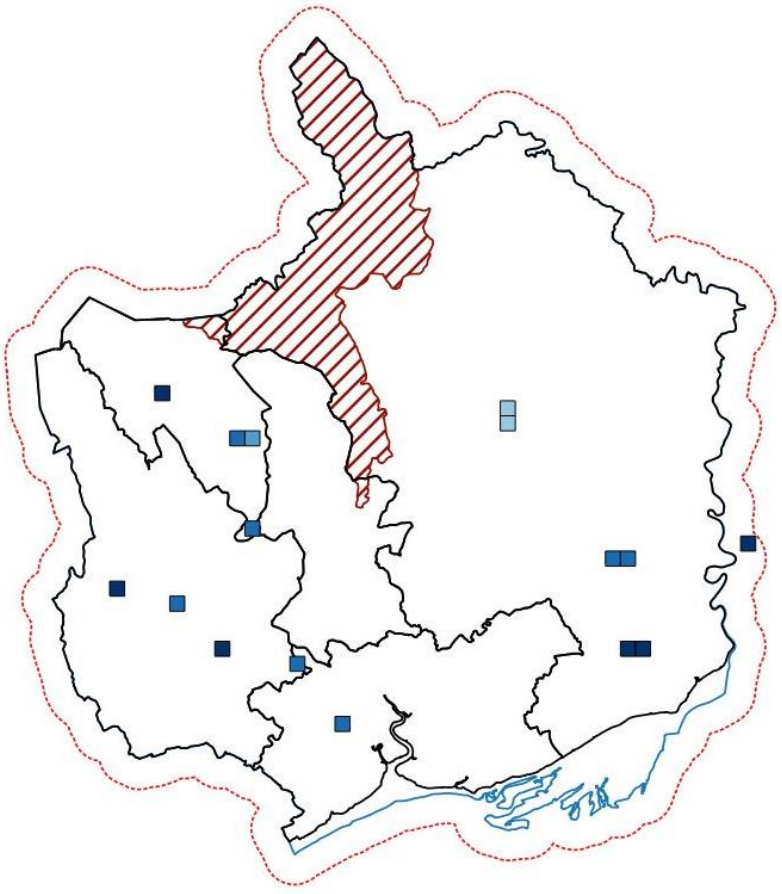
Outlook: What is happening to Forester populations is unclear, both within Greater Gwent and at the UK level. It has to be assumed that the trend that led to their allocation as a priority species is continuing. New information may come from the new National Moth Recording Scheme,[16] launched in 2007.

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,[17] 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.[18]

Density of Forester records (maximum 9 records/km^2)



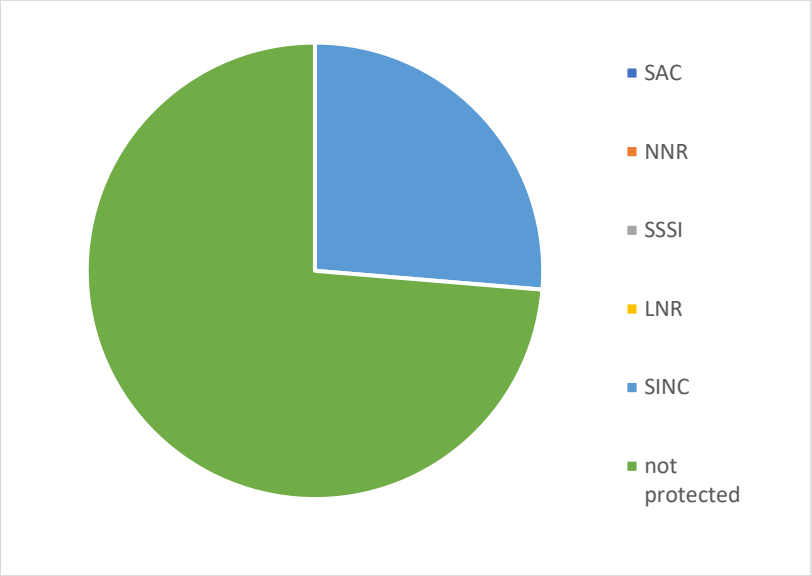
Forester records by decade



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.

Forester records from protected sites



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

Martin Anthoney

Protection: None

Conservation status: Red Data Book (RDB) Nationally Scarce,[19] UKBAP Priority Species, Wales Section 7 List

Data availability: Poor (11 records)

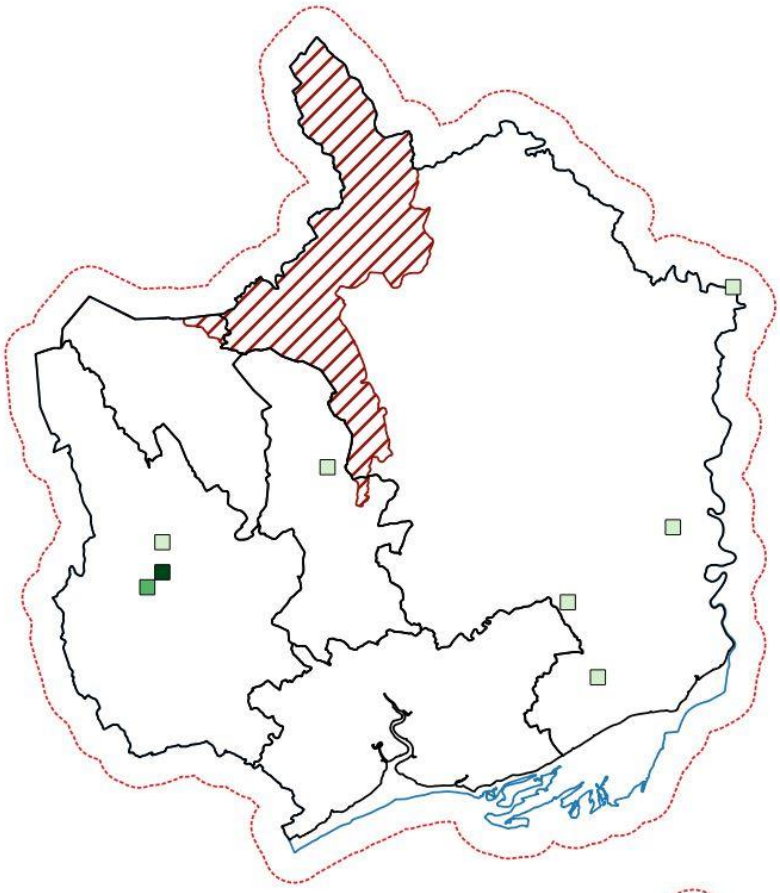
Context: The White-Spotted Sable is a day-flying moth found in woodland glades and rough grassland, particularly on limestone. It is reliant on Goldenrod (*Solidago* sp.) and occasionally Dyers Greenweed (*Genista tinctoria*).[19] The White-Spotted Sable has an extremely limited and localised distribution 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.[20]

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.[19] Generally, the local populations of species with low abundance and limited distribution are more vulnerable to extinction.[21]

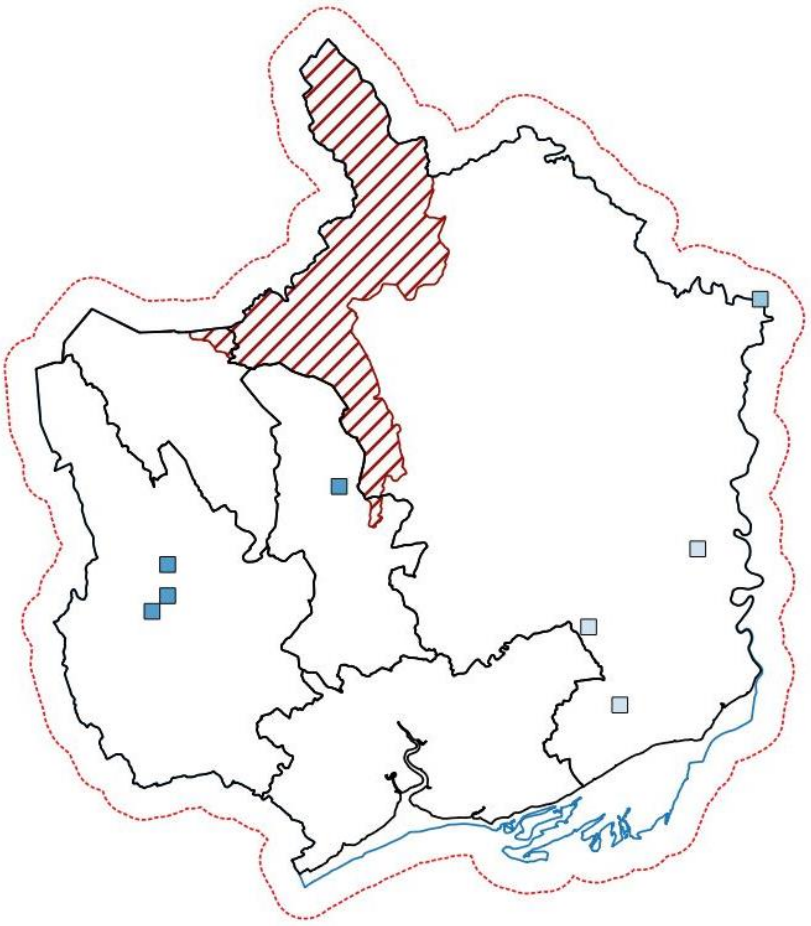
If the species remains in Greater Gwent, it may already be too late to maintain the population. Interventions to support the White-Spotted Sable could include woodland and grassland management to encourage the foodplants, as well as increased survey efforts.

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.[18] However, there have been no recent records.

Density of White-Spotted Sable records (maximum 3 records/km^2)



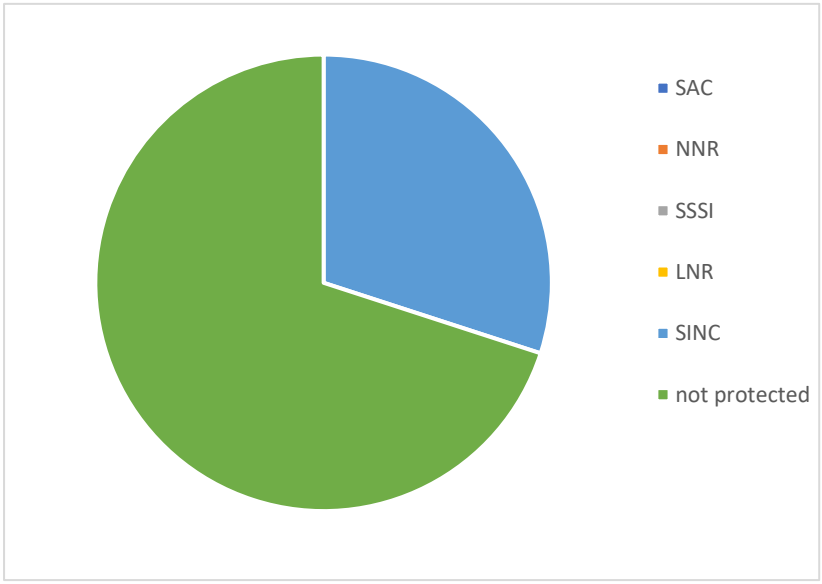
White-Spotted Sable records by decade



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)

Andy Karran

Protection: None

Conservation Status: NEAR THREATENED (UK),[22] UKBAP Priority Species, Wales Section 7 Priority Species

Data availability: Moderate (489 records)

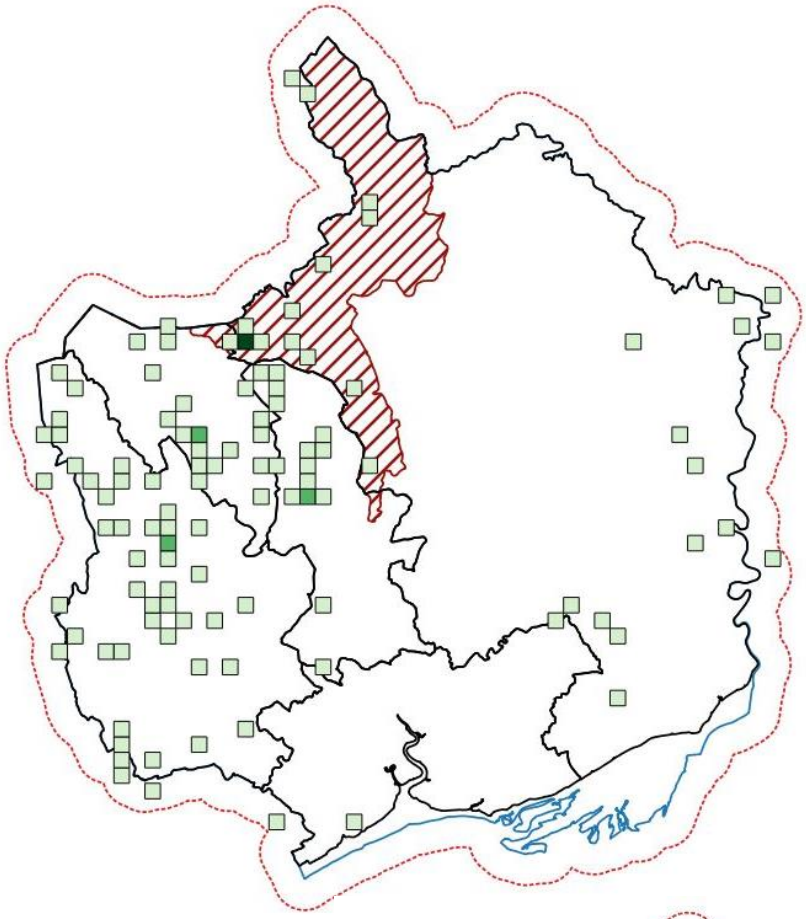
Context: The Small Pearl-Bordered Fritillary has undergone a severe long-term decline. It has lost 76% of its range and 58% of its abundance since 1976[6] and is close to being classified as Vulnerable.[22] Small Pearl-Bordered Fritillaries are found in a range of habitats, including grassland and moorland flushes, and mosaic habitats of grassland, bracken and scrub.[23] 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*).[24]

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.[24] Although the status of the Greater Gwent population is not clear, its presence on sites already managed for biodiversity is reassuring.

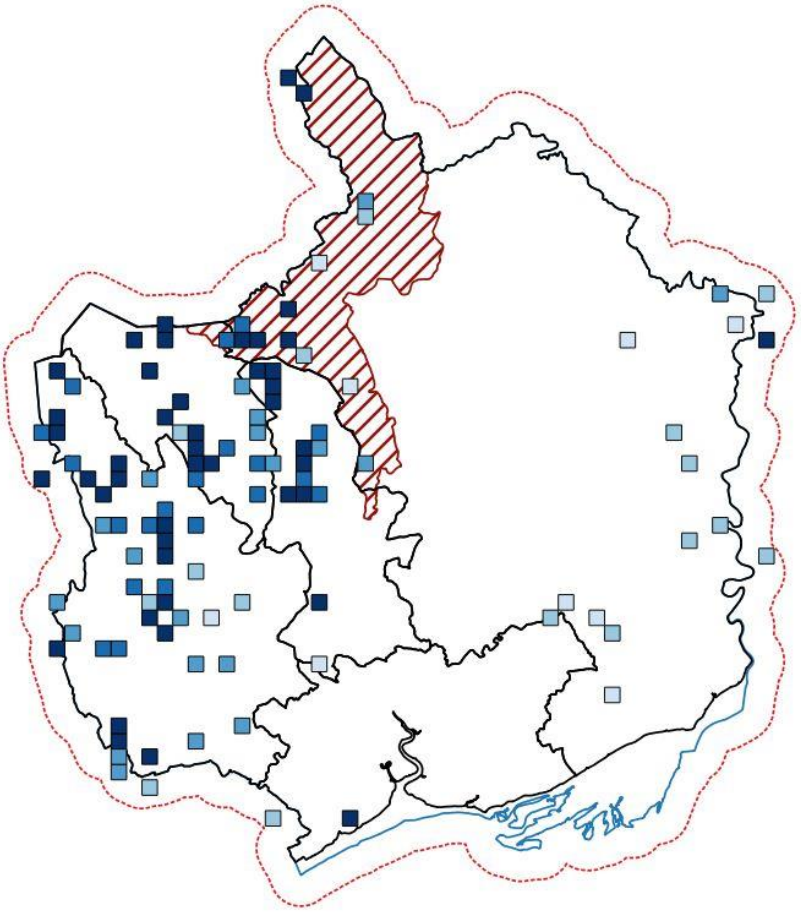
Greater Gwent range: Small Pearl-Bordered Fritillaries are found mostly in the north and west of Greater Gwent, on upland fringe (ffridd) and grassland sites. Hotspots for records occur at Silent Valley and Blackrock, which are both UKBMS sites, as well as Aberbargoed Grasslands and Blaenserchan.

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.[18]

Density of Small Pearl-Bordered Fritillary records, (maximum 87 records/km^2)



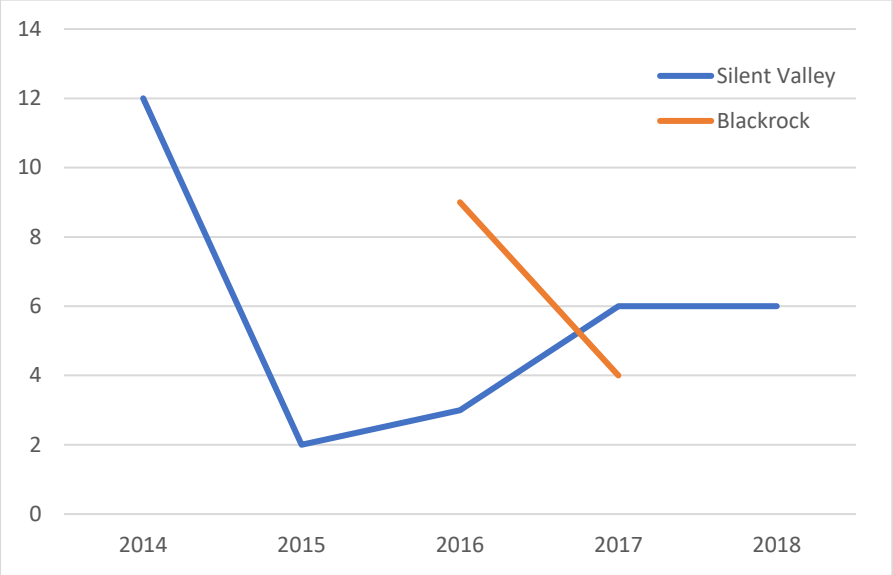
Small Pearl-Bordered Fritillary records by decade



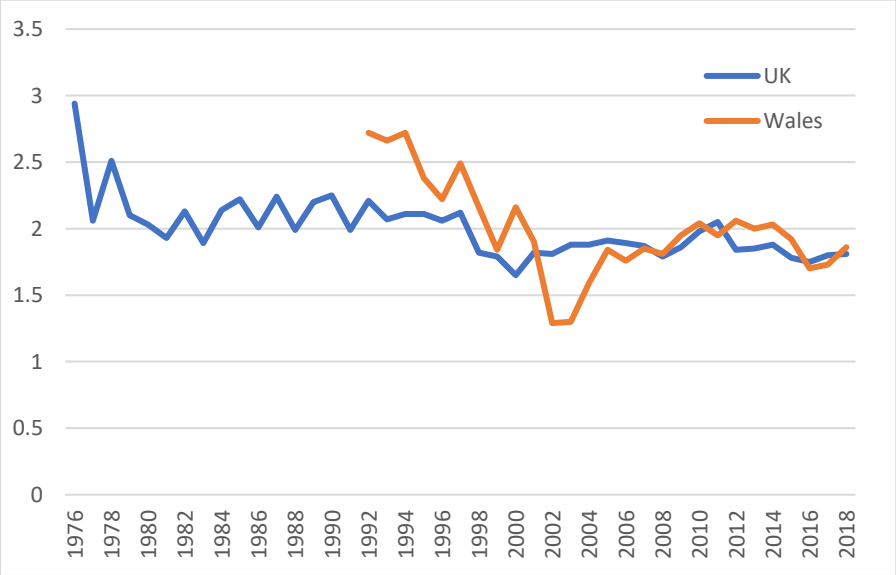
Population trends: Small Pearl-Bordered Fritillaries have been recorded at two UKBMS locations within Greater Gwent: Black Rock and Silent Valley.[13] Peak counts for each year are shown below, but the recording period is not long enough to determine a trend, nor are the two sites representative of the 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.[25] 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[13]

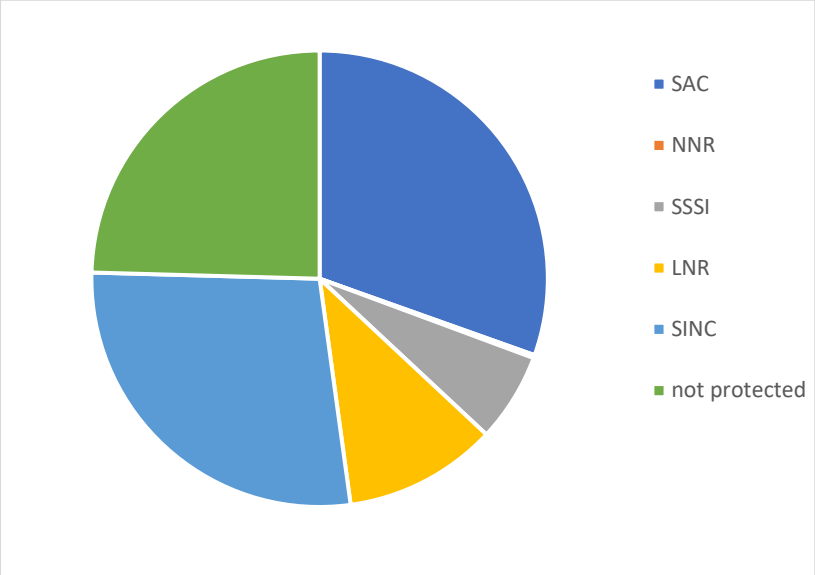


Collated indices for Small Pearl-Bordered Fritillary for the UK and Wales[25]



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



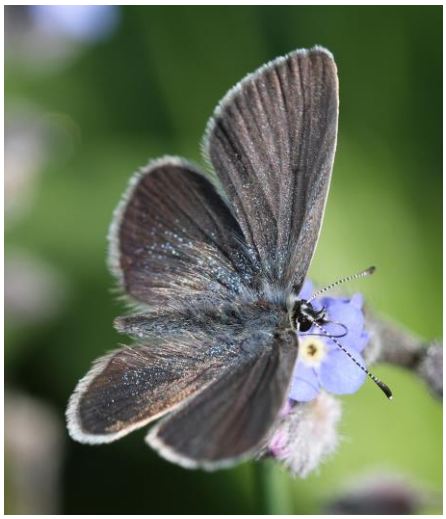
Small Blue *Cupido minimus* (Fuessly, 1775)

Protection: None

Conservation status: NEAR THREATENED (UK),[22] 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.[26] The Small Blue has lost 44% of its range since 1976, and 27% in abundance in the period 2005 to 2014.[6] In Wales, its distribution is largely limited to the southern coast.

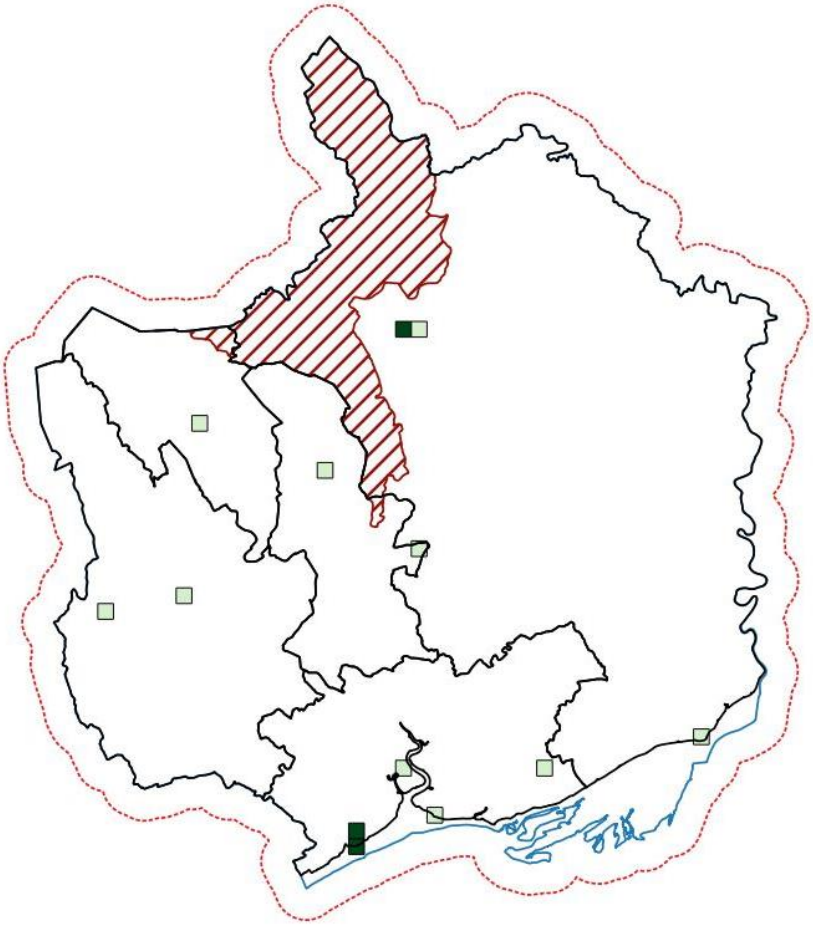


Andy Karran

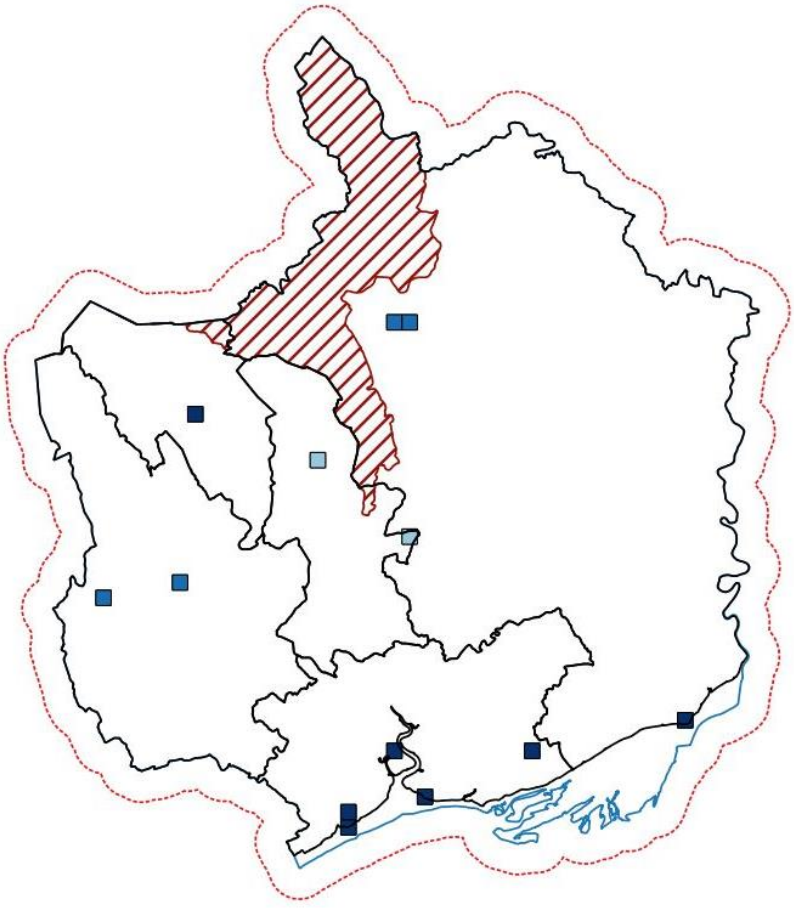
Outlook: Currently the UK population is predicted to remain in decline, although the species is responsive to conservation efforts, such as site management and Kidney Vetch planting, and can quickly colonise new sites.[27] The Pollinating the Levels project[28] (part of the Living Levels scheme) on the 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.

Density of Small Blue records (maximum 2 records/km^2)

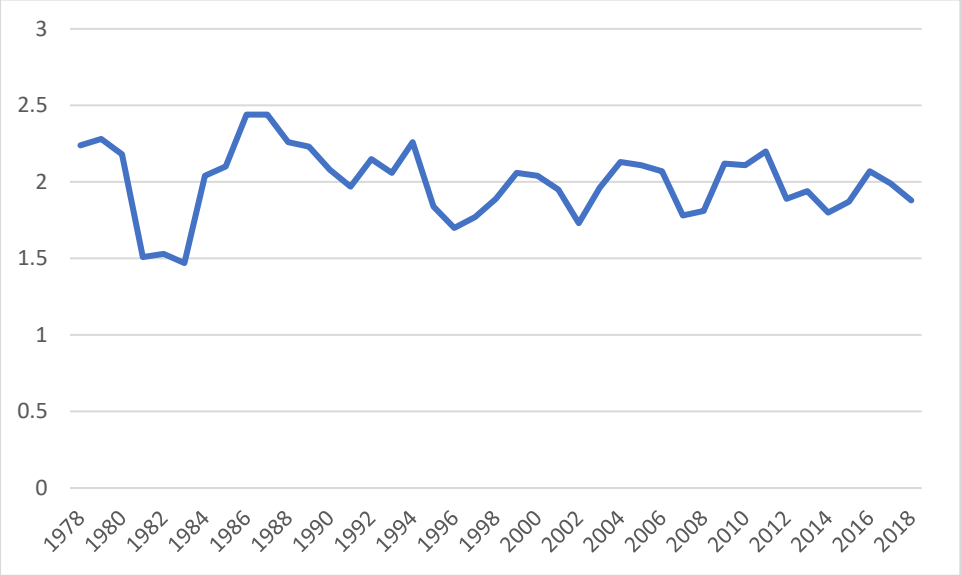


Small Blue records by decade



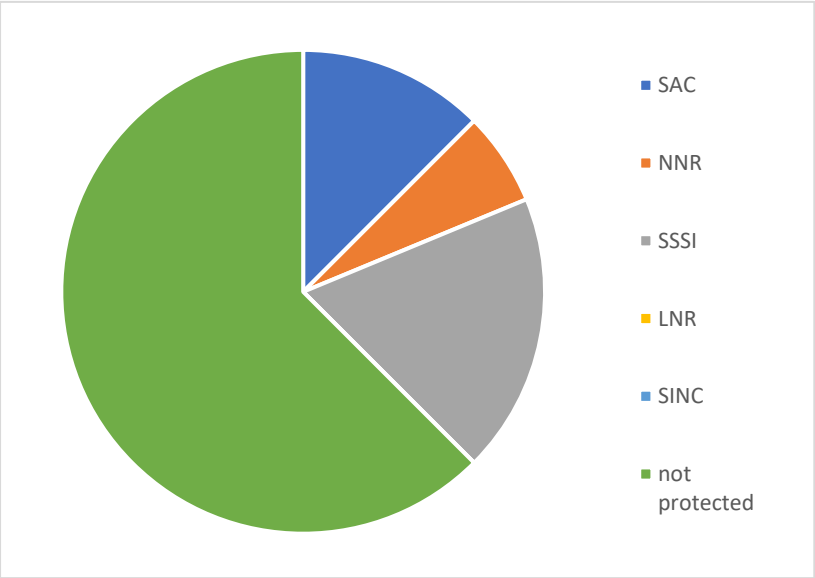
Population trends: The Small Blue has not been recorded at any UKBMS sites within the study area. The UK collated index is shown below; the Small Blue has not been recorded from enough sites in Wales to produce an index.

UKBMS collated index for Small Blue, across the UK[25]



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)

Martin Anthoney

Protection: None

Conservation status: VULNERABLE (Red Data Book category 2),[29] 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.[30] A second population was discovered on Hatterall Ridge in 2005, providing the first English records for the species.[31] To date, there are four known populations, three of which are in the study area.[32]

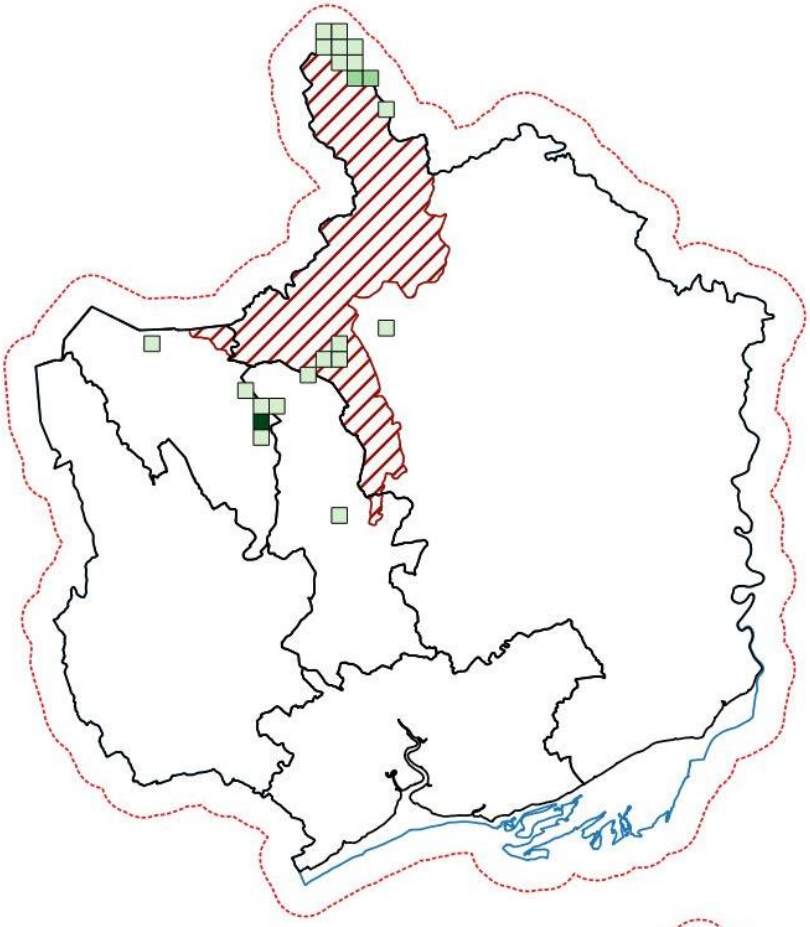
Little is known about Silurian ecology. So far, populations have been found at high altitude, at least 450m above sea level, with larvae feeding on bilberry, and sometimes heath bedstraw.[32] The presence of deep moss is thought to be important.[31] Females very rarely come to light, and males can travel several kilometres from breeding grounds, making breeding areas difficult to locate.[32] 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.[33] 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.[32] A further unknown is how well the species might respond to conservation efforts, and how readily it colonises (or recolonises) new areas.[32]

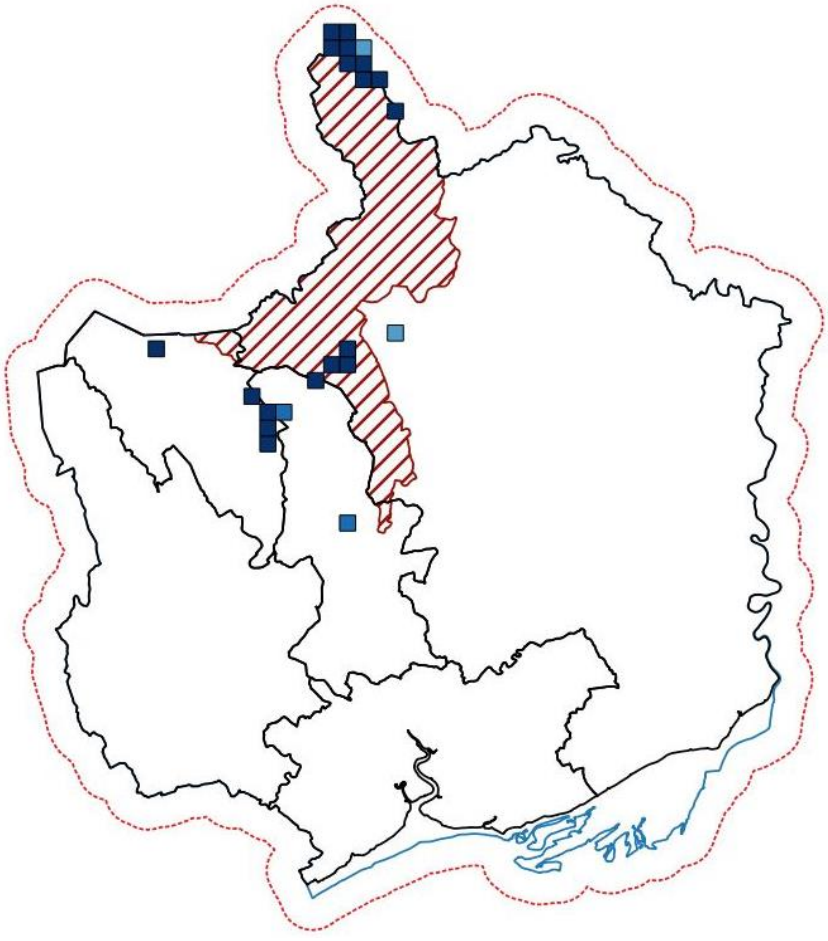
Greater Gwent range: The Silurian is found in the uplands of Blaenau Gwent, Torfaen and Monmouthshire. The recording hotspot is at Coity Mountain/ Blaentillery, where the species was first discovered, with separate populations at Hatterall Ridge on the Herefordshire border, and on the Blorenge. The fourth population lies just outside the study area at Darren Lwyd.[32] 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.[32]

Density of Silurian records, (maximum 113 records/km^2)

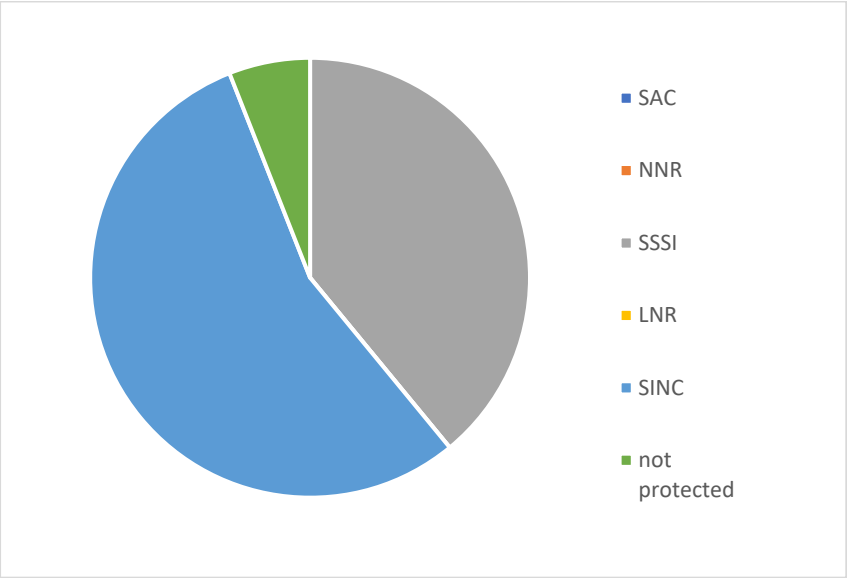


Silurian records by decade



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.

Silurian records from protected sites



Dingy Skipper *Erynnis tages* (Linnaeus, 1758)

Martin Anthoney

Protection: None

Conservation status: UK BAP Priority Species, Environment (Wales) Act Section 7 Species, Red List: VULNERABLE[22]

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.[34]

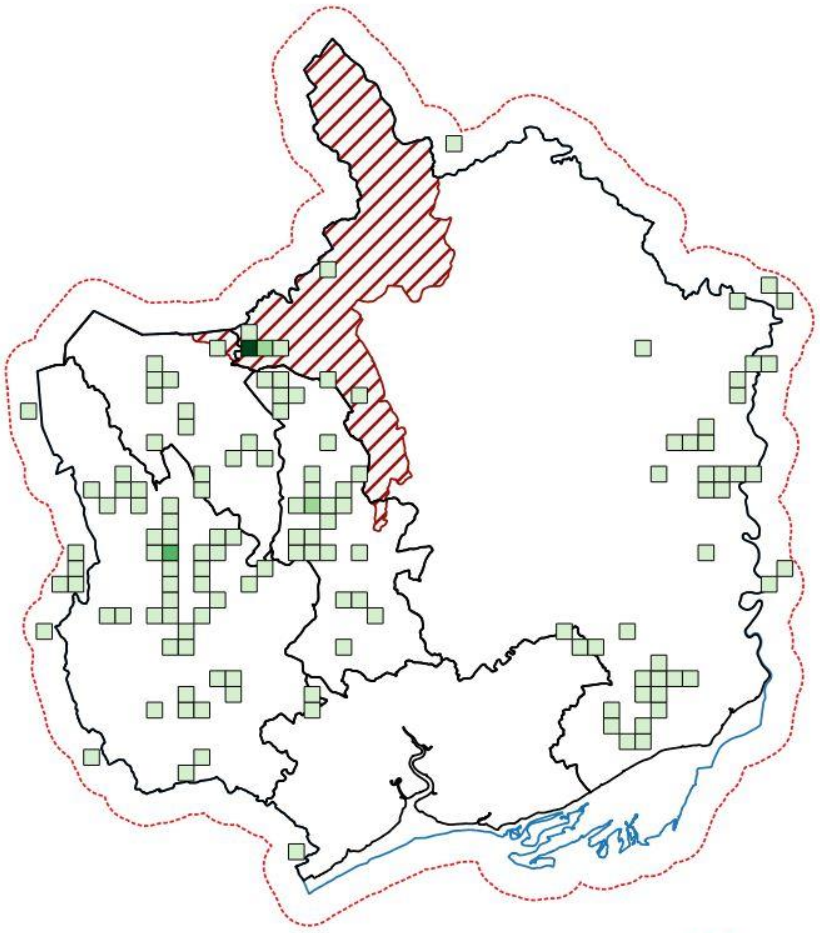
Dingy Skippers have suffered dramatic declines of over 60% since the 1970s, although there are recent signs of population and range growth from 2005 to 2014.[6] Recovery is likely to be slow, as Dingy Skippers generally occur in small colonies of up to 50 individuals and have poor dispersal, which limits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

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[35] 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'.

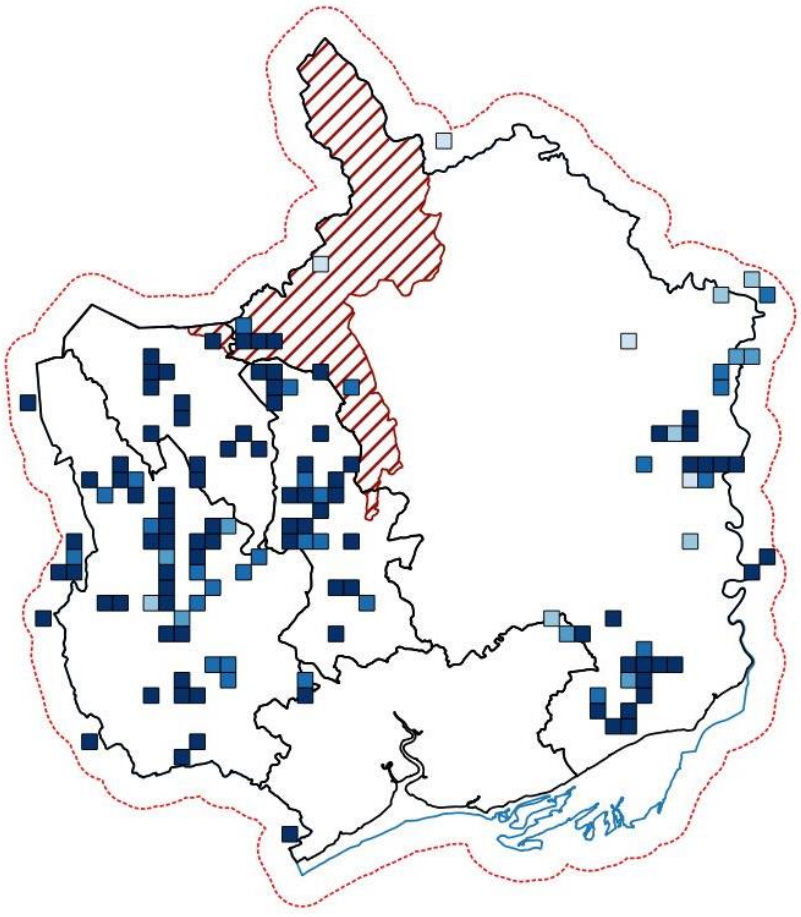
Greater Gwent range: Dingy Skippers are found across the upland areas of Greater Gwent, with isolated populations in the south and west of Monmouthshire. There are no records from Newport and central Monmouthshire, even though there are likely to be suitable habitats, such as urban brownfield sites.

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.

Density of Dingy Skipper records (maximum 97 records/km^2)

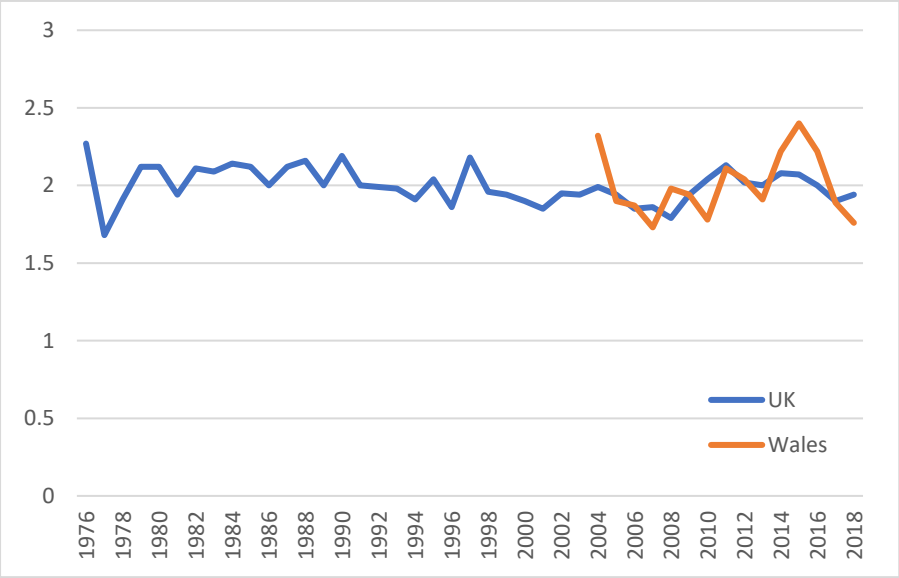


Dingy Skipper records by decade



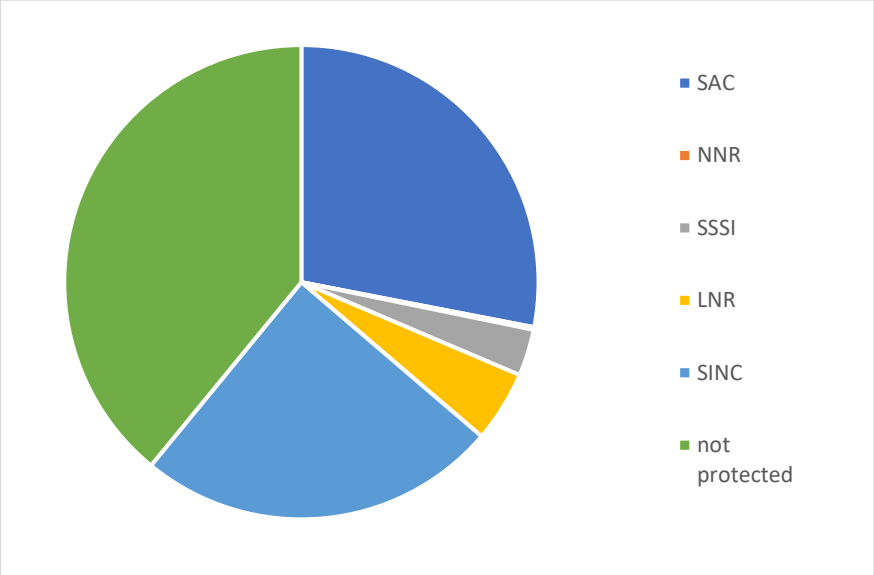
Population trends: Dingy Skippers are not covered very well by UKBMS within the study area, having only been recorded at four UKBMS sites, two of which are in England.[13] Numbers recorded at Blackrock appear to be positive, with a maximum count of 15 individuals in 2017, but there is not enough data to produce a local trend.[13] 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[25]



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)

Andy Karran

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

Conservation status: VULNERABLE (UK),[22] 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.[36] The population has undergone significant declines of 79% between 1976 and 2014,[6] 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.[37]

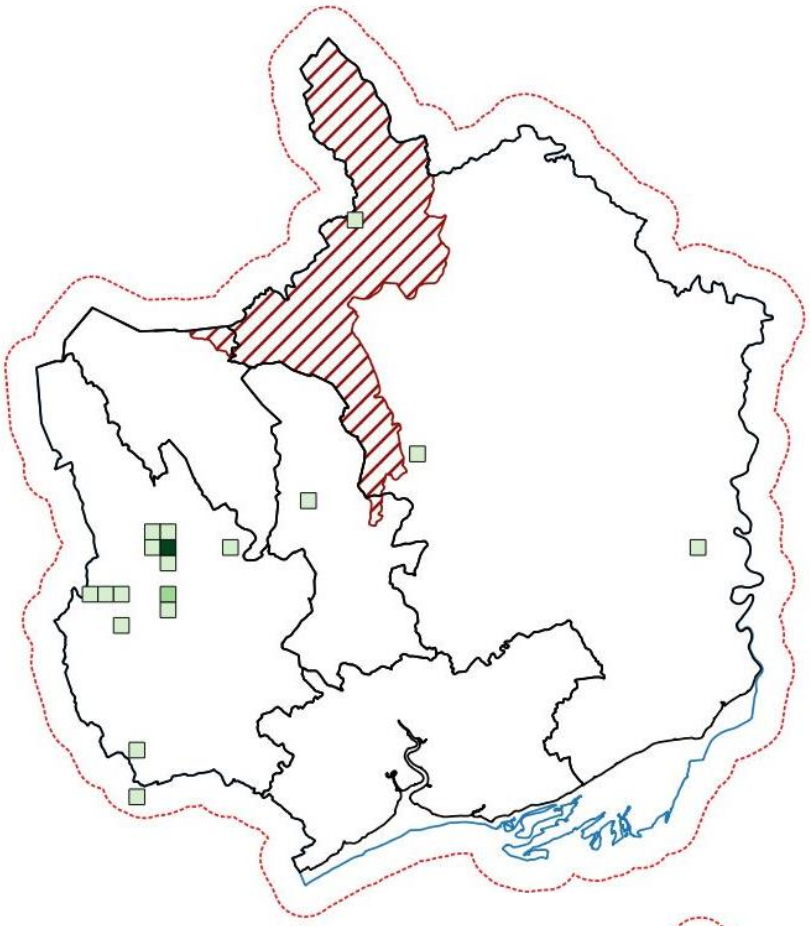
Outlook: The short-term UK trend (2005–2014) for Marsh Fritillary was a decline in both occurrence (22%) and abundance (64%).[6] Although the latest UK Article 17 report states that the range and population are in Favourable condition, habitat, future prospects and overall assessment were Unfavourable.[38]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

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'.[40]

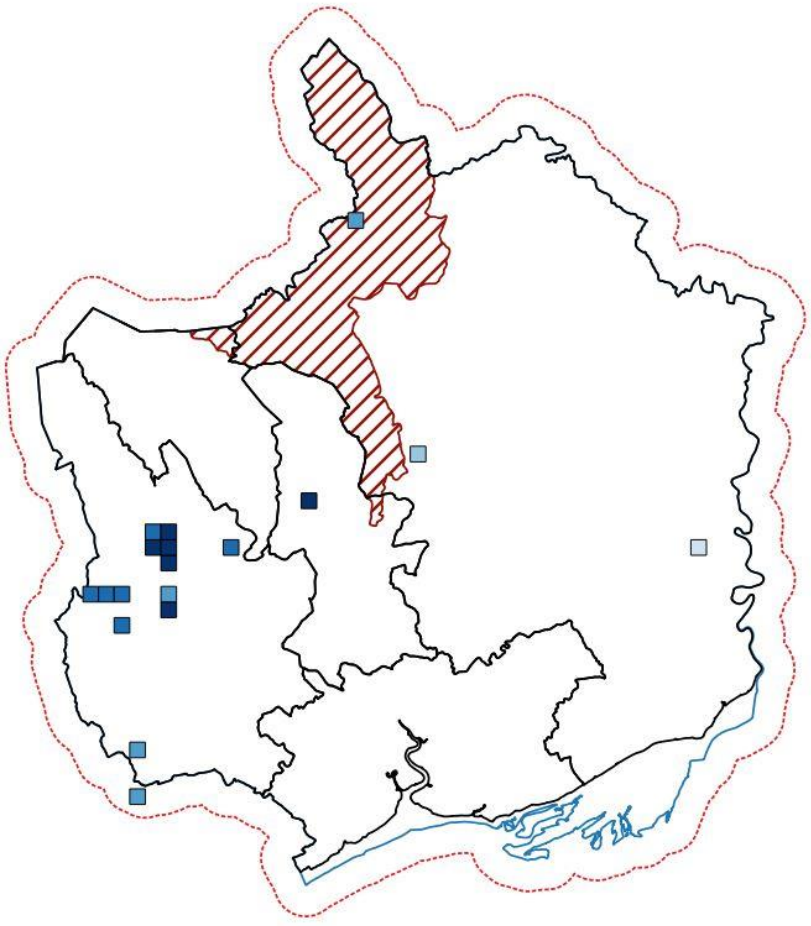
The species is closely monitored across Wales, and new sites are still being found,[39] showing that the species can colonise new sites with suitable habitat in favourable conditions. They have been reintroduced to sites in England, and there is a planned reintroduction to Llantrisant Common in Wales.[41] 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.[42]

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.



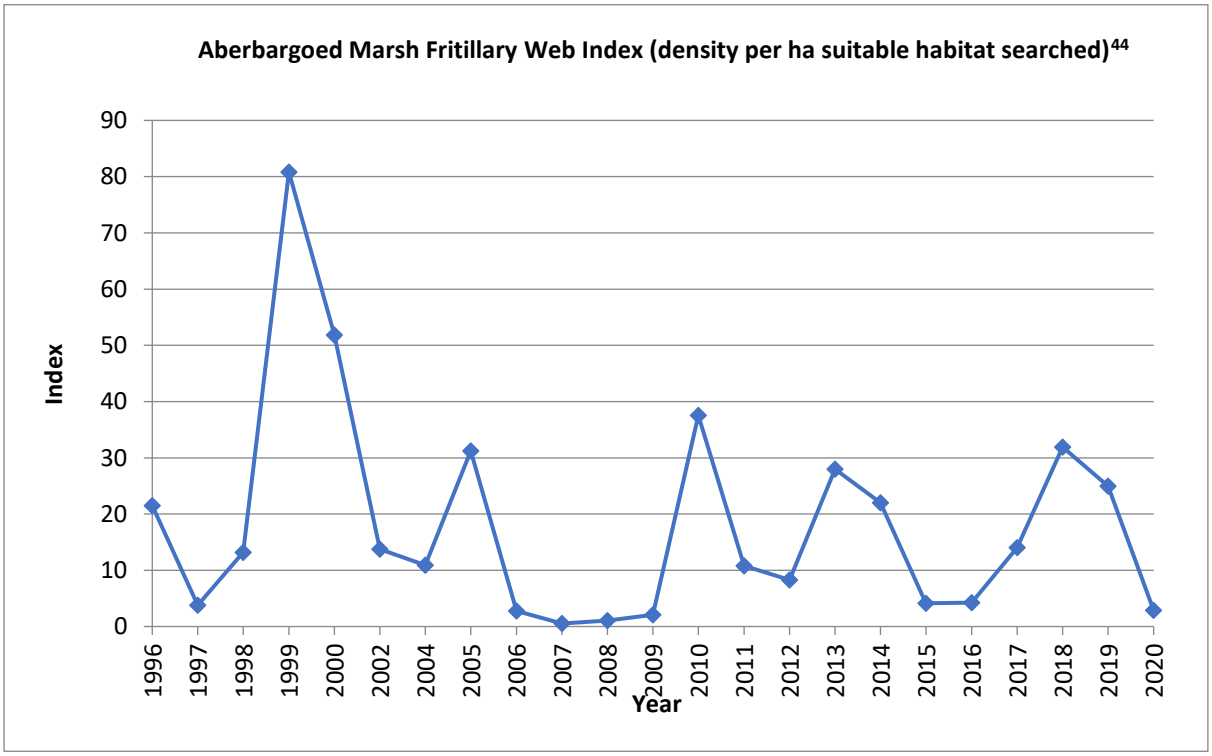
Density of Marsh Fritillary records (maximum 131 records/km^2)

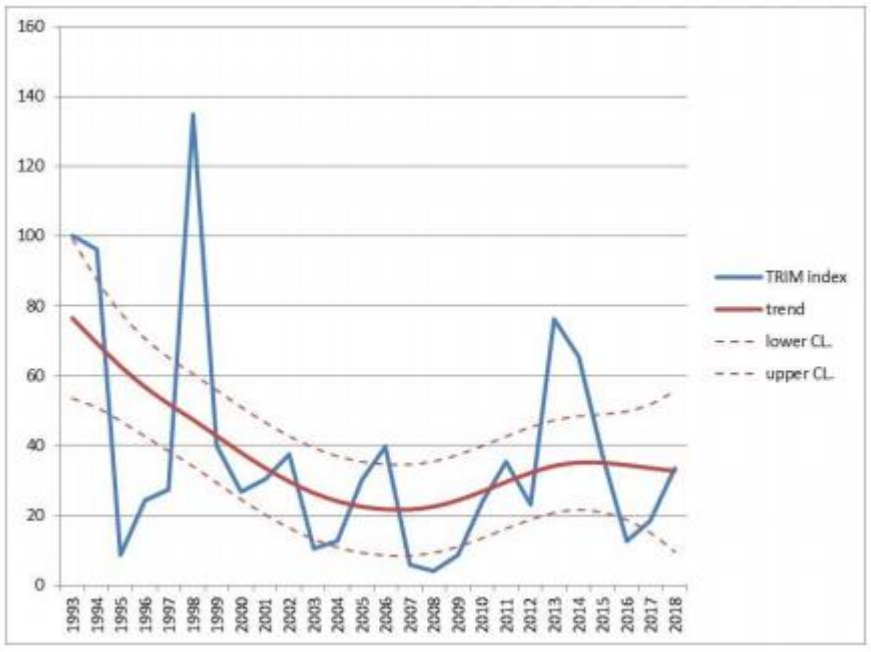


Marsh Fritillary records by decade

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.[39] 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.[43] 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.[39] The UK and Welsh trends derived from UKBMS transects follow a similar pattern.[21]

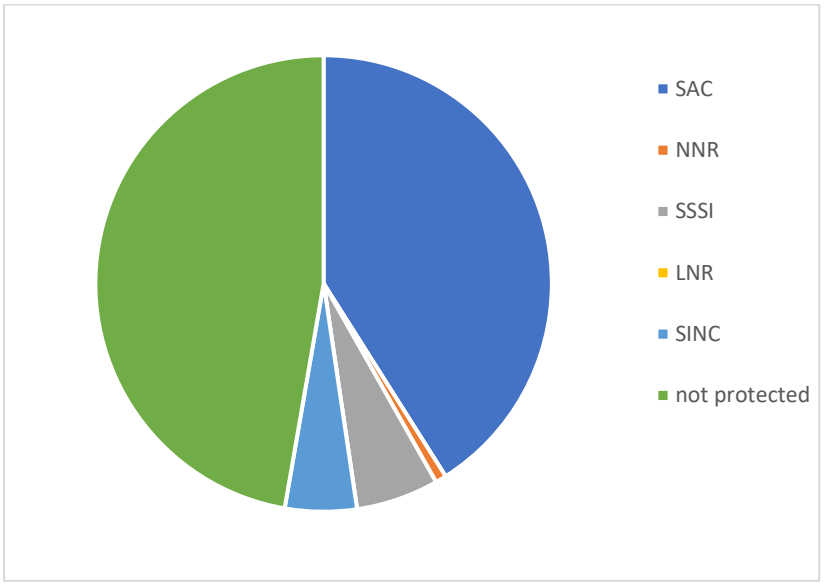




Larval web trend for Wales 1993–2018 showing TRIM and TrendSpotter outputs[39]

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)

Andy Karran

Protection: None

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

Red List: VULNERABLE[22]

Data availability: Moderate (335 records)

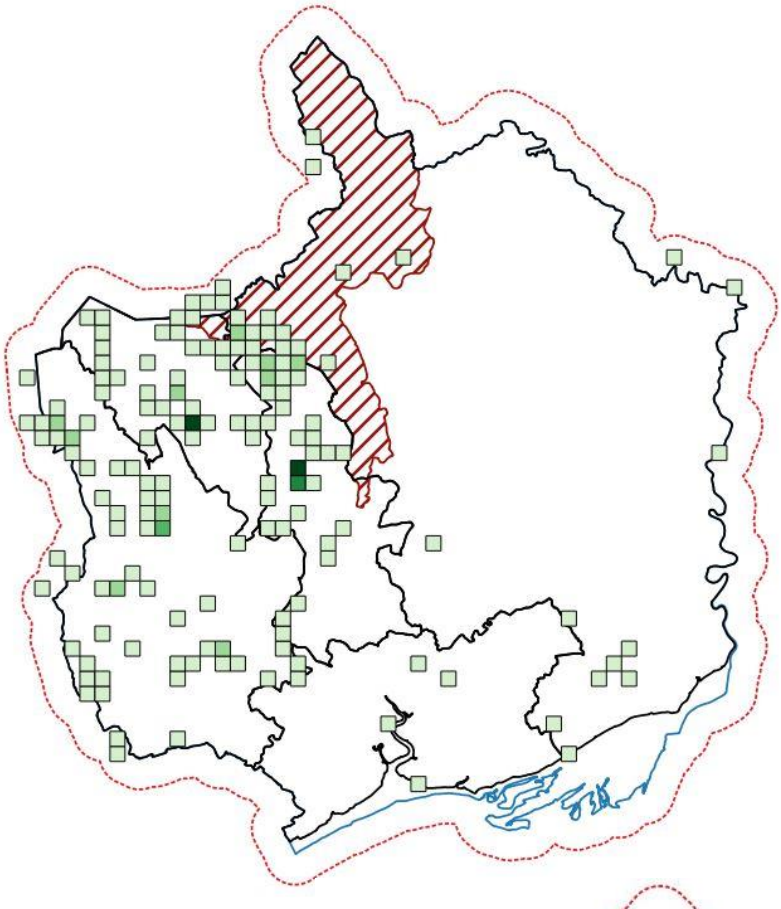
Context: A highly cryptic species, Graylings are found in open habitats with bare ground, such as coastal areas, lowland heath, and brownfield sites such as quarries. In Greater Gwent, they are often found on coal spoil sites. Their main foodplants are grasses, including Sheep's Fescue, Red Fescue, Bristle Bent and Early Hair-Grass,[45] and they often use large rocks for shelter and for warming in the sun.[46] They have undergone a significant population decline of 30–49% from 1995 to 2010,[22] with a decrease in the area of occurrence of 62% from 1976 to 2014.[6] The reasons for decline are not fully understood, although changes in land use are a possible factor.[47]

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.[46]

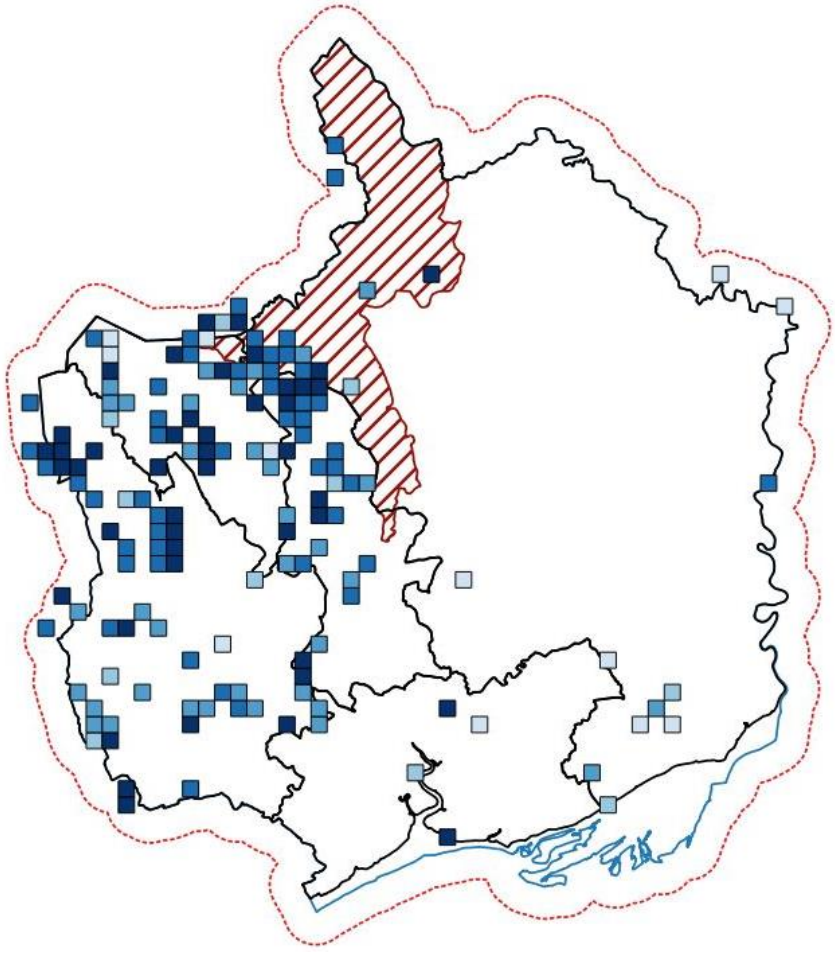
Greater Gwent range: Graylings are mostly found in the north-west of Greater Gwent, with concentrations of records in the uplands, associated with coal spoil sites. Greater Gwent is unlike most of the UK, where the population is distributed along the coast. This is likely due to the nature of the coast 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^2)

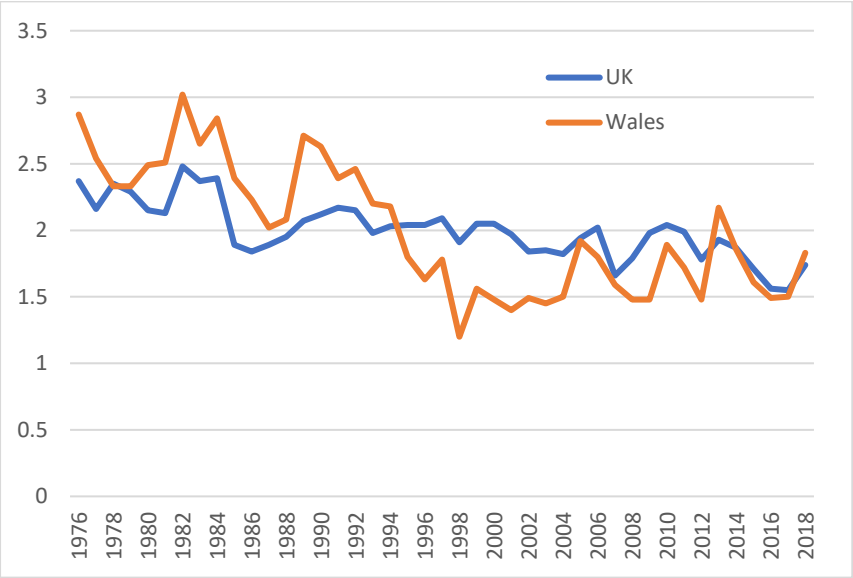


Grayling records by decade



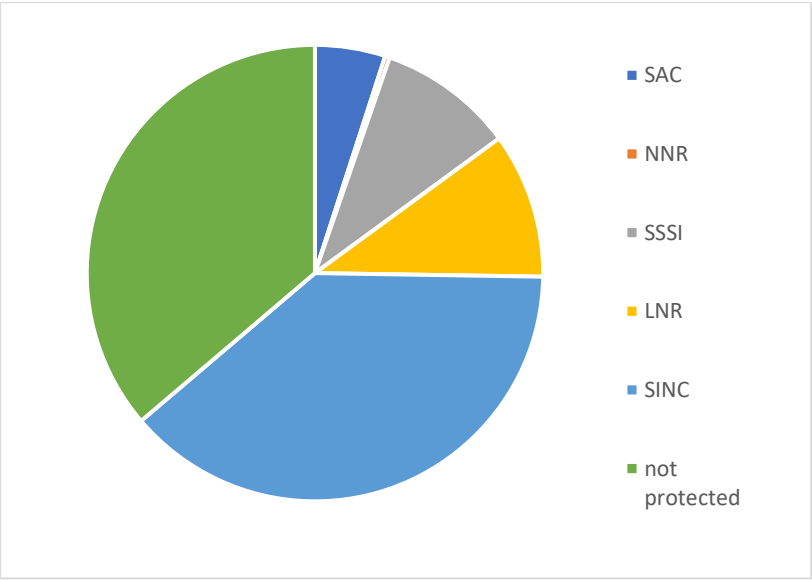
Population trends: UKBMS has records for Grayling at four sites: Clytha, Silent Valley, Blackrock Quarry and Central Valley (Ebbw Vale), but these do not have enough data to produce a regional trend. Only Silent Valley has more than two years of data, with peak counts of five in 2014 and 2015, and three in 2016 to 2018.[13] 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[21]



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)

Andy Karran

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

Conservation status: ENDANGERED[22] (UK) UK BAP Priority Species, Environment (Wales) Act Section 7 Species.

Data availability: Poor (115 records)

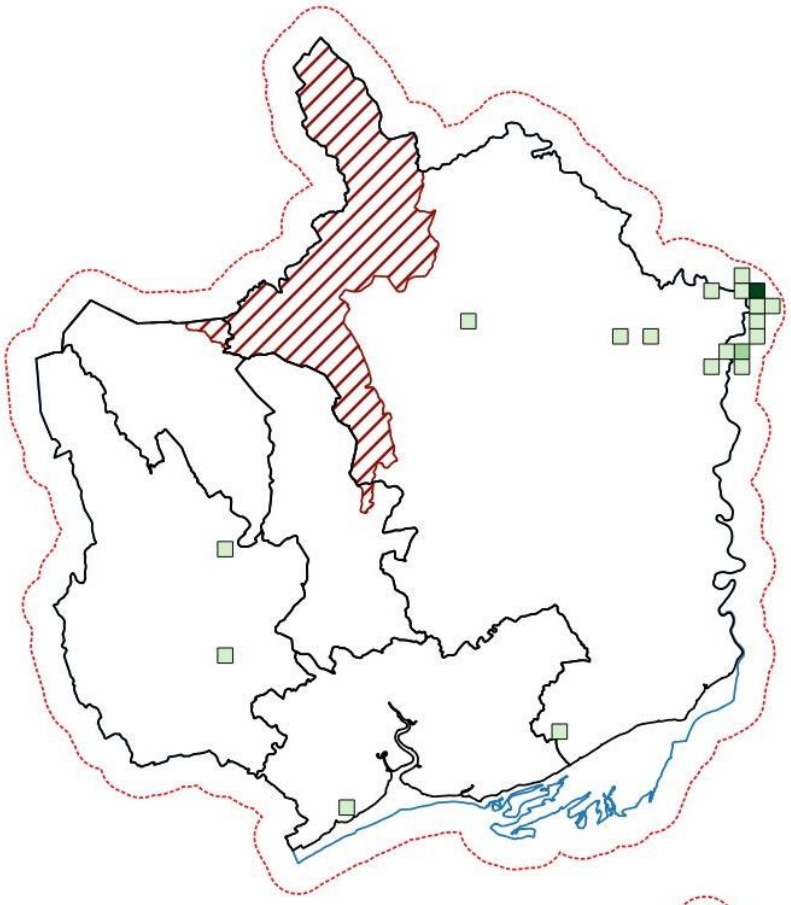
Context: The Wood White is a dainty butterfly found in woodland rides and clearings, as well as hedgerows and scrub mosaic. The larval foodplants are legumes, including Meadow Vetchling (*Lathyrus pratensis*) and Birds-Foot Trefoil (*Lotus corniculatus*).[48] Wood Whites have undergone declines of almost 90% since the 1970s,[6] 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.[48]

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

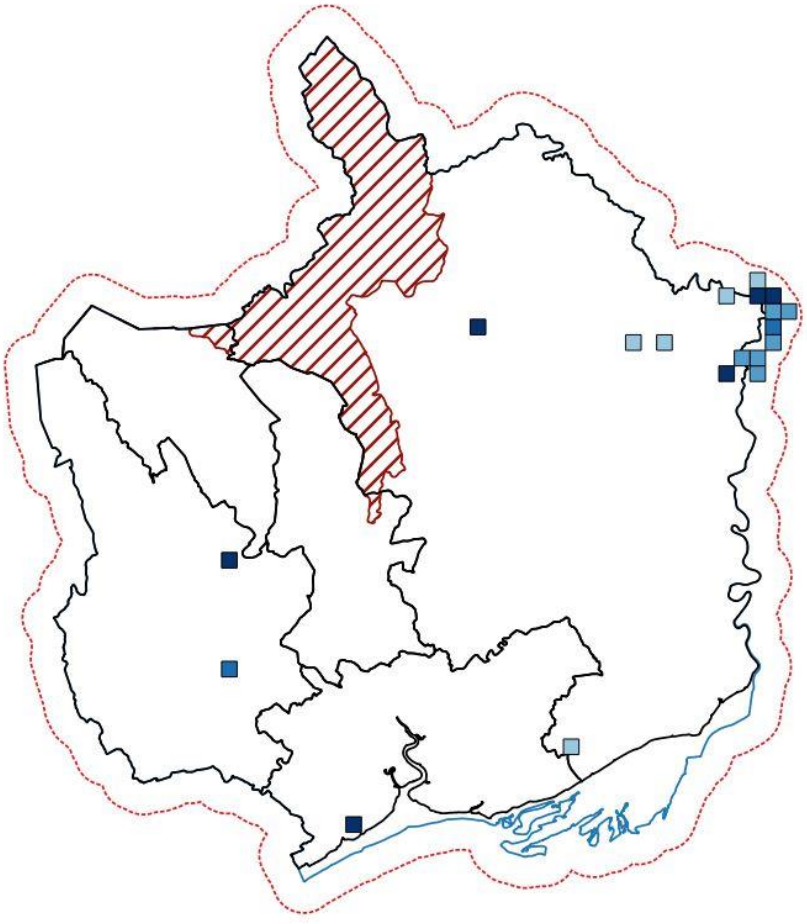
Greater Gwent range: Greater Gwent is at the very edge of the Wood White range. Most records come from Herefordshire, in the Doward area. There is a UKBMS site at Lord's Wood in Herefordshire, which has a high number of records. Away from this population, other records are likely to be windblown individuals 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.[18]

Density of Wood White records, (maximum 33 records/km^2)

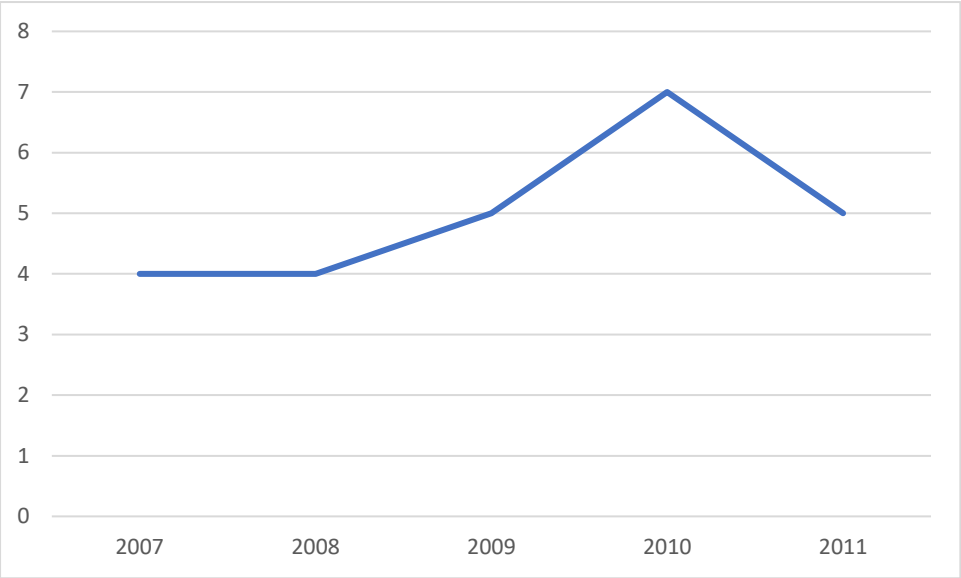


Wood White records by decade

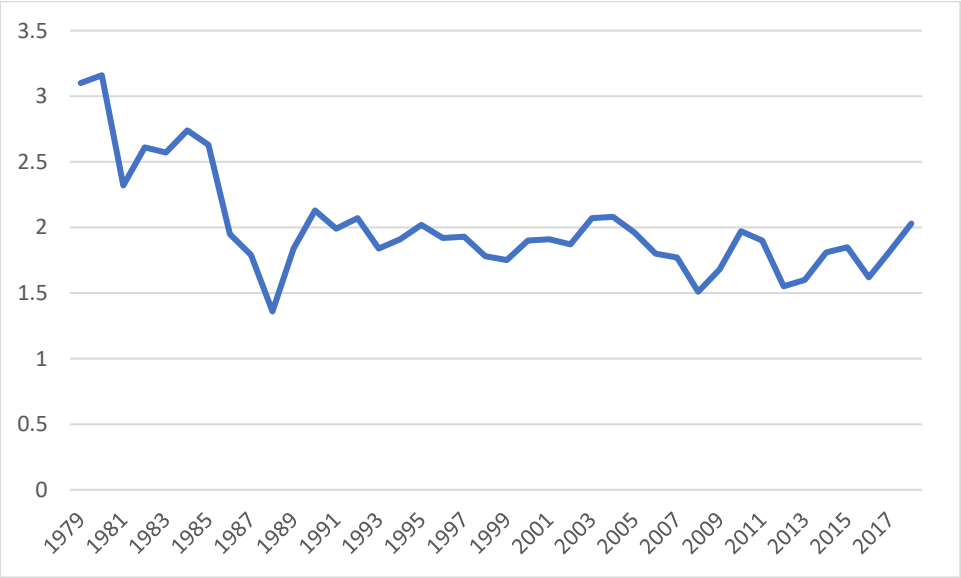


Population trends: Peak counts from the UKBMS transect at Lords Wood show a stable population, or even a possible increase. However, this dataset should be treated with caution due to the relatively short timeframe and the lack of records from 2011 onwards.[13] The UK population trends show severe, ongoing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

Peak Counts of Wood White from UKBMS transect at Lords Wood[13]



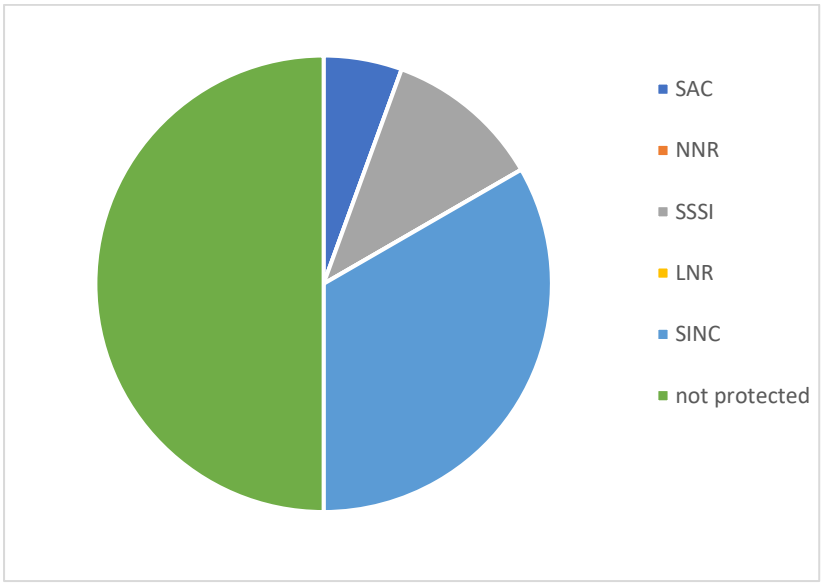
UKBMS collated indices for Wood White in the UK[25]



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)

Pete Hadfield

Protection: None

Conservation status: VULNERABLE[22] (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.[51] 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.[6]

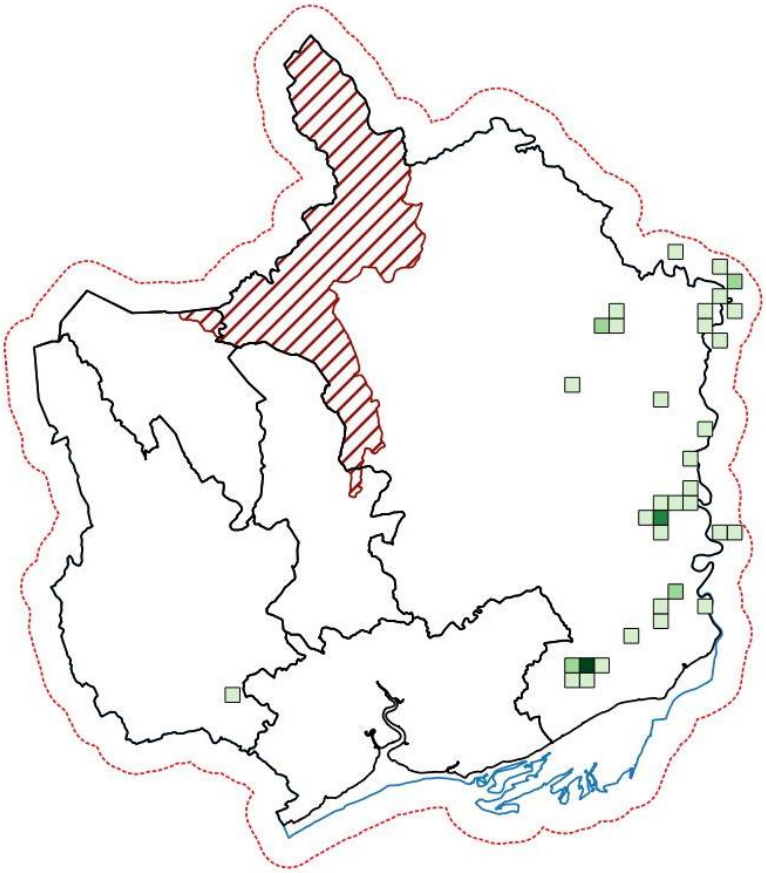
Outlook: The UK population is predicted to continue to decline. Although climate change might lead to the expectation that the White Admiral would expand its range northwards, it is now thought that the response to climate change is more complicated than previously thought. The White Admiral is now predicted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

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.[18] 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.

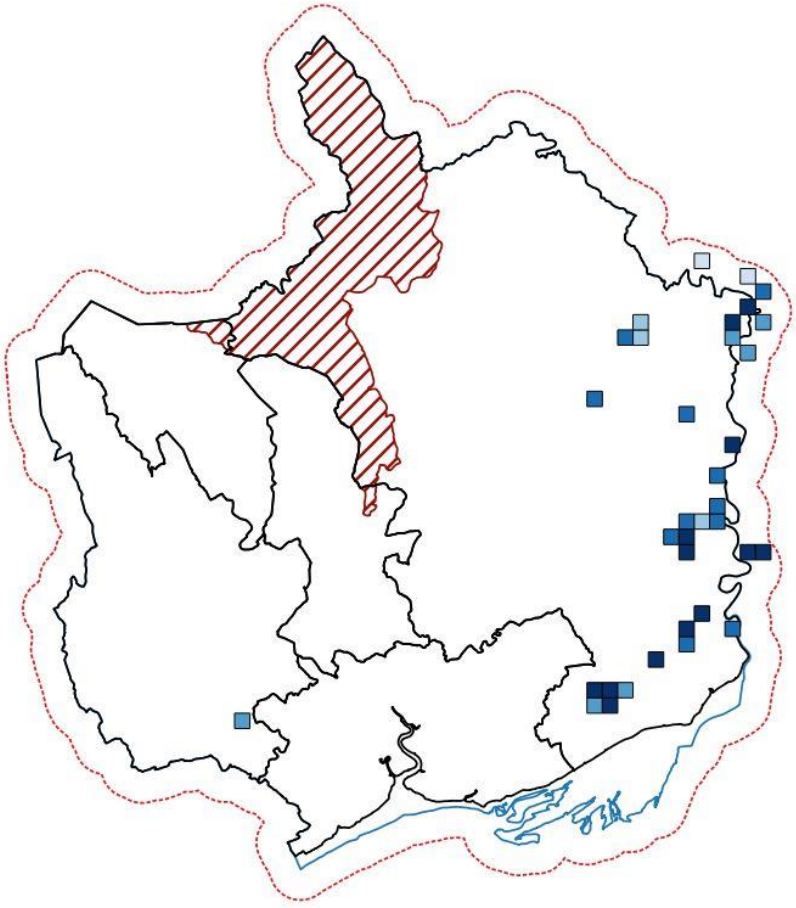
Greater Gwent range: White Admirals are found across the east and south of Greater Gwent, corresponding to the edge of their UK range. Records are generally from woodland sites, particularly the Wye Valley Woodlands, with recording hotspots at Slade Wood, (thought to be the most westerly site in Wales[18]) 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.[13]

Density of White Admiral records, (maximum 30 records/km^2)

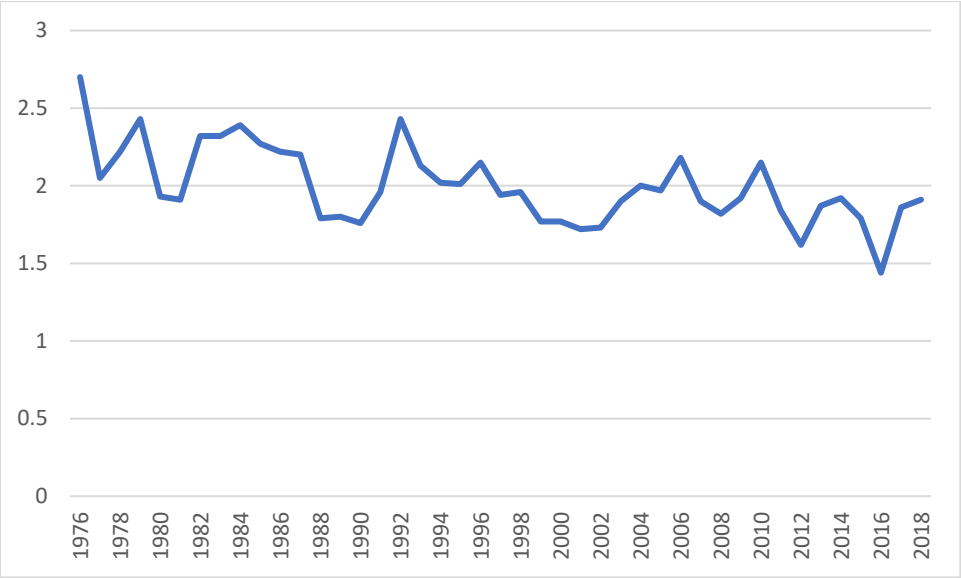


White Admiral records by decade



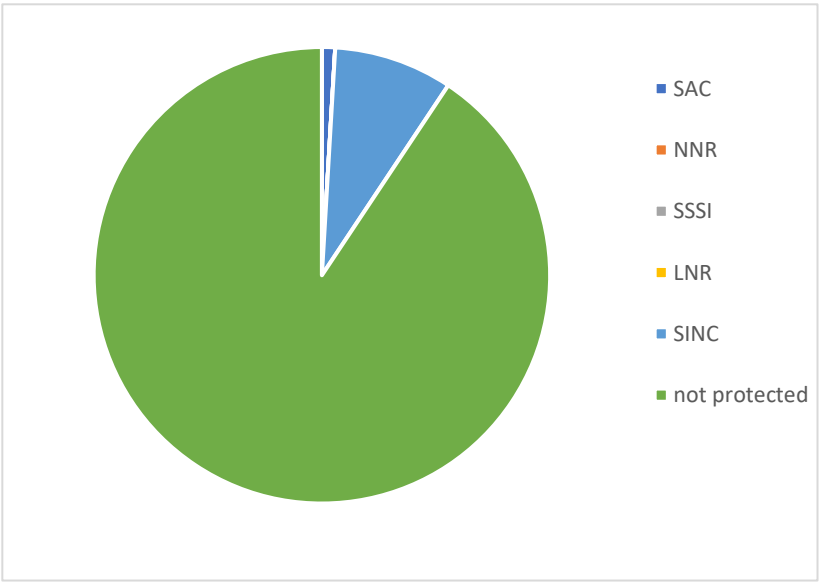
Population trends: There is not enough data to produce a regional trend for the White Admiral. UK trends indicate a long term (1976–2014) decline of 25% in range and 59% in abundance.[6] The short-term (2005–2014) decline is 14% in range and 45% in abundance.[6] The UKBMS trends for the UK shows this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

UKBMS collated indices for the White Admiral for the UK[21]



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.

White Admiral records from protected sites



Grizzled Skipper *Pyrgus malvae* (Linnaeus, 1758)

Andy Karran

Protection: None

Conservation status: VULNERABLE,[22] 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.[52] The larval foodplants are from the Rosaceae family, mainly Agrimony (*Agrimonia eupatoria*), Creeping Cinquefoil (*Potentilla reptans*) and Wild Strawberry (*Fragaria vesca*).[52] The Grizzled Skipper was added to the UKBAP list in 2007 as a result of significant declines:[22] over half of their area of occurrence has been lost since 1976, although the short-term trend is weakly positive.[6]

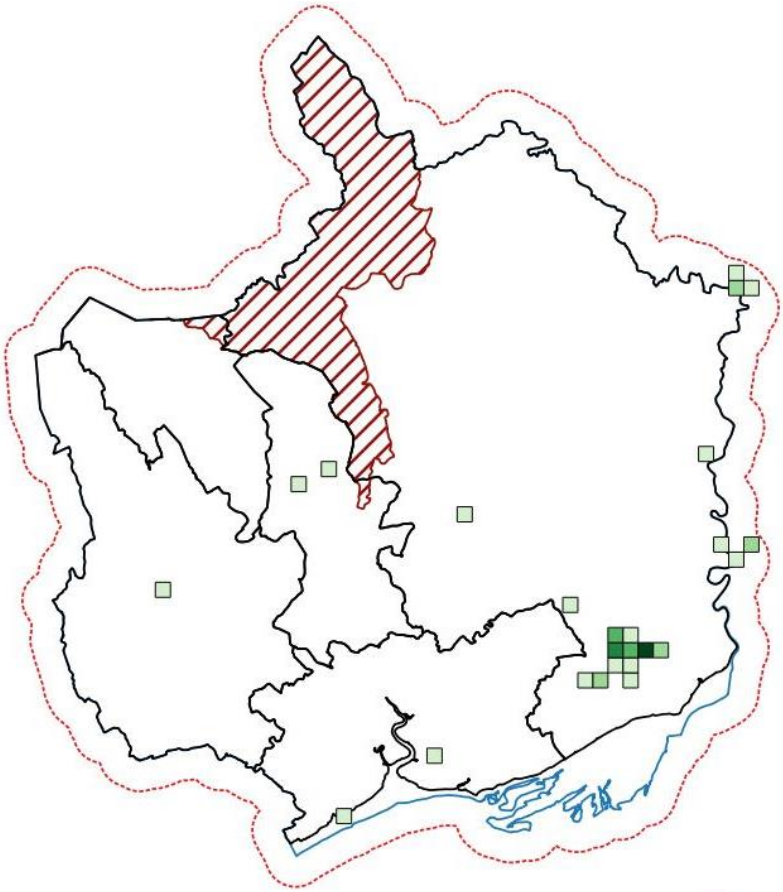
Outlook: Grizzled Skippers are often found on Brownfield sites, meaning that they are often threatened by development. Small and isolated populations are also more vulnerable to extinction.[53]

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.[54] 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.

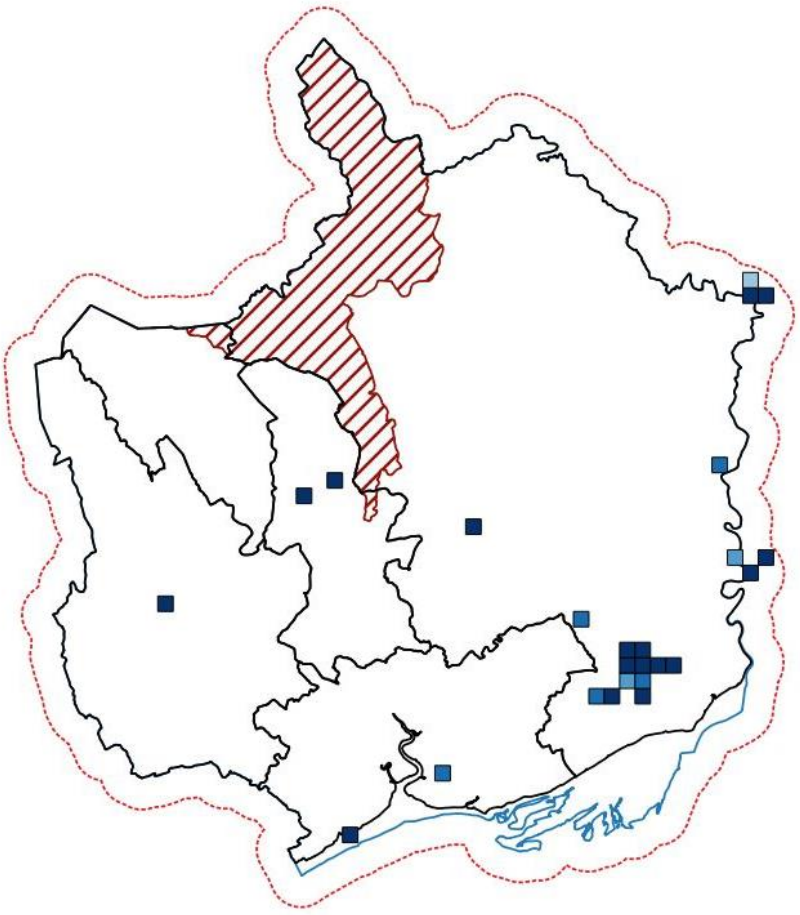
Greater Gwent range: Greater Gwent is at the edge of the UK range for the Grizzled Skipper, which is concentrated in the south and east of England. The Welsh population is mostly restricted to the south, with isolated populations in the north-east.[52]

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.

Density of Grizzled Skipper records, maximum 28 records/km²

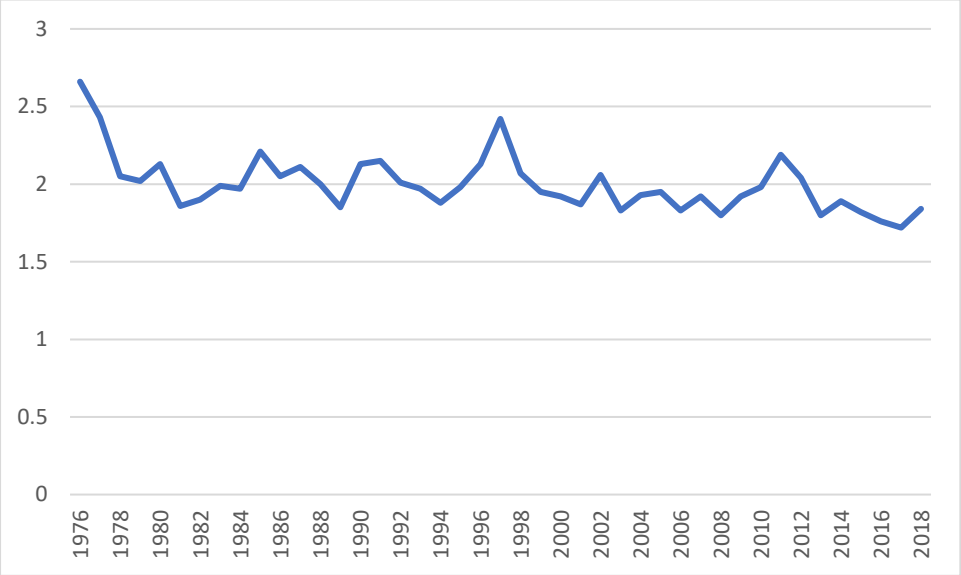


Grizzled Skipper records by decade



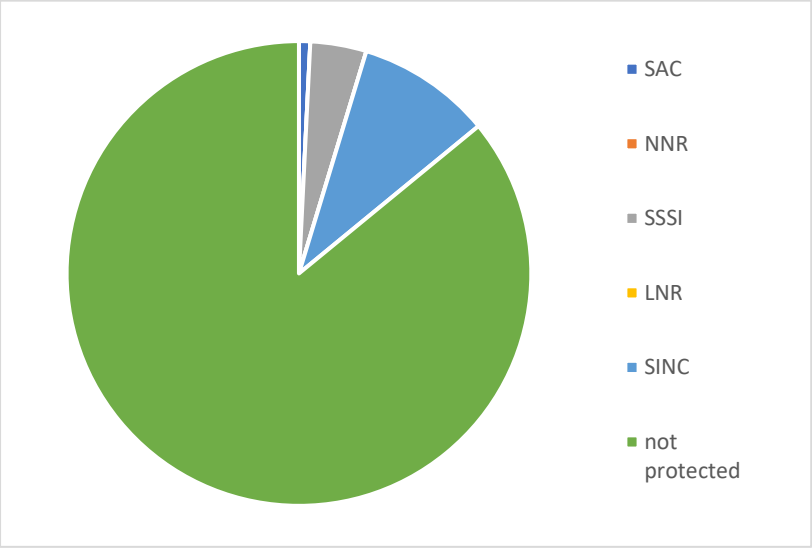
Population trends: There is not enough data to determine a population trend for Greater Gwent. The Grizzled Skipper has not been recorded in any UKBMS transects within the study area. The UK long term (1976–2014) population trend is a decline of 53% in range and 37% in abundance. The short-term (2005–2014) trend points to an increase of 7% in range and no change in abundance.[6] 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[21]



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



References

1. Why butterflies matter: https://butterfly-conservation.org/butterflies/why-butterflies-matter (accessed 7/3/21).
2. What are moths?: https://butterfly-conservation.org/moths/why-moths-matter/what-are-moths (accessed 7/3/21).
3. DEFRA. 2020. UK Biodiversity Indicators 2020. DEFRA, London.
4. Pollock CJ, Capilla-Lasheras P, McGill RAR et al. 2017. Integrated Behavioural and Stable Isotope Data Reveal Altered Diet Linked to Low Breeding Success in Urban-Dwelling Blue Tits (Cyanistes caeruleus)'. Scientific Report 7: 5014.
5. Fox R, Dennis EB, Harrower CA, Blumgart D, Bell JR, Cook P, Davis AM, Evans-Hill LJ, Haynes F, Hill D, Isaac NJB, Parsons MS, Pocock MJO, Prescott T, Randle Z, Shortall CR, Tordoff GM, Tuson D & Bourn NAD. 2021. The State of Britain's Larger Moths 2021. Butterfly Conservation, Rothamsted Research and UK Centre for Ecology & Hydrology, Wareham, Dorset.
6. Fox R, Brereton TM, Asher J, August TA, Botham MS, Bourn NAD, Cruickshanks KL, Bulman CR, Ellis S, Harrower CA, Middlebrook I, Noble DG, Powney GD, Randle Z, Warren MS & Roy DB. 2015. The State of the UK's Butterflies 2015. Butterfly Conservation and the Centre for Ecology & Hydrology, Wareham, Dorset.
7. Brereton TM, Botham MS, Middlebrook I, Randle Z, Noble D, Harris S, Dennis EB, Robinson A, Peck K & Roy DB. 2020. United Kingdom Butterfly Monitoring Scheme report for 2019. UK Centre for Ecology & Hydrology, Butterfly Conservation, British Trust for Ornithology and Joint Nature Conservation Committee.
8. Randle Z, Brereton T, Harris S, Noble D, Botham M, Roy D, Robinson A & Peck K. 2019. Wider Countryside Butterfly Survey Annual Newsletter 2019 Season. Butterfly Conservation, British Trust for Ornithology, UK Centre for Ecology & Hydrology, UK Butterfly Monitoring Scheme and Joint Nature Conservation Committee.
9. The Insect Survey: https://www.rothamsted.ac.uk/insect-survey (accessed 7/3/21).
10. Species total to Dec 2020 provided by Martin Anthoney, County Recorder for Butterflies and Macro-Moths (pers. comm).
11. Anthoney M. undated. Gwent Lepidopterists – A History of Lepidoptera Recording in VC35 (Monmouthshire/Gwent). Monmouthshire Moth & Butterfly Group.
12. Anthoney M (ed.). 2017. The Silurian Monmouthshire Moth and Butterfly Group Newsletter No. 137 December 2017.
13. Individual Site UKBMS data to 2018, courtesy of Butterfly Conservation.
14. Parsons M, Davis T and Prescott T. 2013. Forester Species Factsheet. Butterfly Conservation, Wareham, Dorset.
15. Biodiversity Reporting and Information Group (BRIG). 2007. Report on the Species and Habitat Review. JNCC, Peterborough.
16. National Moth Recording Scheme: https://butterfly-conservation.org/our-work/recording-and-monitoring/national-moth-recording-scheme (accessed 21/02/2021).
17. Flatwoods meadows. Your Green Spaces: https://greenspacescaerphilly.co.uk/flatwoods-meadows/ (accessed 21/02/2021).
18. Anthoney M. 2021. Pers.Comm. from County Recorder for Butterflies and Macro-Moths.
19. White-Spotted Sable: https://butterfly-conservation.org/moths/white-spotted-sable (accessed 09/03/2021).
20. NBN Atlas website species search: https://records.nbnatlas (accessed 09 March 2021).
21. Fagan WF & Holmes EE. 2005. Quantifying the Extinction Vortex. Ecology Letters 9(1): 51–60.

22. Fox R, Warren MS & Brereton TM. 2010. A New Red List of British Butterflies, Species Status 12. Joint Nature Conservation Committee, Peterborough.
23. Ellis S & Wainwright D. undated. Small Pearl-bordered Fritillary Factsheet. Butterfly Conservation, Wareham, Dorset.
24. Ellis S & Wainwright D. 2012 Restoring Very Small Fragmented Landscapes for the Small Pearl-bordered Fritillary in the Durham Coalfield Pennine Fringe. In: Landscape-Scale Conservation For Butterflies and Moths: Lessons from the UK. Butterfly Conservation, Wareham, Dorset.
25. Botham M, Roy D, Brereton T, Middlebrook I, Randle Z. 2017. United Kingdom Butterfly Monitoring Scheme: Collated Indices 2015 version 2. NERC Environmental Information Data Centre': https://doi.org/10.5285/c6c5e93c-06c2–44d5-ab2a-8f6f10951888.
26. Ellis S, Doyle S, Jeffcoate G, Shanks S, Slater M and Wainwright D. undated. Small Blue Factsheet. Butterfly Conservation, Wareham, Dorset.
27. Slater M & Ellis S. 2012. Restoration of a Small Blue Metapopulation on the Southam Lias Grasslands of Warwickshire. In: Landscape-scale Conservation for Butterflies and Moths: Lessons from the UK. Butterfly Conservation, Wareham, Dorset.
28. Pollinating the Levels: https://www.livinglevels.org.uk/project-descriptions/2018/2/19/pollinating-the-levels (accessed 10/3/2021).
29. Silurian: https://butterfly-conservation.org/moths/silurian (accessed 11/03/2021).
30. Anthoney M. undated. Gwent Lepidopterists – A history of Lepidoptera Recording in VC35 (Monmouthshire/Gwent). Monmouthshire Moth & Butterfly Group.
31. Anthoney M (ed.). 2012. The Silurian Monmouthshire Moth and Butterfly Group Newsletter No 82 April 2012.
32. Anthoney M (ed.). 2014. The Silurian Monmouthshire Moth and Butterfly Group Newsletter No 100 April 2014.
33. King A & Lowe N. 2014. Varteg, Torfaen: An Assessment of Suitability for Silurian Moth (Eriopygodes imbecilla). Hawkeswood Ecology.
34. Wainwright D & Ellis S. undated. *Dingy Skipper Factsheet.* Butterfly Conservation Wareham, Dorset.
35. Anthoney M. 2006. The Dingy Skipper Butterfly in Gwent. unpublished.
36. Warren M & Wigglesworth T. undated. Marsh Fritillary Factsheet. Butterfly Conservation, Wareham, Dorset.
37. Marsh Fritillary butterfly (Euphydryas (Eurodryas, Hypodryas) aurinia) - Special Areas of Conservation: https://sac.jncc.gov.uk/species/S1065/ (accessed 30/04/21).
38. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Conservation Status Assessment for the Species: S1065 Marsh Fritillary Butterfly (Euphyryas aurinia)(UK). JNCC.
39. Torfoff G & Williams C. 2018. The Status of the Marsh Fritillary in Wales: 2018. Butterfly Conservation, Wareham, Dorset.
40. JNCC. 2019. Fourth Report by the United Kingdom under Article 17 Conservation Status Assessment for the Species: S1065 Marsh Fritillary Butterfly (Euphyryas aurinia) (Wales) JNCC
41. Saving the Marsh Fritillary in South Wales. Initiative for Nature Conservation Cymru: https://www.natureconservation.wales/project/saving-the-marsh-fritillary-in-south-wales/ (accessed 30/04/21).
42. Ellis S, Bourn N & Bulman C. 2012. Landscape-Scale Conservation for Butterflies and Moths: Lessons from the UK. Butterfly Conservation, Wareham, Dorset.
43. Countryside Council for Wales. 2008. Core Management Plan for Aberbargoed Grasslands Special Area of Conservation. Countryside Council for Wales, Bangor.
44. Marsh Fritillary Larval Web Index provided by Butterfly Conservation Wales.

45. Jones R, Ellis S, Warren M, Joy J, Wainwright, D, Bulman C & Kirkland P. 2013. Grayling Species Factsheet. Butterfly Conservation, Wareham, Dorset.
46. Anthoney M. 2021. Pers.Comm. from County Recorder for Butterflies and Macro-Moths.
47. UKBMS Grayling Species Dactsheet Hipparchia semele. UKBMS: https://ukbms.org/species/grayling (accessed 21/02/2021).
48. Green D & Clarke S. 2015. Wood White Factsheet. Butterfly Conservation Wareham Dorset.
49. Making A Stand For The Wood White: https://butterfly-conservation.org/our-work/conservation-projects/england/making-a-stand-for-the-wood-white (accessed 20/04/2021).
50. Wood White. West Midlands Branch of Butterfly Conservation: https://www.westmidlands-butterflies.org.uk/species/butterflies/whites/wood-white (accessed 20/04/2021).
51. Ellis S, Slater M, Oates M, Willmott K & Hoare D. undated. White Admiral Factsheet. Butterfly Conservation Wareham, Dorset.
52. Jones R, Ellis S, Warren M, Joy J, Wainwright, D, Bulman C & Kirkland P. 2013. Grizzled Skipper Species Factsheet. Butterfly Conservation, Wareham, Dorset.
53. Hearle S & Ellis J. undated. Grizzled Skippers Need Our Help. Butterfly Conservation, Wareham, Dorset.
54. Bell F, Botham M, Brereton TM, Fenton A, Hodgson J. 2021. Grizzled Skippers Stuck in the South: Population-Level Responses of an Early-Successional Specialist Butterfly to Climate Across its UK Range Over 40 Years. Diversity & Distributions: https://doi.org/10.1111/ddi.13245.

Odonata

Odonata – dragonflies and damselflies – are one of the better recorded groups of invertebrates. They are conspicuous and distinctive, making them easier to study and record than many other invertebrate groups. Odonata species use a wide range of freshwater habitats, from large rivers to ditches, and from lakes to small ephemeral pools, but all of these have been affected by hydrological changes, such as drainage and abstraction, pollution and changes in management.[1] In parts of Europe, more than 50% of wetlands have been lost.[2] Three species had become extinct in Britain by the 1960s, and a further 12 are now under threat.[3] Odonata species may also be affected by climate change; a number of species have recently increased their range northwards, and some populations at the edge of ranges have been lost.[3]

Odonata can be used as general indicators of wetland health. Studies[4,5] have found that they are sensitive to changes in condition and levels of disturbance, and that odonata diversity correlates well with overall diversity.

Outlook: Odonata conservation is linked to conservation and management of freshwater and wetland habitats. There have been some successes in raising awareness and increasing knowledge of dragonfly and damselfly species: Odonata recording has increased in recent times,[3] a new national atlas of dragonflies was published in 2014, and a 'State of Dragonflies' report is expected in 2020. Recorders in Greater Gwent are aiming to produce a local odonata atlas within the next decade. The BDS (British Dragonfly Society) recognises Priority Sites[6] based on the presence of rare species or high species richness, and it is hoped that regular monitoring of key sites could be established.

In terms of habitat, the outlook for odonata is poor. Degradation and loss of wetlands is continuing, more rapidly than for other ecosystems. Climate change is predicted to exacerbate this loss.[3]

Odonata in Greater Gwent: There are 28 species of dragonfly and damselfly regularly found in Gwent. Four of these species – Common Clubtail (*Gomphus vulgatissimus*), Small Red Damselfly (*Ceriagrion tenellum*), Variable Damselfly (*Coenagrion pulchellum*) and Scarce Blue-Tailed Damselfly (*Ischnura pumilio*) – are BDS National Priority Species and are considered individually.

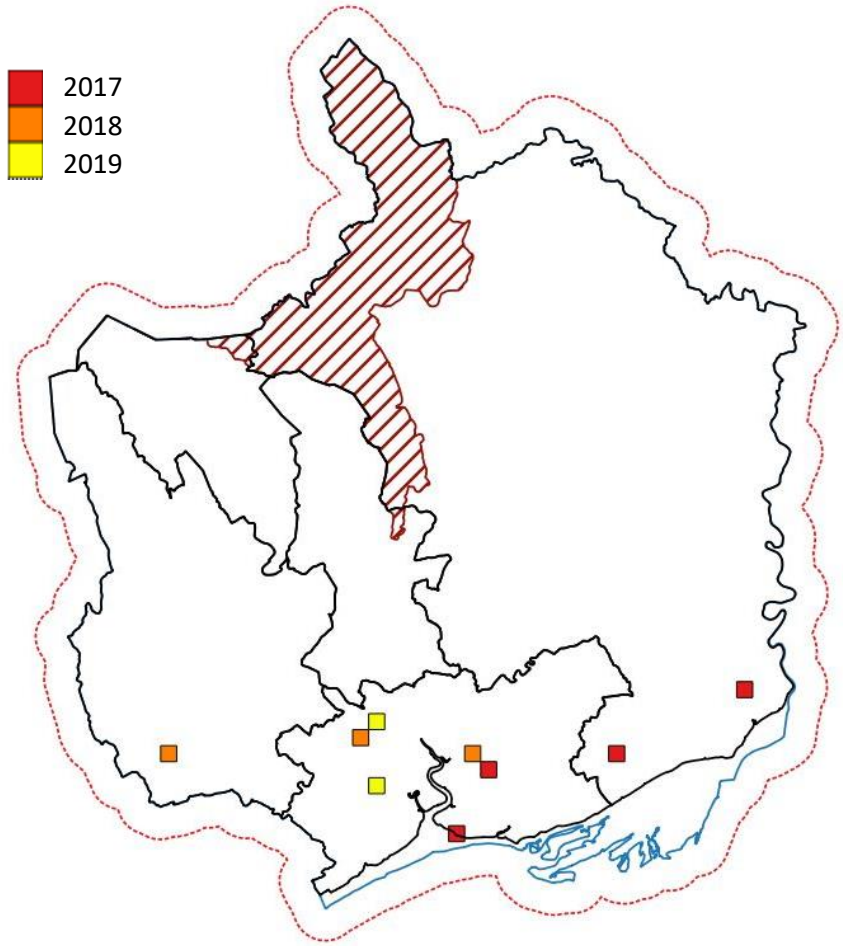
Local Priority Species have also been set by the BDS[6] and by the 'Guidelines for the Selection of Wildlife Sites in South East Wales'.[7] Recent breeding records for these species would contribute towards allocation of sites as BDS Local Priority Sites or Sites of Importance for Nature Conservation (SINCs). Local Priority Species for VC35 (Monmouthshire) and VC41 (Glamorgan) and the SINC lists A (designatory) and B (contributory) are listed below:

Species	Common Name	BDS Local Priority	SINC List	Greater Gwent Records 1970–2019	Greater Gwent Records 2010–2019
Aeshna grandis	Brown Hawker	VC35	B	17	7
Aeshna juncea	Common Hawker	VC35 & VC41		205	86
Brachytron pratense	Hairy Dragonfly	VC35	A	312	45
Coenagrion mercuriale	Southern Damselfly		A	0	0
Cordulia aenea	Downy Emerald	VC41	A	0	0
Erythromma najas	Red-Eyed Damselfly	VC35 & VC41	A	17	15
Libellula quadrimaculata	Four-Spotted Chaser	VC41		92	42
Orthetrum coerulescens	Keeled Skimmer	VC35	A	52	15
Platycnemis pennipes	White-Legged Damselfly	VC35	A	106	31
Sympetrum danae	Black Darter	VC 35 & VC41	B	105	39
Sympetrum sanguinem	Ruddy Darter		A	90	31

Rarities and vagrants include Vagrant Emperor (*Anax ephippiger*) (two records near Newport in 2013 and 2019), Downy Emerald (*Cordulia aenea*) (one undated unconfirmed record near Caldicot), Red-Veined Darter (*Sympetrum fonscolombii*) (four scattered records, the most recent in 2006) and Yellow-winged Darter (*Sympetrum flaveolum*) (one unconfirmed record from Magor in 1965). Gwent also holds the only British record for Banded Darter (*Sympetrum pedemontanum)*, from near Tredegar in 1995.

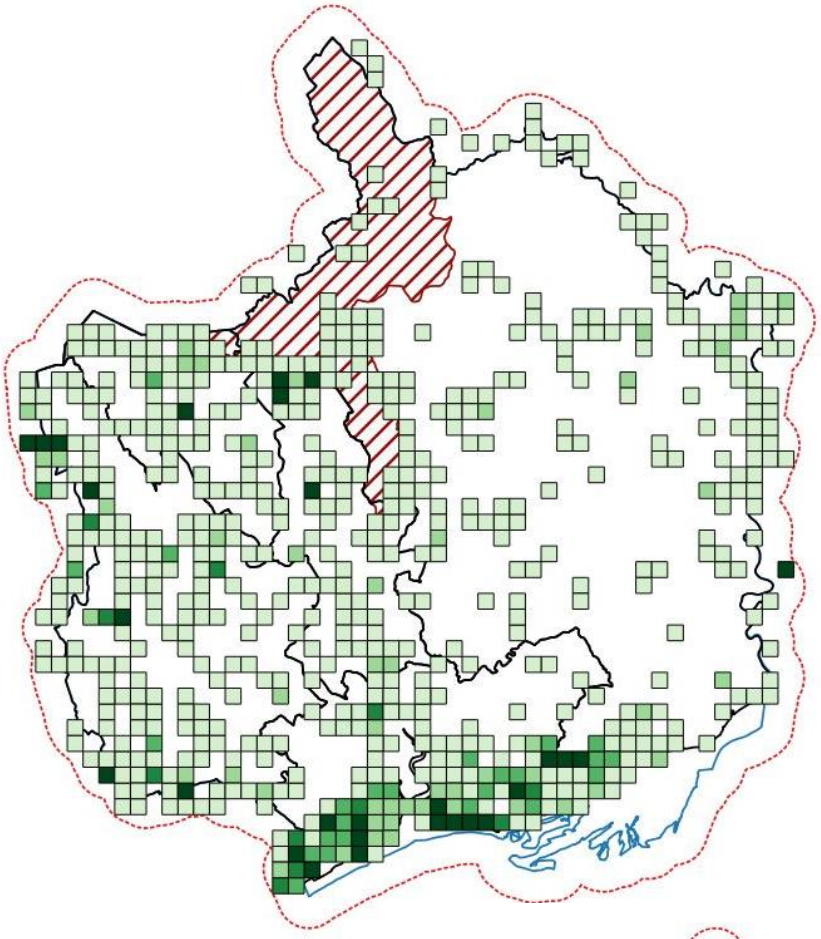
Worthy of mention is a recent colonist, the Small Red-Eyed Damselfly (*Erythromma viridulum*), which was first recorded in the south-east of the UK in 1999. It was first recorded in Gwent in 2017 and appears to be spreading westwards across the Gwent Levels.

Records of Small Red-eyed Damselfly by year

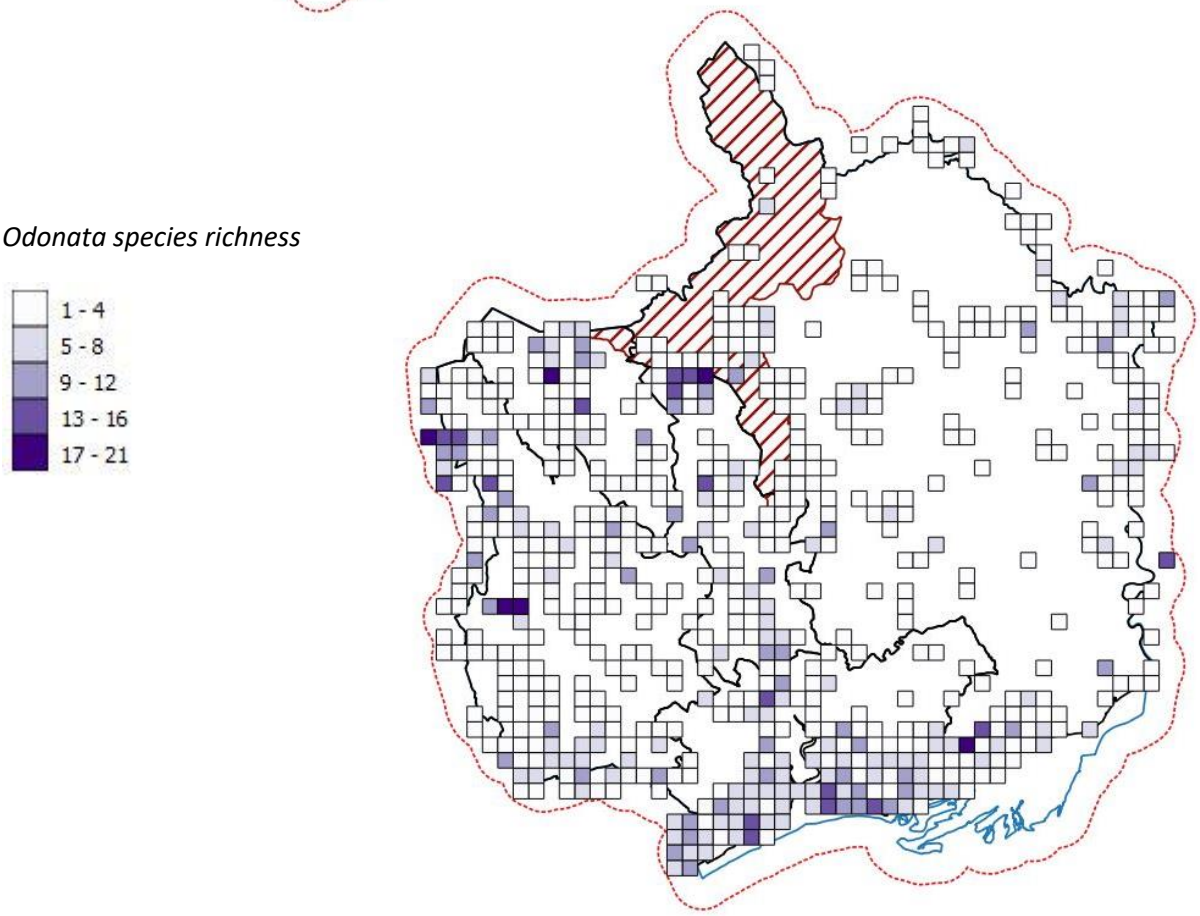


Greater Gwent distribution: Greater Gwent has several areas of importance for dragonflies and damselflies. The Gwent Levels SSSIs (Sites of Special Scientific Interest) in particular represent a large, well recorded area with a high species richness. The post-industrial uplands, such as Garn Lakes and Merthyr Common, also show pockets of high species richness. Odonata recording is often limited to known sites rather than the wider countryside; Central Monmouthshire is very under recorded, as are parts of Newport. The Gloucester hotspot is the result of centring of older records, although the Park Nature Reserve just to the north (not included due to being an incomplete square) has high species richness for Odonata.

Odonata records (maximum set to ≥ 100)

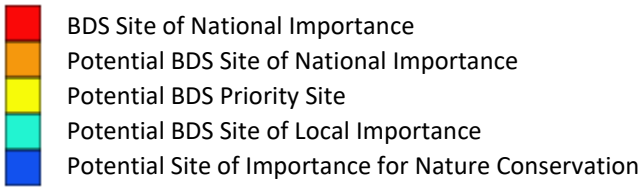


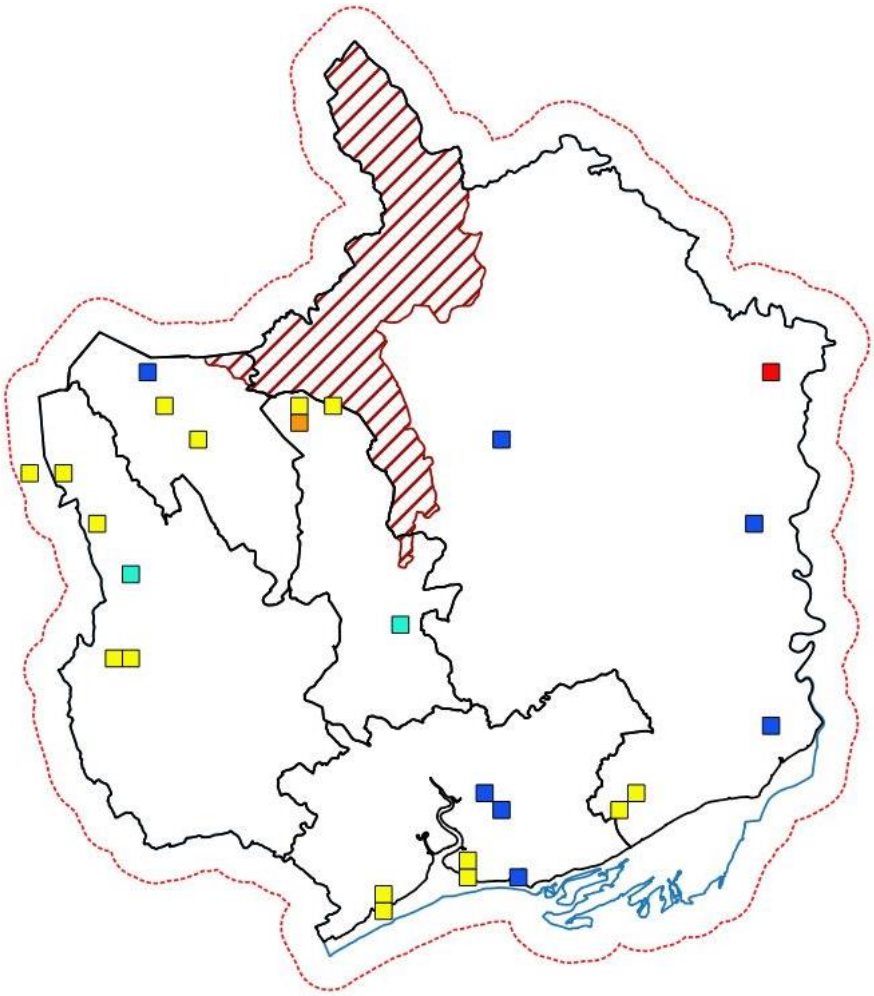
Odonata species richness



Key sites: Important sites for dragonflies are designated on the basis of overall species diversity and the presence of National and Local Priority Species. BDS and the *Guidelines for the Selection of Wildlife Sites in South East Wales* have different criteria: any site meeting BDS criteria will also qualify as a SINC. Analysing the species diversity and abundance and breeding records of Priority Species from 2010 onwards shows 23 sites that could qualify as BDS sites or SINCs; most are already designated at SINC level or higher, although 5 have no protected status. (Note that some sites, such as Newport Wetlands NNR (National Nature Reserve), incorporate more than one square).

Potential Key Sites for Odonata in Greater Gwent





Local Authority	Site name	Protection	Designation	Qualification Criteria	Number of species
BGCBC	Central Valley		Potential BDS Priority Site	High Diversity	13
BGCBC	Circuit Wales Site	SINC	SINC	High Diversity	9
BGCBC	Rhyd y Blew	part SINC	Potential BDS Priority Site	High Diversity and abundance of Black Darter	15
CCBC	Cwmllwydrew Meadows	SINC	Potential BDS Priority Site	High Diversity	14
CCBC	Gelli-gaer Common	SINC	Potential BDS Priority Site	High Diversity, Breeding records for Common Hawker	14
CCBC	Parc Cwm Darren	SINC	Potential BDS Local Importance	Abundance of Common Hawker	5
CCBC	Parc Penallta	Country Park	Potential BDS Priority Site	High Diversity, Breeding records for Common Hawker	16
MCC	Cleddon Bog	SSSI	SINC	High Diversity	9
MCC	Clytha	SAC	Potential BDS Local Importance	Abundance of White-legged Damselfly	3
MCC	Magor Marsh	SSSI	Potential BDS Priority Site	High Diversity	13
MCC	Mathern Mill		SINC	High Diversity	10
MCC	River Wye	SAC	BDS National Importance	Abundance and Breeding records for Common Clubtail, Breeding records for White-legged Damselfly	10
MCC	Unknown		Potential BDS Priority Site	High Diversity	13
MTCBC	Merthyr Common	SINC	Potential BDS Priority Site	High Diversity	14
NCC	Glan Llyn		SINC	High Diversity	10
NCC	Lliswerry Pond	SINC	SINC	High Diversity	9

NCC	Newport Wetlands	NNR	Potential BDS Priority Site	High Diversity, Abundance and Breeding records for Hairy Dragonfly	13
NCC	Peterstone Lakes	SSSI	Potential BDS Priority Site	High Diversity, Abundance and Breeding records for Common Hawker	17
TCBC	Canada Tips	SINC/SSSI	SINC	High Diversity	11
TCBC	Garn Lakes	LNR (Local Nature Reserve)	Potential BDS National Importance	Abundance of Scarce Blue-tailed Damselfly	12
TCBC	Garn yr Erw	SINC	Potential BDS Priority Site	High Diversity	14
TCBC	Sebastopol	SINC	Potential BDS Local Importance	Abundance of Red-eyed Damselfly	8

Small Red Damselfly *Ceriagrion tenellum* (de Villers, 1789)

Protection: none

Conservation status: Red List: LEAST CONCERN (UK)[3]

Data availability: Poor (12 records)

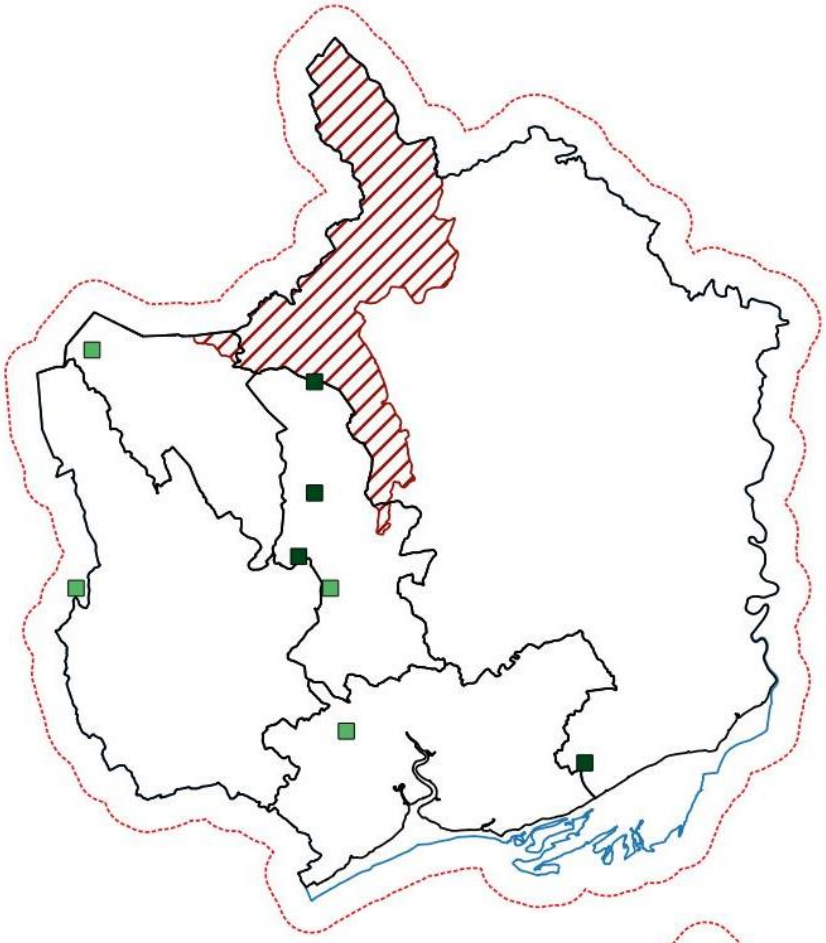
Andy Karran

Context: The Small Red Damselfly has a limited distribution but is not considered Vulnerable as its range is thought to be increasing.[3] It is still listed as a Nationally Important species by the British Dragonfly Society.[6] It is found on heathland bogs in South and West England and Wales. There are only 12 records within Greater Gwent and the 2km buffer.

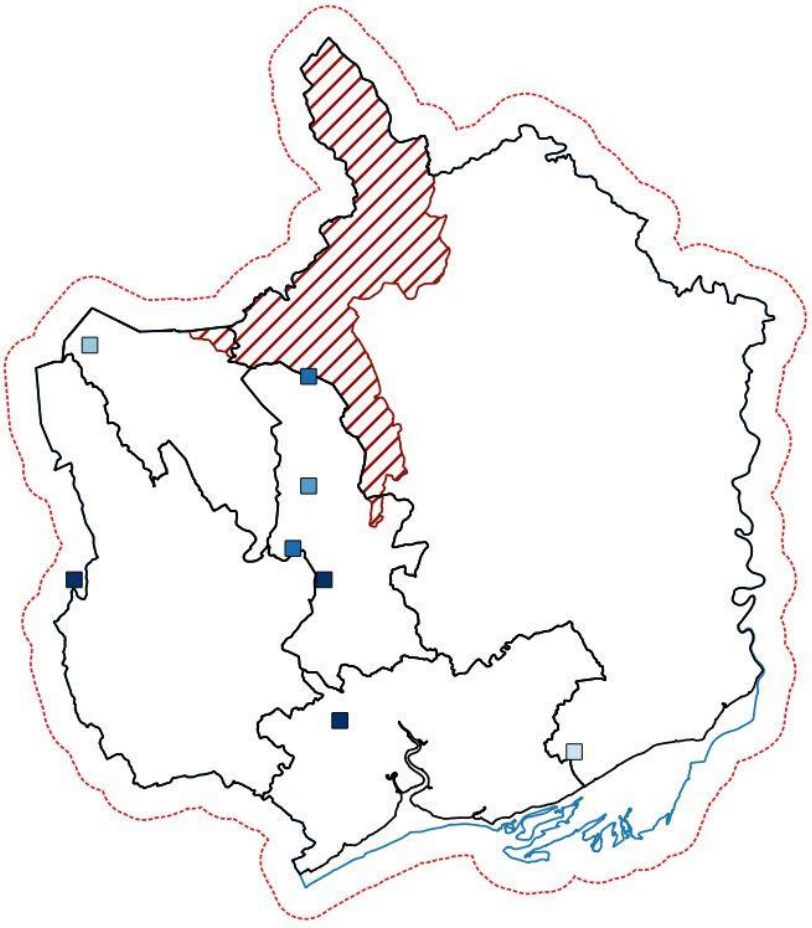
Outlook: Despite an improving national status, there is considerable uncertainty about the status of Small Red Damselfly within Gwent. Targeted surveys have failed to find new records and there is ongoing investigation as to the validity of historic records.[8] Its wet heathland habitat is also threatened by loss, fragmentation, drainage and lack of management.[9]

Greater Gwent range: Small Red Damselfly records are only found within 8 1km squares, and only 3 records are from the last decade. Records are scattered across Gwent, mainly in the west of the study area. It is likely that some of these records are errors, as this species is easily confused with the Large Red Damselfly (*Pyrrhosoma nymphula*) and some of the sites do not correspond to the usual habitat for Small Red Damselfly.

Small Red Damselfly record density (Maximum density 2 records/km²)



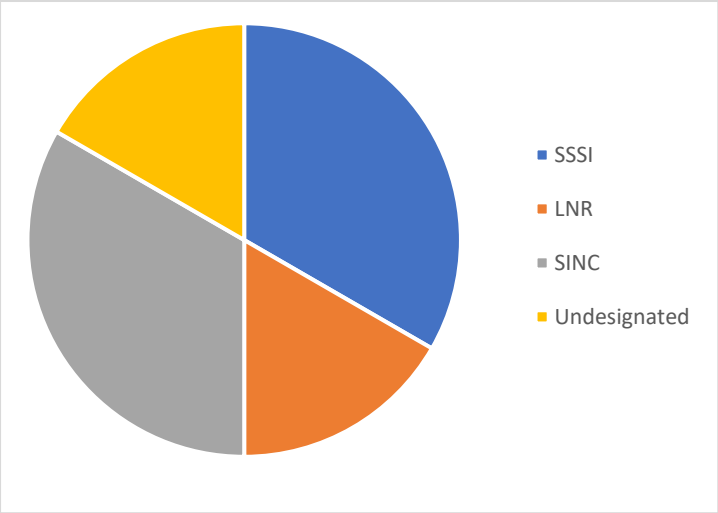
Most recent records for Small Red Damselfly by decade



Population trends: Trends cannot be inferred from such a small number of records for the area. At the UK level, experts believe that the Small Red Damselfly is increasing its range,[3] but this is not reflected locally in the current data for Greater Gwent.

Records on Protected Sites: Over 80% of Greater Gwent records occur on protected sites, with records found on SSSIs on the Gwent Levels and the Blorenge, Tirpentwys LNR and at SINCs such as The British and Coed Gwaun y ffeiriad grasslands.

Small Red Damselfly records from protected sites



Variable Damselfly *Coenagrion pulchellum* (Vander Linden, 1825)

Pete Hadfield

Protection: none

Conservation status: Red List: NEAR THREATENED (UK)[3]

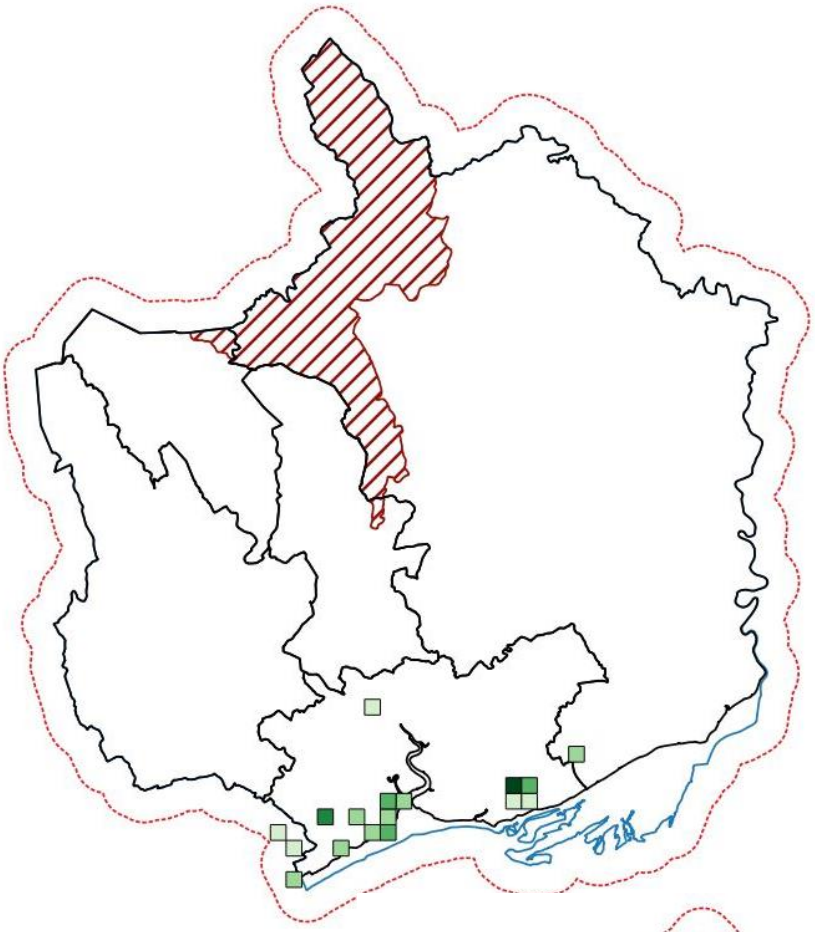
Greater Gwent data availability: Poor (37 records)

Context: The Variable Damselfly is included in the Odonata Red List for Great Britain due to its very limited distribution. It is found in ponds, canals and ditches, and the Greater Gwent population is concentrated on the Gwent Levels. There are only 37 records within the study area.

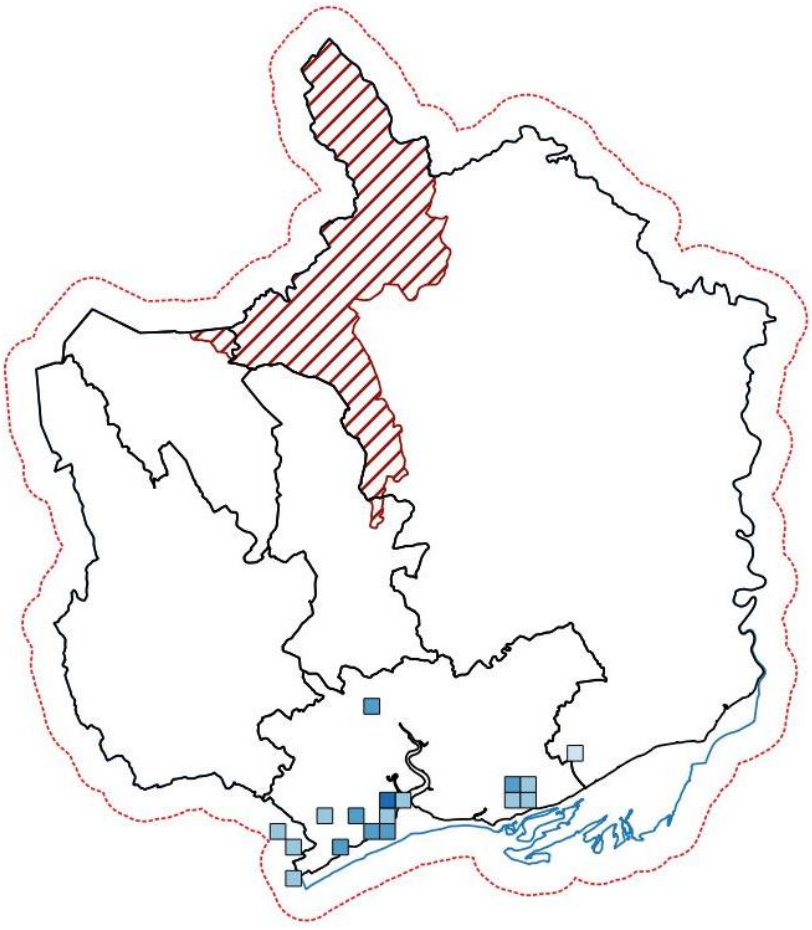
Outlook: There is a lack of recent records for Variable Damselfly in Greater Gwent. However, the absence of records could be the result of limited recording. It is important to note that the Variable Damselfly is easily confused with other, more common, *Coenagrion* species, therefore records are only likely to come from experienced surveyors and dedicated surveys, rather than ad hoc sightings. On a positive note, there are as yet unconfirmed records for the species in 2020,[8] so Variable Damselfly are still present, although possibly in low numbers. Further survey work across the Gwent Levels would be required to give more certainty around this species' status.

Greater Gwent range: Variable Damselfly records are only found within 17 1km squares within Greater Gwent. The majority of records are from the Gwent Levels, the only record outside the Levels, at Gwastad Mawr, is unconfirmed. There is a hotspot near Whitson, but these records date from the 1980s and 1990s. The most recent records are from the eastern end of the St Brides Wentloog Levels and date from 2007.

Record density for Variable Damselfly (maximum 5 records/km^2)



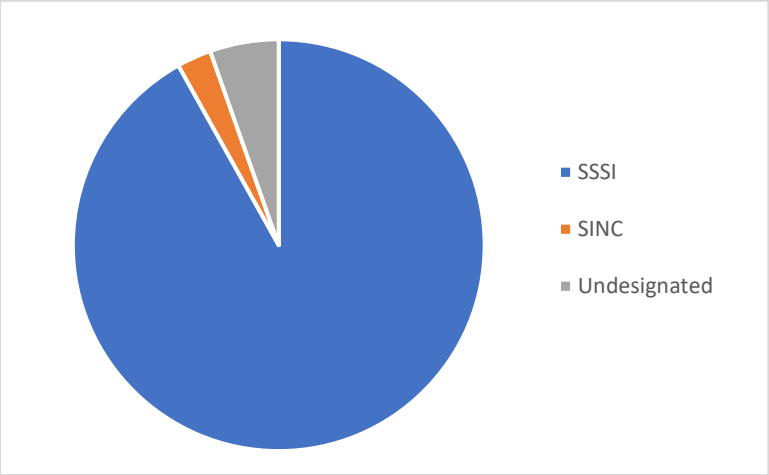
Most recent Variable Damselfly records by date



Population trends: Trends cannot be inferred from such a small number of records for the area. There have been no new confirmed records of Variable Damselfly since 2007, but potential new records in 2020[8] provide some hope for the continuing presence of the species in Greater Gwent.

Protection: Over 90% of Greater Gwent records occur on the Gwent Levels SSSIs, with one unconfirmed record on a SINC at Gwastad Mawr.

Variable Damselfly records from protected sites



Common Clubtail Dragonfly *Gomphus vulgatissimus* (Linnaeus, 1758)

Andy Karran

Protection: none

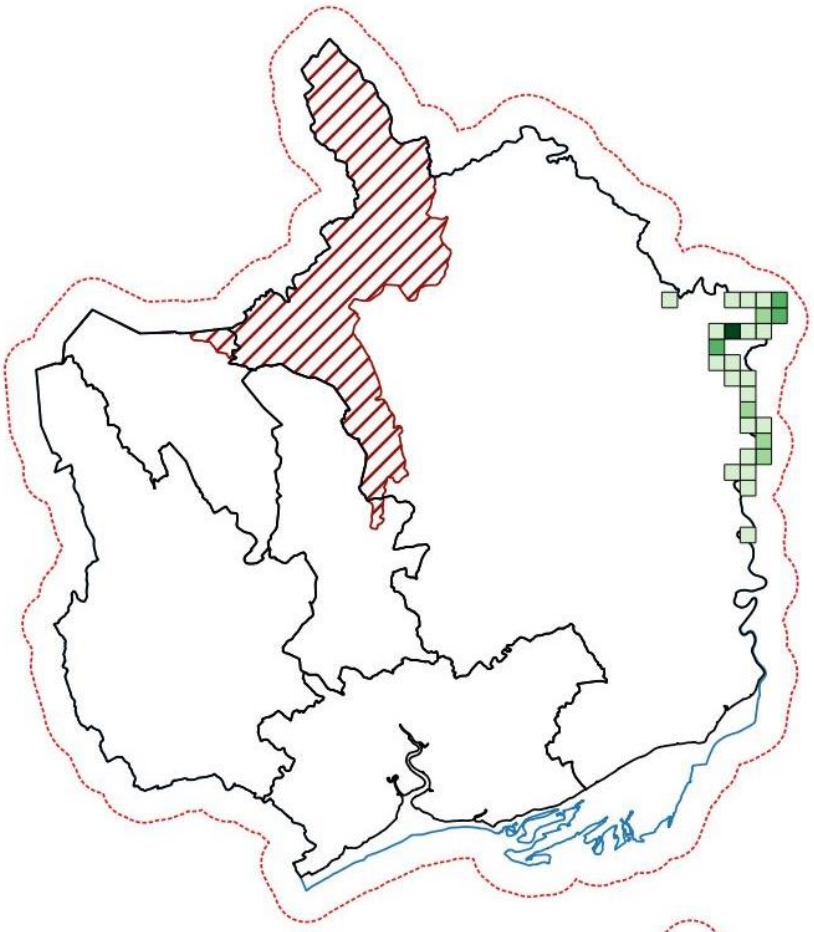
Conservation status: Red List: NEAR THREATENED (UK)[3]

Data availability: Poor (94 records)

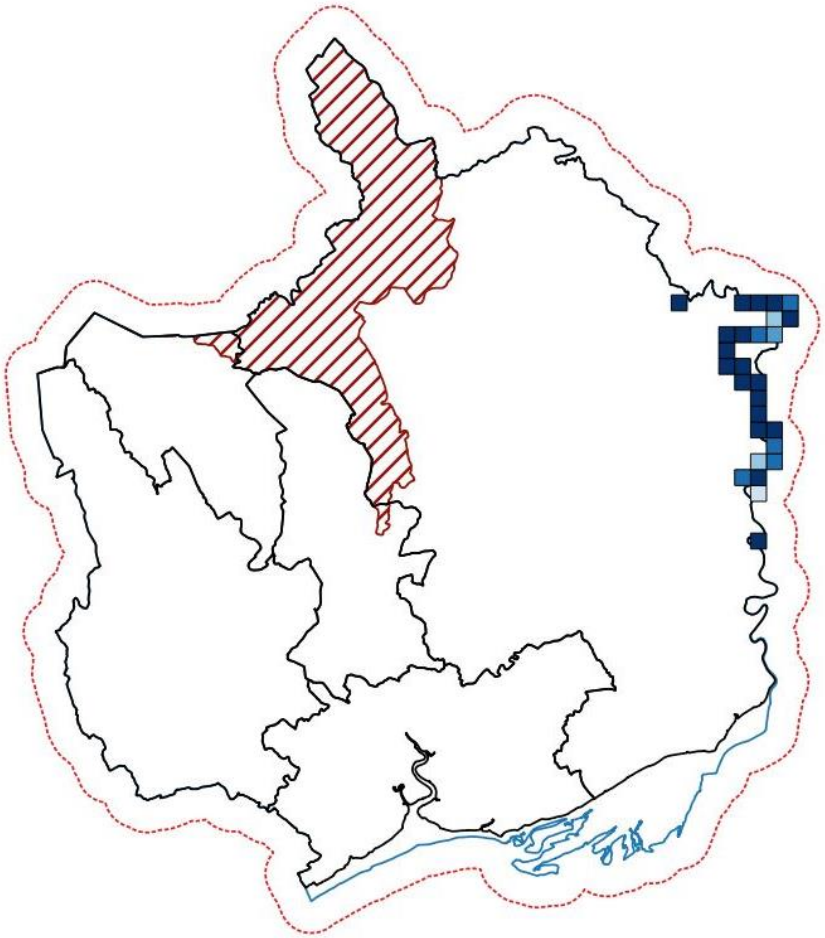
Context: The Common Clubtail is included in the Odonata Red List for Great Britain due to its very limited distribution. It is only found on a few lowland rivers, including the Wye. The British Dragonfly Society started the Clubtail Count in 2017 in response to reports from local dragonfly recorders suggesting possible declines.[10]

Outlook: The limited distribution of Common Clubtail makes it vulnerable. Potential threats are linked to river management, such as pollution and recreational use.[10] Most waterbodies within the Wye catchment are achieving Good or Moderate status within the Water Framework Directive, but rural diffuse pollution is an issue.[11] The number and quality of Clubtail Count records means that the Wye could qualify as a British Dragonfly Society National Priority Site,[6] although further work would be needed to determine the extent of any designation.

Greater Gwent range: Common Clubtail records are only found within 27 1km study area squares (not including squares that extend beyond the 2km buffer) almost exclusively along the River Wye in the northeast of the study area. There is 1 record on the Monnow tributary. The population continues northwards beyond the study area. There are recent records (2010–2019) at the extremes of the range, although it should be noted that there are very few historic records for this species, and 56% of records are from the last five years due to a recent increase in recording.



Record density for Common Clubtail (maximum 13 records/km²)



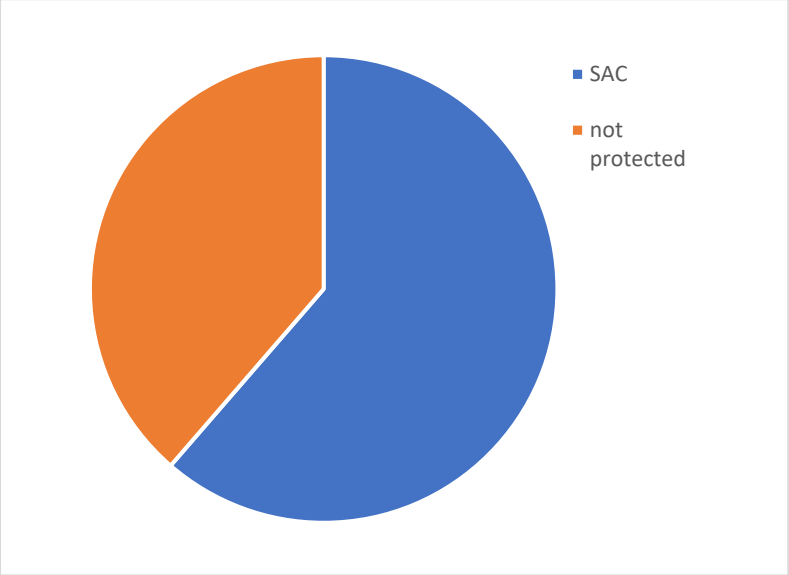
Most recent Common Clubtail records by decade

Population trends: It is too soon to draw any conclusions from the Clubtail Count, although initial results appear to show a positive picture. Clubtail count statistics[10] from within Greater Gwent and the 2km buffer are given below.

	Total monads surveyed	Monads with Clubtails found	Monads with Clubtails absent
2017	7	5	2
2018	14	11	3
2019	12	11	1

Protection: Because of the high association with the River Wye, 61% of Greater Gwent records are within SACs – either the River Wye SAC or the Wye Valley Woodlands SAC. Note that this figure is probably an underrepresentation, as lower resolution grid references are placed in the centre of the square, which may cause the record to appear outside of designated areas.

Common Clubtail records from protected sites



Scarce Blue-Tailed Damselfly *Ischnura pumilio* (Charpentier, 1825)

Protection: none

Conservation Status: Red List: NEAR THREATENED (UK)[3]

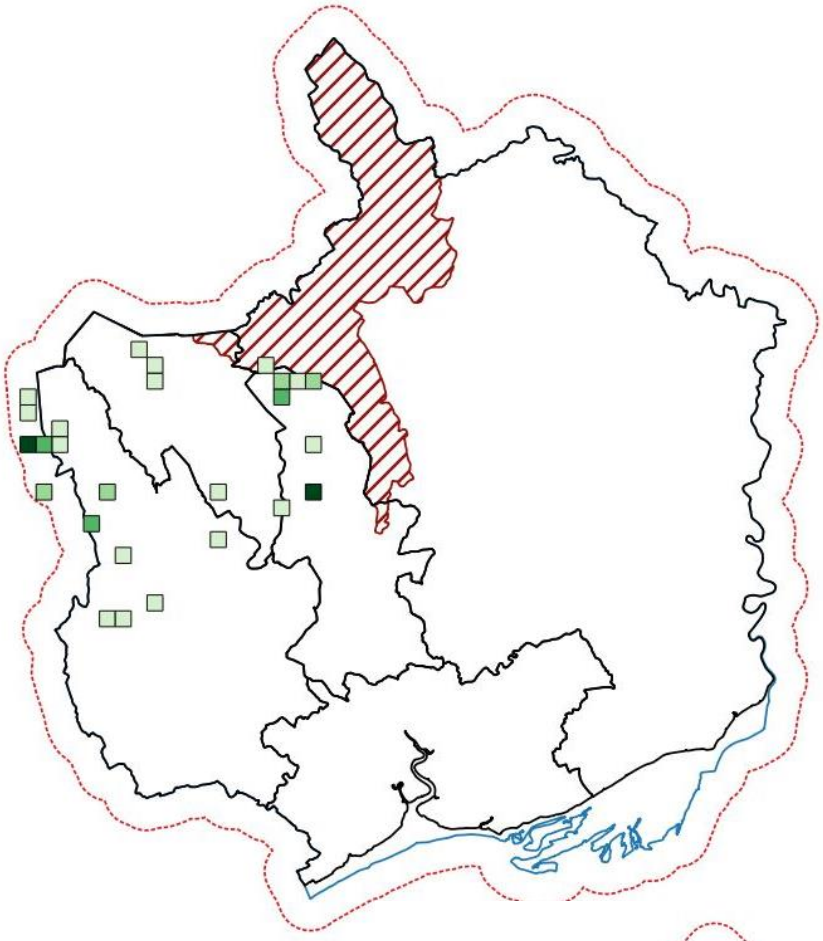
Data Availability: Poor (80 records)

Andy Karran

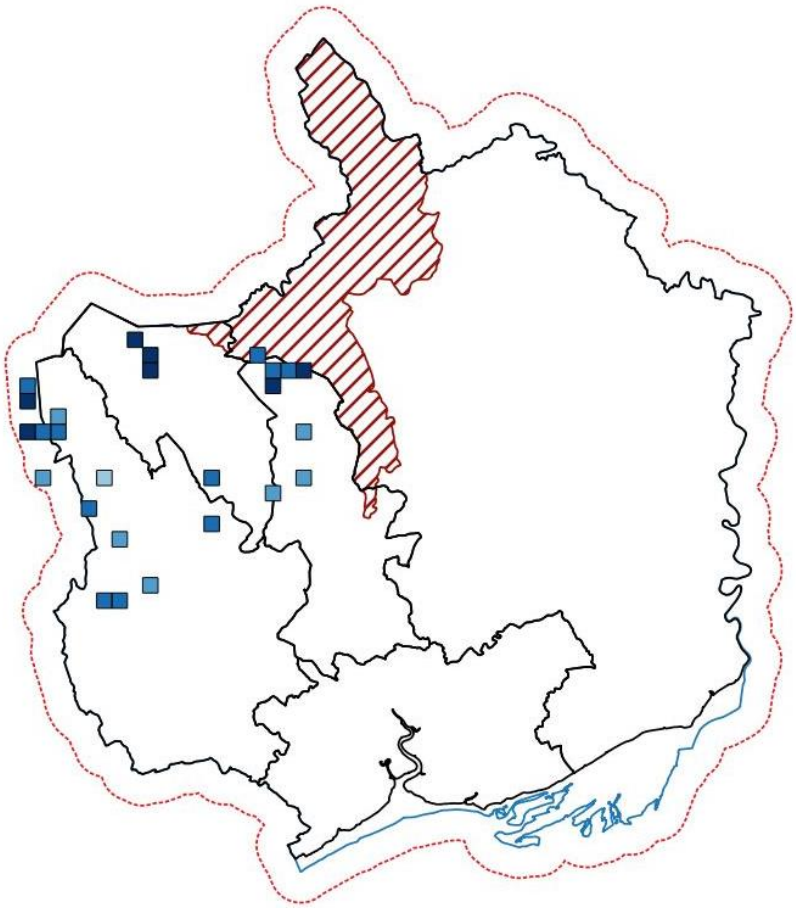
Context: The Scarce Blue-Tailed Damselfly is included in the Odonata Red List for Great Britain due to its very limited distribution, although it is relatively more common in Wales and the south-west of England. It is found in shallow pools and slow flowing water, such as bogs and seepages, often in early successional habitats with a degree of disturbance. There are just 40 records within Greater Gwent and an additional 40 within the 2km buffer, but only 7 records within the last decade.

Outlook: The limited distribution and specific habitat requirements of the Scarce Blue-tailed Damselfly make it very vulnerable. Habitat loss is most likely due to succession and disturbance, and the fragmented nature of the population restricts colonisation opportunities. More survey work would be needed to confirm breeding to confer BDS Priority Site status on sites like Garn Lakes and Merthyr Common.

Greater Gwent range: Scarce Blue-Tailed Damselfly records are only found within 26 1km squares, including those within 2km of the Greater Gwent boundary. Records are limited to the north and west of the region, with hotspots (higher numbers of more recent records) occurring at Garn Lakes LNR and Garn-yr-Erw SINC in Torfaen and at Cefn Gelligaer SINC and Merthyr Common Central candidate SINC[12] on the Caerphilly and Merthyr Tydfil border. Although they are important sites for the species, they would not qualify as British Dragonfly Society Priority Sites[6] because of a lack of breeding records.



Scarce Blue-tailed Damselfly record density (Maximum density 6 records/km^2)

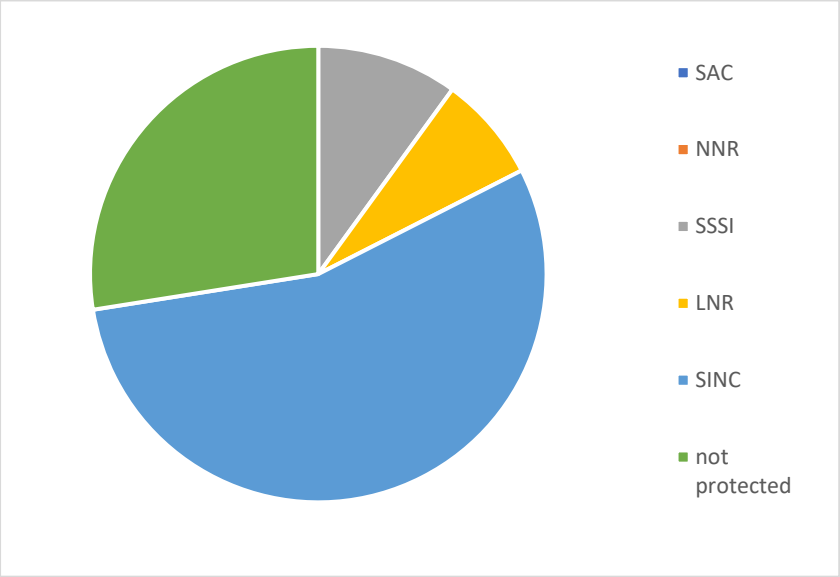


Most recent Scarce Blue-Tailed Damselfly records by decade

Population trends: Trends for Scarce Blue-tailed Damselfly cannot be inferred from such a small number of records for the area. Regular monitoring of sites, particularly potential Priority Sites, would be needed to confirm and monitor breeding presence.

Protection: Over 70% of Greater Gwent records occur on protected sites, with the majority on Sites of Importance for Nature Conservation, such as Garn yr Erw and Cefn Gelligaer. SSSI records are from the Blorenge, and LNR records are from Garn Lakes.

Scarce Blue-tailed Damselfly records from protected sites



References

1. Hayhow DB, Burns F, Eaton MA, Al Fulaij N, August TA, Babey L, Bacon L, Bingham C, Boswell J, Boughey KL, Brereton T, Brookman E, Brooks DR, Bullock DJ, Burke O, Collis M, Corbet L, Cornish N, De Massimi S, Densham J, Dunn E, Elliott S, Gent T, Godber J, Hamilton S, Havery S, Hawkins S, Henney J, Holmes K, Hutchinson N, Isaac NJB, Johns D, Macadam CR, Mathews F, Nicolet P, Noble DG, Outhwaite CL, Powney GD, Richardson P, Roy DB, Sims D, Smart S, Stevenson K, Stroud RA, Walker KJ, Webb JR, Webb TJ, Wynde R and Gregory RD. 2016. State of Nature 2016. The State of Nature partnership.
2. Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being: Wetlands and Water. Synthesis. World Resources Institute, Washington DC
3. Daguet CA, French GC and Taylor P. 2008. The Odonata Red Data List for Great Britain (Species status 11): 1–34. Joint Nature Conservation Committee, Peterborough.
4. Simaika JP & Samways MJ. 2011. Comparative Assessment of Indices of Freshwater Habitat Conditions using Different Invertebrate Taxon Sets. Ecological Indicators 11 (2).
5. Kutcher TE & Bried JT. 2014. Adult Odonata Conservatism as an Indicator of Freshwater Wetland Condition. Ecological Indicators 38.
6. British Dragonfly Society (BDS). 2019. Priority Site assessments. https://british-dragonflies.org.uk/wp-content/uploads/2019/03/Priority-Site-Assessment.pdf (accessed 18/11/2019).
7. Gwent Wildlife Trust. 2004. Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership.
8. Preddy S. 2020. Pers. comm. from VC35 Odonata Recorder.
9. British Dragonfly Society. https://british-dragonflies.org.uk/species-map/small-red-damselfly/ (accessed 25/10/2020).
10. British Dragonfly Society. Common Clubtail webpage: https://british-dragonflies.org.uk/species/common-clubtail/ (accessed 6/11/2019).
11. Natural Resources Wales & Environment Agency. 2014. The Wye Management Catchment – A Summary Of Information About the Water Environment in the Wye Management Catchment. Environment Agency.
12. Jones J. 2018. Review of Sites of Importance for Nature Conservation. Replacement Local Development Plan (2016–2031). Background paper. Merthyr Tydfil County Borough Council.

Other invertebrates

Although lepidoptera and odonata are considered in separate sections, they are a small fraction of the invertebrate diversity within Greater Gwent. Unfortunately, most invertebrates are very under-recorded, due to lack of interest, their cryptic nature and the level of expertise needed to identify some species.

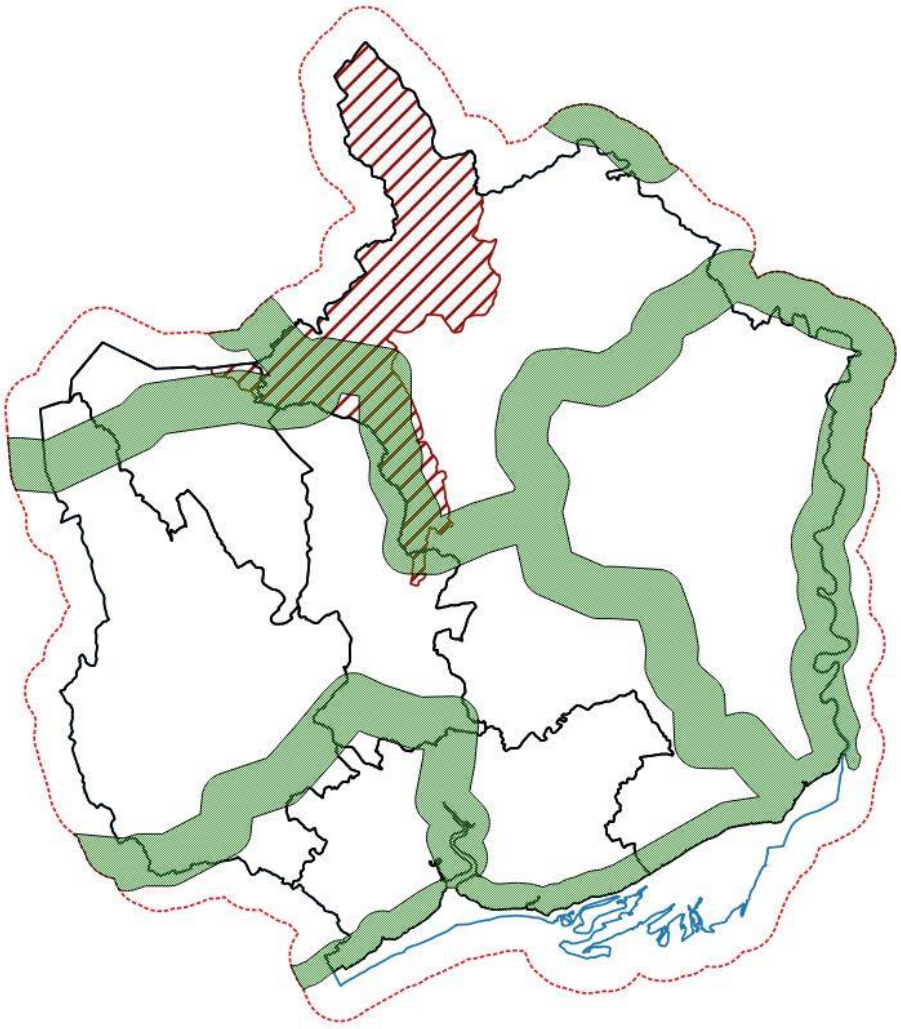
Insect populations are in crisis. It is thought that if current rates of decline continue, 41% of the world's insect species could be extinct within the next few decades.[1] Insects make up over half the species on Earth and carry out fundamental roles such as pollination and nutrient cycling, as well as being a food source for birds, mammals, reptiles and amphibians. Yet many people still think of insects as pests, even though over 99% of insects are actually beneficial.[2]

Threats to invertebrates include habitat loss and fragmentation, chemical use (such as insecticides) pollution (including light pollution), invasive non-native species and climate change. This section includes two rare bumblebees, the Shrill Carder Bee and Brown-Banded Carder Bee, as well as pollinators as a group. Also included are special groups of invertebrates that are found in Greater Gwent and a few other places: coal spoil invertebrates, and the freshwater invertebrates of the Gwent Levels.

Across the UK, Buglife has mapped B-Lines – areas connecting the best habitats and opportunities for habitat creation for insects, particularly pollinators.[3] The aim is to enable insect population recovery and allow for adaptation to climate change. The B-Lines network within Greater Gwent is shown below. Work to identify Important Invertebrate Areas within Greater Gwent has also begun.

Invertebrate recording is covered in numerous ways, ranging from casual recording to targeted schemes run by specialist organisations and societies. Relevant recording schemes are discussed in individual chapters.

B-Lines Network in Greater Gwent



Brown-Banded Carder Bee *Bombus humilis* (Illiger, 1806)

Protection: None

Conservation status: S7 Priority Species

Data availability: Moderate (618 records)

Context: The Brown-Banded Carder Bee is the scarcest of the three all-ginger carder bumblebees, but is difficult to distinguish from the Common Carder Bee (*B. pascuorum*) and Moss Carder Bee (*B. muscorum*). They are found mainly in the south of England and Wales, in flower-rich habitats. They have a preference for clover (*Trifolium* sp), knapweed (*Centaurea* sp), Red Bartsia (*Odontites vernus*) and similar species.[4]

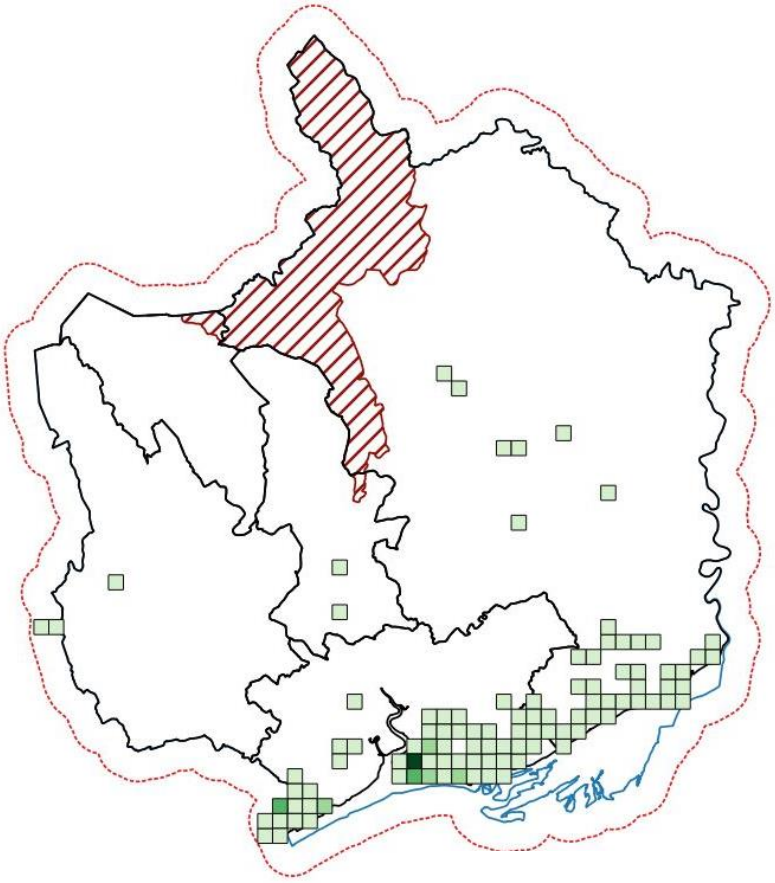
Little is known about Brown-Banded Carder Bee ecology or population trends, but they are thought to have undergone similar, though less extensive, declines to Shrill Carder Bees.[5] Pollinators generally are in serious decline. The UK Pollinator indicator (based on 377 species of bees and hoverflies) has declined by 30% since 1980, with almost half of the species becoming less widespread in the long term.[6] Declines are attributed to multiple pressures – habitat change, loss and fragmentation, disease, invasive non-native species, agro-chemicals and climate change.[7]

Outlook: A lack of available monitoring data in Wales means that population trends are currently difficult to determine. New projects such as Skills for Bees Cymru[8] and existing projects such as Pollinating the Levels[9] aim to increase participation in survey and monitoring activities, such as BeeWalk (the Bumblebee Conservation Trust's standardised national monitoring scheme), and improve available data and site management.

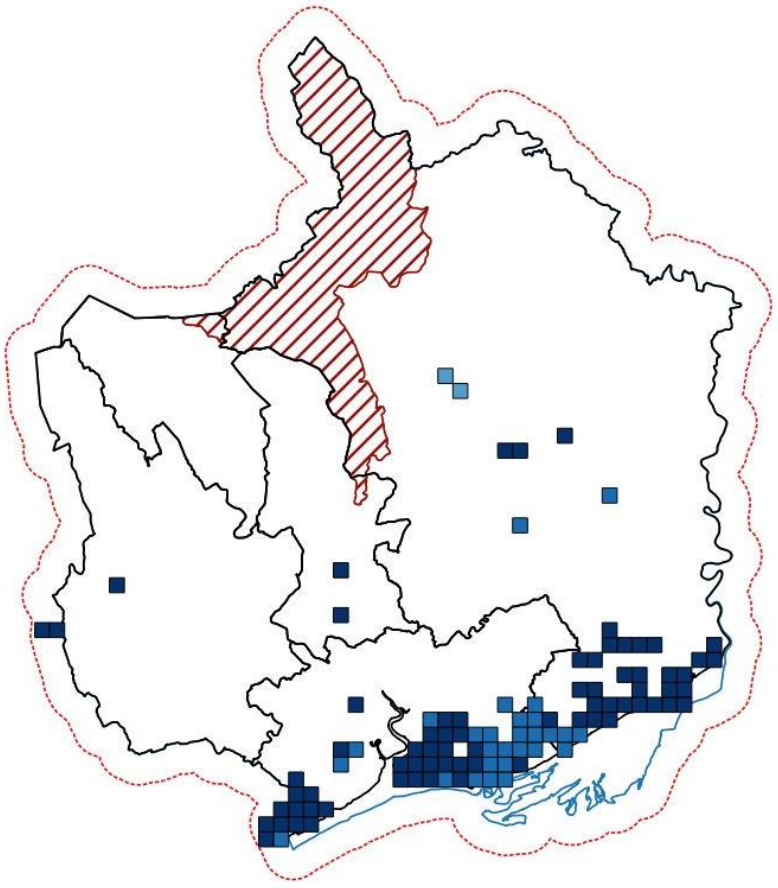
Additionally, actions arising from the Wales Action Plan for Pollinators[6] and Green Infrastructure Action Plan for Pollinators in South East Wales (GIAPP)[10] will also support Brown-Banded Carder Bee populations (see pollinator section).

Greater Gwent range: Brown-Banded Carder Bees are found across the Gwent Levels, in a similar pattern to the Shrill Carder Bee. However, the Brown-Banded Carder Bee is more widespread, found further inland and on smaller habitat patches than the Shrill Carder Bee, as it is thought to utilise a wider range of plants and be more tolerant of fragmentation.[5] The most northerly records are from Clytha Park in Monmouthshire, but these are also among the oldest records. More recent records away from the Levels include Penallta in Caerphilly, Kingcoed, Kitty's Orchard in Monmouthshire and Springvale in Torfaen. It is possible that the Brown-Banded Carder Bee is more widespread, and that records are limited by lack of expertise and survey effort.

Density of Brown-Banded Carder Bee records, maximum 74 records/km²

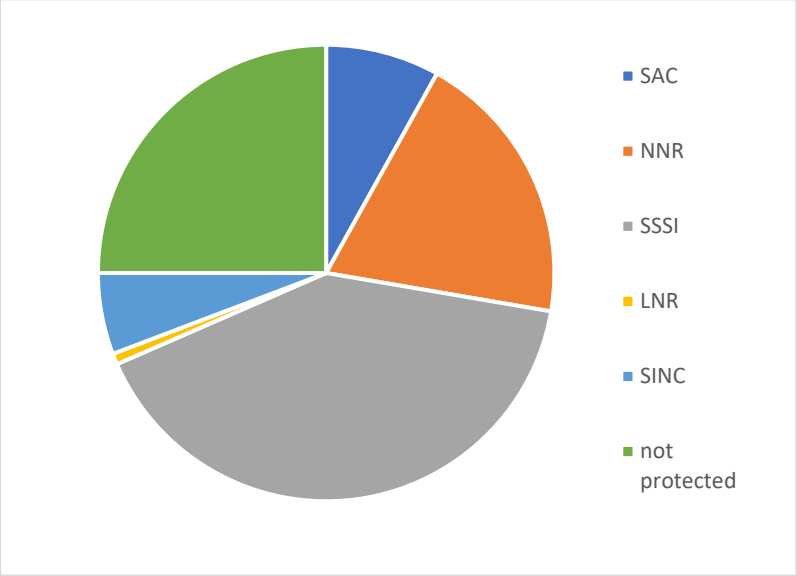


Brown-Banded Carder Bee records by decade



Protection: Three-quarters (75%) of records come from protected sites, with high numbers of records from the Gwent Levels SSSIs and Newport Wetlands NNR. SAC records are likely to be those close to the sea wall included in the Severn Estuary and Usk SACs. There are smaller numbers of records from Springvale and Llwyn Celyn LNRs, and SINCs at Rogiet Country Park, The Minnetts and Sudbrook Mill.

Brown-Banded Carder Bee records from protected sites



Coal spoil invertebrates


Green Tiger Beetle
(Cicindela campestris)

Andy Karran

Protection: None

Conservation status: Various (see below)

Data availability: Moderate (3064 records)

Context: Colliery spoil is a unique feature within the landscape of the Gwent Valleys, formed from the overburden, waste material left over from coal mining. Colliery spoil was often discarded indiscriminately onto valley sides or hill tops, heaped into hummocks of every size and shape to create the colliery spoil tips that are so iconic of the South Wales Valleys. Many colliery spoil tips were simply left alone to naturally revegetate, and these tips are now among the most biodiverse habitats within the South Wales Coalfield.

The mosaic of different habitats and bare ground is particularly valuable for invertebrates, although colliery spoil tips also support a wide range of vascular plants, fungi and lichens.[11] Recent surveys of 15 colliery spoil sites in the South East Wales Valleys found over 900 invertebrate species, 22% of which were conservation priorities.[12] Individual sites have recorded over 100 invertebrate species.[13]

This section uses a short list of invertebrates commonly found on colliery spoil sites (although they can be found on other semi-natural habitats). Some species are considered Local Priorities in the Guidelines for the Selection of Wildlife Sites in South East Wales[14] or are considered National Priority Species. This is a tiny sample of the rich diversity of species found on colliery spoil – surveys carried out by the Colliery Spoil Biodiversity Initiative have found species from 164 different invertebrate families, including 90 bee species and 173 beetle species.[12] Numbers of records are clearly biased towards the more well-recorded groups: butterflies and dragonflies. Small Pearl-Bordered Fritillary, Dingy Skipper, Grayling, and Scarce Blue-Tailed Damselfly are all considered individually in other chapters, where their reliance on colliery spoil sites is shown.

Species	Common Name	SINC	Section 7 Species/UKBAP	Number of Greater Gwent records
Bembecia ichneumoniformis	Six-Belted Clearwing			35
Boloria selene	Small Pearl-Bordered Fritillary	✓	✓	514
Bombus monticola	Bilberry Bumblebee			57
Cicindela campestris	Green Tiger Beetle			106
Cordulegaster boltonii	Golden-Ringed Dragonfly	✓		359
Erynnis tages	Dingy Skipper	✓	✓	573

Hipparchia semele	Grayling	✓	✓	346
Ischnura pumilio	Scarce Blue-Tailed Damselfly	✓		178
Melanargia galathea	Marbled White			707
Myrmeleotettix maculatus	Mottled Grasshopper	✓		86

Outlook: A large programme of land reclamation was implemented in the 1970s and 1980s to remove, re-shape and level many of the old colliery spoil tips. This has left relatively few original tips, and those that remain are threatened with development, removal, exploitation for use as construction aggregate, inappropriate reclamation or 'restoration', or simply an absence of management.[12] Fortunately, the drive to reduce carbon emissions has removed the threat of coal extraction from these sites. Planning Policy Wales now states that 'Proposals for opencast, deep-mine development or colliery spoil disposal should not be permitted.'[15]

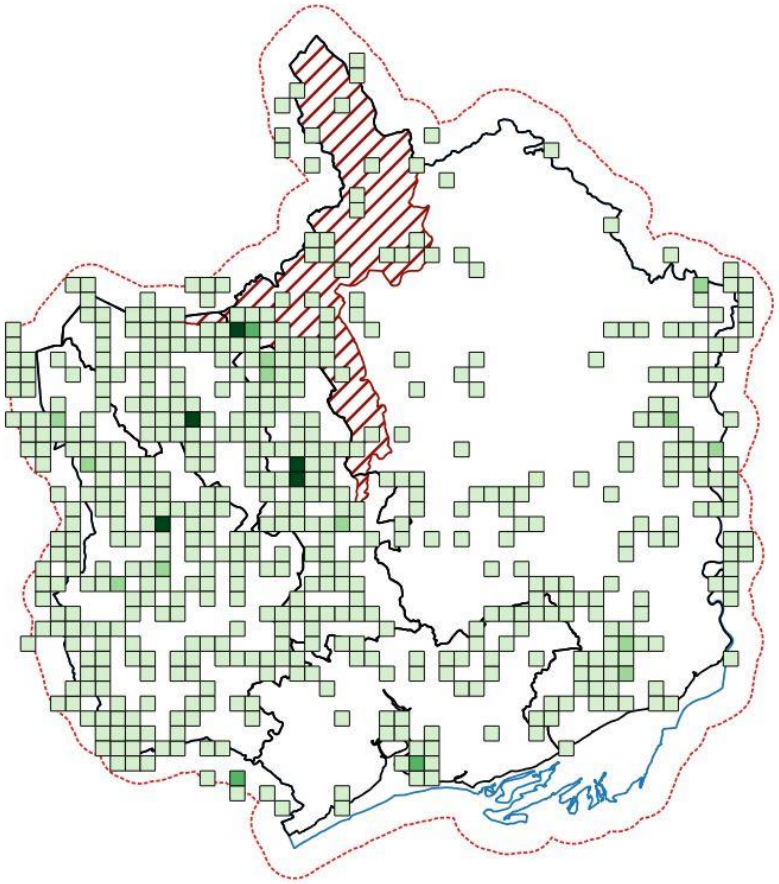
Along with other areas of the uplands, colliery spoil sites are vulnerable to landscape crime, including arson, fly-tipping and illegal off-roading. These can be hugely damaging to biodiversity, as well as negatively impacting amenity and recreation.[16] Various programmes are in place to tackle these issues.

Awareness of colliery spoil sites and their importance for invertebrates is increasing, helped by the Colliery Spoil Biodiversity Initiative and Buglife's work on Brownfield sites. Open Mosaic Habitats on Previously Developed Land, which include colliery spoil, were made a UKBAP Priority Habitat in 2007, and are now a Wales S7 Habitat. However, relatively few sites have been surveyed thoroughly for invertebrates, meaning that they are less likely to be recognised and protected.

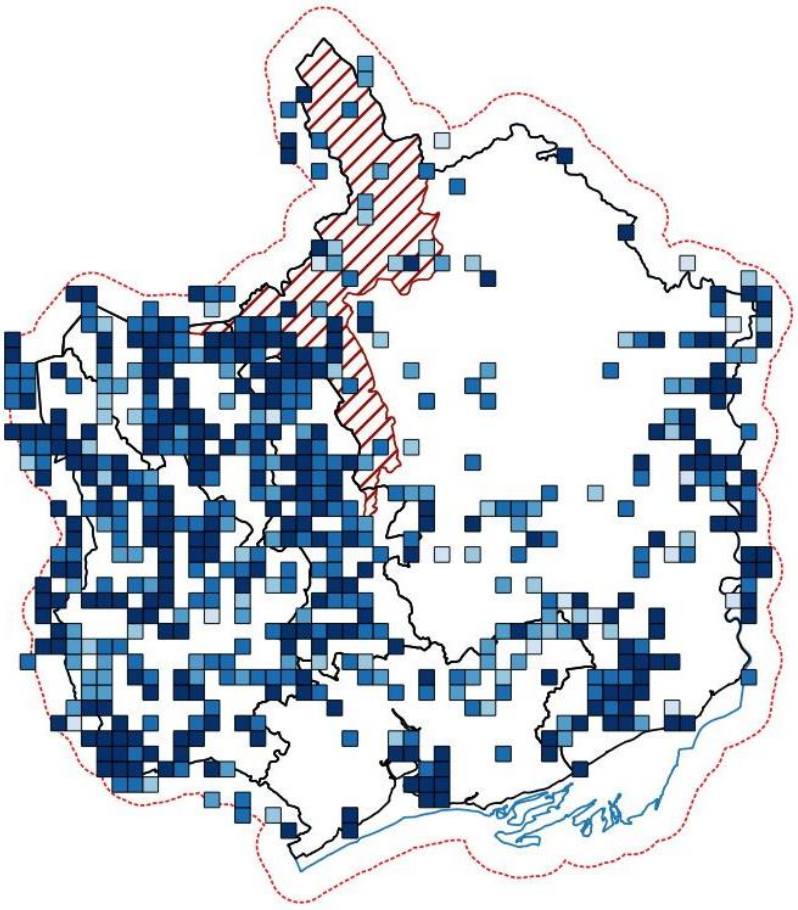
Greater Gwent range: These invertebrate species are found across Greater Gwent, but there is a greater concentration within the valleys to the north-west of the study area, corresponding to the South Wales Coal Measures. Note that very few targeted invertebrate surveys have taken place within the study area (most work by the Colliery Spoil Biodiversity Initiative has taken place further west). Recording hotspots correspond to protected sites such as Silent Valley SSSI/LNR and Aberbargoed Grasslands SAC/NNR, as well as the UK Butterfly Monitoring Scheme site at Black Rock. The area around The British and Blaenserchan Valley has been subject to numerous development proposals, leading to additional survey effort. Most areas have recent records, possibly due to the growing interest in colliery spoil sites.

Diversity hotspots are not always associated with the highest recording effort. The most diverse areas are Garn Lakes (forming an extensive area with the surrounding areas of Coity Tips and Canada Tips), The British & Blaenserchan Valley, and the Rhyd y Blew area to the north of Ebbw Vale. Rhyd y Blew is not a colliery spoil site but a series of engineered plateaus that share many characteristics of colliery spoil, such as bare ground and shallow pools. Other diverse areas (including other post-industrial sites and colliery spoil) include Ffos y Fran/Gelligaer Common, Cymynyscoy Quarry, Parc Penallta/Nelson Bog, Aberbargoed, Caerwent, Trellech Quarry, Central Valley and Silent Valley.

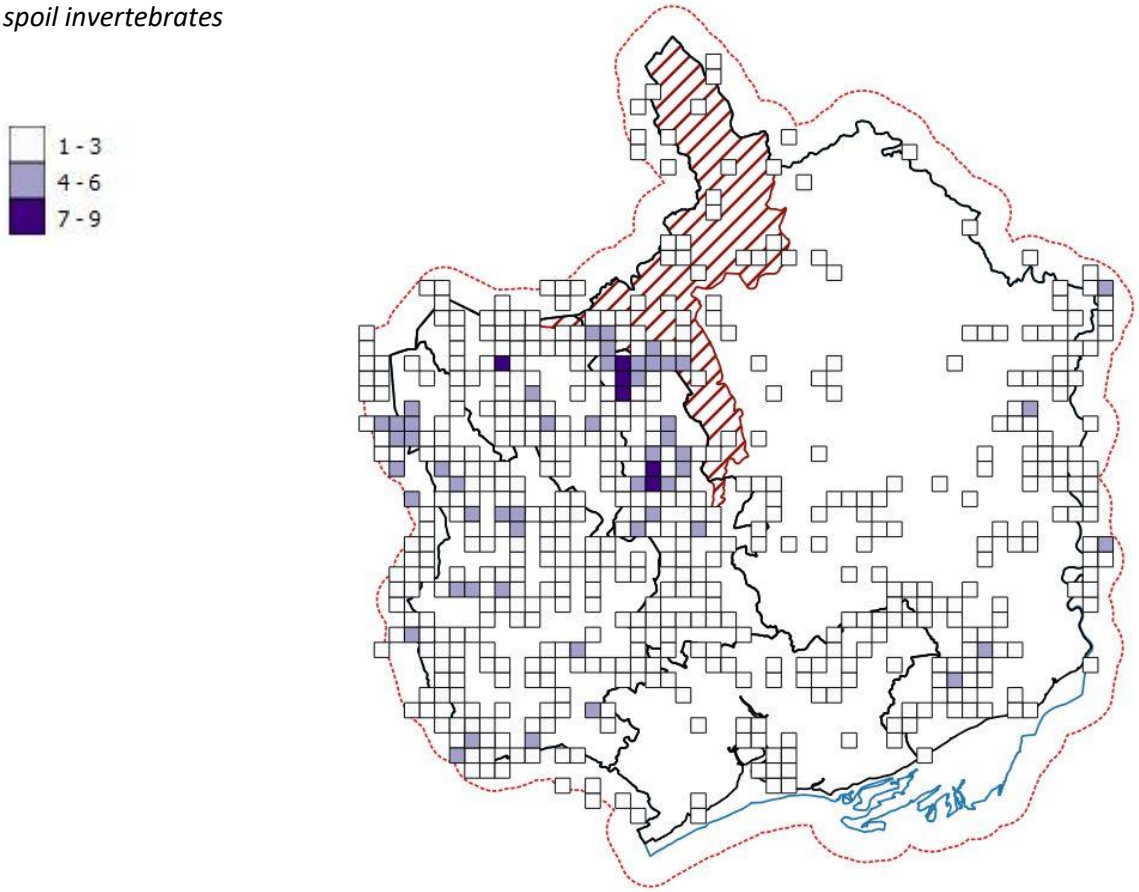
Density of colliery spoil invertebrate records, maximum set to ≥100/km²



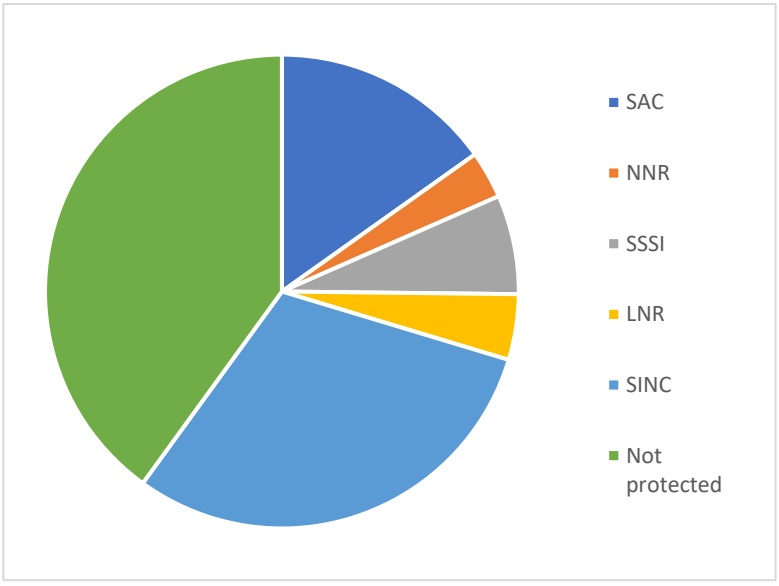
Colliery spoil invertebrate records by decade



Diversity of colliery spoil invertebrates



Protection: 60% of records come from protected sites, with high numbers of records from Aberbargoed Grasslands SAC/NNR and Blackrock (within the Usk Bat SAC). SSSI records come from a range of sites including the Blorenge, Silent Valley, Llandegfedd, Penllwyn Grasslands and Nelson Bog. The SINC records come from a large number of sites, particularly the large upland SINCs that cover much of the eastern valleys area.



Colliery spoil invertebrate records from protected sites

Gwent Levels aquatic invertebrates


Hairy Dragonfly (*Brachytron pratense*)

Andy Karran

Protection: None, although protection conferred by SSSI designation.

Conservation status: See below

Greater Gwent data availability: Poor

Context: The Gwent Levels are a historic landscape, containing a network of drainage ditches known as reens; there approximately 870 miles of ditches across the entire Levels.[17] The area is divided into seven SSSIs and the Newport Wetlands NNR, and is divided by the River Usk SAC and the city of Newport and bounded by the Severn Estuary SAC/SPA. The Gwent Levels SSSIs are notified for the diversity and rare species of plants and invertebrates in the reens, as well as the presence of Shrill Carder Bee. Magor Marsh is also designated for its fen habitat and breeding birds, with Newport Wetlands also of importance for birds.

Rare and notable species found within the Gwent Levels ditches include Silver Colonel Soldier Fly **(***Odontomyia argentata*), Great Silver Water Beetle (*Hydrophilus piceus*), Hairy Dragonfly (*Brachytron pratense*), Variable Dameslefly (*Coenagrion pulchellum*), Ornate Brigadier *(Odontomyia ornata), Physa heterostropha* (a freshwater snail), *Haliplus mucronatus* (a crawling water beetle) and *Hydaticus transversalis* (a water beetle).

It is the length and variation available within the ditch network that provides so many opportunities for different invertebrates; the reens can be shallow or deep, light or shaded, open water or full of plants. The reens undergo a regular maintenance programme of clearing, de-silting and casting (dredging) that provides an ongoing cycle of successional stages for the freshwater community. The data in this section is a summary and visual representation of the survey work carried out between 2009 and 2012 on behalf of the Countryside Council for Wales to monitor the invertebrate interest of the Gwent Levels SSSIs, rather than individual species records. [18,19,20]

The table below lists the numbers of freshwater invertebrate species found within each SSSI:

SSSI	**Number of recorded freshwater invertebrate species on SSSI citation**	**Number of Species found by survey[18,19,20]**
Magor & Undy[17,21]	>300 (43 nationally rare & notable)	148 (12 nationally rare & notable*) in 49 reens & field ditches
Rumney & Peterstone[22,23]	>164	
Nash & Goldcliff[24,25] (including part of Newport Wetlands)	>350	
Redwick & Llandevenny[26,27]	>200	101 species (8 nationally rare & notable*) in 24 reens
St Brides[28,29]	>200	

Whitson[30,31]	>400 (65 nationally rare & notable)	90 (8 nationally rare & notable*) in 24 reens
Magor Marsh[32]	No details given, although the aquatic invertebrate assemblage is a feature.	

*Listed in Red Data Book or Nationally Scarce

Outlook: The Countryside Council for Wales (CCW) reports[18,29,20] state that diversity in the Gwent Levels reens is generally low compared to other grazing marsh ditches in Britain, such as the Somerset Levels. Although the surveys did not sample every reen, overall species richness and numbers of rare and notable species were low when compared with the SSSI citations. It is generally thought that there are 144 rare and notable invertebrates found in the reens (it is unclear where this figure originally came from), but the surveys only found 19 in total. Some species have been downgraded in recent iterations of the Red Data Books,[19] but this would not account for all of the missing species.

The reports indicate that this low level of diversity and species quality is part of an ongoing decline since the 1980s. The most significant possible cause is eutrophication from farm run-off, leading to an abundance of duckweed (*Lemna* spp.) and algae. This shades out the submerged macrophyte vegetation that many species feed on. Additionally, *Lemna* makes sampling more difficult and can lead to species being overlooked.[28,19,20]

A second factor is the regularity and type of ditch clearance. Too much clearance can result in less availability of species rich, late-successional habitat, which takes time to develop. The angle of the banks can also affect the availability of shallow water margins, favoured by many species.[18,19,20] Conversely, lack of reen maintenance can also result in poor habitat quality, with over-shading or silting also limiting biodiversity. Individual landowners are responsible for management of over 85% of the reen and ditch system,[17] so reen management can vary enormously.

These concerns are consistent with the pressures widely faced by freshwater invertebrates, particularly habitat loss, poor habitat quality and pollution. Smaller water bodies, such as ponds and ditches, have less protection and regulation, but are more vulnerable to losses, and are affected by climate change to a greater degree.[2]

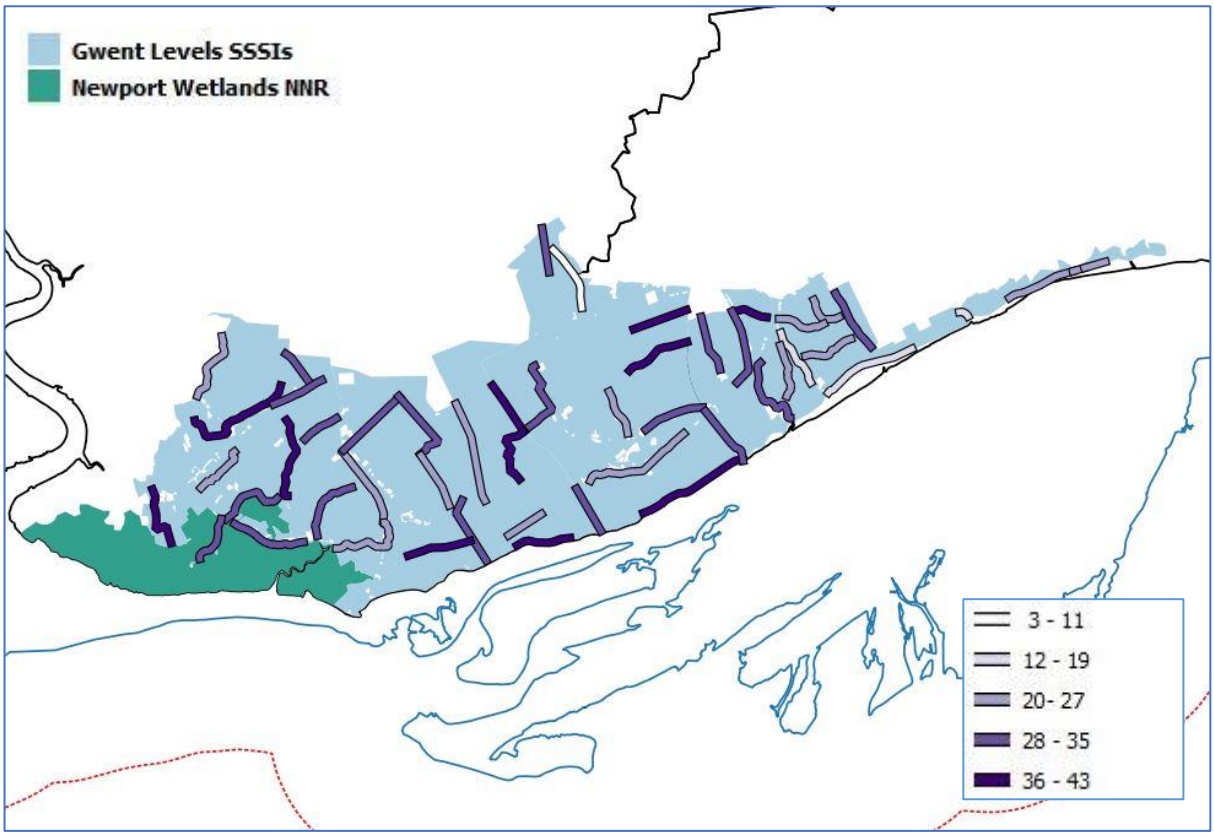
The Living Levels Partnership is currently working to restore some of the ditch network, as well as working with landowners and raising awareness of the importance of the reens.[33]

Greater Gwent range: The CCW surveys measured the species richness and Species Quality Index (SQI) of a sample of reens across the Gwent Levels. Species quality is measured by a scoring system for rarity, according to a standard methodology produced by Buglife.[33] Common species score 1, Nationally Rare or Scarce species score 3 and Red List species score 5. The SQI is calculated by dividing the total score by the number of species found.

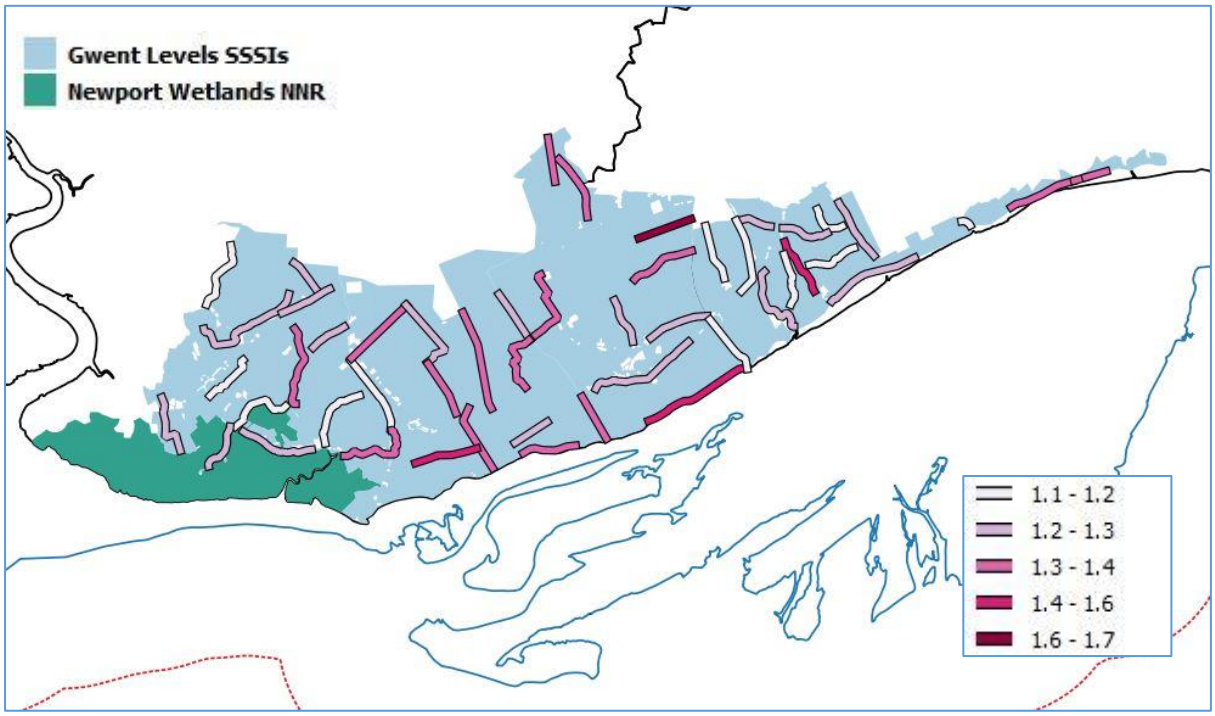
The maximum species richness for any surveyed reen is 43, although many reens and ditches fall within the higher categories of species richness. Reens with lower species richness tend to be towards the edges of the SSSIs. This is far below the overall species richness found by the survey, demonstrating that the high levels of diversity are spread throughout the reen network.

In contrast, very few reens have a high SQI score. Just four reens scored above 1.5, with the maximum being 1.68. This shows that the rarest invertebrates are found in relatively few reens. Undoubtedly the condition of individual reens will have changed since the CCW surveys were carried out, but it is important to bear in mind that while overall diversity is spread across the Gwent Levels, the rare species are not, and both these elements of assemblage and individual species are key features of the Levels SSSIs.

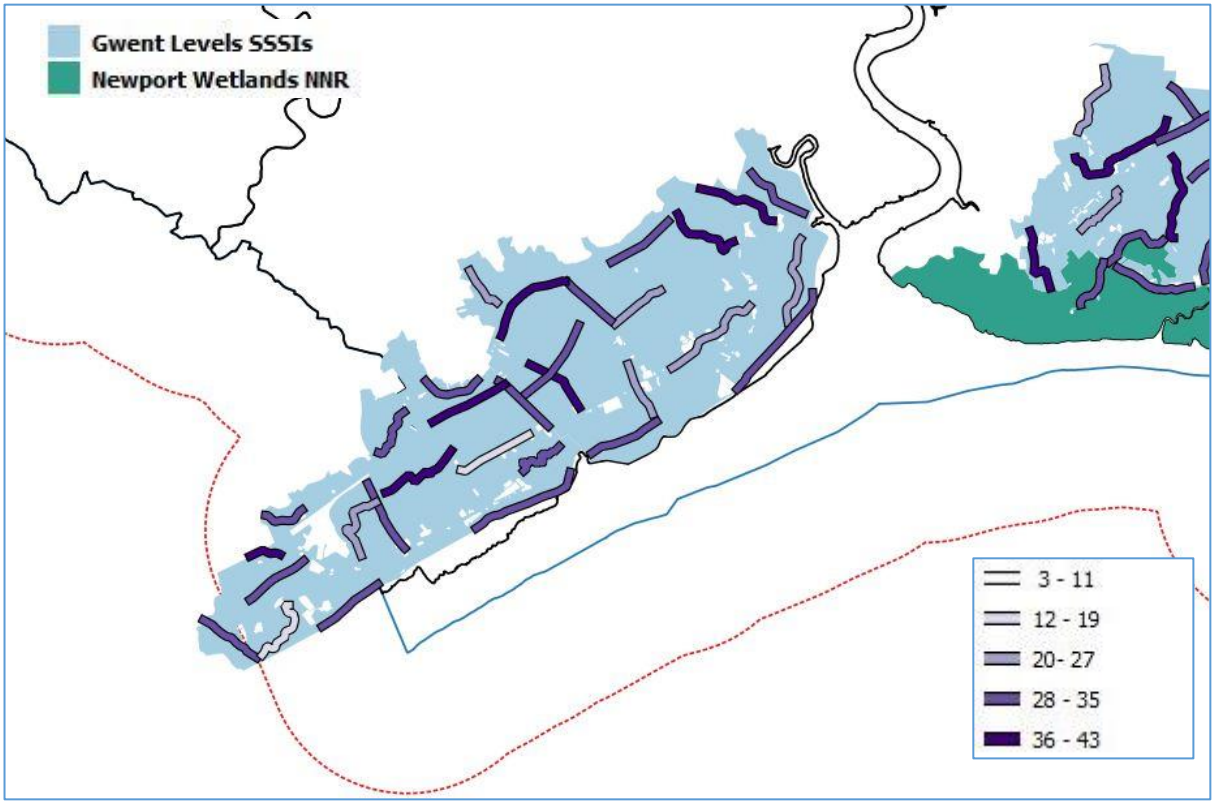
Species richness of surveyed reens and ditches – Eastern Levels



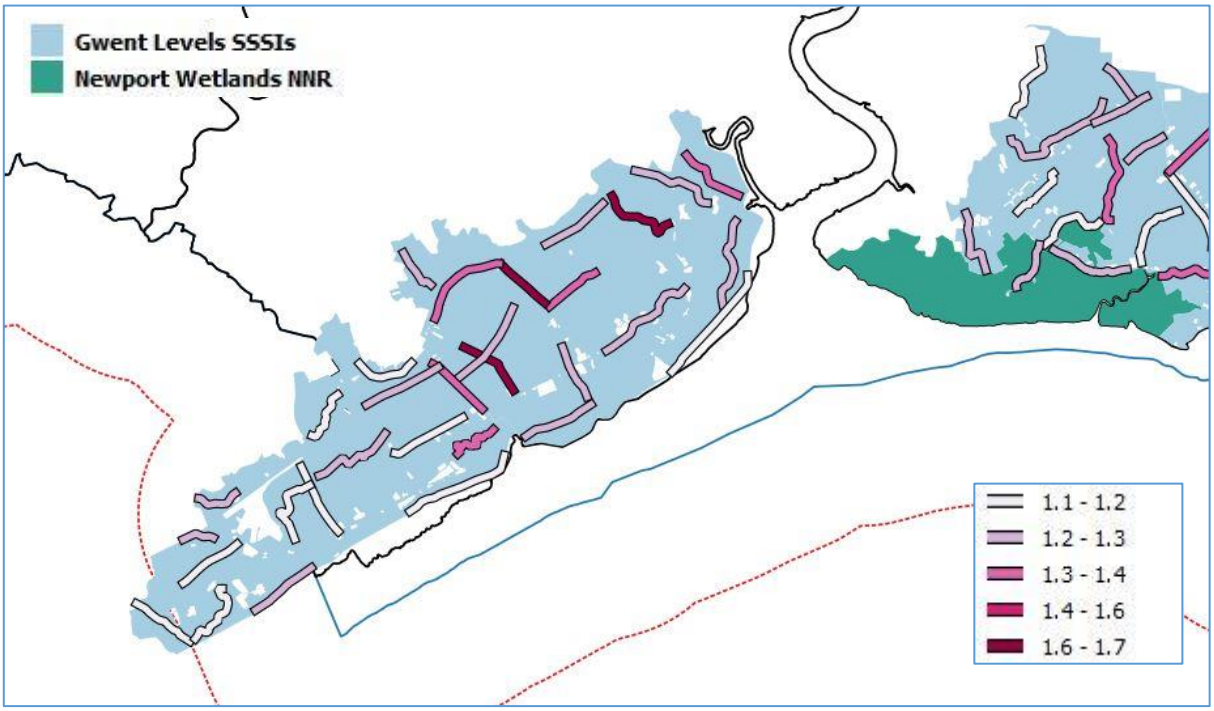
Species Quality Index of surveyed reens and ditches – Eastern Levels



Species richness of surveyed reens and ditches – Western Levels



Species Quality Index of surveyed reens and ditches – Western Levels



Pollinators


Garden Tiger (*Arctia caja*)

Andy Karran

Protection: none

Conservation status: The pollinators considered here are S7 Wales Priority Species, but not all pollinators are listed.

Data availability: Moderate (30,706 records for 101 species)

Context: Pollinators are a fundamental part of our ecosystems: 87.5% of the world's wild flowering plants and more than 75% of global food crops are pollinated by insects and other plants.[34] The value of pollination as a contribution to the UK crop market was £430 million per annum (in 2007).[35] Insect pollinators include bees (both wild bees and farmed honeybees), wasps, flies (especially hoverflies), butterflies and moths. It is important to note that although the honeybee (*Apis mellifera*) is an important pollinator for a number of crops and economically important for wax and honey products, it is just one of around 4,000 species of insect that provide pollination.[36] Some plant species are only pollinated by specialist species, while other crops benefit from being pollinated by a wider diversity of species,[34] so it is crucial to maintain wild pollinator abundance and diversity.

Pollinator decline is therefore a very serious issue. The UK Pollinator indicator (based on 377 species of bees and hoverflies) has declined by 30% since 1980, with almost half of the species becoming less widespread in the long term.[6] Of those species where a long-term trend could be calculated, 41% of moths[37] and 57% of butterflies[38] have declined in abundance since the mid 1970s. In Wales, honeybees have declined by 23% between 1985 and 2005.[7] Declines are attributed to multiple pressures: habitat change, loss and fragmentation, disease, invasive non-native species, agro-chemicals and climate change.[7]

This section uses the pollinator species listed on the S7 Priority Species list, 101 of which have records within the study area. There is a bias on the S7 list towards moths and butterflies, compared to bees, wasps and hoverflies; this may be due to historic interest and data availability, rather than there being fewer species of bee, wasp or hoverfly in decline or at risk. Note that due to the size of the dataset, this section does not include English records from HBRC, GERC or NBN.

Outlook: Considerable efforts are being made to conserve pollinators. The Welsh Government launched its Action Plan for Pollinators (the first of its kind in the UK) in 2013.[7] The plan focuses on four themes: policy, governance and evidence; diverse and connected habitats; healthy pollinator populations; and raising awareness. Successes arising from the action plan include the establishment of the Wales Pollinator Task Force and the national Caru Gwenyn/Bee Friendly initiative, which launched in 2016.

Pollinator populations are now more closely monitored through the UK Pollinator Monitoring Scheme run by UK Centre for Ecology and Hydrology (UKCEH) and numerous casual and structured recording schemes through the Bee, Wasp and Ants Recording Society, Butterfly Conservation (see Lepidoptera section for more details), Bumblebee Conservation, Buglife and Plantlife.

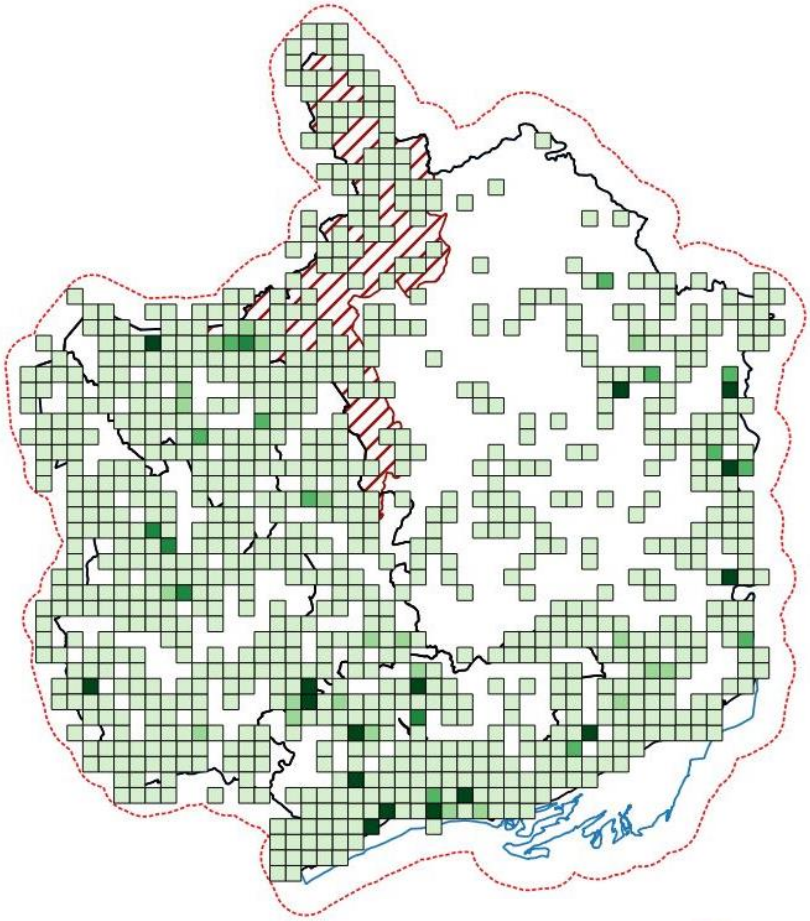
More locally, the award-winning Green Infrastructure Action Plan for Pollinators in South East Wales (GIAPP)[10] was launched in 2015. Monmouthshire was one of the first counties to achieve Bee Friendly status, and Newport is currently working towards becoming a Bee Friendly city. Pollinator work has involved local authorities and the third sector, as well as housing associations, schools and community groups, carrying out activities such as wildflower planting and habitat management.

Pollinator conservation has natural synergy with other conservation initiatives, and work on wildflower meadows, roadside verges, traditional orchards, school and church grounds, and wildlife-friendly farming will all be beneficial for pollinators. Equally, pollinator conservation is likely to improve habitat and connectivity for other species. It is probably too early to tell if this work is having a positive impact: the UK pollinator index is currently showing little change in the short term, although more species are now increasing in distribution compared to the long-term trend.[6]

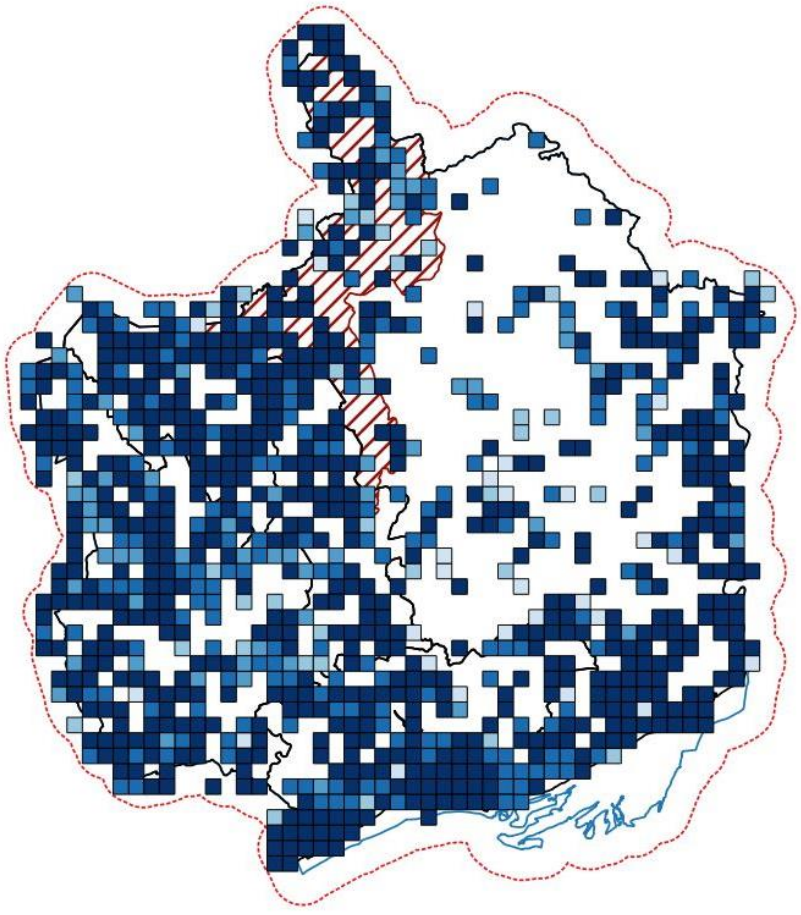
Greater Gwent range: The S7 pollinators are found widely, but thinly, across Greater Gwent, with many recent records. However, with a large number of species, there is huge variation: 10 species have less than 5 records within 50 years, and 8 species have more than 1,000 records. The average is 304 records, with the bee and wasp species generally having fewer records than the lepidoptera.

The 'pinprick' pattern of record density and species richness is reflective of recording bias, where specialist recorders make considerable efforts at certain sites. These are sometimes sites known for their invertebrate or overall interest, such as the UKBMS site at Blackrock, Newport Wetlands NNR and Pentwyn Farm SSSI, but recording bias can also reflect long-term recording effort in recorders' gardens. Also of note is the lack of records in central Monmouthshire, which reflects the general recording bias within the study area but is of particular relevance as most of the local agricultural industry is located here.

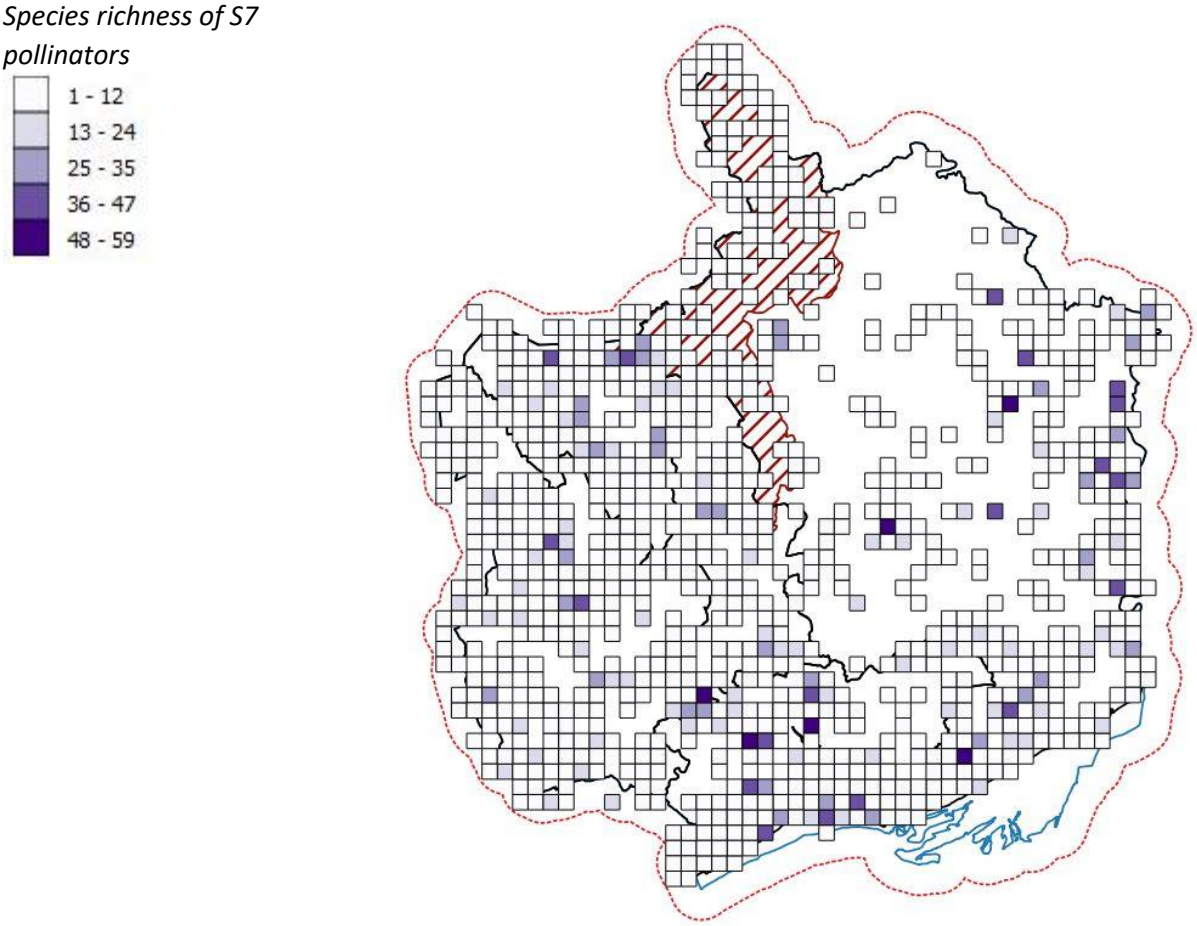
Density of S7 pollinator records, maximum ≤500 records/km²



S7 pollinator records by decade

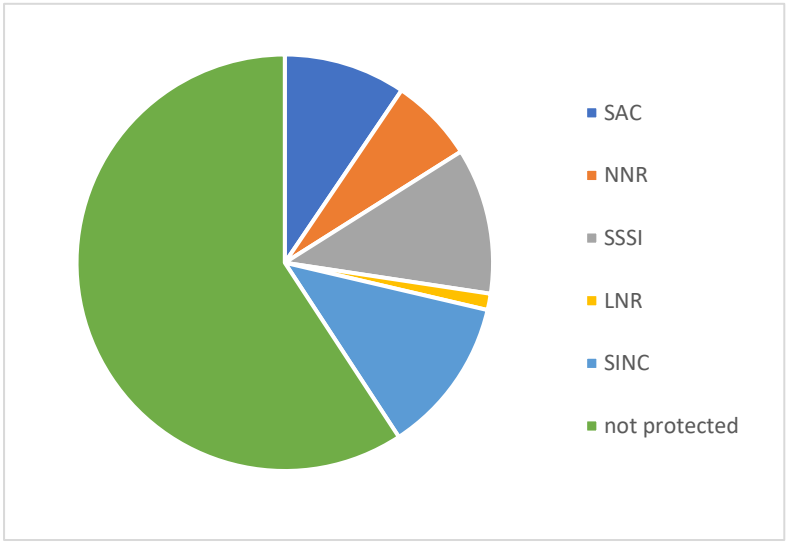


Species richness of S7 pollinators



Protection: 41% of records come from protected sites, with high numbers of records from the Gwent Levels SSSIs and Newport Wetlands NNR. Other key sites include Aberbargoed SAC, Pentwyn Farm SSSI, Silent Valley SSSI/LNR and Blaenserchan Valley SINC. As with overall record distribution, records from protected sites are likely to be biased towards sites favoured by recorders.

S7 Pollinator records from protected sites



Shrill Carder Bee *Bombus Sylvarum* (Linnaeus, 1761)

Gabi Horup

Protection: None

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

Data availability: Good (1,012 records)

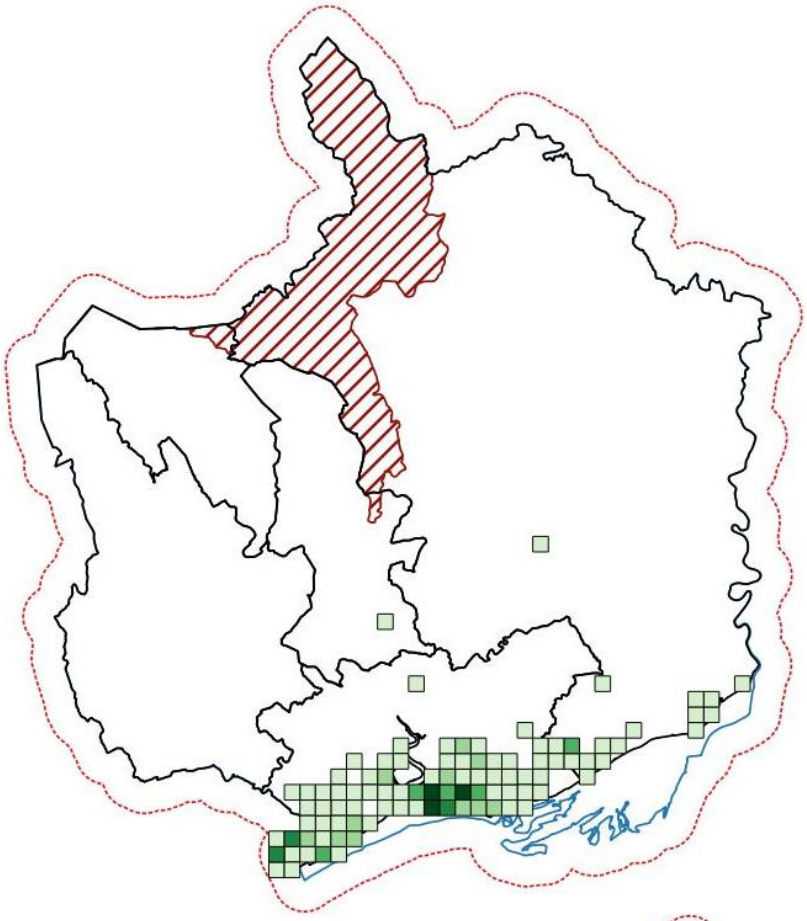
Context: Shrill Carder Bees are one of the rarest bumblebees in England and Wales. Historically they were relatively widespread throughout Southern England and lowland Wales but are now believed to be restricted to just five isolated areas, three of which are in South Wales. The reasons for this significant decline in distribution are not fully understood but are thought to be linked to habitat loss and fragmentation.[39] Shrill Carder Bees require extensive mosaics of flower-rich habitat for feeding, close to tussocky grassland for nesting, as they do not forage far from the nesting sites and are thought to have low dispersal ability. Colonies are relatively small, consisting of 50–70 workers and their queen. Shrill Carder Bees normally fly between May and September.[40]

Outlook: Shrill Carder Bees are still threatened by inappropriate habitat management, development and changes in land-use, and landscape-scale conservation work is required to restore populations. A lack of available monitoring data in Wales means that population trends are difficult to determine.

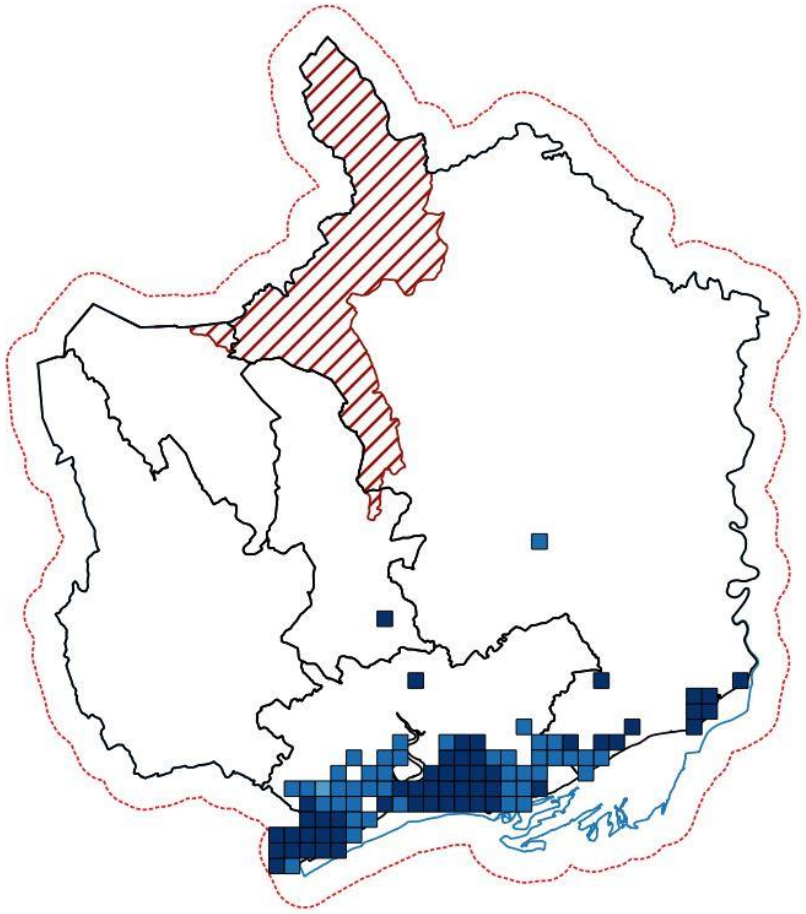
The Gwent Shrill Carder Bee population is thought to be one of the most significant of the five remaining populations. The Gwent Levels population is thought to be at highest risk from inappropriate management, development, insecticide usage and extreme weather events associated with climate change.[39] Through new projects such as Skills for Bees Cymru[8] and existing projects such as Pollinating the Levels,[9] work is ongoing to increase participation in survey and monitoring activities such as BeeWalk (the Bumblebee Conservation Trust's standardised national monitoring scheme) and improve available data and site management.

Due to the serious declines of the species, a 10-year conservation strategy (2020–2030) for England and Wales has been produced with a range of partners and stakeholders. The strategy aims to prevent further losses, increase habitat resources and populations, improve knowledge and understanding, and raise awareness.[41] Additionally, actions arising from the Wales Action Plan for Pollinators[42] and Green Infrastructure Action Plan for Pollinators in South East Wales (GIAPP)[10] will also support Shrill Carder Bee populations (see pollinator section).

Greater Gwent range: Shrill Carder Bees are found across the south of the study area and are strongly associated with the Gwent Levels. Most records are recent, as the population was only found in 1998 by Mike Pavett, who spotted them while carrying out surveys on the Gwent Levels.[43] Subsequent surveys carried out by the Countryside Council for Wales and National Museums & Galleries of Wales in 2003 found them to be widespread in the central and west of the Gwent Levels, as far as the outskirts of Cardiff, and inland to the edges of Newport, with some sites hosting over 100 workers.[43] Surveys to determine the eastern extent of the population in 2010 found Shrill Carder Bees as far east as Portskewett and the edge of Chepstow, albeit in smaller numbers and not as far inland.[43]



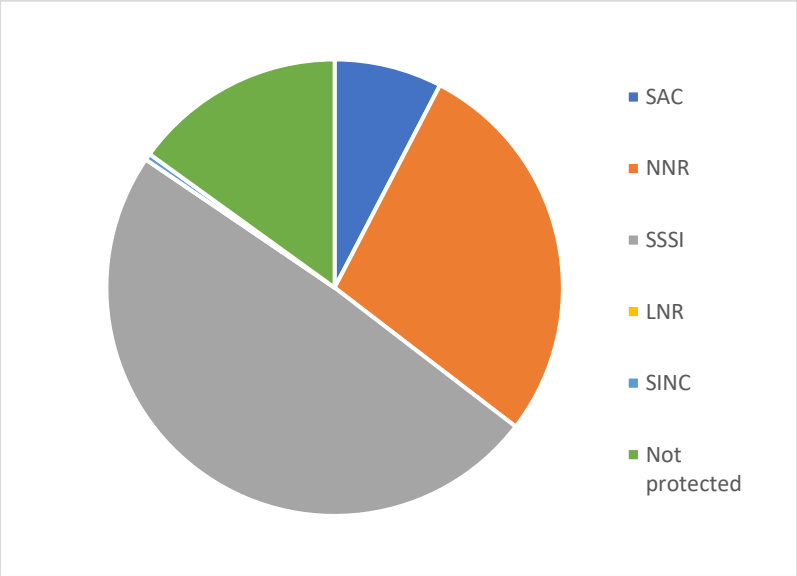
Density of Shrill Carder Bee records, maximum 58 records/km²



Shrill Carder Bee records by decade

Protection: 85% of Shrill Carder Bee records come from protected sites within the Gwent Levels Area: the Severn Estuary SAC, Newport Wetlands NNR, and the Gwent Levels SSSIs. As a result of the extensive survey work, Shrill Carder Bees have been added as a qualifying feature on six of the eight Gwent Levels SSSIs.[44]

Shrill Carder Bee records from protected sites



References

1. Sánchez-Bayo F and Wyckhuys KA. 2019. Worldwide Decline of the Entomofauna: A Review of its Drivers. Biological Conservation 232: 8–27.
2. Macadam CR, Whitehouse A & Shardlow M. 2020. No Insectinction – How to Solve the Insect Declines Crisis. Buglife. The Invertebrate Conservation Trust, Peterborough.
3. Buglife. 2021. B-Lines – Insect Superhighways. Buglife. The Invertebrate Conservation Trust, Peterborough.
4. Brown-Banded Carder Bee. Bumblebee Conservation Trust: https://www.bumblebeeconservation.org/ginger-yellow-bumblebees/brown-banded-carder-bee/ (accessed 17/05/2021).
5. Smith MN. 2011. The Status and Distribution of the Shrill Carder Bee Bombus Sylvarum on the Eastern Gwent Levels and within the Caerwent and Caldicot Areas of Gwent in 2010. CCW Contract Science Report No. 972. Countryside Council for Wales, Bangor.
6. JNCC UK Biodiversity Indicators 2020 – Change in the Distribution of Pollinators 1980–2017. UKBI - D1c. Pollinating insects: https://jncc.gov.uk/our-work/ukbi-d1c-pollinating-insects (accessed 16/05/2021).
7. Welsh Government. 2013. Action Plan for Pollinators. Welsh Government (Biodiversity Team).
8. Skills for Bees. Bumblebee Conservation Trust: https://www.bumblebeeconservation.org/skills-for-bees-cymru/ (accessed 16/05/21).
9. Pollinating the Levels. Living Levels: https://www.livinglevels.org.uk/project-descriptions/2018/2/19/pollinating-the-levels (accessed 2/5/2021).
10. TACP. 2015. Green Infrastructure Action Plan for Pollinators in South-east Wales. Report to Monmouthshire County Council on behalf of Monmouthshire County Council and Blaenau Gwent, Caerphilly and Torfaen County Borough Councils December 2015. TACP UK Ltd.
11. Olds L. undated. Colliery Spoil Tips Biodiversity Briefing Paper. Colliery Spoil Biodiversity Initiative.
12. Olds L. 2019. Invertebrate Conservation Value of Colliery Spoil Habitats in South Wales. Colliery Spoil Biodiversity Initiative.
13. Lush MJ, Shepherd P, Kirby P, Lush CE and Griffiths R. 2016. Definition and Mapping of Open Mosaic Habitats on Previously Developed Land: Phase 2 Testing Methods and Developing the Habitat Inventory (WC0795). Defra, Natural England and Countryside Council for Wales.
14. Gwent Wildlife Trust. 2004. Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership.
15. Welsh Government. 2021. Planning Policy Wales (Edition 11).
16. TACP. 2015. Natural Resources Management Plan for South-East Wales Uplands. Report to Torfaen County Borough Council. October 2015. TACP UK Ltd.
17. Countryside Council for Wales. 2008. Gwent Levels: Magor and Undy Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
18. Boyce DC. 2010. Monitoring Invertebrate Features on SSSIs: Aquatic Invertebrates on Gwent Levels: Whitson SSSI. CCW Regional Report no. SEW/10/1. Countryside Council for Wales, Bangor
19. Boyce DC. 2012. Monitoring Invertebrate Features on SSSIs: Aquatic Invertebrates on Gwent Levels: Redwick & Llandevenny SSSI, St Brides SSSI. CCW Regional Report no. SEW/12/01. Countryside Council for Wales, Bangor
20. Boyce DC. 2013. Monitoring Invertebrate Features on SSSIs: Aquatic Invertebrates on Gwent Levels: Magor and Undy SSSI, Nash and Goldcliff SSSI, Newport Wetlands SSSI, Rumney and

Peterstone SSSI. CCW Regional Report no. CCW/SEW/13/3. Countryside Council for Wales, Bangor
21. Countryside Council for Wales. 1989. Gwent Levels: Magor and Undy Site of Special Scientific Interest Citation. Countryside Council for Wales, Bangor.
22. Countryside Council for Wales. 2008. Gwent Levels: Rumney and Peterstone Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
23. Countryside Council for Wales. 1993. Gwent Levels: Rumney and Peterstone Site of Special Scientific Interest Citation. Countryside Council for Wales, Bangor.
24. Countryside Council for Wales. 2008. Gwent Levels: Nash and Goldcliff Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
25. Countryside Council for Wales. 1987. Gwent Levels: Nash and Goldcliff Site of Special Scientific Interest Citation. Countryside Council for Wales, Bangor.
26. Countryside Council for Wales. 2008. Gwent Levels: Redwick and Llandevenny Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
27. Countryside Council for Wales. 1989. Gwent Levels: Redwick and Llandevenny Site of Special Scientific Interest Citation. Countryside Council for Wales, Bangor.
28. Countryside Council for Wales. 2008. Gwent Levels: St Brides Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
29. Countryside Council for Wales. 1991. Gwent Levels: St Brides Site of Special Scientific Interest Citation. Countryside Council for Wales, Bangor.
30. Countryside Council for Wales. 2008. Gwent Levels: Whitson Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
31. Countryside Council for Wales. 1991. Gwent Levels: Whitson Site of Special Scientific Interest Citation. Countryside Council for Wales, Bangor.
32. Countryside Council for Wales. 2008. Magor Marsh Site of Special Scientific Interest – Your Special Site and its Future. Countryside Council for Wales, Bangor.
33. Targeted Natural Heritage Restoration. Living Levels: https://www.livinglevels.org.uk/project-descriptions/2018/2/19/targeted-natural-heritage-restoration (accessed 18/05/21).
34. IPBES. 2016. The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production. S.G. Potts, V. L. Imperatriz-Fonseca, and H. T. Ngo (eds). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany.
35. UK National Ecosystem Assessment (NEA). 2011. The UK national Ecosystem Assessment Technical Report. UNEP-WCMC, Cambridge.
36. Save the Bees (But Which Ones?) Buglife: https://www.buglife.org.uk/blog/save-the-bees-but-which-ones/ (accessed 16/05/21).
37. Fox R, Dennis EB, Harrower CA, Blumgart D, Bell JR, Cook P, Davis AM, Evans-Hill LJ, Haynes F, Hill D, Isaac NJB, Parsons MS, Pocock MJO, Prescott T, Randle Z, Shortall CR, Tordoff GM, Tuson D and Bourn NAD. 2021. The State of Britain's Larger Moths 2021. Butterfly Conservation, Rothamsted Research and UK Centre for Ecology & Hydrology, Wareham, Dorset.
38. Fox R, Brereton TM, Asher J, August TA, Botham MS, Bourn NAD, Cruickshanks KL, Bulman CR, Ellis S, Harrower CA, Middlebrook I, Noble DG, Powney GD, Randle Z, Warren MS and Roy DB. 2015. The State of the UK's Butterflies 2015. Butterfly Conservation and the Centre for Ecology & Hydrology, Wareham, Dorset
39. Page S, Comont R, Lynch S and Wilkins V. 2019. Species Knowledge Review: Shrill Carder Bee Bombus sylvarum in England and Wales. Bumblebee Conservation Trust & Buglife.
40. Bumblebee Conservation Trust. 2017. The Shrill Carder Bee (information guide leaflet). Bumblebee Conservation Trust.

41. Page S, Lynch S, Wilkins V and Cartwright B. 2020. A Conservation Strategy for the Shrill Carder Bee, Bombus sylvarum, in England and Wales 2020–2030. Bumblebee Conservation Trust.
42. Welsh Government. 2013. Action Plan for Pollinators. Welsh Government (biodiversity team).
43. Pavett PM. 2004. The Status of the Shrill Carder Bee Bombus sylvarum on the Gwent Levels CCW. Contract science report no.623. Countryside Council for Wales and National Museums & Galleries of Wales.
44. Smith MN. 2011. The Status and Distribution of the Shrill Carder Bee Bombus Sylvarum on the Eastern Gwent Levels and within The Caerwent And Caldicot Areas of Gwent in 2010. CCW contract science report no. 972. Countryside Council for Wales, Bangor.

Vascular Plants

Plants underpin every aspect of our lives, from the air we breathe to our food, clothes, medicines and more. They also support the vast majority of other species, and are usually the means by which we classify, define and subdivide ecosystems and habitats. And yet they are often overlooked: globally, two in five plants are estimated to be threatened with extinction.[1] Only 10% of plants have been formally assessed, and these assessments show considerable bias towards 'useful' species. Some of the most species-rich plant families, such as daisies (*Asteraceae*) and orchids (*Orchdaceae*) are among the most under-represented on the Global Red List.[1]

It is difficult to summarise the diversity of plants found across Greater Gwent. For a relatively small area, there is a huge diversity of habitats (woodlands, meadows, uplands, wetlands) on a wide variety of soils, altitudes and aspects. Greater Gwent supports one of the oldest trees in Wales, the Mamhilad Yew (thought to be between 2,000 and,3000 years old and with a girth over 35ft) and one of the world's smallest flowering plants, Rootless Duckweed (*Wolffia arrhiza*), which is found in the ditches of the Gwent Levels.

Gwent has two Important Plant Areas (IPAs). The Wye Valley IPA, along the English border, is identified for its 'exceptional richness of vascular plants in broadleaved woodland'.[3] These diverse woodlands support populations of the native Welsh Daffodil (*Narcissus pseudonarcissus)*, and rare Narrow-leaved Bitter-cress (*Cardamine impatiens*), Spreading Bellflower (*Campanula patula*) and Tintern Spurge (*Euphorbia serrulate*). The cliffs of the Brecon Beacons National Park IPA extend into Greater Gwent and include the Clydach Gorge, Pwlldu and several ridges of the Black Mountains. The cliffs are identified for the populations of endemic Whitebeams (*Sorbus*) and Hawkweeds (*Hieracia*).[4]

Plant recording in Greater Gwent owes much to the work of Trevor Evans MBE, former Botanical Society of Britain and Ireland (BSBI) county recorder, who spent 20 years compiling the *Flora of Monmouthshire*[5], a comprehensive atlas describing over 1,800 species found in Gwent. This incredible work remains a crucial reference for all local botanists. The local BSBI group, the Monmouthshire Botany Group, is active and organises regular field meetings. The local BSBI county recorders also compile the Rare Plants Registers, which list locally rare (≤ 3 sites in a vice-county) and locally scarce species (≤10 sites in a vice-county), as well as plants considered under threat in a Welsh or GB context. The vc35 Rare Plant Register lists 283[6]* species; the vc41 register lists 302[7] species.

Within the *Flora of Monmouthshire*, Evans notes many of the changes affecting the distribution and abundance of plants within Gwent. These include the loss of species-rich meadows, hedgerows and verges, and the increased shading within woodland. He attributes the losses in plant diversity, and their impact on other species, to several factors, including changes in agriculture, particularly the use of pesticides and herbicides, and loss of headlands, drainage of wetlands, introduction of non-native ornamental plants, and an over-zealous need for 'tidiness'.[5]

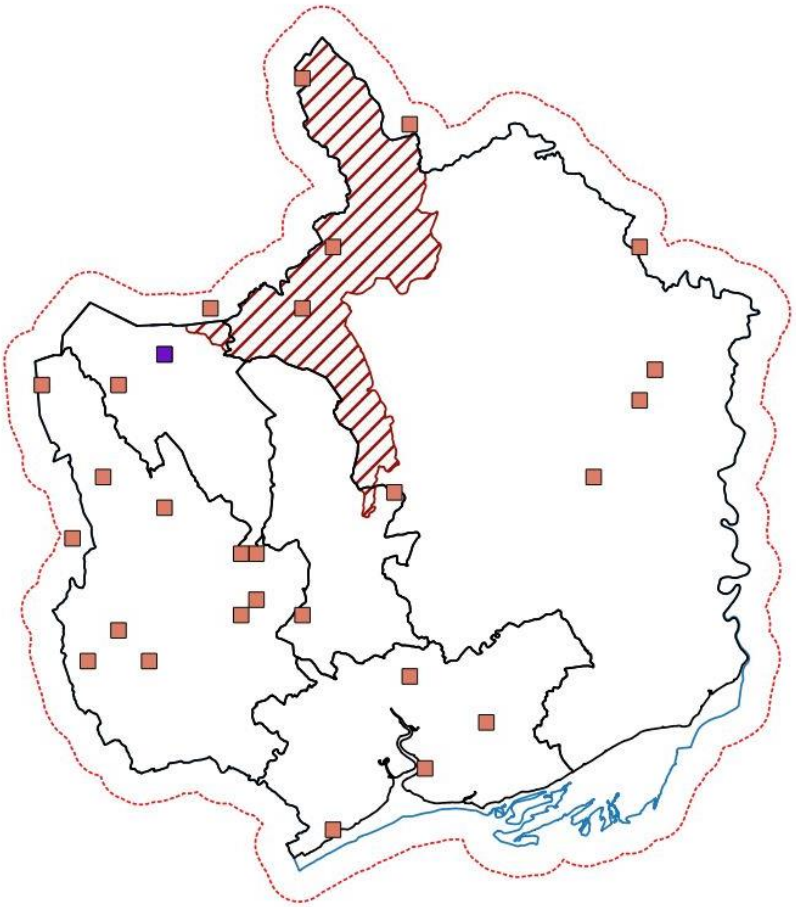
There are several recording schemes for plants. The BSBI has been collecting plant records since 1836 and is about to publish the third *Atlas of British and Irish Flora*. The BSBI also directs targeted surveys, such as the Threatened Plants Project, though their local members.[8] While the current record collection is exceptional, it does not have the power to determine trends in abundance. To address this, a new recording scheme, the National Plant Monitoring Scheme (NPMS), was launched by BSBI, UKCEH, Plantlife and JNCC in 2015.[9]

NPMS is based on 1km squares, allocated on a random-weighted basis to achieve representation of the different habitats across the UK.[9] Uptake within the study area is very good (96%), with just one square unadopted. Other plant recording schemes include Plantlife's Great British Wildflower Hunt, which encourages searches for particular species; Every Flower Counts (also Plantlife), surveying wildflowers and pollinators on lawns, and the BSBI Garden Wildflower Hunt, focused on wildflowers within gardens.

This section highlights just four plant stories: arable wildflowers (as a group), Spreading Bellflower, Lesser Butterfly Orchid (*Platanthera bifolia*) and Green-Winged Orchid (*Anacamptis morio*). While this is a tiny sample of the rich diversity of plants in Greater Gwent, they do illustrate the dramatic declines of some plant species, and the ongoing threats they face.

*this figure is from the 2007 list. This has since been updated with a 2019 list[10]; the exact number of species may have changed as species have been removed and added.

NPMS squares within the study area (pink – adopted, purple -unadopted)



Arable Wildflowers

Julian Woodman

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation Status: Various, see below

Data Availability: Poor (303 records)

Context: This suite of annual plants, which thrive on frequent disturbance, is the single most threatened element of the UK flora. These species are characteristic of arable fields and other cultivated ground, sharing the ecological niche of the crop plants among which they grow.[11] Since they are so closely associated with traditional arable farming practices, their survival depends on suitable conditions being maintained on at least parts of some farms.

Many of these species are thought to be ancient introductions, brought to Britain with the first food crops by early farmers. More than 150 species of plant make up this group in Britain,[11] but because the distribution of individual species depends on geology, soil type and climate, many of these may never have occurred in Gwent. A selection of relevant species is shown in the table below.

A combination of factors has led to the decline of arable wildflowers. The development of more efficient seed-cleaning techniques may have been one of the first to have an effect, perhaps starting more than a century ago. Other reasons include the significantly increased use of fertiliser and herbicides, changes in type of crop (such as to maize and oilseed rape) and the use of modern crop varieties.

In the *Flora of Monmouthshire*, Evans states: 'Modern agricultural methods, notably the widespread use of herbicides on crops, has spelt the demise of most 'weeds' of arable land in Monmouthshire, as elsewhere in the UK. The modern practice of autumn sowing, rather than spring sowing of cereal crops, has led to the ploughing of stubble soon after harvest.'[5]

Historically, many more livestock farms than today would have had at least a small area of arable land, and field margins would have been managed less intensively. Small arable fields are now rare, having either been enlarged by the removal of field boundaries or converted to pasture.

Common Name	Scientific Name	Red List 2005[13]	Wales Red List 2007[26]	Number of Greater Gwent records	Most recent record
Blue Pimpernel	*Anagallis arvensis ssp foemina*	LC		2	1987
Bugloss	*Anchusa arvensis*	LC		10	2016

Corn Chamomile[+]	*Anthemis arvensis*	EN - (A2c)	EN	2	2010
Stinking Chamomile	*Anthemis cotula*	VU - (A2c)	VU	55	2019
Lesser Quaking Grass	*Briza minor*	LC		4	2018
Rye Brome	*Bromus secalinus*	VU - (A2c)		13	2019
Cornflower*	*Centaurea cyanus*	LC	CR	10	2019
Maple-Leaved Goosefoot	*Chenopodium hybridum*	LC		6	2018
Treacle-Mustard	*Erysimum cheiranthoides*	LC		8	2017
Dwarf Spurge	*Euphorbia exigua*	NT - A		14	2016
Broad Leaved Spurge	*Euphorbia platyphyllos*	LC		1	1980–1994
Tall Ramping-Fumitory	*Fumaria bastardii*	LC		1	2016
Red Hemp-Nettle[+]	*Galeopsis angustifolia*	CR (A2c)	CR	3	1999
Corn Marigold	*Glebionis segetum*	not listed		21	2019
Henbane	*Hyoscyamus niger*	not listed		6	2003
Smooth Cats Ear[+]	*Hypochaeris glabra*	VU - (A2c)		3	2004
Sharp-Leaved Fluellen	*Kickxia elatine*	LC		46	2019
Round-Leaved Fluellen	*Kickxia spuria*	LC		8	2005
Henbit Dead-Nettle	*Lamium amplexicaule*	LC		1	2015
Field Pepperwort	*Lepidium campestre*	LC	VU	12	2014
Weasels Snout	*Misopates orontium*	VU - (A2c)		2	1988
Prickly Poppy	*Papaver argemone*	VU - (A2c)	EN	1	1992
Corn Buttercup	*Ranunculus arvensis*	CR (A2c)	CR	5	1981
Annual Knawel	*Scleranthus annuus*	EN - (A2c)		1	2005
Field Woundwort	*Stachys arvensis*	NT - A	VU	65	2019
Spreading Hedge-Parsley	*Torilis arvensis*	EN - (A2c)		1	1994
Wild Pansy	*Viola tricolor ssp tricolor*	NT - A	VU	2	2012

[+]Unverified records

*Difficulty distinguishing wild and cultivated populations

Outlook: Past and current agri-environment schemes have included options which favour arable wildflowers by supporting cultivated field margins, unsprayed cereals and winter stubble. However, it appears that take-up of these options may not have been as great under Glastir than under its predecessor, Tir Gofal. The future prospects for some of these plants in Gwent will depend on the details of the Sustainable Farming Scheme, which is currently being designed.

Organic farming may be expected to provide some of the conditions that arable wildflowers need by avoiding the use of herbicides and artificial fertilisers.

Greater Gwent range: Records held by SEWBReC of the 27 species listed in the table are widely distributed across Gwent but with fewer from the west and north, reflecting the higher altitude and relative lack of arable farmland there.

However, from the third of the maps below, which shows the diversity of records, it can be seen that very few 1km squares (monads) have records of more than three of the species listed. The greatest concentration of such squares is in north-eastern Gwent where winter stubbles can still be found, particularly in wet winters when cultivation is difficult.

Evans, writing in the *Flora of Monmouthshire*, published in 2007, mentioned three sites that supported Field Woundwort and the two species of Fluellen: Kilpale near Caerwent, Llantrisant in the Usk Valley and some oat fields at Middle Hendre, west of Monmouth. (He also found other rare arable wildflowers in these oat fields.) Other locations where the SEWBReC records indicate clusters of species are Clytha Hill, Llangovan, Dingestow and Treowen. There are concentrations of older records at Llanbradach in the west of Gwent and Brockwells Meadow in the south.

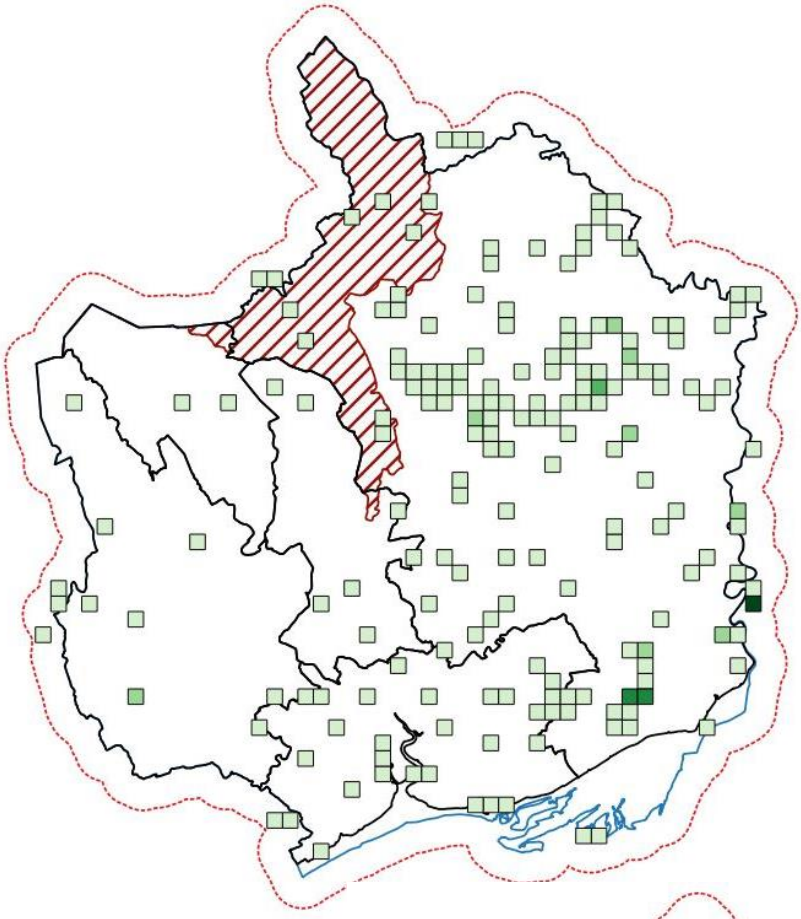
The maps show an apparent hotspot on the Gloucestershire border, but this is in fact an error arising from older non-specific records being attributed to the centre of squares. Records appearing to be from the Severn Estuary are the result of erroneous grid references.

There is some doubt over the validity of a few records in the table: records for Red Hemp-Nettle are unverified and some for Cornflower may be of cultivated origin.

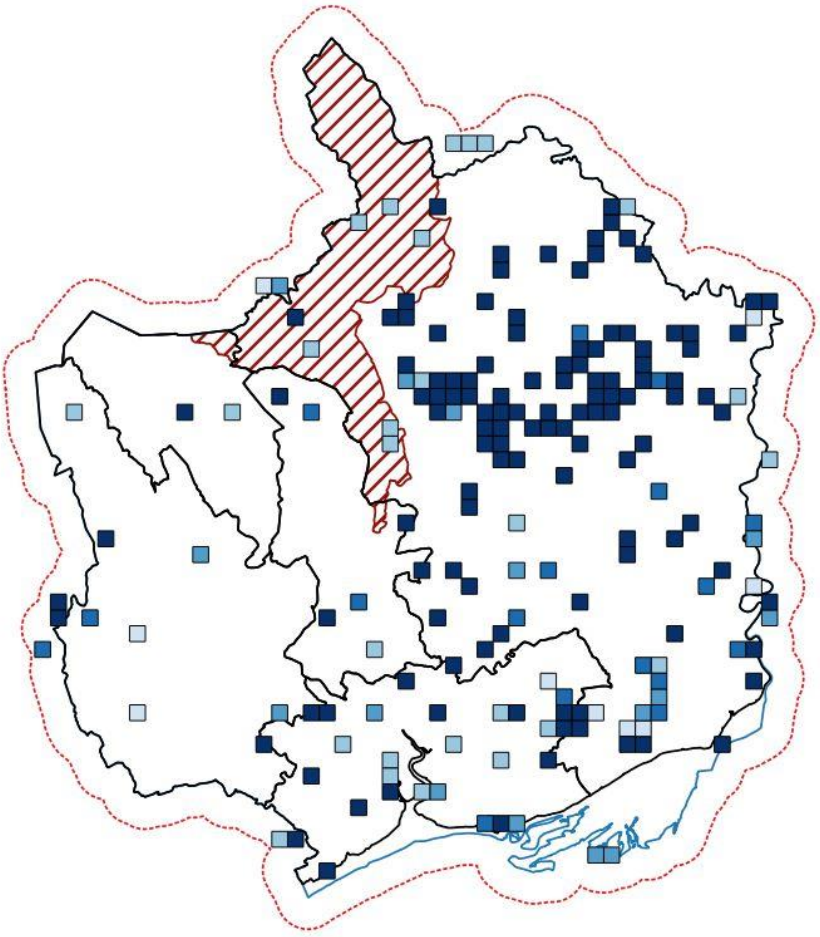
Plantlife published a report in 2015[12] which identified Important Arable Plant Areas based on 2km squares (tetrads). This report drew on records from a variety of sources, including monitoring of arable wildflowers for Tir Gofal between 2009 and 2012. Monmouthshire vice-county was found to have many tetrads with coincidences of three of the species selected in that report, and a few with five or six. These selected species, however, included Corn Spurrey (*Spergula arvensis*) and Corn Mint (*Mentha arvensis*), species which are more common than those in the list above and so not included in it or in the maps presented here. Ten tetrads were considered to be of national importance.

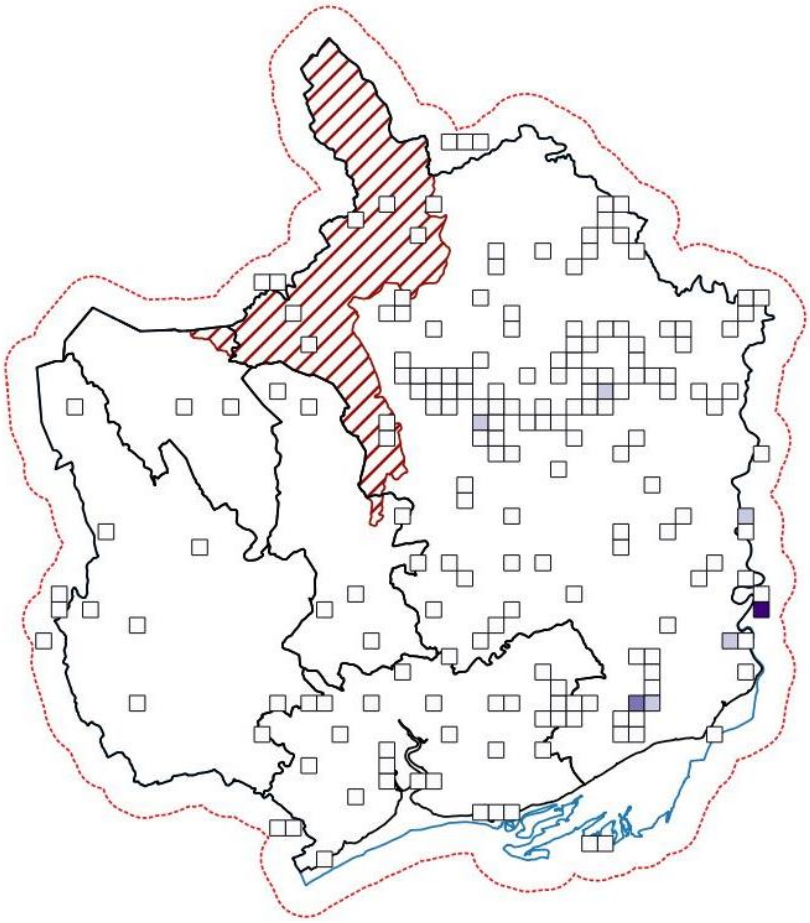
The strong message from the Plantlife report was that targeted searches would be worthwhile in Greater Gwent (both Monmouthshire vice-county and the adjacent vice-county of Glamorgan). Further surveys may be expected to reveal the presence of some arable wildflower species where they were recorded in the past and some new localities.

Distribution of arable wildflowers records (max 16 records/km^2)



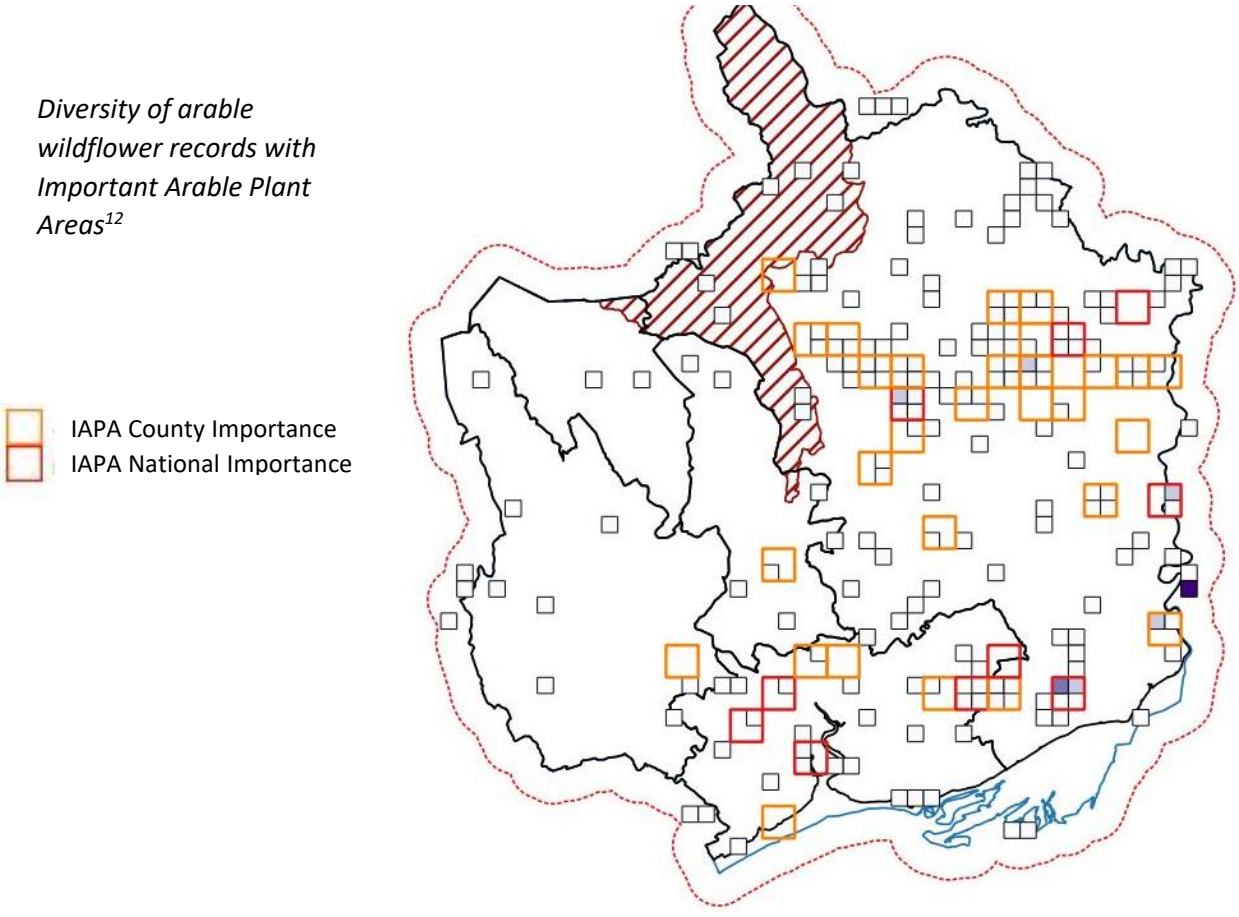
Records of arable wildflowers by decade





Diversity of arable wildflower records

Diversity of arable wildflower records with Important Arable Plant Areas[12]



Habitats Patterns: Arable wildflower communities and species show a surprisingly high fidelity to particular sites, so much so that many populations of rarer species have been recorded from particular fields for decades or even centuries.[11]

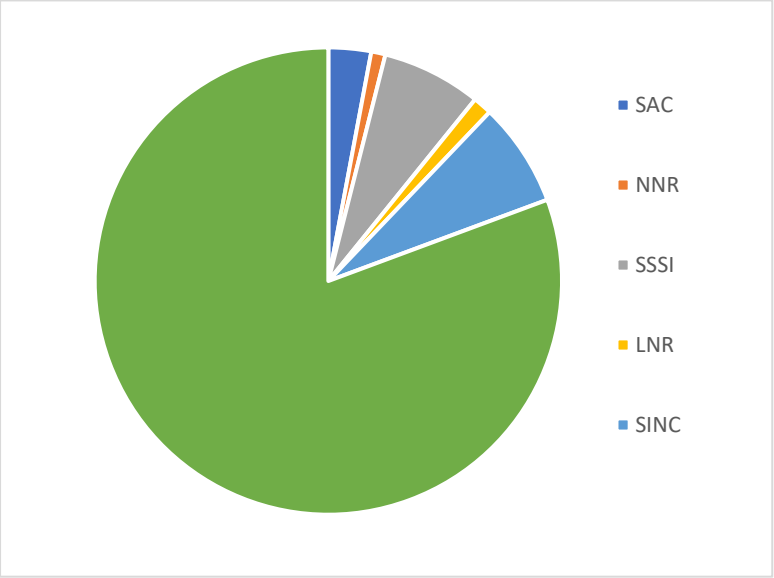
Arable wildflower populations are subject to great fluctuations in diversity of species from year to year, depending on crop management regimes and climatic conditions.[11] Arable wildflowers do not necessarily germinate every year that the field is cultivated and can remain dormant and undetected in the soil seed bank for many years until conditions are suitable.[12]

Population trends: Of the 30 vascular plant species that have shown the greatest relative decline across Britain between the 1930–69 and 1987–99 recording periods of the *Atlas of British and Irish Flora*, 18 are characteristic of arable and other cultivated ground.[11]

These levels of decline were reflected by the assessment of the threat status of Britain's vascular plant flora in the *Vascular Plant Red Data List for Great Britain,*[13] published in 2005, and supplementary surveys. No fewer than 7 species are regarded as extinct as arable wildflowers in Britain (although may occur as casuals on occasion), while a further 54 species are considered threatened.[11]

Protection: Most records are not from protected sites, as would be expected from the nature of the habitat. However, there are some records from SSSIs including from the Gwent Levels, Cwm Llanwenarth Meadows and Brockwells Meadow. Records from SSSIs which are also SAC include a few from the Severn Estuary, River Usk, Usk Bat Sites and the Wye Valley Woodlands. (Those from the Severn Estuary include some from the sea wall but also erroneous grid references.) The NNR records are from Newport Wetlands.

Arable Wildflower records from protected sites



Green-Winged Orchid *Anacamptis morio* (L.) (R.M. Bateman, Pridgeon & M.W. Chase)

Andy Karran

Protection: Wildlife & Countryside Act (1981, as amended)

Conservation Status: NEAR THREATENED (UK)[13]

Data Availability: Poor (162 records)

Context: The Green-Winged Orchid has a short spike bearing between six and twelve flowers. These are most often various shades of purple, but individuals also occur with pink or occasionally white flowers. The distinctive green veins of the lateral sepals are particularly clear in the paler forms. It is a perennial which reproduces by seed.

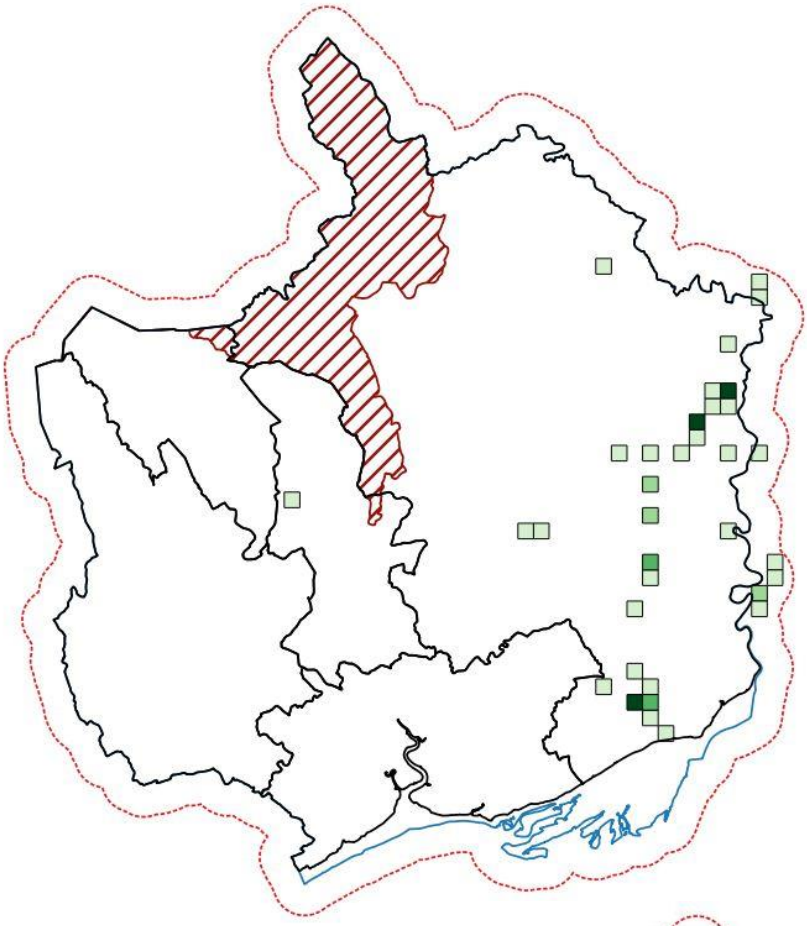
This species was formerly widespread in the lowlands of England and Wales, being commonest in the south and east of England and the coastal areas of Wales. It has declined very significantly since the 1950s as a result of agricultural improvement, and it is now rarely found except in grasslands managed for nature conservation or in other places, such as churchyards, where management is not intensive. It is usually regarded as a strong indicator of old agriculturally unimproved grasslands. [14]

It does, however, tolerate a wide range of soil conditions and management regimes. Soils in which it is found range from base-rich to base-poor and from dry to damp, while management varies from traditional hay meadow management to pasture. Plants can persist in a vegetative state for many years if the inflorescences are removed by mowing or grazing; they eventual flower and fruit when this pressure is released.[14]

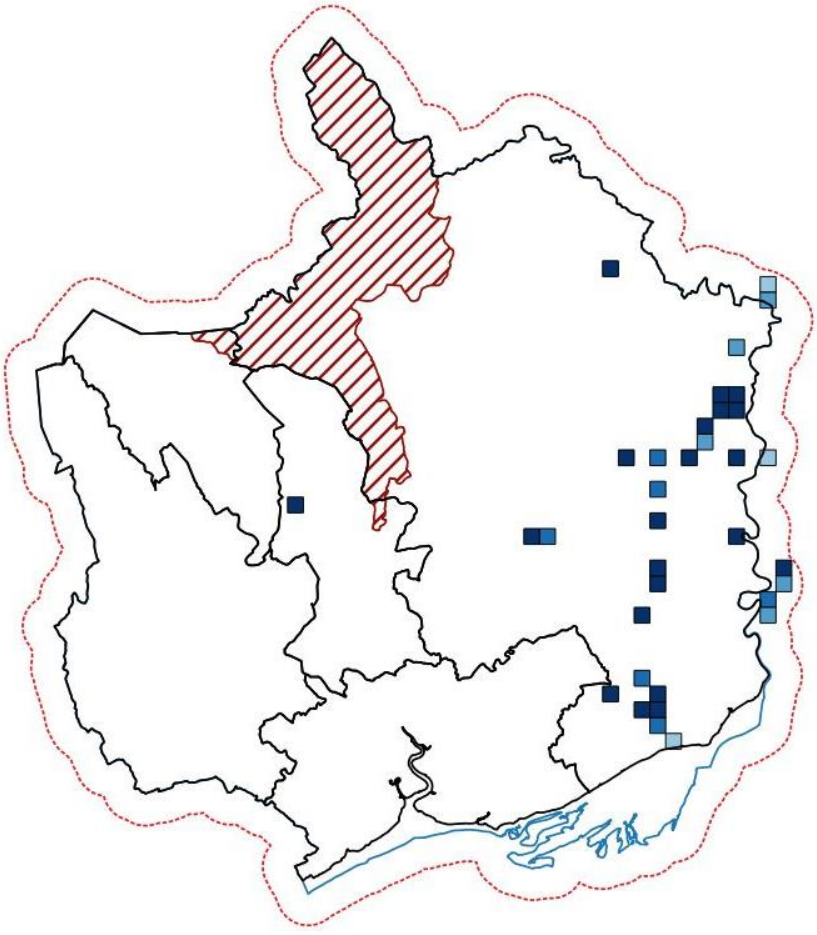
Outlook: While the UK population has declined drastically, it could now be considered relatively stable. This is because many of the remaining populations are found within nature reserves or other grasslands managed specifically for nature conservation. This is equally true in Gwent, where several populations, including the two largest, are in the care of the Gwent Wildlife Trust.

Greater Gwent range: Evans[5] quotes Wade[15] who described the Green-Winged Orchid as a frequent native in all districts. Evans went on to say that this no longer reflected the current (2007) situation. He described it as largely confined to the eastern quarter of the vice-county. The maps below indicate that this is still true, but with the notable exception of an outlier in Torfaen. This population, found in 2015, is at Blaenserchan, near Abersychan. Another new population was discovered near Tintern in 2014.

The two largest populations, both having as many as 4,000 flower spikes in recent years, are at the Gwent Wildlife Trust reserves of New Grove Meadows and Pentwyn Farm.[16,17] Another centre of population is further south, in the Caerwent area, where sites include Brockwells Meadows Wildlife Trust Reserve and land managed by the Ministry of Defence. Although there are several populations in this locality, the numbers of individuals are small in comparison with New Grove and Pentwyn.



Distribution of Green-Winged Orchid records across Greater Gwent (maximum 22 records/km^2)



Records of Green-Winged Orchid by decade

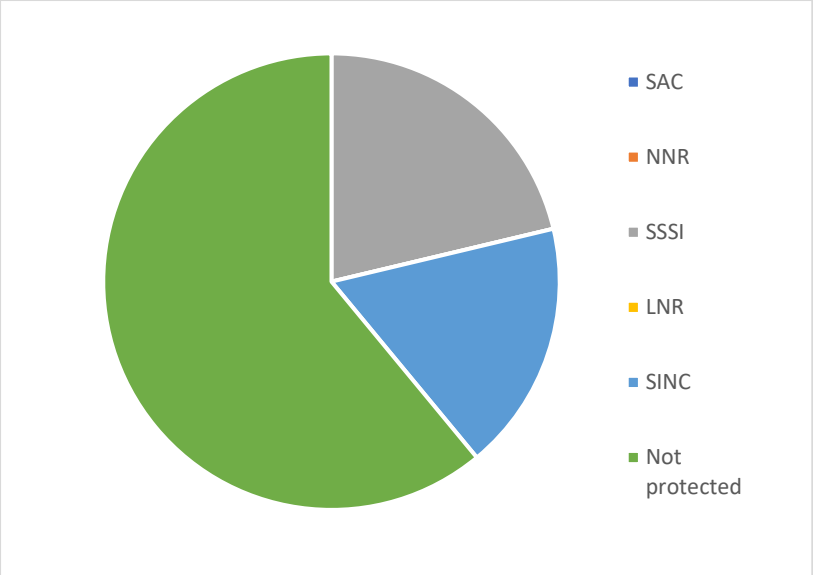
Population trends: There are encouraging signs that this orchid can become established, or re-established, in response to favourable management. Small numbers have been seen in fields undergoing restoration management close to sites which hold the large populations, for example at Gwent Wildlife Trust's Wysewood Common, near Pentwyn Farm.[17]

Protection: Several Gwent populations occur within Sites of Special Scientific Interest: Brockwells Meadows; Dinham Meadows; Cobblers Plain Meadows, Devauden; Lower Nex Meadows, Devauden and Pentwyn Farm Grasslands, Penallt.[18,6]

New Grove Meadows Wildlife Trust Reserve is a Site of Importance for Nature Conservation as well as being Monmouthshire's Coronation Meadow.[16] Protected sites (SSSI and SINC) together account for 39% of records held by SEWBReC.

In addition, Green-Winged Orchid is present at Trellech Wet Meadow, which is leased by the Monmouthshire Meadows Group.[19] It also occurs in some of the privately-owned meadows managed by members of the group.

Green-Winged Orchids records from protected sites



Lesser Butterfly Orchid *Platanthera bifolia* (L.) (Rich)

Andy Karran

Protection: None

Conservation Status: Vulnerable (UK)[13] Section 7 Priority (Wales)

Data Availability: Poor (18 records)

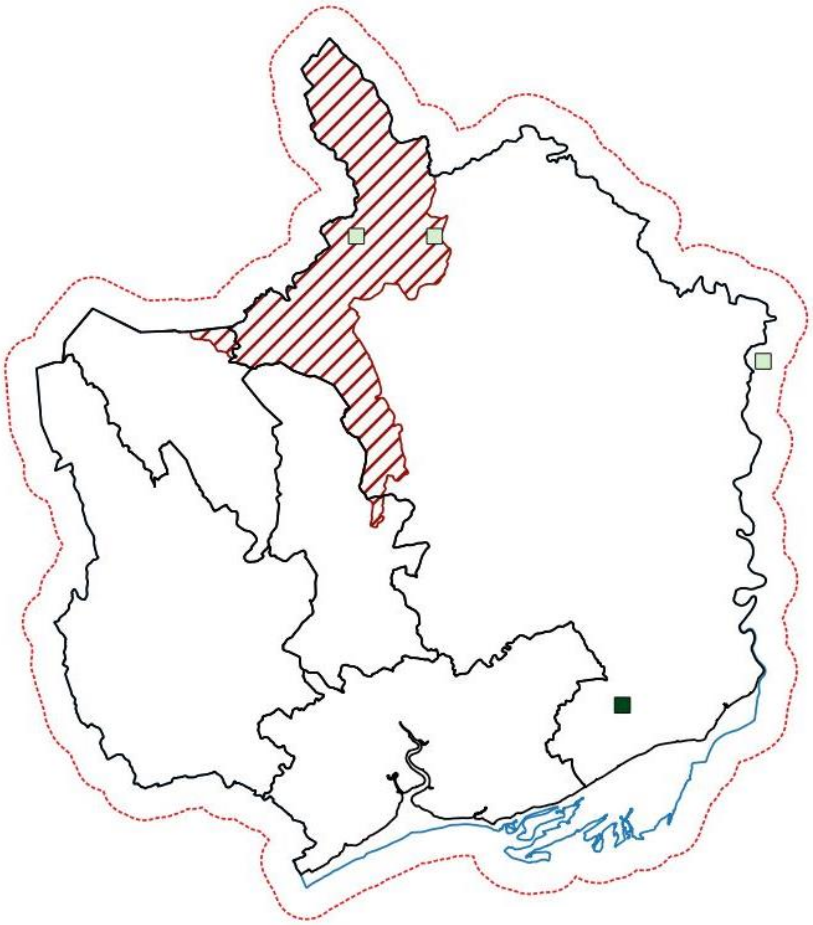
Context: Lesser Butterfly Orchid is a long-lived perennial with a tall spike of white flowers. It can be found in a wide range of habitats, including woodland, heathland, grassland and even some wetlands such as mires and bogs.[20] Despite this, there has been a long-term decline since the 1930s: Lesser Butterfly Orchid has been lost from about 75% its former range in England.[20] Declines are thought to be related to habitat changes such as overshading, agricultural improvement and scrub encroachment.

Outlook: Currently the UK population is predicted to continue to decline.[13] Evans[5] describes the decline in Gwent as 'remarkable'. From being described as 'locally frequent' in 1970,[5] the Gwent population is now confined to a single site[5,10] and is classified as 'Locally Rare' in VC35.

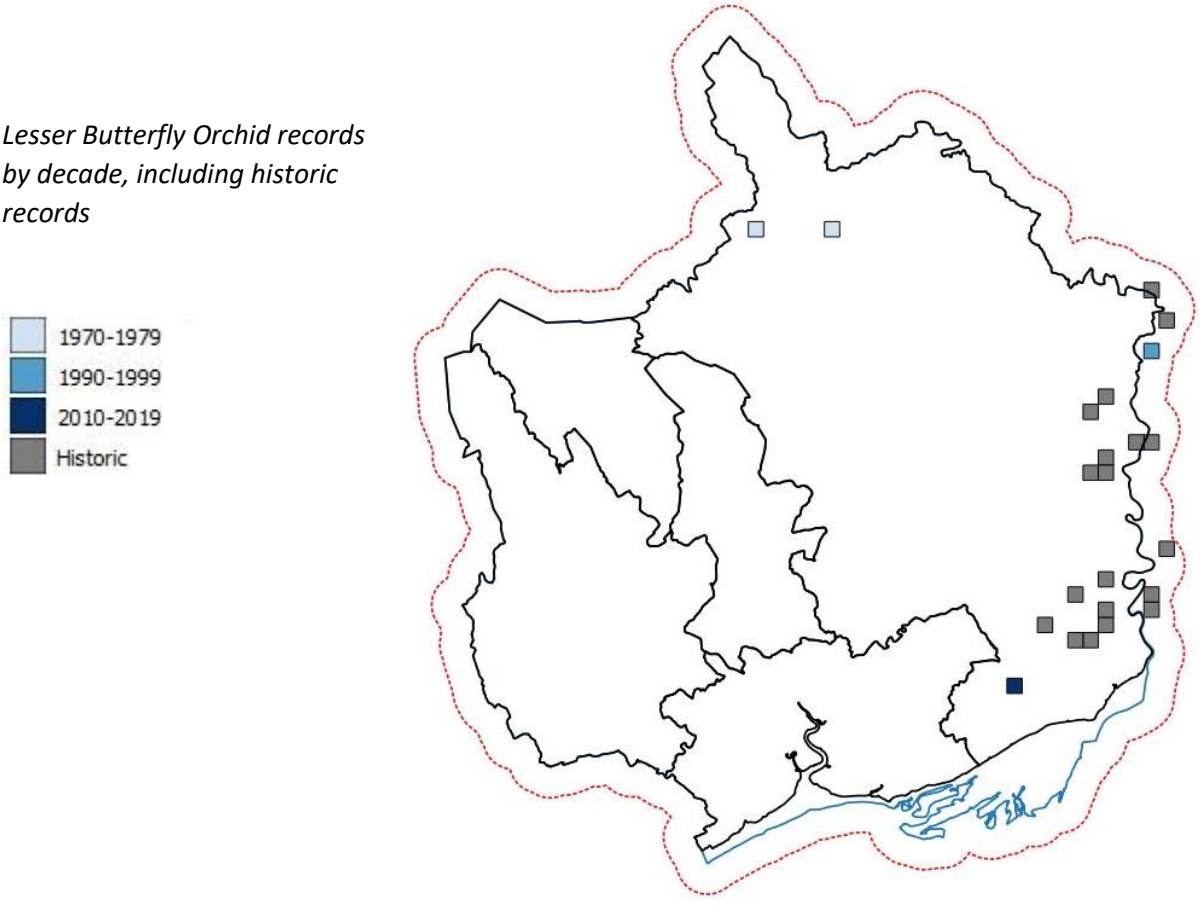
Greater Gwent range: Lesser Butterfly Orchids are currently only found at one site – Hardwick Plantation/Slade Wood; although there are records from the 1970s from within the Brecon Beacons National Park, and from the 1990s just over the border in Gloucestershire.

If historic records are considered, the population previously spread along the English border and across the southern part of Monmouthshire.

Lesser Butterfly Orchid records in Greater Gwent (maximum density 15 records/km^2)



Lesser Butterfly Orchid records by decade, including historic records



Population trends: If historic records (37 additional records dating back as far as 1850) are considered, as many as 23 monads have been occupied at some point. The only records from the last decade are from Hardwick Plantation/Slade Wood, although the most recent is from 2011.

Protection: Hardwick Plantation/Slade Wood is not a protected site, neither are the locations within the Brecon Brecons with older records. If Lesser Butterfly Orchids were found at any site then this should automatically be considered for SINC status,[21] although this is difficult to determine if plants do not flower regularly.

Spreading Bellflower *Campanula patula* (L.)

Protection: None

Conservation Status: ENDANGERED (UK)[13] CRITICALLY ENDANGERED (Wales)[10] Section 7 Priority (Wales)

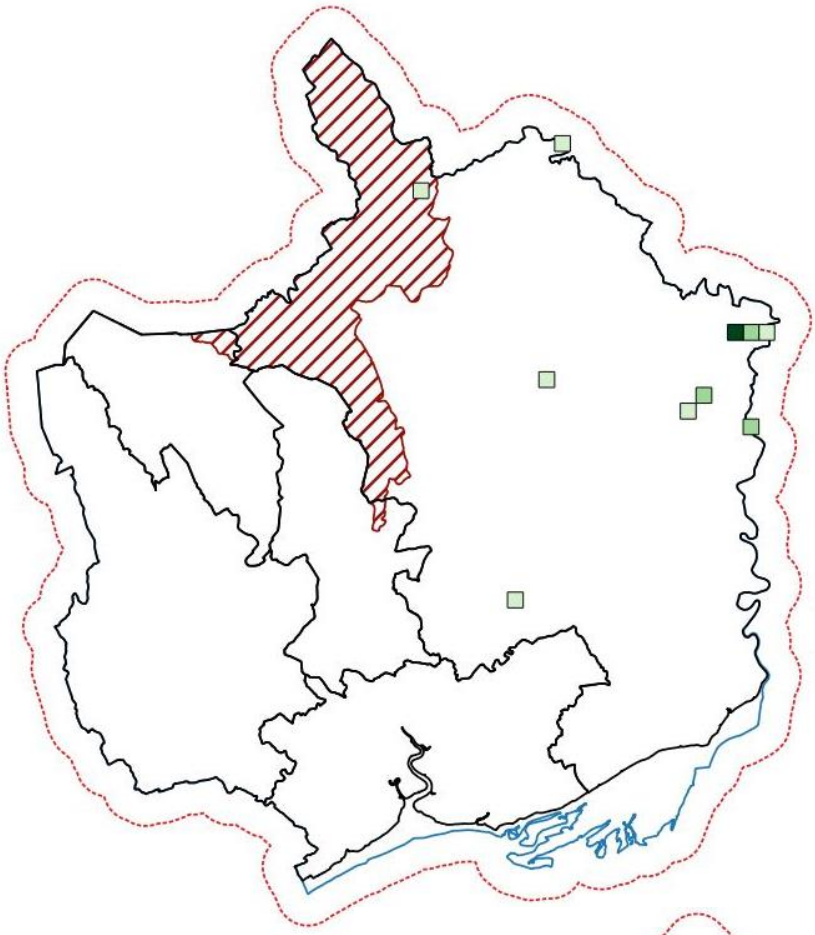
Data Availability: Poor (20 records)

Alistair Hotchkiss

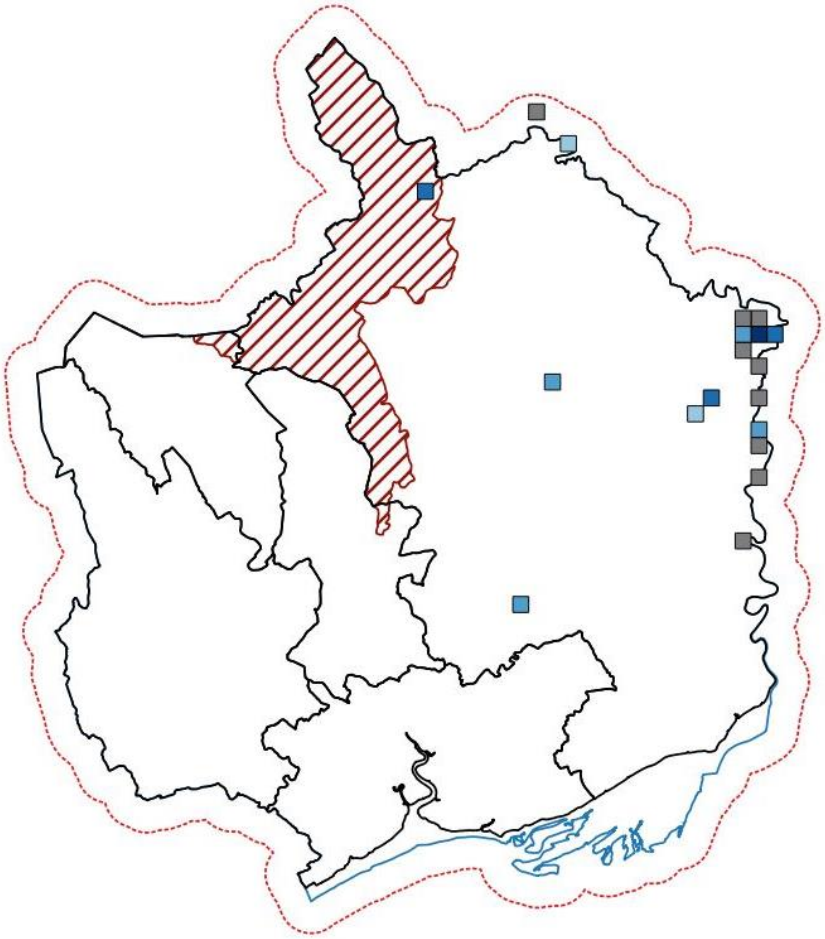
Context: Spreading Bellflower is a biennial plant with purple-blue star-shaped flowers. It can be found on sunny banks and verges especially in open woodland or near woodland edges. The seed can be very long-lived but requires disturbance to germinate.[22] The UK population is believed to have been in decline since the early 1800s[23] and is limited to the Welsh borders and the West Midlands.[22] It is classified as Endangered due to the low number of remaining plants: in 2005 the population was estimated at just 330 individuals.[13]

Outlook: Given the historic declines and extremely low numbers of plants, continued decline and eventual extinction from Greater Gwent seems likely, as Spreading Bellflower is limited to a single site, and just two plants. The National Botanic Garden of Wales suggests that some populations are unlikely to recover without supplementary planting or reintroductions.[23] Recent projects in Gloucestershire in 2016[24] and Herefordshire in 2019[25] have had some degree of success.

Greater Gwent range: Greater Gwent is at the south-west edge of the UK Spreading Bellflower range. The largest cluster of records is around Fiddlers Elbow NNR, and smaller woodlands to the east of it. A smaller cluster of records is at Lydart, to the south of Monmouth. There are several isolated records further south and west, but some of these are low resolution grid references, so may not be accurate.



Spreading Bellflower records in Greater Gwent (maximum density 10 records/km^2)



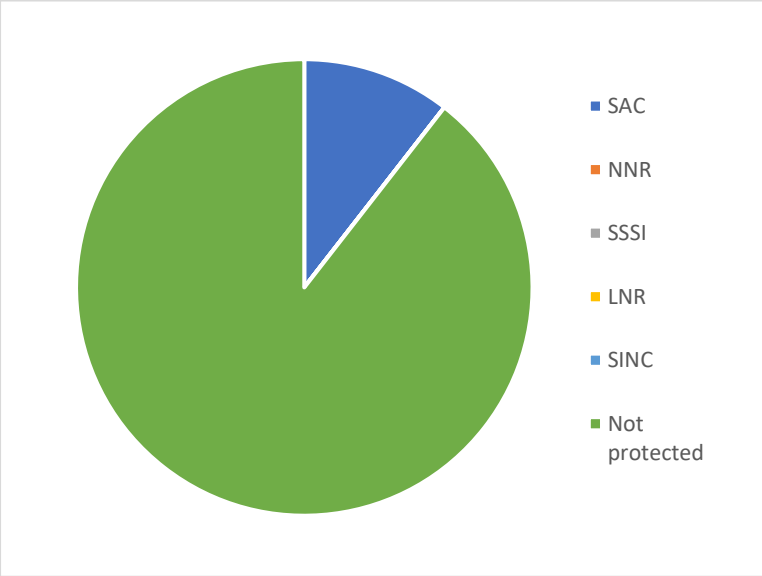
Spreading Bellflower records by decade, including historic records (pre-1970)

Population trends: If historic records (18 additional records dating back as far as 1850) are considered, as many as 19 monads have been occupied at some point, mostly along the English border. There are only ten monads with records after 1970, and just 1 record from the last decade. Evans[5] reports a more recent decline, stating that 'even the 8 tetrads of 1990 are now down to 3 tetrads, with only 1 plant in one of those sites'.

Despite the Lydart population once showing over 100 plants,[10] it seems likely that the population is now limited to a single site near Fiddlers Elbow, where two plants were observed in 2018.

Protection: Just over 10% of records (2 records) fall within the Wye Valley Woodlands SAC and Fidder's Elbow NNR. This is probably an underestimate of protection, as many of the more recent records are within close proximity to Woodland SINCs such as High Meadows Wood, Reddings Enclosure and Lydart Orles Wood, designated for their Ancient Woodland status. Any site with Spreading Bellflower should automatically be considered for selection as a SINC.[21]

Spreading Bellflower records from protected sites.



References:

1. Antonelli A, Fry C, Smith RJ, Simmonds MSJ, Kersey PJ, Pritchard HW (eds.). 2020. State of the World's Plants and Fungi 2020. Royal Botanic Gardens, Kew. https://doi.org/10.34885/172
2. Evans T. 2007. The Churchyard Yews of Gwent: https://www.ancient-yew.org/mi.php/the-churchyard-yews-of-gwent/94
3. Plantlife, Wye Valley IPA: https://www.plantlife.org.uk/uk/nature-reserves-important-plant-areas/important-plant-areas/wye-valley
4. Plantlife, Brecon Beacons National Park IPA: https://www.plantlife.org.uk/uk/nature-reserves-important-plant-areas/important-plant-areas/cliffs-brecon-beacons-national-park
5. Evans T. 2007. Flora of Monmouthshire. The Chepstow Society.
6. BSBI. 2007. VC35 Monmouthshire Rare Plant Register Checklist: https://database.bsbi.org/object.php?objectid=2cd4p9h.dnr59a&class=ChecklistInstance
7. BSBI. 2013. VC41 Glamorgan Rare Plant Register checklist (draft): https://database.bsbi.org/object.php?objectid=2cd4p9h.dnr59h&class=ChecklistInstance
8. BSBI. Threatened Plans Project: https://bsbi.org/threatened-plants-project (accessed 05/05/2021).
9. Pescott OL, Walker KJ, Harris F, New H, Cheffings CM, Newton N et al. 2019. The Design, Launch and Assessment of a New Volunteer-Based Plant Monitoring Scheme for the United Kingdom'. PLoS ONE 14(4): e0215891.
10. Tyler SJ & Wood E. 2019. Monmouthshire County Rare Plant Register. BSBI & Natural Resources Wales.
11. Byfield AJ & Wilson PJ. 2005. Important Arable Plant Areas: Identifying Priority Sites for Arable Plant Conservation in the United Kingdom. Plantlife International, Salisbury, UK.
12. Shellswell CH. 2015. Wales' Important Arable Plants. Plantlife, Salisbury.
13. Cheffings CM & Farrell L (eds.), Dines TD, Jones RA, Leach SJ, McKean DR, Pearman DA, Preston CD, Rumsey FJ, Taylor I. 2005. The Vascular Plant Red Data List for Great Britain. (Species Status no. 7): 1–116. Joint Nature Conservation Committee, Peterborough.
14. Chatters C. Species account in Stewart A, Pearman DA, Preston CD. 1994. Scarce Plants in Britain. Joint Nature Conservation Committee, Peterborough.
15. Wade AE. 1970. The Flora of Monmouthshire. National Museum of Wales, Cardiff.
16. Gwent Wildlife Trust: https://www.gwentwildlife.org
17. Green T. Pers. Com.
18. Natural Resources Wales: https://naturalresources.wales
19. Monmouthshire Meadows Group: https://monmouthshiremeadows.org.uk
20. Species Fact Sheet: Lesser Butterfly-Orchid. Natural England and Plantlife, Salisbury.
21. Gwent Wildlife Trust. 2004. Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Sites Partnership.
22. Spreading Bellflower. Plantlife, Salisbury: https://www.plantlife.org.uk/application/files/2614/7913/4133/Brief20sheet20–20Spreading20bellflower20briefing_sheet.pdf
23. National Botanic Garden of Wales: https://botanicgarden.wales/science/saving-plants-and-fungi/conserving-welsh-plants-and-habitats/spreading-bellflower-campanula-patula/ (accessed 22/06/2020).
24. https://plantlife.love-wildflowers.org.uk/about_us/blog/rare-spreading-bellflower?display=one (accessed 22/06/2020).

25. https://www.ledburyreporter.co.uk/news/17834231.rare-blooms-frith/(accessed 22/06/2020).
26. Dines T. 2007. A Vascular Plant Red Data List for Wales. Plantlife Wales.

Fungi

There are thought to be at least 12,000 species of fungi in Britain (including lichenised fungi), with new species being added each year.[1] However, fungi are among the least widely understood parts of our biodiversity, and there is much more to learn about fungi ecology, diversity and conservation.[2] Most of the world's ecosystems would collapse without fungi; they are often the primary decomposers and form positive mycorrhizal associations with nearly all plants. Fungi are a food source for many species and enable other species to feed on decomposing matter by breaking it down.

Fungi are widely grown or foraged from the wild as a foodstuff and are also valuable in the production of foods such as bread, cheese and even chocolate. Many important pharmaceutical drugs are derived from fungi, including penicillin, cyclosporin and statins.[2]

In contrast, fungi are the most significant pathogens for plants and, as such, include *Magnaporthe oryzae*, the world's most important fungal rice disease, *Ophiostoma novo-ulmi,* Dutch elm disease, and *Hymenoscyphus fraxineus*, the Ash dieback fungus.[3]

There are significant gaps in our knowledge and understanding of fungi. They are difficult to record, as fruiting bodies, the main source of records, may not appear in the same place, or appear every year, and sometimes only exist for a matter of days. Other species can only be identified by microscopy, culturing or even DNA typing. To compound this, there is a recognised skills shortage in taxonomy, particularly for fungi.[4] Until recently there were only three fungi species on the global IUCN Red List, compared to almost 20,000 plants. There is a Global Fungal Red List Initiative aiming to address this imbalance, and there are now over 200 Red listed fungi, with hundreds more undergoing assessment.[5]

Wales is considered to have an 'extraordinary' diversity of fungi,[4] and there are 27 species of fungi on the Wales Section 7 list, and 58 proposed Important Fungus Areas (IFAs).[1] Greater Gwent has two IFAs: Cwm Clydach, for populations of rare species and outstanding woodland habitat (300 recorded species); and Garn Ddyrys (Blorenge), for outstanding grassland habitat (50 species). Mynydd Llangattock, just outside the study area, is also an IFA. Fungi recording (and some foraging) is carried out by the Gwent Fungus Group.

Note that the project was unable to obtain permission to use some NBN fungi records, so there may be additional records for fungi.

Beech Deadwood Fungi

Protection: none

Conservation Status: various, see below

Data Availability: Poor (45 records)

Context: Deadwood Fungi are a key component of woodland ecosystems, and the deadwood fungi of Beech woodlands in Britain are considered internationally important.[6] High diversity of deadwood fungi is more likely in older woodlands, as well as parklands and wood pasture, with long continuity of uneven age structure.[7] This section uses the list of SSSI indicator species for Beech Deadwood Fungi assemblages.[6] Although the list consists of 30 species of ascomycetes (sac fungi), gilled fungi, poroid fungi and others, only 10 of these have been found within the study area. Very few Beech Deadwood Fungi have been found in Wales as a whole, and it is thought that the assemblage is, like native Beech, on the edge of its range in Gwent and therefore impoverished compared with south-eastern Britain. Nevertheless, the presence of two species of the rare genus *Hericium* strongly suggests that some Gwent sites are significant for Beech Deadwood Fungi.

Scientific Name	Common Name	Number of records	Latest record	Red List Status[8]
Camarops polysperma	Thick Tarcrust	3	1998	NT
Ceriporiopsis gilvescens	Pink Porecrust	2	2012	
Coriolopsis gallica	Brownflesh Bracket	1	1982	
Eutypa spinosa	Spiral Tarcrust	22	2010	
Ganoderma pfeifferi	Beeswax Bracket	4	2017	
Hericium cirrhatum	Tiered Tooth	9	2019	*VU**
Hericium coralloides	Coral Tooth	1	1973	NT
Inonotus cuticularis	Clustered Bracket	1	2006	

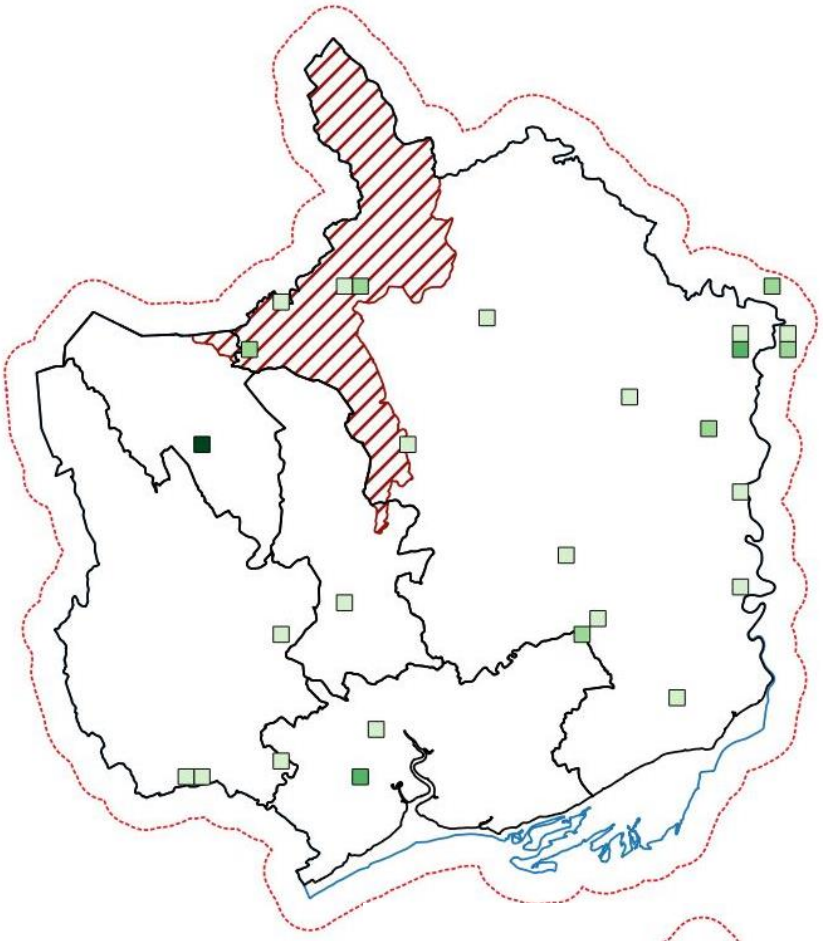
Phleogena faginea	Fenugreek Stalkball	1	2019	
Volvariella bombycina	Silky Rosegill	1	1999	

*Not listed on the 2006 Red Data list, but cited as Vulnerable on the 1992 list, as stated in Ainsworth 2004[7]

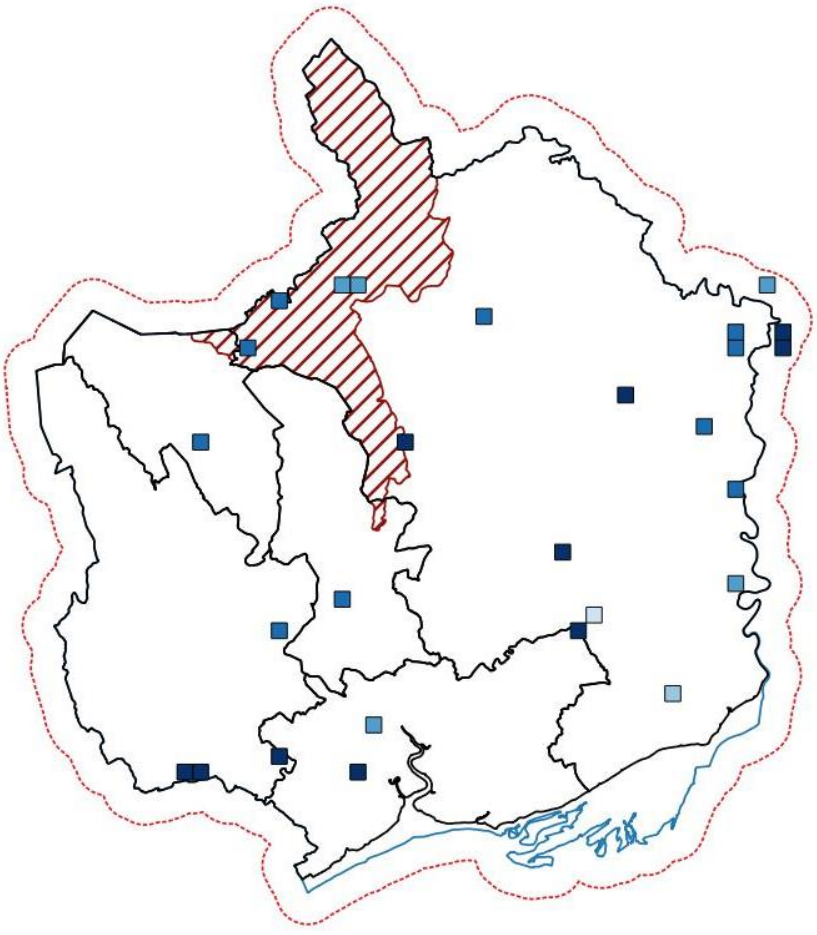
Outlook: It is difficult to predict what is happening to Beech Deadwood Fungi, due to lack of data. Until recently, deadwood was often removed from managed forests due to a misconception that this would improve tree health, or simply for 'tidiness'.[10] Now, the UK Forestry Standard includes guidelines to retain and manage veteran trees and leave a proportion of standing and fallen deadwood.[11] However, it will naturally take a long time to restock a variety of ages and types of deadwood. Currently, 82% of Welsh native woodlands are thought to be in an unfavourable condition for deadwood volume.[12] The same is true of most parklands in Gwent, with tidy landowners removing dead or dying landscape trees, often as a ready source of firewood. Without a change in guidance for private land managers the outlook for Beech fungi in parkland is not promising.

Greater Gwent range: Records of these rare fungi are very thinly scattered across Greater Gwent. This is perhaps due to lack of survey and awareness of the appearance of most species, rather than genuine absence. Silent Valley and Cwm Clydach stand out as sites with two of these species, and Silent Valley has the most records, but neither site has records within the last decade. In fact, out of 27 squares within the study area, only 10 have records within the last 10 years. Other sites with multiple records include Tredegar Park, Beaulieu Wood and Priory Grove, St Marys Vale and Wentwood, but these are only for one species. Local mycologists suggest that there are other sites likely to support Beech Deadwood Fungi, such as the Reddings Enclosure, which are not highlighted by current records.

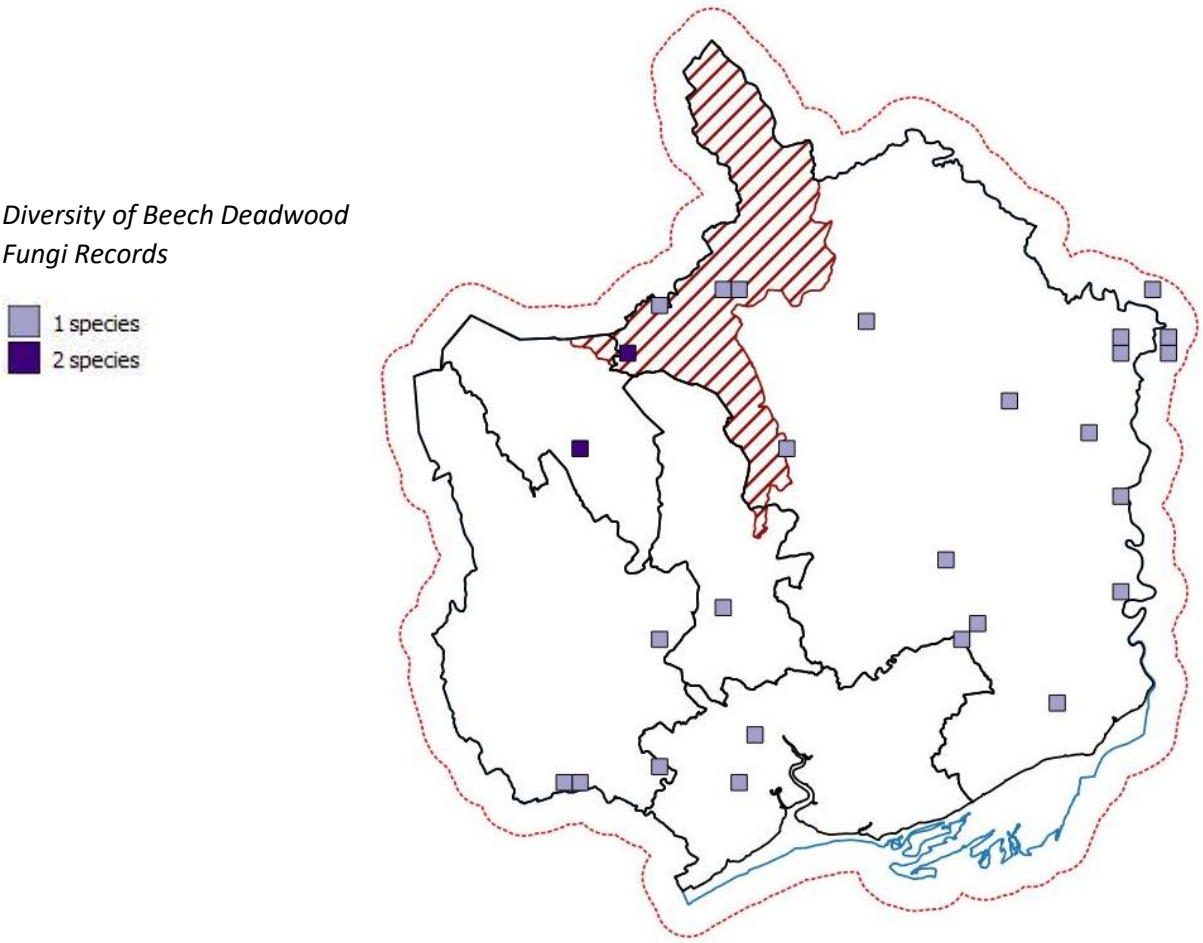
Density of Beech Deadwood Fungi Records (max 5/km^2)



Beech Deadwood Fungi by decade

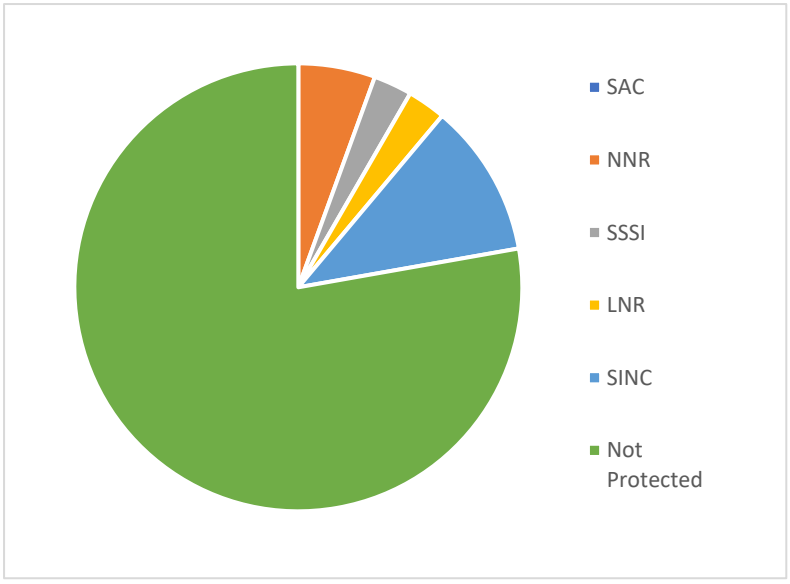


Diversity of Beech Deadwood Fungi Records



Protection: Only 22% of records come from protected sites, which is unexpected as these fungi would be indicative of older woodlands. All Ancient Semi-Natural Woodlands (ASNW) in Greater Gwent are designated at least as SINCs, so it might be that records are falling outside of protected sites due to centring of grid references, particularly for older records with less accurate locations. Records from protected sites include Cwn Clydach NNR, Silent Valley SSSI/LNR, and SINCs at Cefn Onn, Ruperra Woodlands, Bargain Wood, and Caerwent.

Beech Deadwood Fungi records on protected sites



Oak Deadwood Fungi

Protection: none

Conservation Status: various, see below

Data Availability: Moderate (211 records)

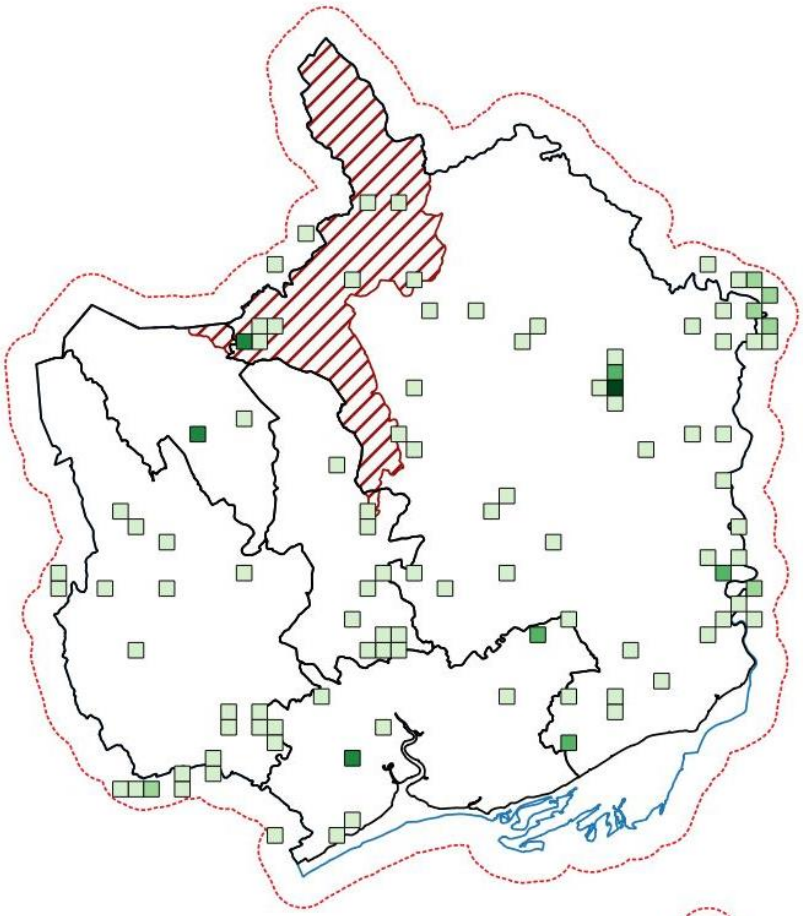
Context: Deadwood fungi are a key component of woodland ecosystems, and the deadwood fungi of Oak woodlands in Britain are considered internationally important.[6] High diversity of deadwood fungi is more likely in older woodlands, as well as parklands and woodpasture, with long continuity of uneven age structure.[7] This section uses the list of SSSI indicator species for Oak Deadwood Fungi assemblages.[6] The list consists of 16 species; 12 of which have been found within the study area.

Scientific Name	Common Name	Number of records	Latest record	Red List Status[8]
Daedalea quercina	Oak Mazegill	22	2017	
Fistulina hepatica	Beef-Steak Fungus	23	2017	
Ganoderma lucidum	Lacquered Bracket	4	2010	
Ganoderma resinaceum	A bracket fungus	5	2017	
Grifola frondosa	Hen of the Woods	7	2016	
Gymnopus fusipes	Spindle Toughshank	10	1973	
Hymenochaete rubiginosa	Oak Curtain Crust	27	2019	
Laetiporus sulphureus	Chicken of the Woods	56	2019	
Mycena inclinata	Clustered Bonnet	16	2019	
Piptoporus quercinus	Oak Polypore	6	2009	EN,

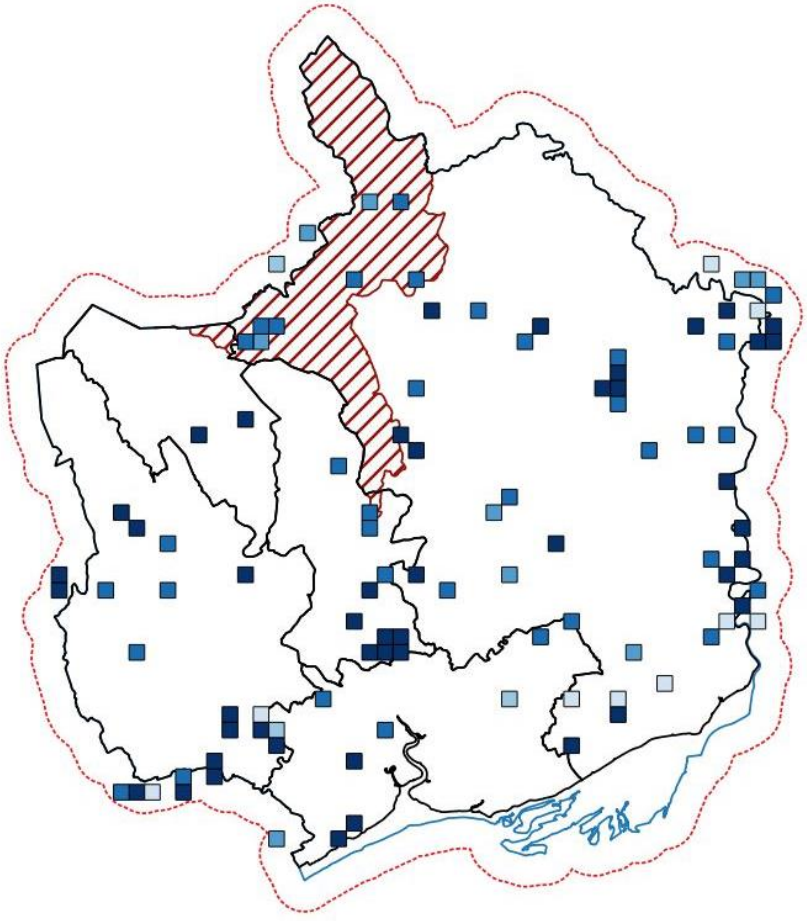
				Section 7
Podoscypha multizonata	Zoned Rosette	3	2019	
Pseudoinotus dryadeus	Oak Bracket	12	2017	

Outlook: It is difficult to predict what is happening to Oak Deadwood Fungi because of a lack of data. Until recently, deadwood was often removed from managed forests due to a misconception that this would improve tree health, or simply for 'tidiness'.[10] Now, the UK Forestry Standard includes guidelines to retain and manage veteran trees and leave a proportion of standing and fallen deadwood.[11] However, it will naturally take a long time to restock a variety of ages and types of deadwood. Currently, 82% of Welsh native woodlands are thought to be in an unfavourable condition for deadwood volume.[12] The same is true of most parklands in Gwent, with tidy landowners removing dead or dying landscape trees. However, there are far more ancient Oaks than Beeches in the landscape of Gwent, and the outlook for Oak saprotrophic fungi is probably better than for Beech saprotrophs in the county.

Greater Gwent range: Records of these rare fungi are widely scattered across Greater Gwent, with recent records for most sites. The most diverse sites are at Dingestow, Tredegar Park, Cwm Clydach, Pontypool Park, Magor Marsh and Lady Park Wood, as well as two English sites. Fungi records are 'valid' for a period of 50 years,[6] so even sites with older records, such as Pontypool Park and Lady Park Wood should be considered significant. Dingestow could be considered for SSSI status, as eight species is the threshold for designation.[6]

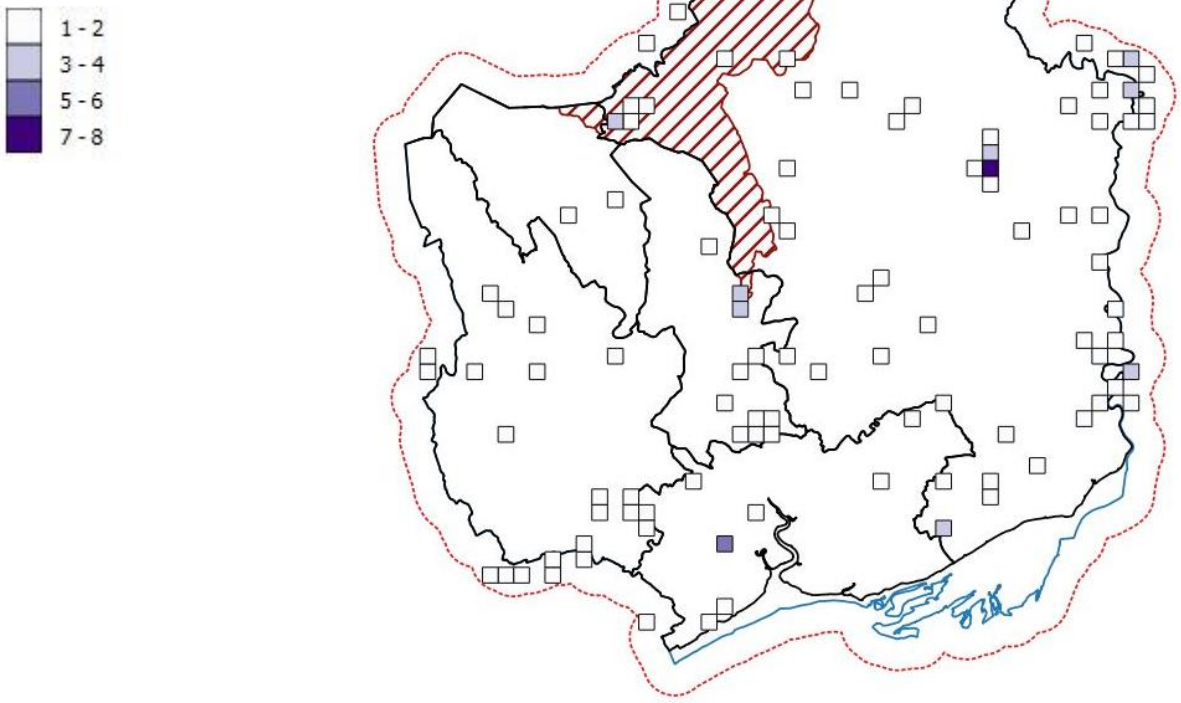


Density of Oak Deadwood Fungi Records (max 12/km^2)



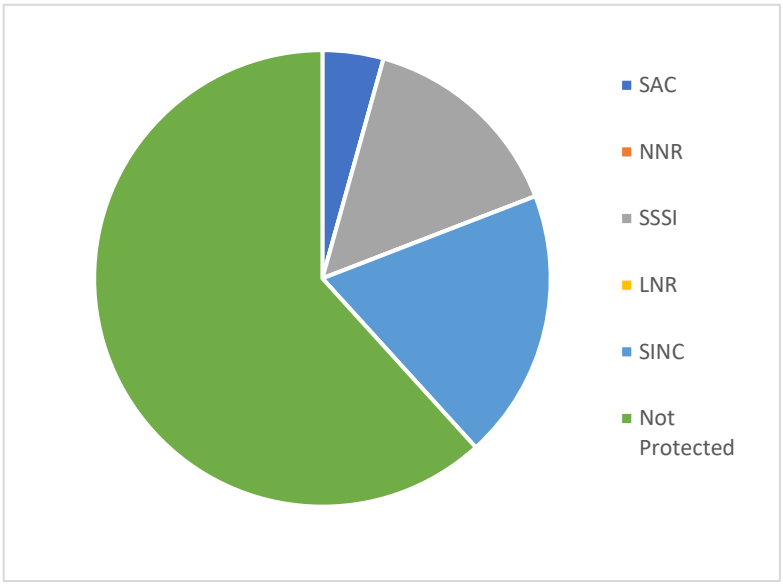
Oak Deadwood Fungi records by decade

Species richness of Oak Deadwood Fungi



Protection: Just over a third (38%) of records are from protected sites. SAC records are from the Wye Valley Woodlands and SSSI records are from Cwm Clydach (falling outside the NNR), Cwm Merddog (Silent Valley), Strawberry Cottage Wood and the Gwent Levels. SINC records are from a number of sites, especially old estates and parkland, such as Piercefield Park, Llantarnam, and Pontypool Park, and Ancient Semi Natural Woodlands, such as Bargain Wood and Park Wood. It is likely that more sites fall within small woodland fragments, especially in Monmouthshire, and centring of records causes them to fall outside of the protected area.

Oak Deadwood Fungi records from protected sites



Grassland Waxcap Fungi


Crimson Waxcap *(Hygrocybe punicea)*

Andy Karran

Protection: none

Conservation Status: various, see below

Data Availability: Good (3,242 records for 46 species)

Context: Diverse grassland fungi grow in ancient pastures, forming varied associations with grasses, plants and mosses. There are five main groups of fungi that are found mostly in grasslands: Clubs & Corals; Crazed-Caps; Earthtongues; Pinkgills; and Waxcaps. Many are very colourful, with red, orange, yellow, green and even pink and purple species. Some grassland fungi are common and widespread, such as Parrot Waxcap and Blackening Waxcap, but some are extremely rare, including Pink Coral, Violet Coral and Grey Waxcap. Waxcaps are probably the most recorded group of grassland fungi.

Grassland fungi are lost during ploughing or if fertility gets too high, and it takes decades for a really diverse assemblage of grassland fungi to develop: at Dingestow Court, rare grassland fungi are still absent from a lawn that was ploughed 70 years ago, despite their presence on another otherwise identical lawn. Ancient grassland is widespread in Gwent, and some sites are of international significance. Rich assemblages of grassland fungi are scattered across the area, and it is likely that there are still some to be discovered. Detecting grassland fungi is complicated by their relatively short fruiting season and variability of fruiting between different years. Analysis of eDNA is allowing detection of grassland fungi in soil samples at any time of year, potentially revolutionising the study of these species.

Note that waxcap taxonomy has been subject to many changes as more is discovered about these species and their relationships to one another. The scientific names below follow Boertmann (2010) as described in the current SSSI guidelines[6].

Scientific Name	Common Name	Study Area records	SSSI indicators[6]	High diversity indicators[6]	Red Data List[1]
Hygrocybe acutoconica	Persistent Waxcap	88	✓		
Hygrocybe aurantiosplendens	Orange Waxcap	30	✓	✓	*
Hygrocybe calciphila	Limestone Waxcap	16	✓		
Hygrocybe calyptriformis	Pink Meadow Cap	92	✓	✓	VU
Hygrocybe cantharellus	Goblet Waxcap	15	✓		

Hygrocybe ceracea	Butter Waxcap	128	✓		
Hygrocybe chlorophana	Golden Waxcap	390	✓		
Hygrocybe citrinovirens	Citrine Waxcap	38	✓	✓	
Hygrocybe coccinea	Scarlet Hood	212	✓		
Hygrocybe coccineocrenata	Bog Waxcap	2			
Hygrocybe colemanniana	Toasted Waxcap	60	✓	✓	
Hygrocybe conica	Blackening Waxcap	268	✓		
Hygrocybe flavipes	Yellow Foot Waxcap	63	✓	✓	
Hygrocybe fornicate	Earthy Waxcap	29	✓		
Hygrocybe glutinipes	Glutinous Waxcap	120	✓		
Hygrocybe helobia	Garlic Waxcap	7	✓		
Hygrocybe ingrata	Dingy Waxcap	7	✓	✓	
Hygrocybe insipida	Spangle Waxcap	189	✓		
Hygrocybe intermedia	Fibrous Waxcap	71	✓	✓	
Hygrocybe lacmus	Grey Waxcap	10	✓	✓	*
Hygrocybe laeta	Heath Waxcap	1	✓		
Hygrocybe miniata	Vermillion Waxcap	38	✓		
Hygrocybe mucronella	Bitter Waxcap	41	✓		
Hygrocybe nitrata	Nitrous Waxcap	20	✓	✓	
Hygrocybe pratensis	Meadow/Pale Waxcap	356	✓		
Hygrocybe punicea	Crimson Waxcap	107	✓	✓	
Hygrocybe quieta	Oily Waxcap	139	✓		

Hygrocybe radiata	Slender Waxcap	3	✓		*
Hygrocybe reidii	Honey Waxcap	104	✓		
Hygrocybe russocoriacea	Cedarwood Waxcap	76	✓		
Hygrocybe spadicea	Date-Coloured waxcap	3	✓	✓	VU[+]
Hygrocybe splendidissima	Splendid Waxcap	24	✓	✓	
Hygrocybe substrangulata		2	✓		
Hygrocybe virginea	Snowy Waxcap	455	✓		
Hygrocybe vitellina		4	✓		

***** European Species of Conservation Concern

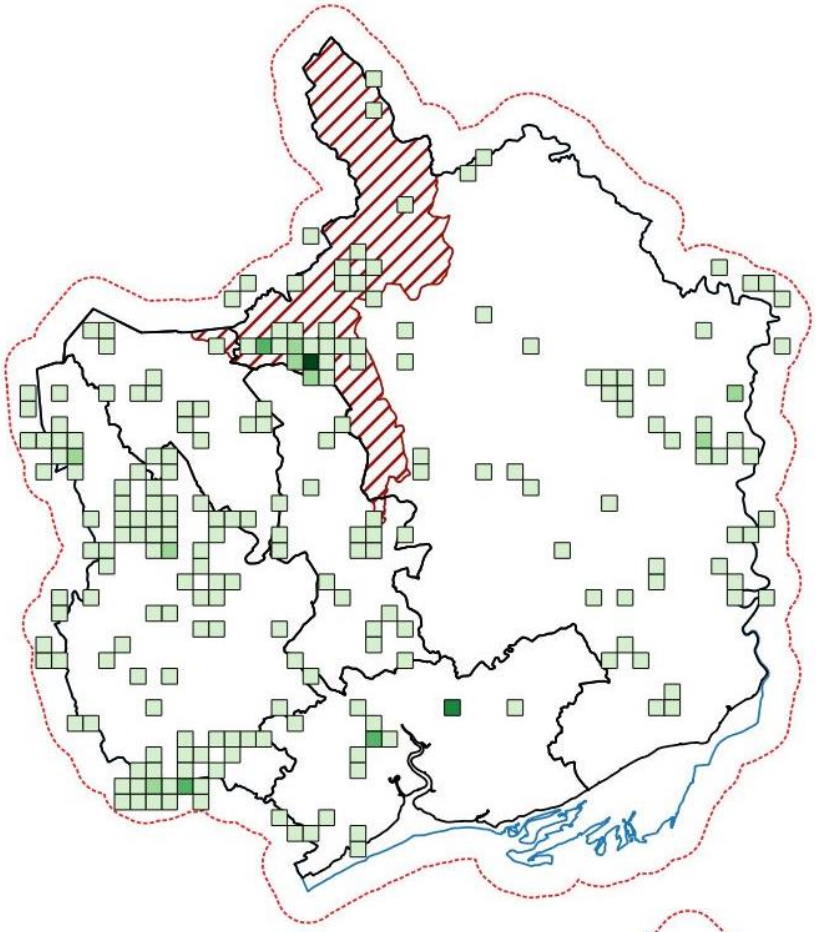
[+] Wales Section 7 Priority Species

Outlook: Grassland fungi are very easy to destroy through ploughing, but Gwent is blessed with many ancient grasslands that are unlikely to be ploughed, especially in the western valleys, the north-east and the Trellech plateau. Understanding and appreciation of grassland fungi continues to improve, aided significantly by a book published by two Gwent mycologists.[13] Management to protect grassland fungi is specifically covered by a Glastir farm prescription, and is being discussed for the Sustainable Farm Scheme. Known rich grassland fungi sites are mapped to prevent grant-funded tree planting, but woodland creation is still a very significant threat to these species, especially because permanent pasture is largely protected from ploughing but not from planting. The impacts from agricultural nitrogen pollution on grassland fungi remain unknown. Churchyards and cemeteries are often very important for the survival of grassland fungi, providing mowing takes place regularly and grass is removed to prevent nutrient build-up.

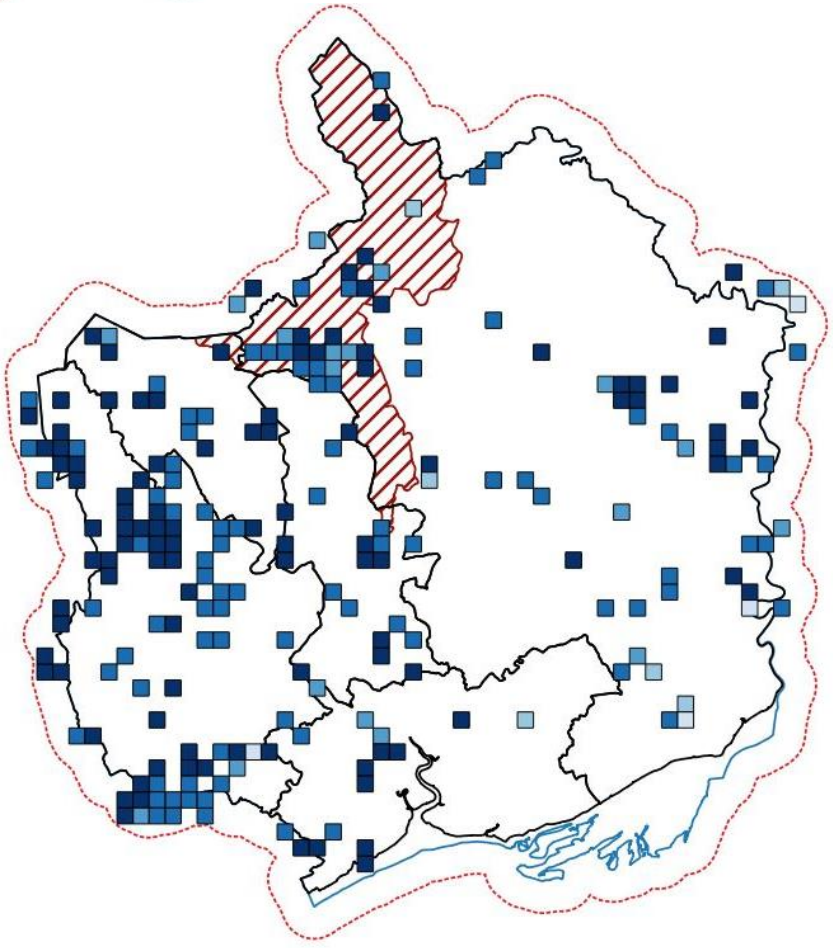
Greater Gwent range: Grassland fungi occur in farmland, hillsides, cemeteries, churchyards and lawns, and therefore have a very wide range in Gwent, although there are no records from the Gwent Levels. The county holds one of the most diverse grassland fungus sites in Britain. This internationally important site covers the grassland and heathland mosaics between the Blorenge and Cwm Clydach, including Gilwern Hill, and has 30 recorded waxcap species. Only two sites in the UK are known to hold more species than this.[14]

Other hotspots include Christchurch Cemetery LNR, Glasllwch Cemetery, Cefn Onn SINC, Aberbargoed Grasslands SAC/SSSI, Fochriw Tips and Cefn Gelligaer SINC, Pontypool Park SINC, Dingestow Court, Pentwyn Farm SSSI, New Grove Meadows SINC, Mountain Ranch and Mynydd Llangattwg SAC/SSSI. Sites supporting 19 or more SSSI species should be considered for notification. Sites with 12–19 SSSI species should be prioritised for further survey.

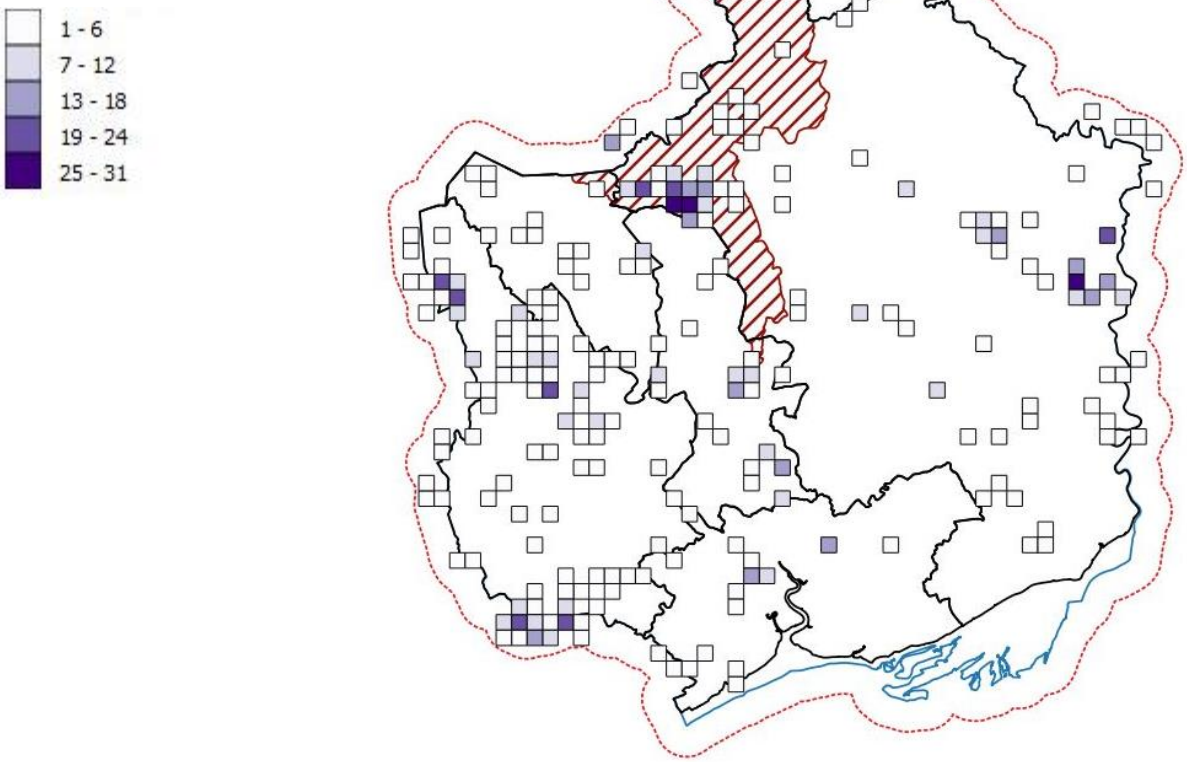
Density of Waxcap Fungi Records (max 301 records/km^2)



Waxcap records by date

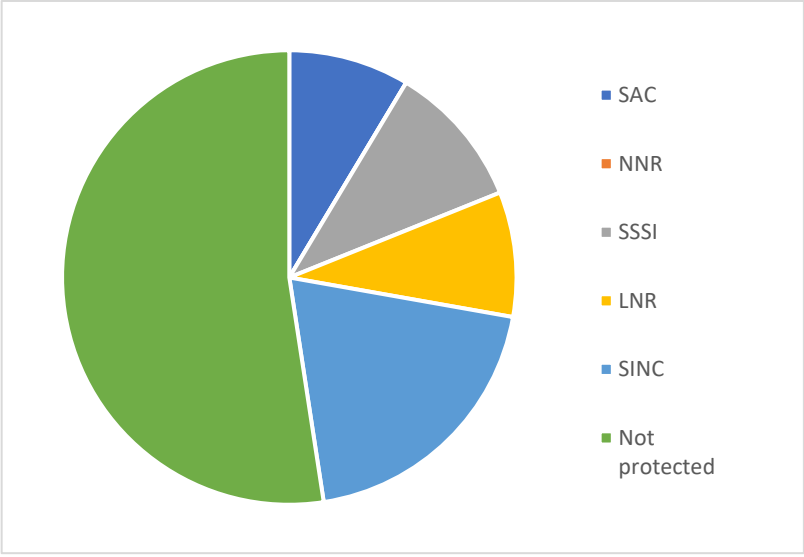


Species richness of waxcap fungi



Protection: Just under half (48%) of waxcap fungi records are from protected sites. SAC records are from Aberbargoed Grasslands, and the Usk Bat SAC (and the Cwm Clydach NNR, which falls within the Usk Bat SAC). Important SSSIs include the Blorenge and Pentwyn Farm. LNR records are almost entirely from Christchurch cemetery. SINC records are scattered throughout the area, and include Coed-y-Moeth and Cwmsyfiog Hillside, Cwmsyfiog SINC and Caerphilly Common, as well as those SINCs mentioned previously. Much of the internationally important complex in the Blorenge, Gilwern Hill, Cwm Clydach area is designated SSSI and has grassland fungi specifically addressed during management decisions, although many records fall outside of the protected areas.

Waxcap fungi records from protected sites



References

1. Evans S, Marren P and Harper M. 2001. Important Fungus Areas. Plantlife, Association of British Fungus Groups & British Mycological Society.
2. Fungus Conservation Forum. 2008. Saving the Forgotten Kingdom – A Strategy for the Conservation of the UK's Fungi: 2008–2015. Plantlife International, Salisbury.
3. Haw K and Jones H. 2015. The Bad and the Ugly. Wood Wise. Woodland Conservation News Autumn 2015, 10–14.
4. Woods, RG. 2009. A Strategy and Action Plan for the Conservation of Lower plants and fungi in Wales 2009–2015. Plantlife International, Salisbury.
5. The Global Fungal Red List Initiative The Global Fungal Red List Initiative (ekoo.se)
6. Bosanquet SDS, Ainsworth AM, Cooch SP, Genney DR and Wilkins TC. 2018. Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 14 Non lichenised Fungi. Joint Nature Conservation Committee, Peterborough.
7. Ainsworth AM. 2004. BAP Fungi Handbook. English Nature Research Report 660. English Nature, Peterborough.
8. Evans S, Henrici A, Ing B. 2006. Red Data List of Threatened British Fungi. British Mycological Society
9. Smart SM, Allen D, Murphy J, Carey PD, Emmett BA, Reynolds B, Simpson IC, Evans RA, Skates J, Scott WA, Maskell LC, Norton LR, Rossall MJ and Wood C. 2009. Countryside Survey: Wales Results from 2007. NERC/Centre for Ecology & Hydrology, Welsh Assembly Government, Countryside Council for Wales.
10. Humphrey J and Bailey S. 2012. Managing Deadwood in Forests and Woodlands. Forestry Commission Practice Guide. Forestry Commission, Edinburgh.
11. Forestry Commission. 2017. The UK Forestry Standard. Forestry Commission, Edinburgh.
12. Ditchburn B, Wilson T, Henderson L, Kirby K and Steel P. 2020. NFI Woodland Ecological Condition in Wales: Classification Results. National Forest Inventory, Forestry Commission
13. Wood E and Dunkelman J. 2020. Grassland Fungi: A Field Guide. Monmouthshire Meadows Group.
14. Griffith GW, Gamarra JGP, Holden EM, Mitchel D, Graham A, Evans DA, Evans SE, Aron C, Noordeloos ME, Kirk PM, Smith SLN, Woods RG, Hale AD, Easton GL, Ratkowsky DA, Stevens DP, Halbwachs H. 2013. The International Conservation Importance of Welsh 'Waxcap' Grasslands. Mycosphere 4(5): 969–984. Doi 10.5943/mycosphere/4/5/10.

Lichens and Bryophytes

Lichens and Bryophytes are often overlooked and under-recorded when compared to other species groups. There are around 1,800 lichen species and 1,000 bryophyte species found in the UK, with 119 species and 3 communities or assemblages listed on the Section 7 List in Wales. Of those Section 7 species, just 11 have been recorded in Greater Gwent, most with 5 or fewer records. The exception is Spreading-Leaved Beardless Moss (*Weissia squarrosa*), which has 29 recent records in central Monmouthshire.

Greater Gwent has a long history of recording bryophytes and relatively good coverage. The area has a high species richness, with one 1km^2 supporting over 150 species.[1] This is in part due to the wide variety of substrates provided by the area's geological diversity and the consequent variety of habitats, from woodlands and meadows to wetland and heath. In this section are highlighted some of the rarest mosses recorded in Greater Gwent, such as Flood Moss (*Myrinia pulvinata*) and Irish Earth-Moss *Ephemerum hibernicum*, as well as significant moss communities on arable land and limestone soils.

For lichens, Wales as a whole is extremely species rich: at one time it supported 71% of the British lichen flora, despite accounting for only 11% of Britain's area.[2] Greater Gwent seems less well recorded, especially when compared with neighbouring Gloucestershire or the Brecon Beacons National Park. The British Lichen Society holds no records at all for some 10km squares in Greater Gwent.[3] This lack of lichen recording and, in particular, lichen recorders, is recognised as a national problem for Wales, and there is now a dedicated Lichen Apprenticeship Scheme, CENNAD,[4] which aims to train more lichen experts.

Like many other species, both bryophytes and lichens are threatened by habitat loss. Ash dieback is predicted to have a significant negative impact on both: 58 bryophytes and 546 lichens are associated with ash, and many of these species are already Nationally Rare or Scarce.[5] Both bryophytes and lichens are sensitive to pollution and can be useful indicators of air quality, as shown by analysis of epiphytic mosses and nitrogen-sensitive lichens in this section.

Arable Bryophytes


Field Hornwort (*Anthoceros agrestis*)

Sam Bosanquet

Protection: none

Conservation Status: none

Data Availability: Good (112 records, for 30 species)

Context: Historically almost every farm in Gwent had some arable land for cereals or forage, and specialist mosses, liverworts and hornworts of arable land would have been very widespread. Intensification of arable farming during the twentieth century led to significant declines in the distribution and abundance of arable bryophytes. In particular, those that produce sporophytes in late winter or spring have been disproportionately affected by a switch to autumn cultivation rather than overwintering of stubbles. A nationwide survey of arable bryophytes[6] showed that Gwent was a national hotspot for bryophyte-rich arable fields, and the highest species tally for any arable field in Britain came from a field near Dingestow.

Arable bryophytes protect bare soil from erosion by binding the soil surface and can form a very high cover in cereal stubble fields. Autumn cultivation prevents the development of an arable bryophyte carpet, while slurry spreading and soil compaction are believed to reduce bryophyte abundance and diversity. Maize fields are particularly poor for arable bryophytes.

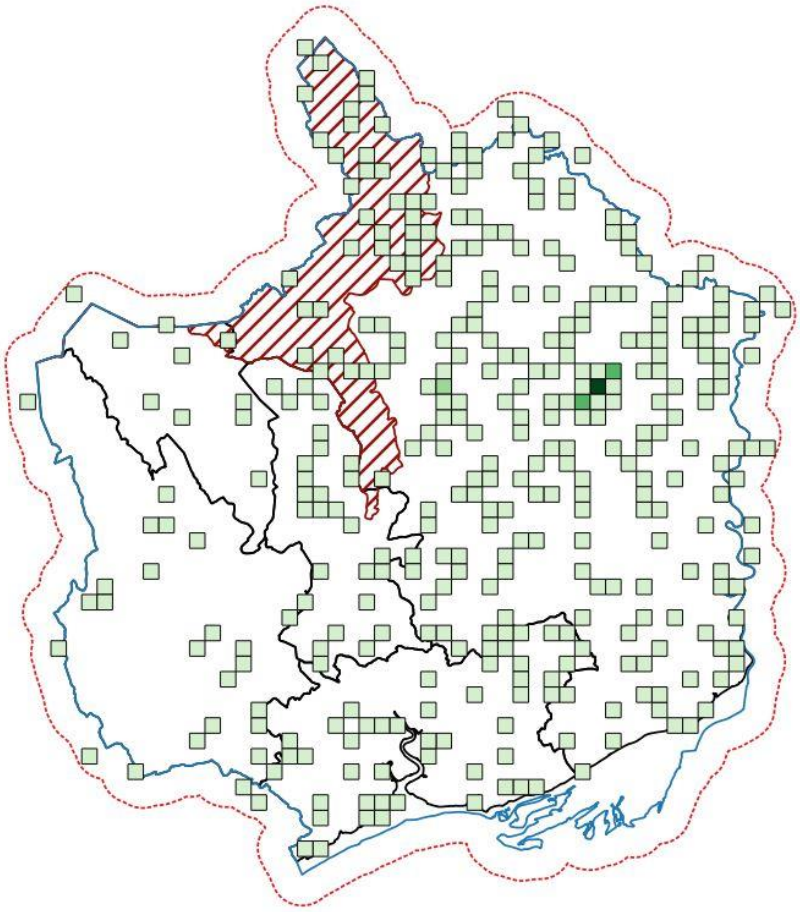
Although more than 70 bryophyte species have been recorded in arable fields in Gwent, only 30 of these are considered to be typical of the habitat as they occur in arable far more frequently than in other situations. Nine of these arable specialists are listed in the most recent Red Data List[7] and/or are Nationally Scarce (recorded in fewer than 100 hectads in Britain since 1970).

Scientific name	Common name	Greater Gwent records	Greater Gwent sites	UK status
Acaulon muticum	Rounded Pygmy-Moss	13	10 (but only 3 are arable)	RDB Vulnerable
Anthoceros agrestis	Field Hornwort	24	16	Nationally Scarce, RDB Vulnerable
Didymodon tomaculosus	Sausage Beard-Moss	2	1	Nationally Scarce
Entosthodon fascicularis	Hasselquist's Hyssop	19	13	RDB Near Threatened
Fossombronia caespitiformis	Husnot's Frillwort	2	2 (only 1 arable)	Nationally Scarce
Microbryum floerkeanum	Floerke's Phascum	2	2 (only 1 arable)	RDB Near Threatened
Phaeoceros carolinianus	Carolina Hornwort	22	11	Nationally Scarce, RDB Endangered
Weissia rutilans	Pointed-Leaved Stubble-Moss	6	3 (none arable)	Nationally Scarce
Weissia squarrosa	Spreading-Leaved Beardless-moss	22	5 (only 3 arable)	Nationally Scarce, RDB Near Threatened

Outlook: The nationwide arable bryophyte survey[1] identified pressures on arable bryophytes including loss of small-scale arable on livestock farms, declining frequency of spring cultivation and overwintered stubbles, over-use of fertilisers, and loss of soil structure. These pressures are all apparent in Gwent, especially in the low-lying Usk Valley and Raglan area, where silage, maize and oilseed rape cultivation have increased since the early 2000s. Bryophyte-rich stubbles are still encountered frequently in north-east Gwent, especially when wet winters make cultivation difficult, and this may be enough to allow the local survival of our arable bryophyte flora.

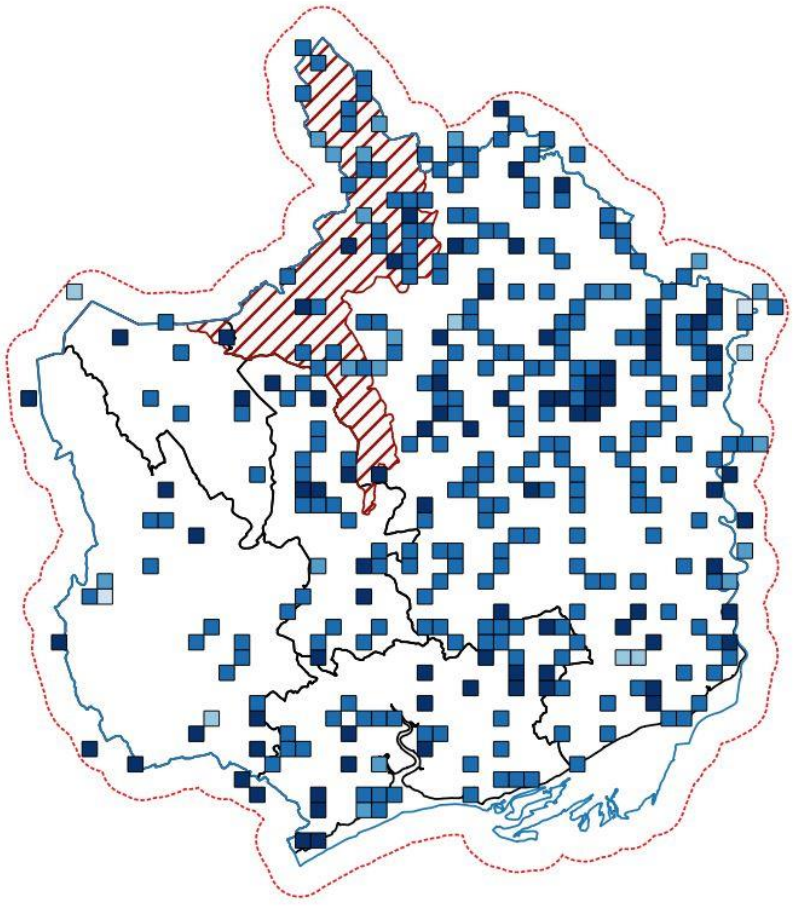
Prospects for arable bryophytes remain uncertain. Despite their role in reducing soil erosion in overwintered stubble fields, they are not widely appreciated by farmers or policy makers. Arable bryophytes are not specifically mentioned in consultation drafts for the Welsh Sustainable Farming Scheme, although they may benefit from options designed to conserve farmland birds.

Greater Gwent range: Arable bryophytes are found across Greater Gwent, but the majority are in the eastern half of the county. Greater Gwent is on the western edge of the core arable area of Britain, and relatively frequent wet autumns make overwintered stubbles disproportionately more frequent here than further east in Britain. Maps show Dingestow to be a particular hotspot for arable bryophytes. This is due in part to detailed recording, but it also reflects the abundance of low intensity arable in that area in the early 2000s. The low frequency of arable bryophytes in north-western Gwent reflects a relative lack of arable there, although several of the commoner arable bryophytes are able to survive on other periodically disturbed ground, such as in cemeteries.

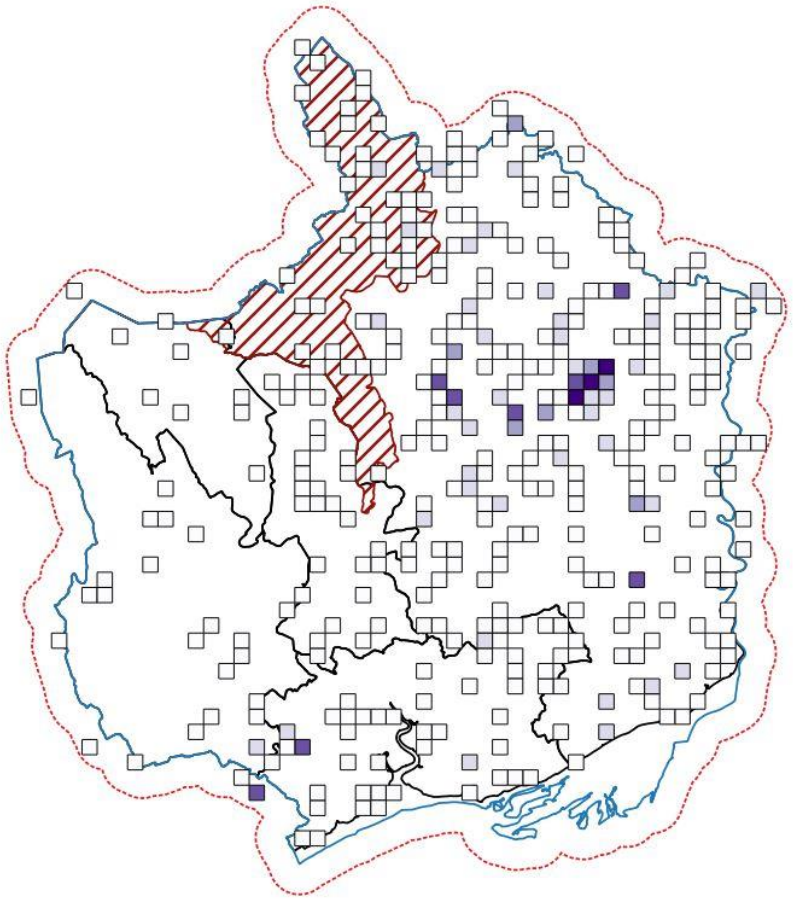


Density of records.
Maximum set to 115/km²

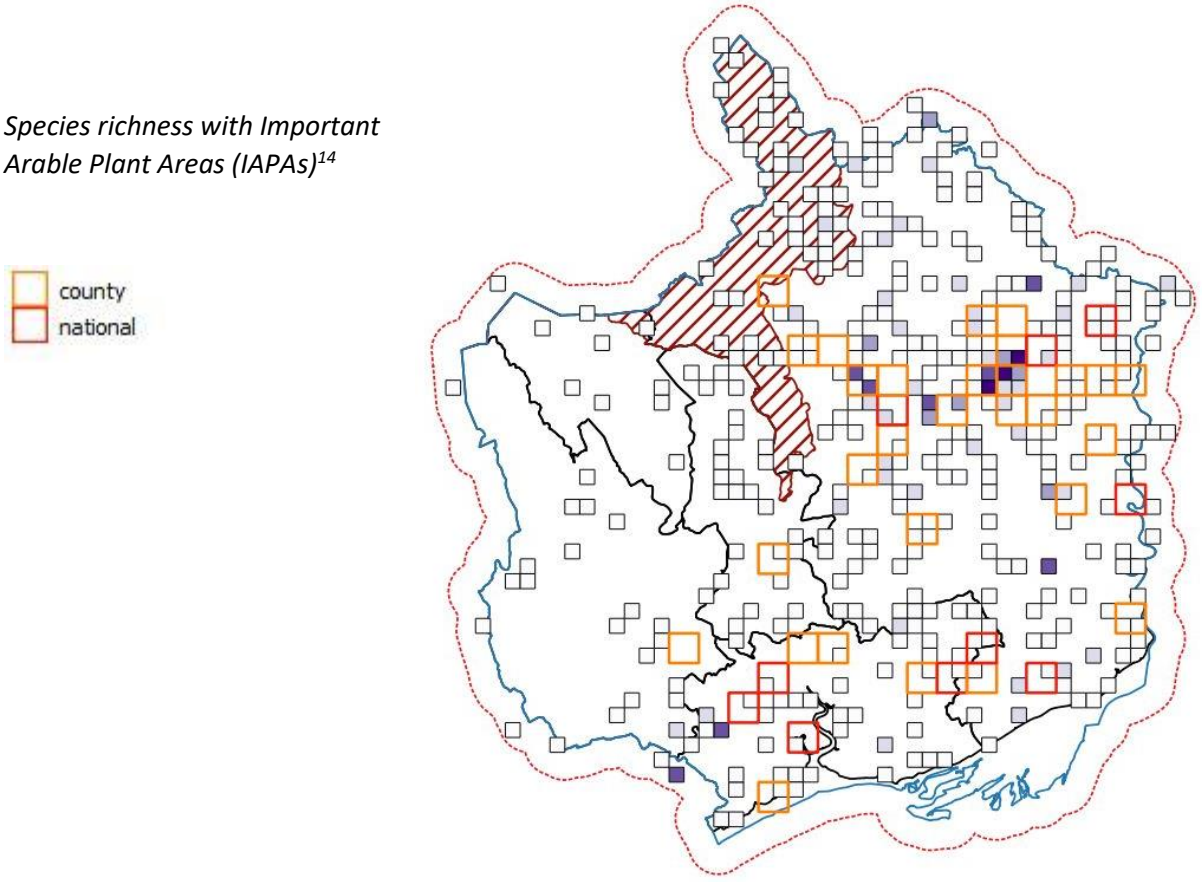
Species records by decade



Species richness of arable bryophytes/km²



Species richness with Important Arable Plant Areas (IAPAs)[14]

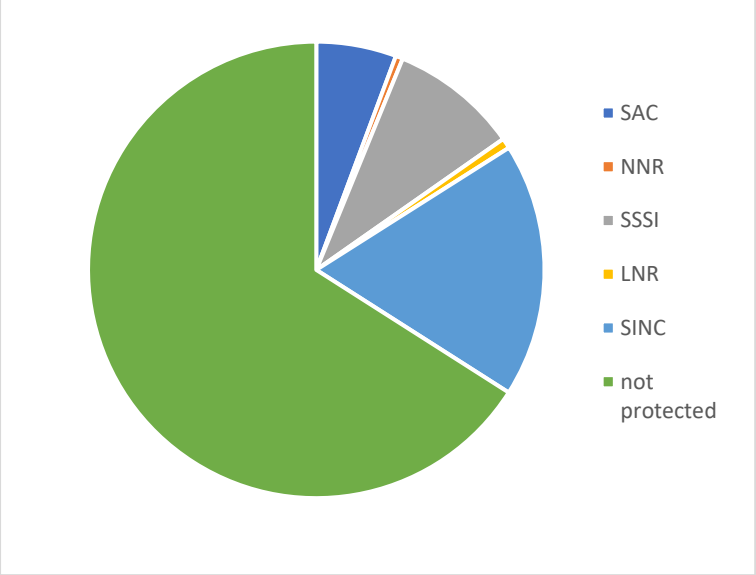


Habitats patterns: There is relatively poor coincidence with Plantlife's Important Arable Plant Areas (IAPAs).[15] This is partly because of the lack of specialist bryophyte surveys in some of these areas, but it is also because the drier fields favoured by many arable vascular plants are unsuitable for most of the uncommon arable bryophytes. Damp, clay and clay loam soils usually support the richest arable bryophyte assemblages.

Population trends: The majority of arable bryophyte records from Gwent come from the 2001 to 2004 'Survey of the bryophytes of arable land'.[6] Prior to 2000 there was very little bryophyte recording at all in Gwent, especially not on arable land, and recording has been more broadly focused since 2004. Changes in arable land management, especially increases in slurry usage and the cultivation of maize and oilseed rape, make it highly likely that arable bryophytes are continuing to decline in Gwent, but there is a lack of very recent survey data.

Protection: Although there are some arable fields within designated sites, including the Gwent Levels SSSIs and those bordering the River Usk (Lower Usk) SSSI, only a tiny minority support rich arable bryophyte assemblages and none are recognised as an SSSI feature. No SINCs have been selected for arable bryophytes, although sites with Red listed species such as *Anthoceros agrestis* and *Phaeoceros carolinianus* qualify for selection. The Dingestow Court has a potentially qualifying Arable Bryophyte Assemblage feature but awaits notification.

Arable bryophyte records from protected sites



Irish Earth-Moss *Ephemerum hibericum* (Holyoak & V.S.Bryan)

Protection: none

Conservation Status: none

Data Availability: Poor (1 record)

E.hibericum habitat

Sam Bosanquet

Context: Irish Earth-Moss (*Ephemerum hibernicum*) is a specialist moss of seasonally flooded, lime-rich areas. It was described as new to science from Irish turloughs in 2005 and is otherwise known from five European countries.[8] Wentwood Reservoir is one of just two known British sites, the other being a turlough in Carmarthenshire. As such, this is one of Gwent's rarest species, both in British and global terms.

Ephemerum hibernicum is thought to have long-lived spores, which germinate when water levels are low, and rapidly produce new spore capsules. This lifestyle suits its naturally fluctuating turlough habitat as well as conditions at Wentwood Reservoir, where the water level varies depending on supply and demand. It is one of a suite of notable bryophytes that grow on lake and reservoir margins that includes the Nationally Scarce *Riccia cavernosa* at Llandegfedd Reservoir, Pant-yr-eos and Wentwood, *Ephemerum sessile* at Llandegfedd and Wentwood, and *Weissia rostellata* at Wentwood.

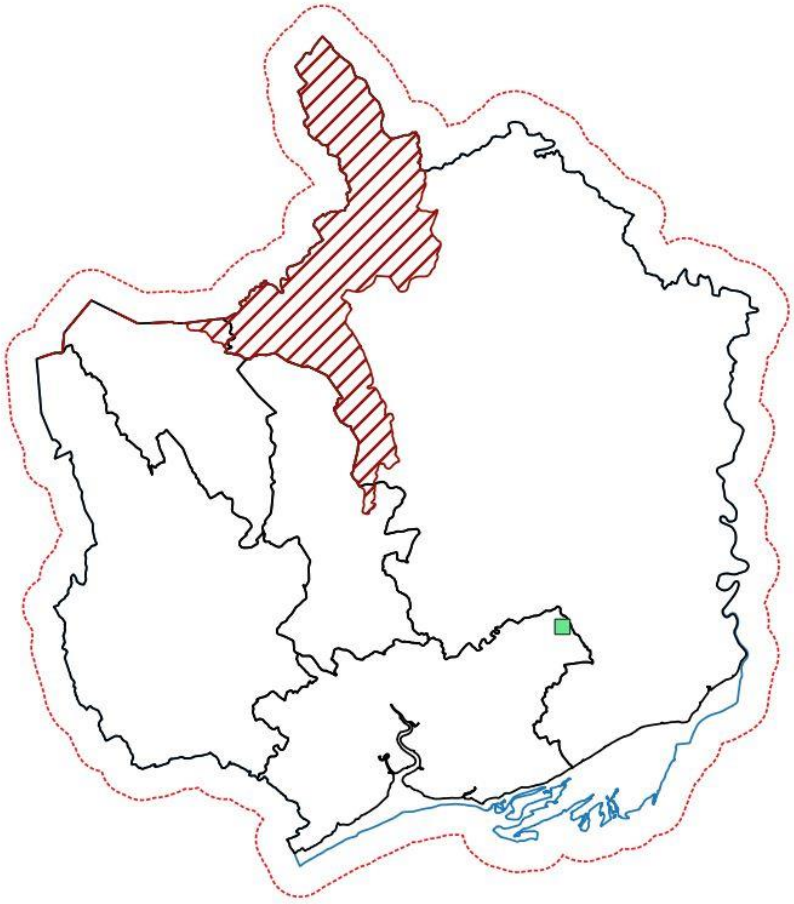
The only time *Ephemerum hibernicum* has been found in Gwent was in November 2003, when it was frequent at the north end of Wentwood Reservoir. The site has not been searched for bryophytes subsequently, and the status of the population is unknown.

Outlook: The UK population of *Ephemerum hibernicum* is currently restricted to two sites. The Carmarthenshire colony is in a National Nature Reserve and is considered secure, but the Gwent colony is on a water-supply reservoir and is vulnerable to changes in water-level management. Elsewhere in Britain, lake margin bryophytes have been lost through the maintenance of high water levels, because this does not allow the bryophytes to germinate, and through invasion of non-native plants especially New Zealand Pygmyweed (*Crassula helmsii*).

Greater Gwent range: The restriction of *Ephemerum hibernicum* in Gwent to Wentwood Reservoir is likely to be genuine, because relatively lime-rich lakes with seasonally fluctuating water levels are rare in the area. The Nedern turlough was searched recently and there is no suitable habitat for *E. hibernicum* there. Llandegfedd Reservoir and Pant-yr-eos Reservoir might offer suitable conditions, but *E. hibernicum* was not recorded at either during surveys in the early 2000s.

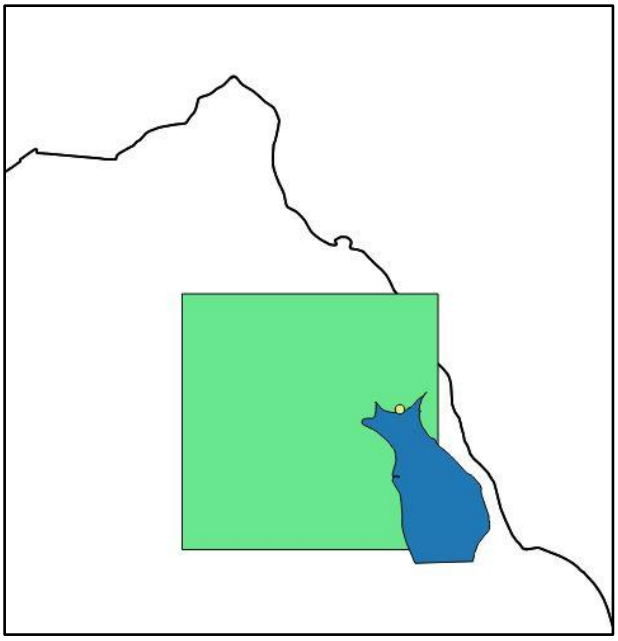
Population trends: The current state of the population is unknown and requires survey.

Protection: Wentwood Reservoir is not designated, but surrounding grassland is a SINC for its acid grassland diversity.



E. hibernicum record in Greater Gwent

Inset showing location of record, at northern end of Wentwood Reservoir.



Epiphytic Bryophytes

Protection: none

Conservation Status: see below

Data Availability: Good (881 records)

Context: Epiphytes are plants that grow on other plants: in this case bryophytes (mosses and liverworts) that grow on trees. They are a natural part of healthy ecosystems and help absorb water and particulates as well as sheltering invertebrates.

Sam Bosanquet

During the nineteenth and twentieth centuries, industrial pollution, especially sulphur dioxide, made most tree bark in Gwent so acidic that very few mosses grew on it. Reductions in sulphur dioxide – thanks to a combination of legislation, improved technology and outsourcing of polluting industries to other countries – have allowed an astonishing resurgence of epiphytic mosses and liverworts in Gwent and much of the rest of Britain. Trees in Newport and western Gwent, where epiphytes were completely absent in the late twentieth century, now support a diverse range of mosses: for example, 24 species on ash trees in a park in Bettws; 21 on maple in Crindau; and 18 on ash and maple at Dyffryn.

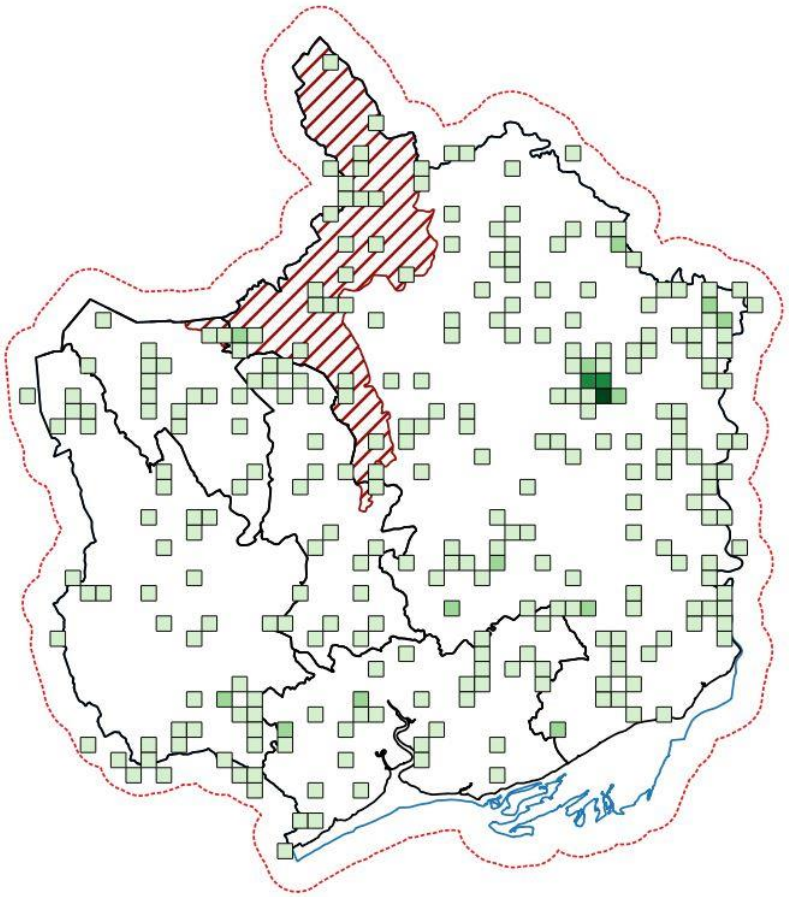
Many of our commonest epiphytic bryophytes, such as Dilated Scalewort (*Frullania dilatata*) and Lateral Cryphaea (*Cryphaea heteromalla*) are now found across Gwent. Twelve species of epiphytic bryophyte that were unknown in Gwent before 2000 have been recorded recently in the county, highlighting the spread of some of these species. Some are now very widespread, such as Frizzled Pincushion (*Ulota phyllantha)*.

Scientific name	Common name	GG records
Cololejeunea minutissima	Minute Pouncewort	123
Colura calyptrifolia	Fingered Cowlwort	17
Neckera pumila	Dwarf Neckera	32
Orthotrichum pallens	Pale Bristle-Moss	4
Orthotrichum pumilim	Dwarf Bristle-Moss	2
Orthotrichum schimperi	Schimper's Bristle-Moss	1
Orthotrichum striatum	Smooth Bristle-Moss	124
Pylaisia polyantha	Many-flowered Leskea	30
Syntrichia papillosa	Marble Screw-Moss	102
Syntrichia virescens	Lesser Screw-Moss	12

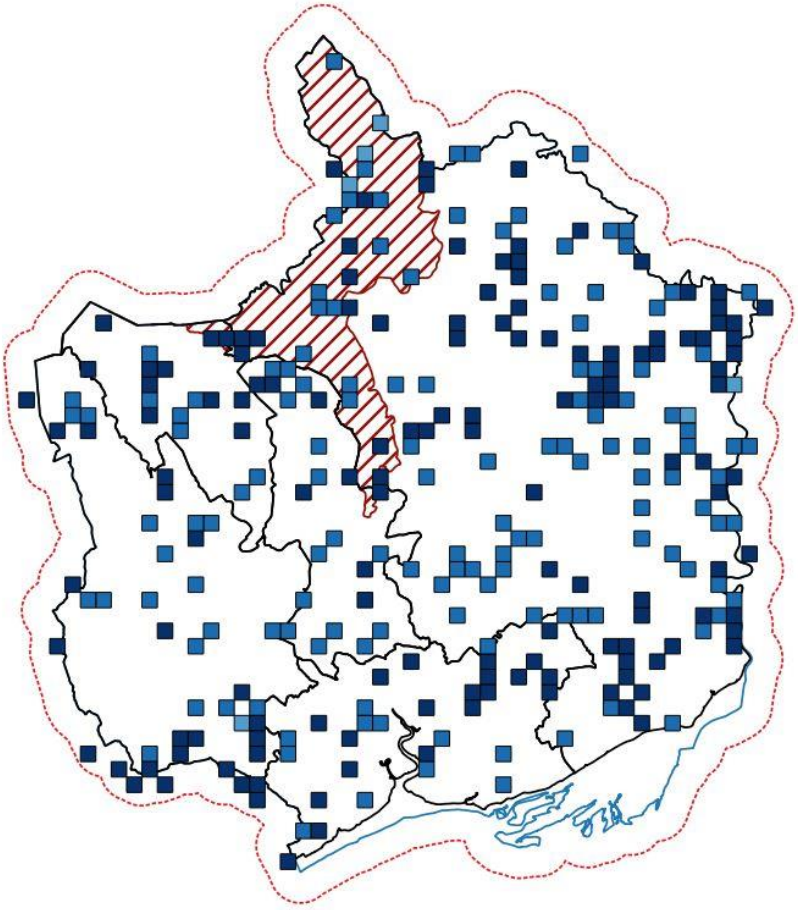
Ulota calvescens	Balding Pincushion	1
Ulota phyllantha	Frizzled Pincushion	380

Outlook: Sulphur dioxide continues to decline in Britain, and two current major air pollutants – nitrogen oxides (NOx) and particulates – actually seem to favour many epiphytic mosses and liverworts. Gwent populations of these bryophytes are expected to continue to increase, at least in urban areas; this is in stark contrast to many nitrogen-sensitive epiphytic lichens (see N-sensitive Lichens section).

Greater Gwent range: Epiphytic bryophytes are now found across Gwent, whereas in the first bryophyte *Atlas* they were largely restricted to the north-east of the county, away from industrial pollution. Even the rarer species that were absent from the area until 2000 are now widely distributed, although there is an obvious recording hotspot at Dingestow.

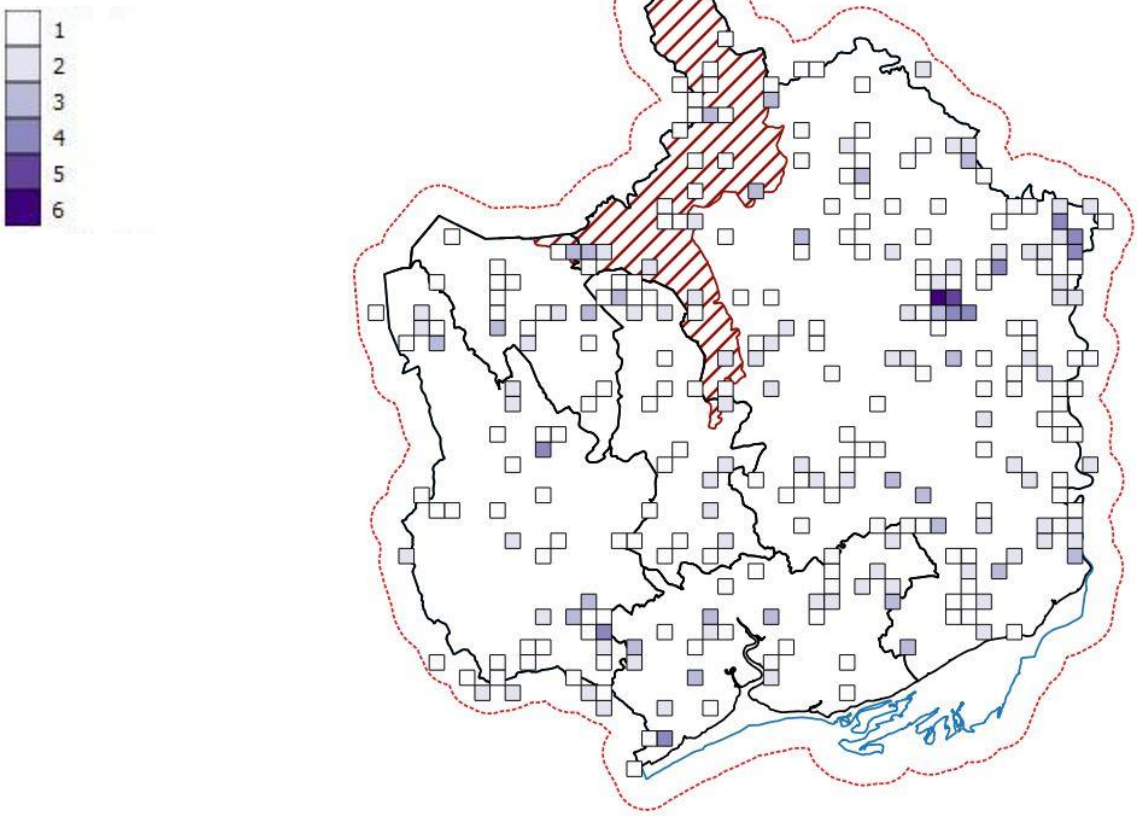


Distribution of Epiphytic moss records across Greater Gwent (maximum 26/km^2)



Epiphytic moss records by date

Diversity of Epiphytic moss records



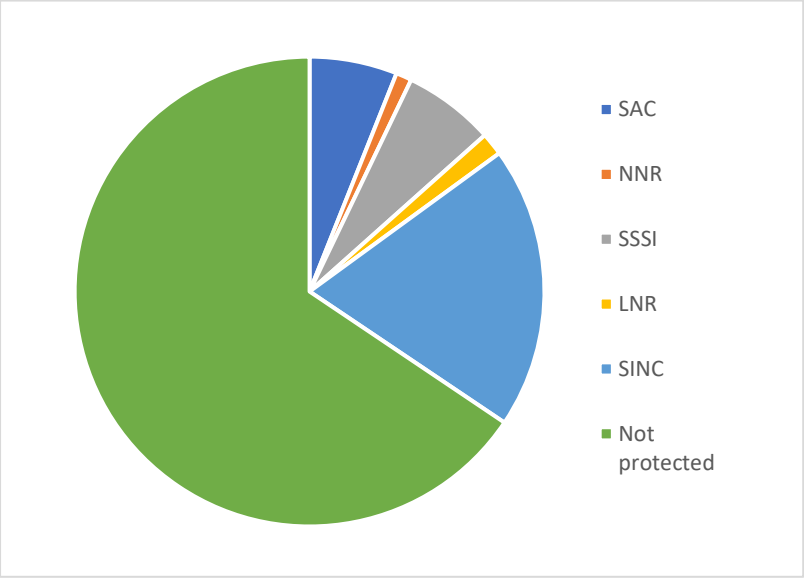
Habitats patterns: There is no obvious pattern in occurrence of epiphytic bryophytes in Gwent now, and differences tend to reflect host tree species more than habitat. Ash, maple or willow can hold 20 or more epiphytic mosses in woodland, field boundary or urban habitats, whereas birch or oak typically support fewer species regardless of habitat.

Population trends: There is a significant upward trend in occurrence of the mapped rarer epiphytic bryophytes (unsurprisingly because they were unknown in the area, with the exception of a 1967 record of *Pylaisia polyantha*, until 2000) and commoner epiphytic species. This reflects a substantial increase across Britain, particularly in polluted areas,[8] resulting from the combined effects of sulphur dioxide reduction and climate change. Some of the epiphytic mosses and liverworts, such as *Cololejeunea minutissima*, are frost-sensitive and were restricted to the west coast of Britain during the twentieth century but have spread rapidly north-eastwards over the last 20 years. However, without reductions in sulphur dioxide pollution, these climate change range expansions would not have been possible, because polluted, acidic bark cannot support *Cololejeunea minutissima* regardless of the climate.

Some epiphytic mosses that were once very rare in Britain as a whole have recently colonised southern Britain, probably because of drifting spores from continental Europe.[9] Gwent is the only area of Britain where the former Red List species *Orthotrichum pallens*, *O. pumilum* and *O. schimperi* have been found, although this is probably a reflection of detailed recording here. Several other epiphytic mosses are expected to colonise Gwent over the next few years.

Protection: Just over 34% of records come from protected sites. This is really a reflection of how much land is protected across the region, rather than an association with any particular habitat or site. Technically some of the rarer epiphytes could be used for SINC selection, for example, the Environment (Wales) Act Section 7 mosses *Orthotrichum pallens* and *O. pumilum*. The great thing about this story is that the mosses have gone from being absent to everywhere to being found not only protected sites but also in Newport city centre and the Valleys, showing that air quality was the limiting factor rather than any particular habitat requirement.

Epiphytic Moss records from protected sites



Flood Moss *Myrinia pulvinata* (Wahlenb.) Schimp

Protection: none

Conservation Status: none

Data Availability: Poor (7 records)

M.pulvinanta habitat

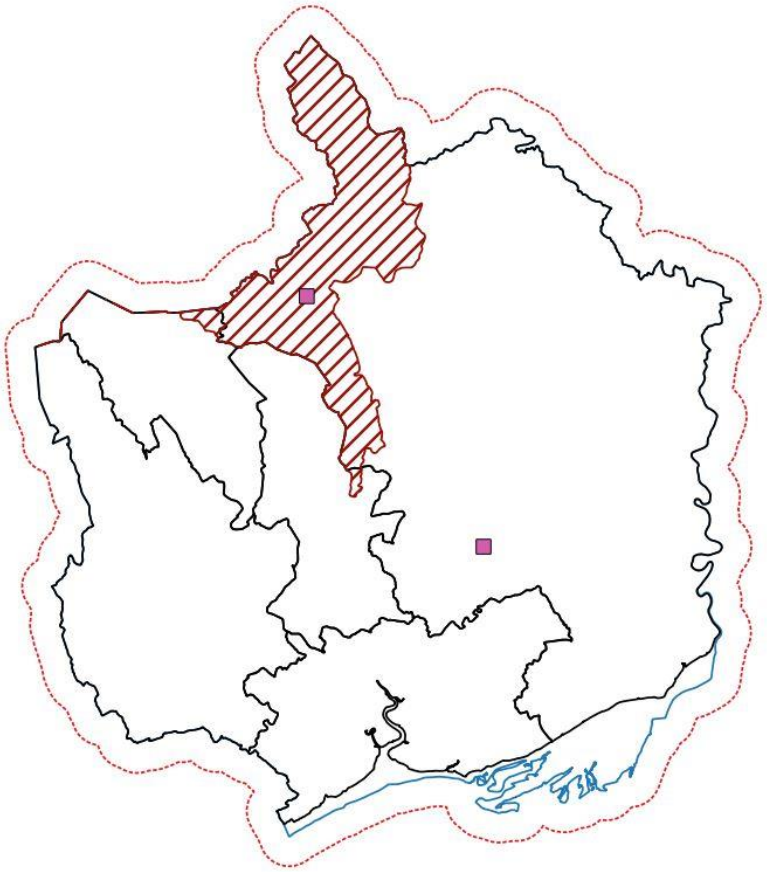
Sam Bosanquet

Context: Large rivers that flood regularly are home to many specialist plants and invertebrates that have evolved to survive periodic inundation and burial with silt. Flood Moss (*Myrinia pulvinata*) is one of the most ecologically demanding of these specialist species, and is restricted to tree trunks well above mean water levels in a zone that is flooded regularly but perhaps not annually. It is known from fewer than 50 British sites and is restricted in Gwent to the River Usk.

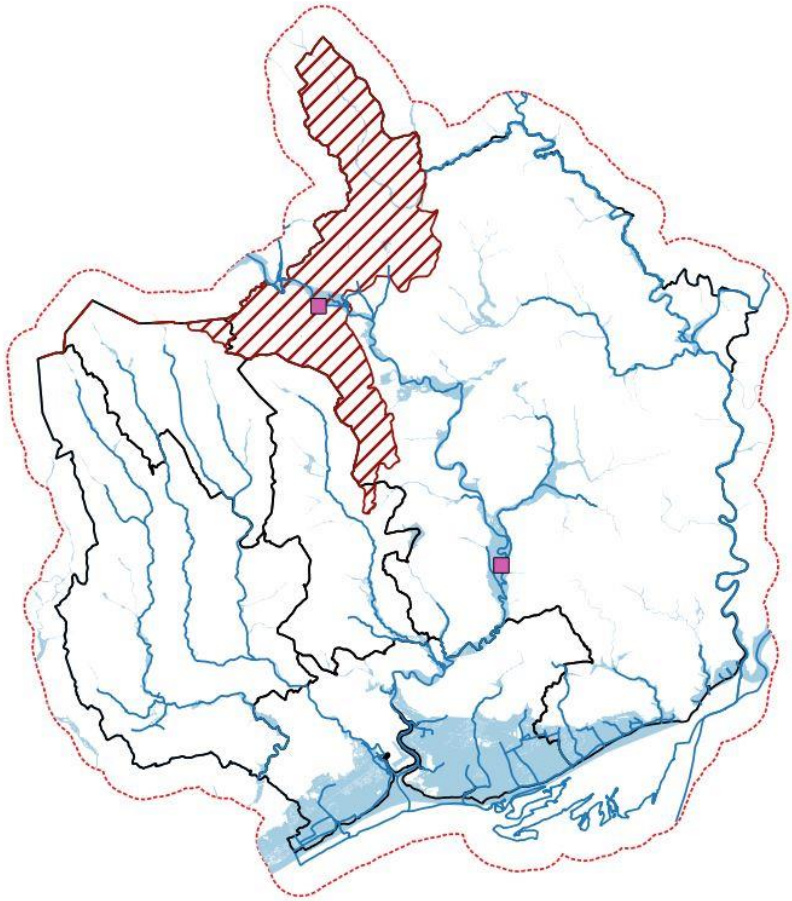
There are records from two reaches of the river, at Govilon and Llantrisant, dating from 2000 and 2006 respectively. The species has declined elsewhere in Britain,[8] although it might be somewhat overlooked. Riverbank management, flood scheme construction and diseases affecting crack willow and alder are all threats to this rare moss.

Outlook: The UK population of *Myrinia pulvinata* is declining,[8] and ongoing construction of 'hard' flood defences is a threat to some of its remaining colonies. Both Gwent sites are in relatively broad floodplains with few dwellings that seem unlikely to be priorities for new flood defences. Nevertheless, this moss is known from just one tree at Govilon and two at Llantrisant, so there is a significant risk that a colony could be lost unintentionally to tree felling.

Greater Gwent range: The restriction of *Myrinia pulvinata* in Gwent to the River Usk is probably genuine, because the river has a broad flood plain and carries a high silt load. *Myrinia* grows on the Wye upstream of Hay-on-Wye but has never been found on the Gwent reach of the Wye. The Zone 3 flood map suggests suitable habitat may also occur near Llanfihangel Gobion and The Bryn, and targeted searching of these areas is needed.



Distribution of Flood Moss records across Greater Gwent



Flood Moss records with main rivers[15] and Flood Zone 3[16]

Habitats Patterns: *Myrinia pulvinata* is, unsurprisingly, restricted in Gwent by its very exacting habitat requirements.

Population trends: The Llantrisant population was discovered in 2001 and revisited in 2003 and 2006; it appeared stable over that period. The Govilon colony has not been revisited since it was discovered in 2000.

Protection: Both colonies of *Myrinia pulvinata* are within the River Usk SSSIs, but they are not recognised as a qualifying feature of the SSSIs.

Limestone Bryophytes

Protection: none

Conservation Status: none

Data Availability: Moderate (264 records)

Sam Bosanquet

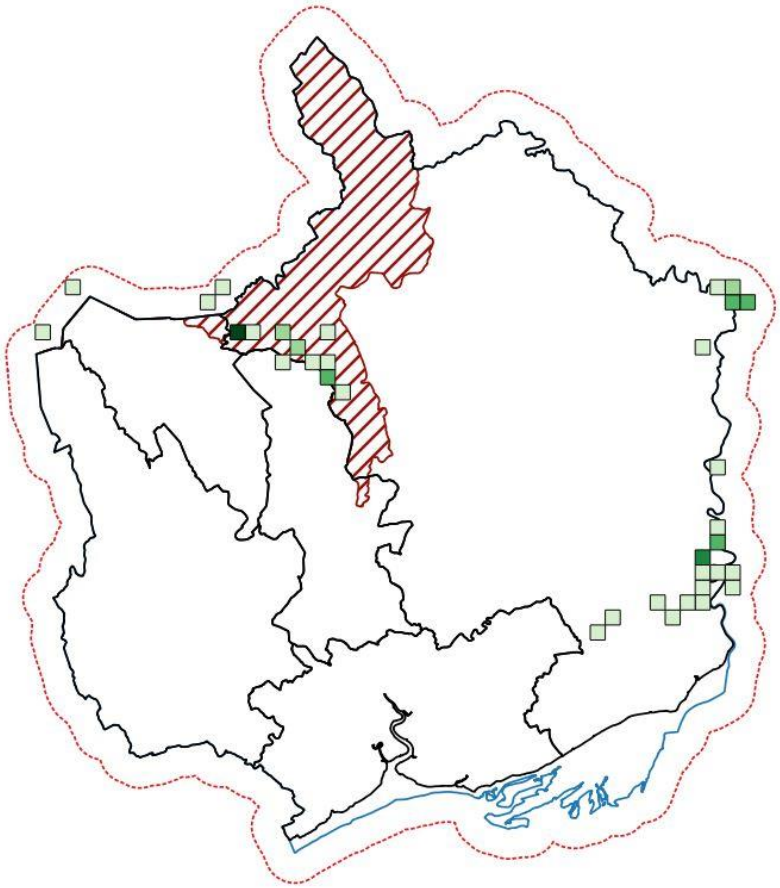
Context: Carboniferous limestone is relatively limited in extent in Britain, but has two significant outcrops in Gwent. One is in the lower Wye Valley at Lady Park Wood and near Chepstow, and the other runs from Cwm Clydach and Gilwern Hill southwards along the Blorenge ridge to the Machen area. This hard, lime-rich rock supports numerous uncommon mosses and liverworts, and Gwent is one of the most important areas in Wales for limestone bryophytes, with 12 Nationally Rare and Scarce species present.

The Rare and Scarce limestone bryophytes are restricted to natural outcrops of limestone rather than quarries, and quarrying has undoubtedly reduced their populations in Gwent. However, there was very little bryophyte recording in the area until 2000, so it is impossible to confirm historic losses. Since 2000, most populations appear to be stable, with the notable exception of Long-Leaved Tail-Moss (*Anomodon longifolius*), but threats include changes in shading and rampant growth of ivy and brambles enhanced by nitrogen (N) pollution.

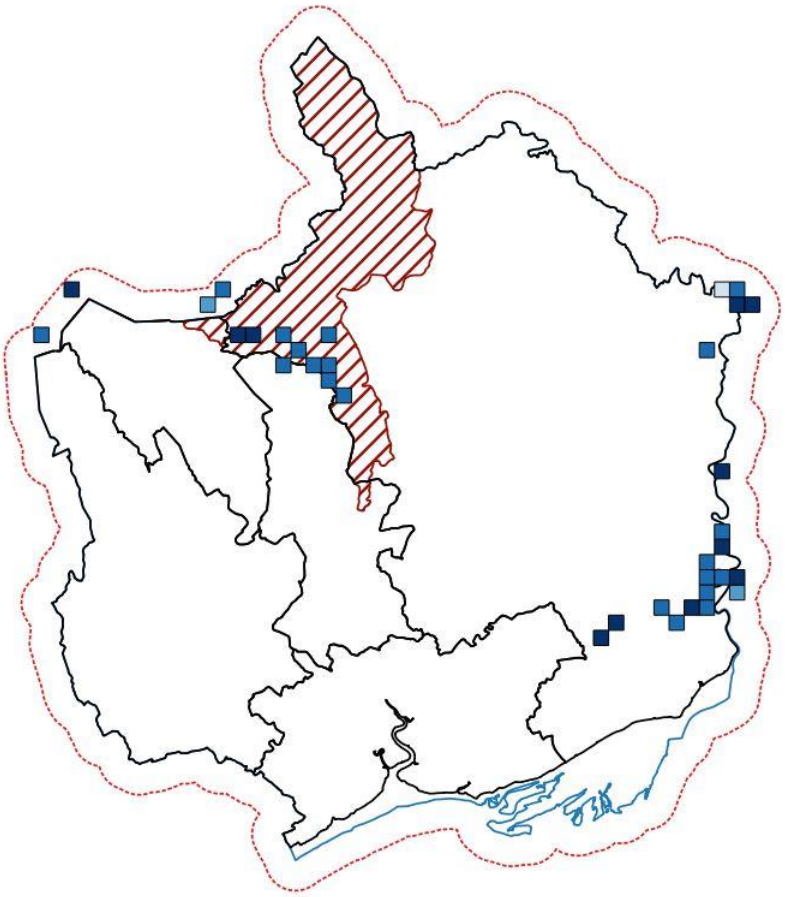
Scientific name	Common name	GG records
Amblystegium confervoides	Tiny Feather-Moss	14
Anomodon longifolius	Long-Leaved Tail-Moss	14
Campylophyllum calcareum	Chalk Feather-Moss	24
Cololejeunea rossettiana	Rossetti's Pouncewort	18
Entosthodon muehlenbergii	Muehlenberg's Thread-Moss	2
Lejeunea mandonii	Atlantic Pouncewort	2
Seligeria acutifolia	Sharp Rock-Bristle	25
Seligeria campylopoda	Bentfoot Rock-Bristle	47
Seligeria donniana	Donn's Rock-Bristle	21
Seligeria patula	Spreading Rock-Bristle	5
Seligeria pusilla	Dwarf Rock-Bristle	41
Thuidium recognitum	Lesser Tamarisk-Moss	3

Outlook: The UK range of the Rare and Scarce limestone bryophytes is stable, and there is little likely threat of new quarrying threatening populations because so many sites are designated SSSI. Climate change is also unlikely to be a significant threat because many of the limestone bryophytes are found much further south in Europe than Britain. Competition from plants such as ivy and bramble, enhanced by nitrogen pollution and potentially by the opening of woodland canopies due to ash dieback, are the principal threats. Most of these species have very small, localised populations within any particular site, and stochastic events, such as treefall or accidental damage, are possible. Since 2000, one of the three Gwent colonies of *Anomodon longifolius* has been lost to treefall at Lady Park Wood and another has been swamped by brambles following woodland management near Mounton, leaving just a single population in the whole of Wales.

Greater Gwent range: The Nationally Rare and Scarce limestone bryophytes are concentrated in three areas of Gwent: the outcrops between Cwm Clydach and the Blorenge; the Lady Park Wood area; and the Blackcliff-Wyndcliff limestone. There are further limestone outcrops in eastern Torfaen and the Machen area, but these have been extensively quarried and notable bryophytes have not been found despite much surveying.

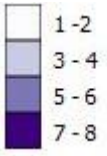


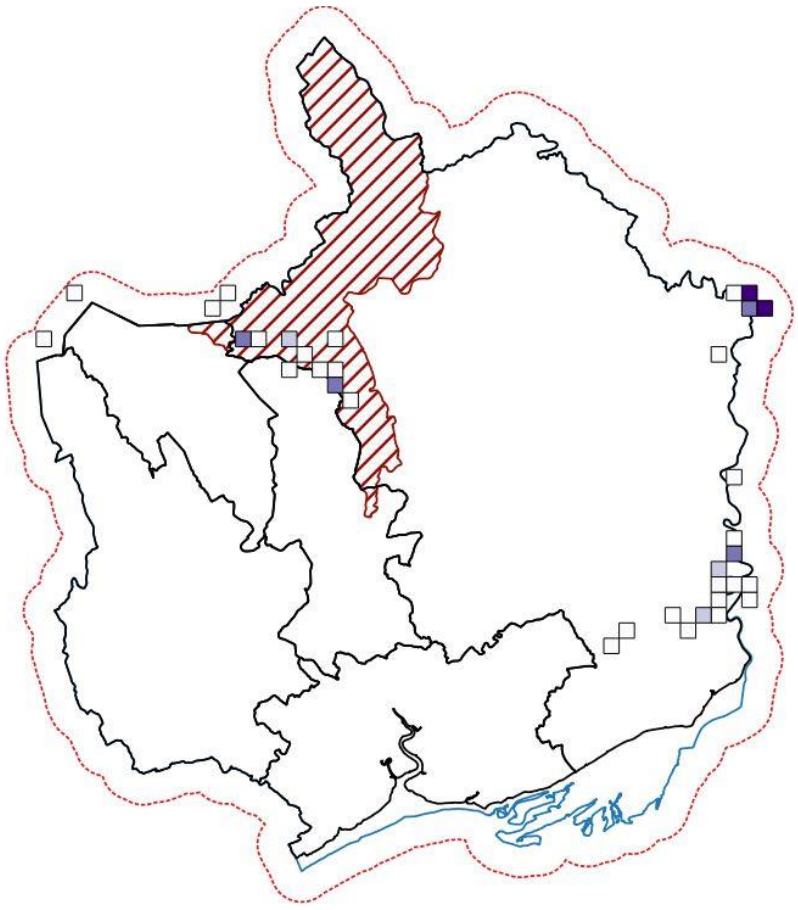
Distribution of Rare and Scarce limestone bryophyte records (maximum 31/km^2)



Rare and Scarce limestone bryophyte records by date

Diversity of Rare and Scarce limestone bryophytes



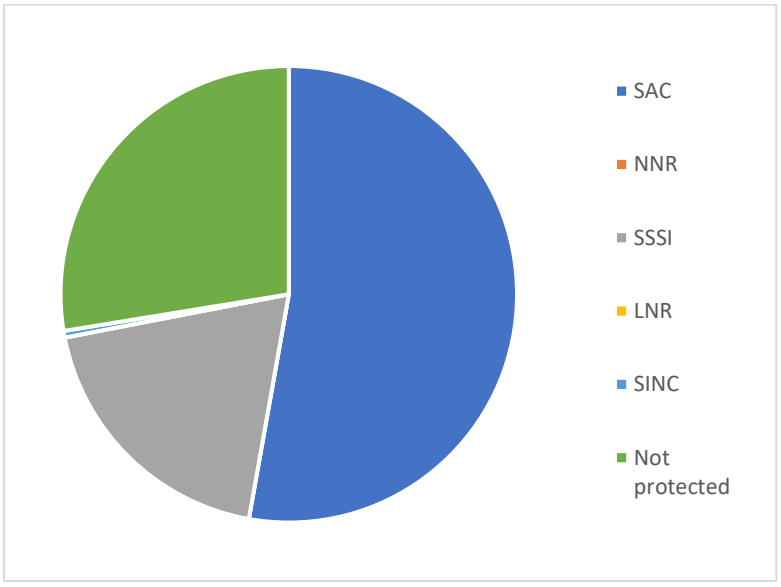


Habitats Patterns: The distribution of Rare and Scarce limestone bryophytes follows natural exposures of Carboniferous limestone in Gwent. Disused quarries hold commoner lime-loving bryophytes, sometimes in abundance, as do outcrops of Silurian limestone in the Usk area, but the rare species are absent. The main natural limestone exposures have all been surveyed in detail, often on multiple visits by experts, but so too have many former quarries, so recording bias is not the cause of the concentration of records of rarer species in these natural sites.

Population trends: There are insufficient historic records to allow population trends to be established, although *Anomodon longifolius* has declined at Lady Park Wood and gone from the Mounton and Wyndcliff areas.

Protection: Just over 72% of records of these Rare and Scarce bryophytes come from protected sites. Lady Park Wood, Blackcliff-Wyndcliff, Piercefield and Cwm Clydach are all SAC, whilst parts of Gilwern Hill and the Blorenge are SSSI. Some important areas of limestone between Gilwern Hill and the Blorenge deserve notification as SSSI for their bryophytes, as do several localities for *Seligeria campylopoda* and *Thuidium recognitum* (and *Anomodon longifolius,* if it has not been lost) in south-east Gwent. The most important sites for limestone bryophytes in Gwent can be ranked using the diversity of Nationally Rare and Scarce species they hold. The top six sites in order of importance are: Lady Park Wood, the Blorenge, Cwm Clydach, Blackcliff-Wyndcliff, Gilwern Hill, Mounton woods, and Piercefield.

Rare and Scarce limestone bryophte records from protected sites



Stone Roof Tile Mosses

Protection: none

Conservation Status: none

Data Availability: Good (55 records represent coverage of most likely sites for these species)

Sam Bosanquet

Context: Sandstone tiled roofs in the southern Welsh Marches support a suite of nationally rare and scarce mosses that are also found, albeit rarely, on droughted rock exposures. When locally sourced stone tiles were a widespread form of roofing, these mosses would have been common in Gwent. They are now restricted to fewer than 20 church and barn roofs in the area and are known to have been lost from two churches due to re-roofing and cleaning since 2000. Most colonies hold just a handful of patches of the rare mosses, probably because of pre-2000 cleaning, and the majority of churches and chapels in Gwent have unsuitable slate or artificial tile roofs.

Although 22 moss species have been recorded on stone roof tiles in Gwent, the majority are relatively common in Wales. Four exceptions are highlighted by Plantlife[10] as being important in a British context. Both *Grimmia laevigata* and *Grimmia ovalis* are listed as Near Threatened in the most recent Red Data List[7], and all four species are Nationally Scarce (found in fewer than 100 hectads across Britain).

Scientific name	Common name	Greater Gwent records	Greater Gwent sites	UK status[7]
Grimmia decipiens	Great Grimmia	10	2	Nationally Scarce
Grimmia laevigata	Hoary Grimmia	11	7 (lost from 2)	Near Threatened, Nationally Scarce
Grimmia ovalis	Flat-rock Grimmia	27	16 (lost from 2)	Near Threatened, Nationally Scarce
*Hedwigia ciliata**	Fringed Hoar-Moss	7	4	Nationally Scarce

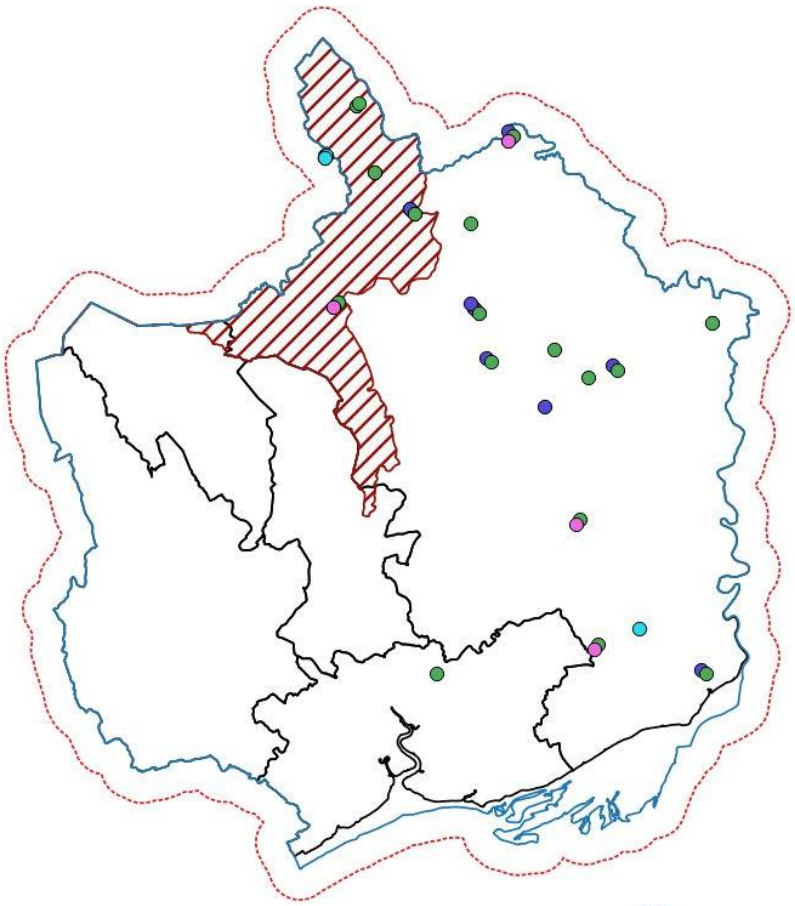
*includes both var. *ciliata* and var. *leucophaea*

Outlook: The UK populations of all four roof tile mosses are believed to be declining on natural rock due to eutrophication,[8] and one of the two Gwent colonies of *Grimmia decipiens* had declined from seven patches in 1999 to one alga-choked patch in 2018 due to ammonia pollution. Cleaning and re-roofing of sandstone tiled roofs have caused declines in Gwent and undoubtedly elsewhere in Britain. At least two church roofs that supported these rare mosses have been repaired and cleaned since the

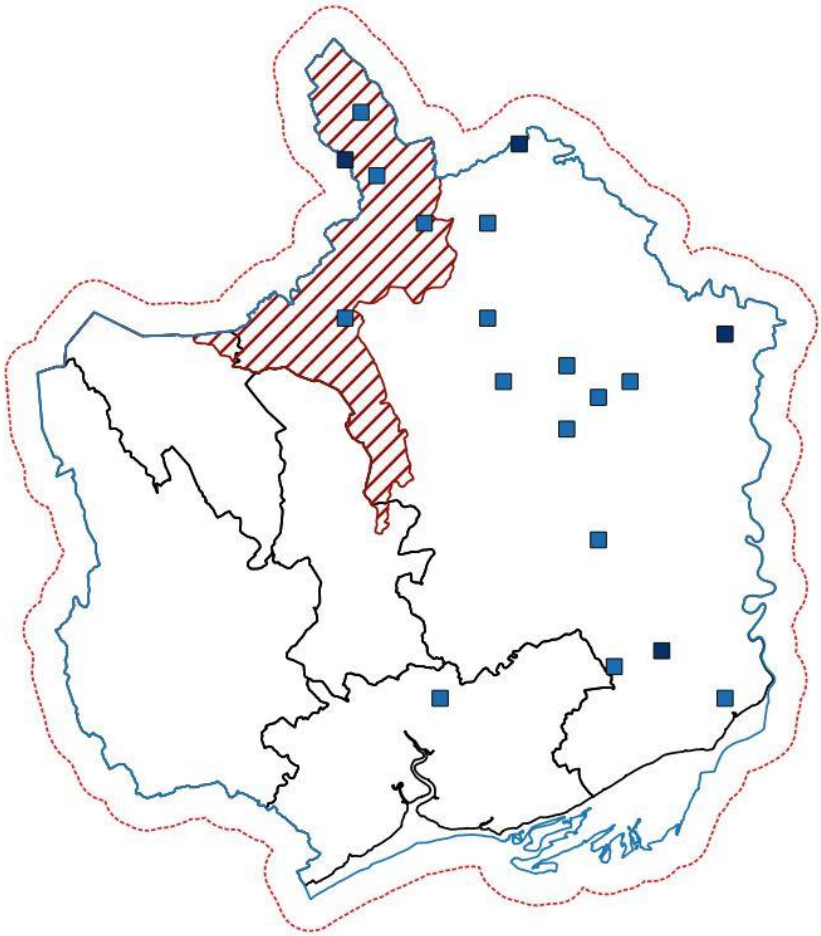
colonies were discovered; other recently re-roofed churches had the rare mosses restricted to porches, and many visited between 1999 and 2002 had clean tiled roofs entirely lacking mosses. Given the rarity of stone-tiled buildings in Gwent, and the rarity of these mosses on those buildings, the loss of one roof is a significant reduction in the overall resource.

Greater Gwent range: The four Nationally Scarce roof tile mosses have been recorded from 18 sites in Gwent. The majority of sites are churches in the north-east between Raglan, Dixton and Llangua, but there are also five sites in the BBNP, and five in southern Gwent between Caerleon and Rogiet. Greater Gwent is on the south-western edge of the core British range of these mosses, which extends into Herefordshire and south Powys; none of these species has been found in Glamorgan and the lack of records from western Gwent is considered genuine because of the rarity of sandstone roof tiles.

Fifteen sites are churches, two are stone-tiled barns, and one colony of *Grimmia decipiens* is on a bridge. The only historic record was made in 1925 and related to a hotel in Tintern, which has since been re-roofed and lost its colony of *Grimmia ovalis*. Targeted recording of church roofs between 1999 and 2002 revealed the majority of the current known sites, and only seven sites have been visited in the last decade.



Distribution of Rare roof tile mosses across Greater Gwent (records offset to show locations with multiple species

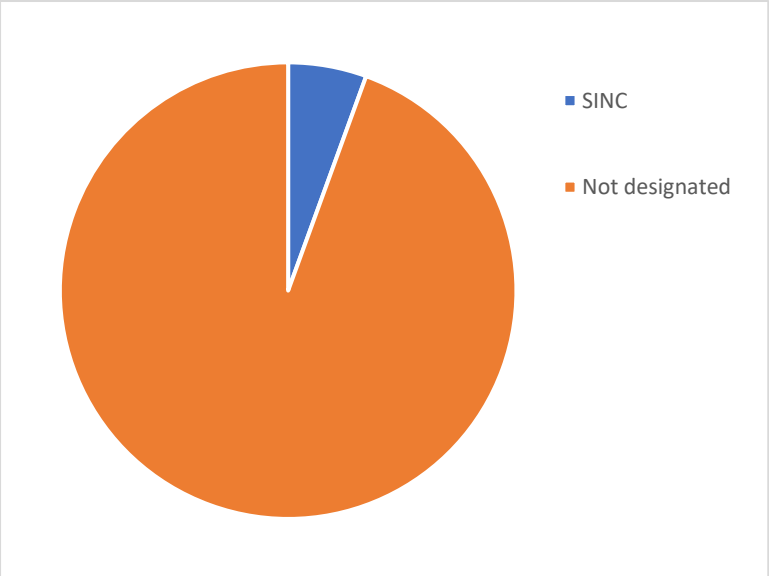


Roof tile moss records by date

Population trends: The lack of historic data makes it impossible to be certain that these species have declined, but a decline can be inferred with reasonable confidence given the number of cleaned or re-roofed churches in eastern Gwent compared with the number now supporting roof tile mosses. At least two church roofs (Llanvapley and Raglan) that supported these rare mosses have been repaired and cleaned since the colonies were discovered, and their survival is uncertain; other recently re-roofed churches (Caerleon, Llangattock Lingoed and Rogiet) had the rare mosses restricted to porches, whilst several (for example, Llandenny) had clean tiled roofs entirely lacking mosses.

Protection: None of the stone roof tile mosses grows in a statutorily protected site (SSSI) in Gwent, and only one site is a SINC (for neutral grassland rather than mosses). The *Guidelines for Selection of Wildlife Sites in South Wales*[11] state that any site supporting a Red Data Book species or species from three or fewer sites should be designated. Colonies of the Near Threatened *Grimmia laevigata* and *Grimmia ovalis* might thereby become SINC. Many churches were involved in GWT's Living Churchyards Project or the Caring for God's Acre and Beautiful Burial Ground schemes, but it is not known whether any specifically considered roof tile mosses.

Stone roof tile moss records from protected sites.



N-Sensitive Lichens

Protection: none

Conservation Status: none

Data Availability: Moderate (459 records)

Sam Bosanquet

Context: Epiphytic lichens are abundant on trees in unpolluted forests throughout the world and would be abundant in Gwent without air pollution. Historic sulphur dioxide pollution from industry decimated acid-sensitive lichens across the county, whilst agricultural ammonia pollution combined with industrial NOx are now damaging N-sensitive lichens. Epiphytic lichens grow in bushy, three-dimensional carpets on tree branches and play vital roles in heathy ecosystems by intercepting rainfall, cycling nutrients, and providing shelter for invertebrates.[12] Most people now think of trees having bare bark, which shows how unfamiliar we are with healthy, functioning ecosystems.

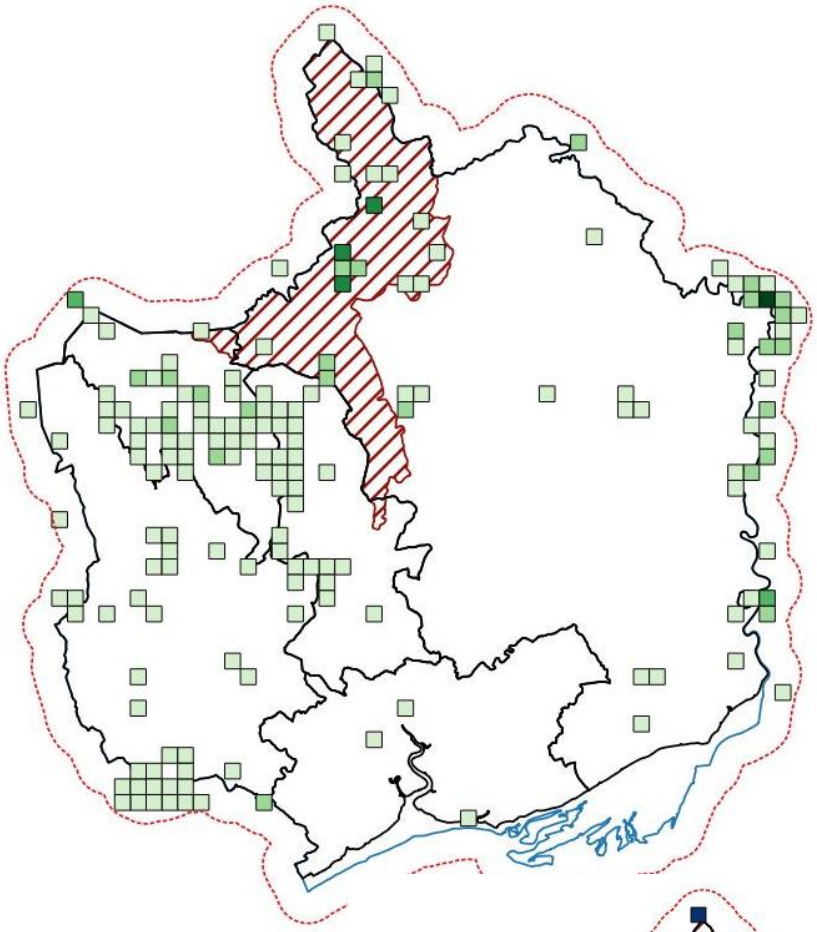
Scientific name	Common name	Number of GG records
Bryoria fuscescens		0
Evernia prunastri	Oak Moss	67
Graphis elegans		14
Graphis scripta	Script Lichen	30
Hypogymnia physodes	Dark Crottle	190
Hypogymnia tubulosa		21
Ochrolechia androgyna		18
Parmelia saxatilis		111
Parmelia sulcata	Netted Shield Moss	75
Pseudevernia furfuracea		1
Sphaerophorus globosus		2
Usnea articulata		3
Usnea cornuta		1
Usnea dasopoga		1
Usnea esperantiana		1
Usnea florida	Witches Whisker	4

Usnea subfloridana		30
Usnea wasmuthii		1

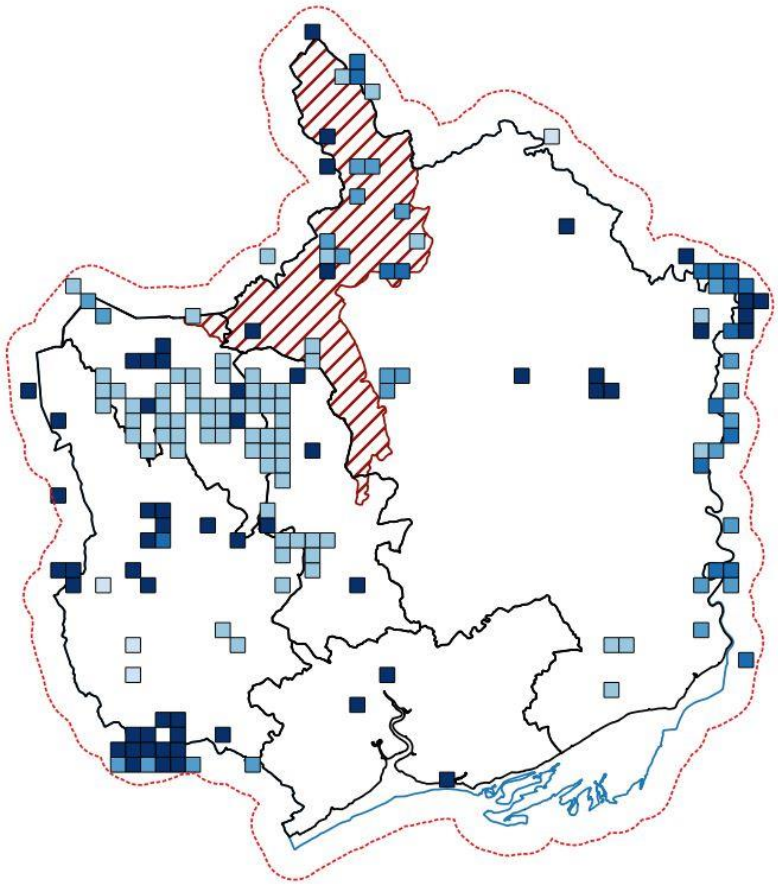
Outlook: According to Rowe et al.[13] over 60% of the UK currently receives ammonia concentrations above the critical level set to protect lichens and bryophytes (1 µg/m^3); this represents 87.9% of England, 56.3% of Wales, 17.9% of Scotland and 90.8% of Northern Ireland. The situation in Gwent is worse than that in Wales as a whole: 372 1km squares in Gwent have ammonia concentrations <1 µg/m^3, whereas 1262 are >1µg/m^3. Of the 1634 squares in the area, 77.2% have ammonia concentrations that are too high to support N-sensitive lichens.

The current trend is towards increased intensive agriculture in lowland Gwent, but most lowland parts of the county are already too N-polluted to support N-sensitive lichens. Hope comes from the western valleys, where ammonia-producing intensive agriculture remains rare and ammonia concentrations are still low. N-sensitive lichens such as *Usnea dasopoga* and *Pseudevernia furfuracea* have recently been recorded in Torfaen, and many areas of Gwent that were once so polluted by industry that epiphytes were almost lost are now bastions of the area's epiphytic lichens.

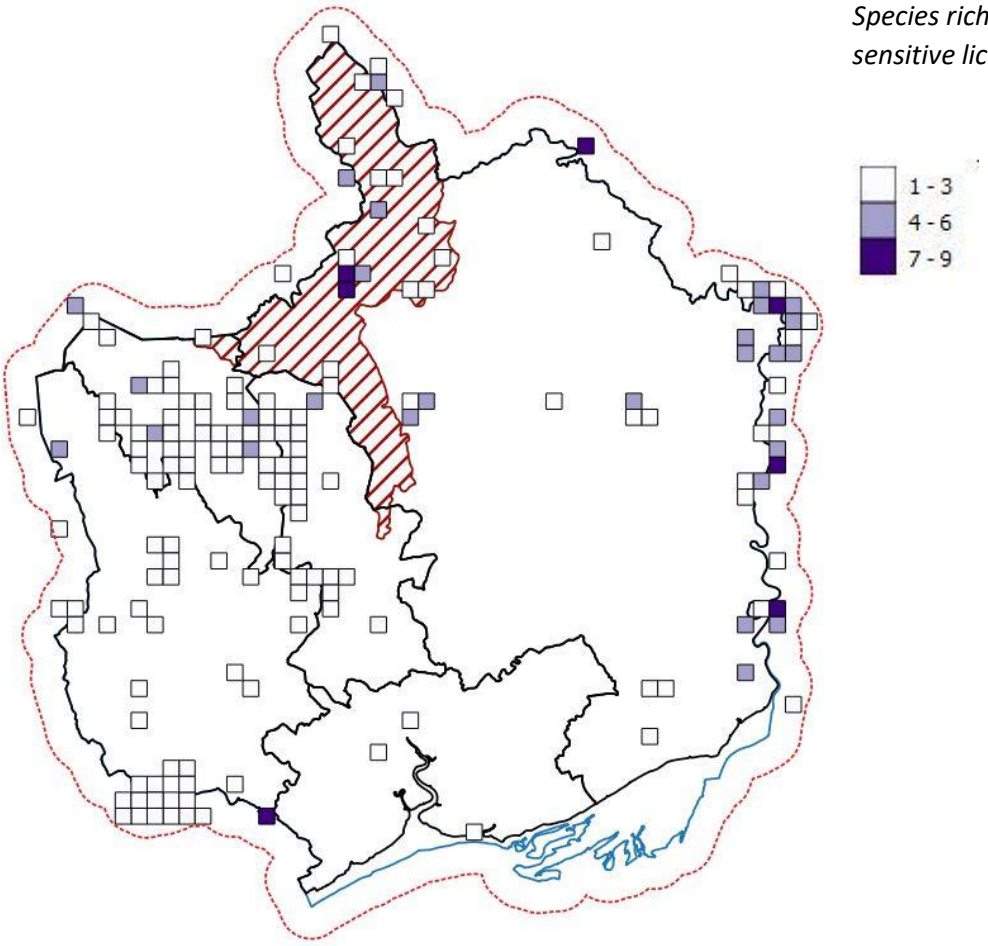
Greater Gwent range: N-sensitive lichens would once have occurred across Gwent, but most of the eastern and southern parts of the area are too N-polluted for them to survive other than where topography and tree cover provide shelter from ammonia. In contrast, the Wye Valley, Black Mountains and the western valleys of Gwent support widespread populations of these epiphytic lichens, although many grid squares have no recent records.



Distribution of N-sensitive lichens records across Greater Gwent (max density 24/km^2)



N-sensitive lichen records by date



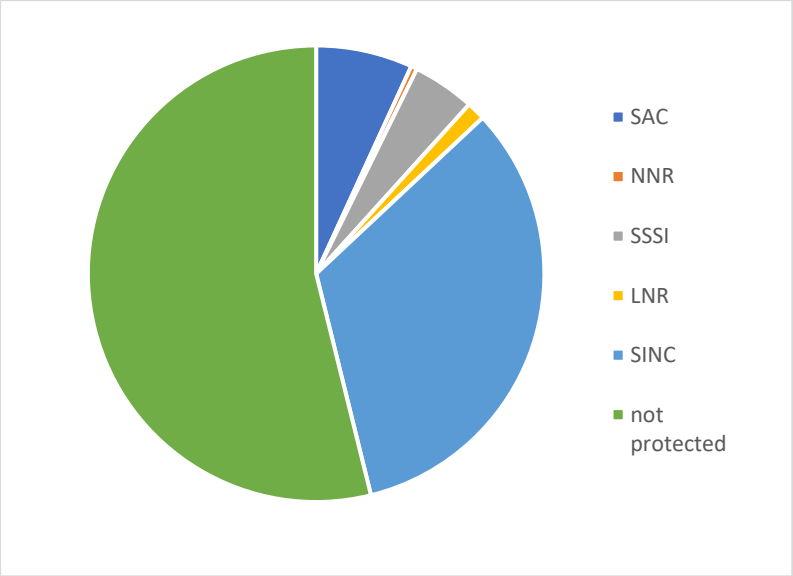
Species richness of N-sensitive lichen records

Habitats patterns: N-sensitive epiphytic lichens should be present in most woodland types, but are especially typical of oak and birch woodland. However, air pollution overrides any habitat patterns: there are suitable woodlands throughout lowland eastern Gwent, but pollution has made much of this unsuitable for these species. The paucity of recent lichen recording affects the distribution maps. However, recent observations suggest that some N-sensitive species, such as *Evernia prunastri* and *Usnea subfloridana*, are still scattered in eastern Gwent, where ammonia levels are low; while N-sensitive lichens are widespread and often abundant in the Black Mountains and western valleys (Sam Bosanquet, pers. comm.).

Population trends: There is insufficient data to determine trends at the population level, but observations at Dingestow Court suggest ongoing declines of N-sensitive lichens on parkland oak branches there (Sam Bosanquet, pers. comm.).

Protection: Just over 46% of records come from protected sites: mostly from the large upland SINCs in the Valleys, with some from woodland SACs such as Cardiff Beech Woods and Sugar Loaf Woodlands. Epiphytic lichens are key ecosystem components within the woodland habitats for which Sugarloaf Woodlands SAC and some nearby SSSI are notified, so this technically confers some legal protection on them, but there are complexities in demonstrating damage through off-site air pollution.

N-sensitive epiphytic lichens records from protected sites



References

1. Bosanquet S. undated. A Bryological Tour of Monmouthshire (vc35): Bryological Tour Through Monmouthshire: https://websites.rbge.org.uk/bbs/Bryodiversity/vc35/vc35site.htm (accessed 28/11/2020).
2. Woods RG. 2010. A Lichen Red Data List for Wales. Plantlife, Salisbury.
3. British Lichen Society records map for all species: https://www.britishlichensociety.org.uk/recording-mapping/bls-databases (accessed 28/11/2020)
4. Plantlife. CENNAD. Lichen Apprenticeship Scheme: https://www.plantlife.org.uk/wales/our-work/projects-wales-cymru/cennad-lichen-apprenticeship-sche (accessed 28/11/2020)
5. Lawrence R and Cheffings CM (eds). 2014. A Summary of the Impacts of Ash Dieback on UK Biodiversity, Including the Potential for Long-Term Monitoring and Further Research on Management Scenarios. JNCC Report No.501.
6. Preston CD, Hill MO, Porley RD and Bosanquet SDS. 2010. Survey of the bryophytes of Arable Land in Britain And Ireland 1: A Classification of Arable Field Assemblages. Journal of Bryology 32 (2): 61–79.
7. Callaghan DA and Hodgetts NG. in press. GB Bryophyte Red Data List. Journal of Bryology.
8. Blockeel TL, Bosanquet SDS, Hill MO and Preston CD. 2014. Atlas of British and Irish bryophytes. Nature Bureau, Newbury.
9. Bosanquet S. 2012. Vagrant Epiphytic Mosses in England and Wales. Field Bryology 107: 3–17.
10. Bosanquet S. 2012. Looking After Mosses on Sandstone Roofs. Plantlife Cymru, Bangor.
11. Gwent Wildlife Trust. 2004. Guidelines for the Selection of Wildlife Sites in South Wales. The South Wales Wildlife Partnership.
12. Bosanquet SDS. 2018. NRW Evidence Report
13. Rowe EC, Mitchell Z, Tomlinson S, Levy P, Banin LF, Sawicka K, Martín Hernandez C & Dore A. 2020. Trends Report 2020: Trends in Critical Load and Critical Level Exceedances in the UK. Report to Defra under Contract AQ0843, CEH Project NEC05708: https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2006181057_Trends_Report_2020.pdf
14. Shellswell CH. 2015. Wales' Important Arable Plants. Plantlife, Salisbury.
15. Data from Lle - Home (gov.wales). Main Rivers dataset - Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.
16. Data from Lle - Home (gov.wales). Flood Map: Flood Zone 3 dataset. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Some features of this information are based on digital spatial data licensed from the Centre for Ecology & Hydrology © NERC (CEH). Defra, Met Office and DARD Rivers Agency © Crown copyright. © Cranfield University. © James Hutton Institute. Contains OS data © Crown copyright and database right 2015. Land & Property Services © Crown copyright and database right.

Invasive Non-native Species (INNS) and Plant Diseases

There are at least 3,224 non-native species in Great Britain, 2,010 of which are classified as established (self-sustaining in the wild).[1] At least 275 established non-native species have been designated as having a negative ecological or human impact and are therefore termed invasive non-native species (INNS).[2] Once established, INNS can be extremely difficult and costly to contain or eradicate; only nine are known to have been eradicated from Britain.[2]

The number of species arriving in Britain is increasing, as is the number of INNS.[2] The area over which they are established is also increasing.[1] Most non-native species established in Britain originate from Europe, but in recent decades the rates of new arrivals originating from North America and temperate Asia are increasing.[2] Most arrive as ornamental species, but aquaculture is also an important pathway in freshwater environments. In marine environments, the arrival pathway for many species is unknown, but stowaways and aquaculture are both significant pathways.[2]

Impacts associated with INNS include reduced yields and productivity of crops, reduction in amenity and recreational value, increased erosion and siltation, decreased water retention and flooding. Impacts on native biodiversity include preying on or outcompeting native species, habitat disruption (such as shading), introducing and spreading disease, and interfering with genetic integrity. The cost of INNS to the Welsh economy, including both managing and controlling INNS and mitigating their impacts, is estimated over £125 million annually.[3] The cost of controlling INNS increases exponentially as invasion progresses.[3]

At the UK level, INNS actions are directed by the Great Britain Invasive Non-native Species Strategy,[4] which aims to increase awareness, improve co-ordination on INNS issues and provide a framework for action. The GB Non-native Species Secretariat (NNSS) provides a portal for species information, best practice and alerts and risk assessments for species that pose significant threats. The NNSS also co-ordinates campaigns such as 'Check, Clean, Dry' and 'Be Plant-Wise'.

There is a specific Welsh INNS portal hosted by NBN Atlas Wales, which includes over 300 non-native species of interest to Wales. The Wales Biodiversity Partnership (WBP) INNS Group has produced a list of Priority INNS for Action,[5] which classifies INNS as priorities for prevention, management (where eradication is feasible) or long-term management (where control, containment or mitigation is feasible). There are currently 45 species on the Welsh list of Priority INNS. An INNS strategy for Wales is under development through the Wales Resilient Ecological Networks (WaREN) project.

Plant pests and diseases, although clearly linked with INNS, are covered by a separate strategy – the Plant Biosecurity Strategy for Great Britain[6] – which forms part of wider work on plant health, one of DEFRA's top priorities. The strategy has a similar focus to INNS priorities, including on raising awareness and early identification of risks. There is a UK Plant Health Information Portal[7] that lists more than 1,200 plant pests and pathogens on the Plant Health Risk Register. Pests and pathogens are given a risk rating based on likelihood of occurrence, level of impact and the value of the host plant(s). Certain plant pests and diseases are notifiable, meaning that the appropriate plant health authority must be informed if they are found.

This section includes the 'big three' plant INNS: Giant Hogweed, Japanese Knotweed, Himalayan Balsam and the American Signal Crayfish. It also includes a significant plant pathogen: Ash Dieback.

Ash Dieback *Hymenoscyphus fraxineus* (T. Kowalski, Baral, Queloz & Hosoya)

Andy Karran

Relevant legislation: The Plant Health (Forestry) Order (Amendment, 2012)

Data availability: Poor (8 records)

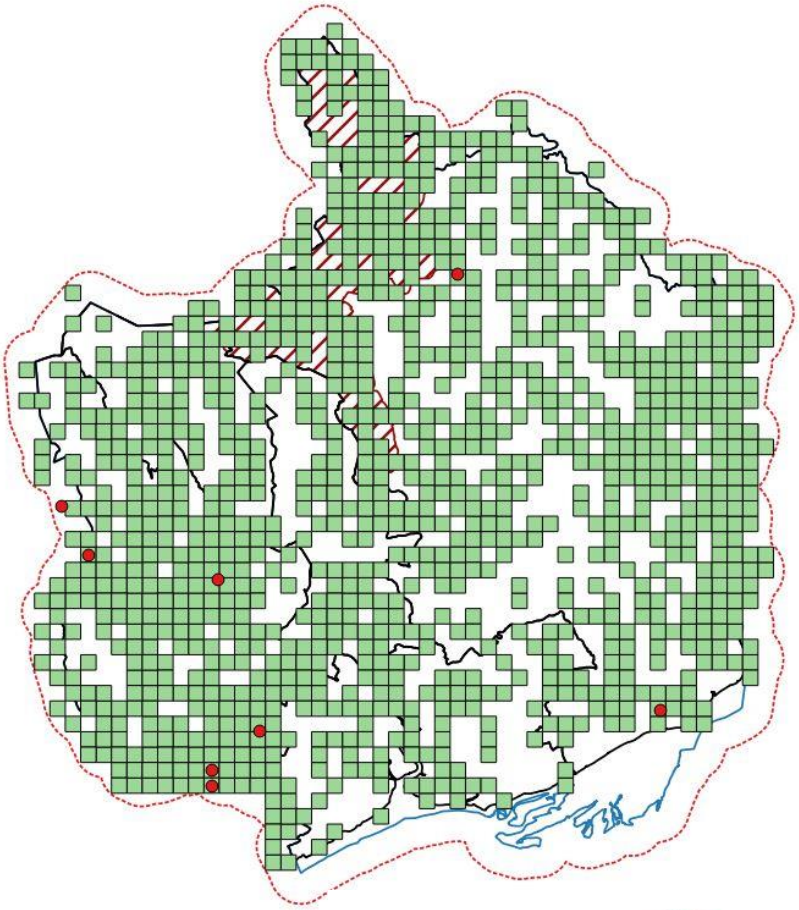
Context: Ash Dieback is a fungal disease affecting ash trees (*Fraxinus excelsior*), previously known as *Chalara fraxinea.* It was first confirmed in the UK in nursery trees in 2012, although there is now evidence that it first entered Great Britain as early as 2006.[8] It is now widespread across England, Wales and parts of Scotland.[9] Symptoms of Ash Dieback include blackened leaves, leaf loss, crown dieback and bark lesions. Most infected trees will eventually die, although this depends on many factors such as tree age and location.[10]

Outlook: Ash trees account for almost 7% of Welsh woodland cover, estimated at around 16.5 million trees.[11] JNCC research has identified 44 lichen, fungi and invertebrate species that only occur on living or dead ash. A further 62 are highly associated with ash, and over a thousand are associated with ash; the list includes mammals, birds, plants, bryophytes, fungi and over 500 invertebrates.[12] It is not feasible to stop the spread of Ash Dieback, and the Welsh Strategy is focussed on research, monitoring and reactive management.[10] Nationally, research is focussed on identifying and breeding tolerant trees.[8] Recent research from France suggests that the disease is less severe when ash density is low and in isolated trees.[13]

Greater Gwent range: There are very few records for Ash Dieback: just five records within Greater Gwent, with the earliest in 2016. By contrast, mapping provided by Fera, Natural Resources Wales and Forestry Commission at hectad scale shows Ash Dieback to be widespread, dating back to 2014.[9] Ash trees are widespread across the area in both woods and linear features.[10]

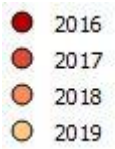
This discrepancy could be due to several factors: time lags in reporting cases of Ash Dieback to Local Records Centres; the use of other recording pathways, such as internal organisational reporting, Observatree or Treealert; or lack of confidence among recorders in identifying Ash Dieback, especially as other diseases affecting ash can appear similar.

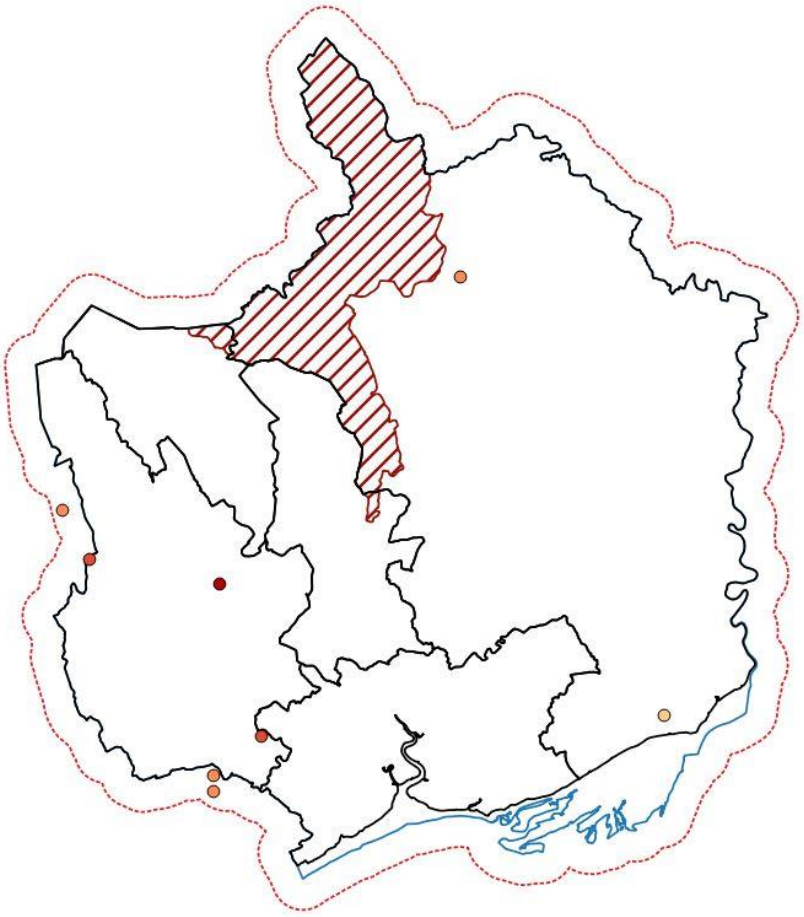
This is of particular concern as 'engaging citizen science to help build tree health capacity and assist with the monitoring of *Chalara* dieback of ash' is a Key Priority in Wales's response to Ash Dieback.[10]



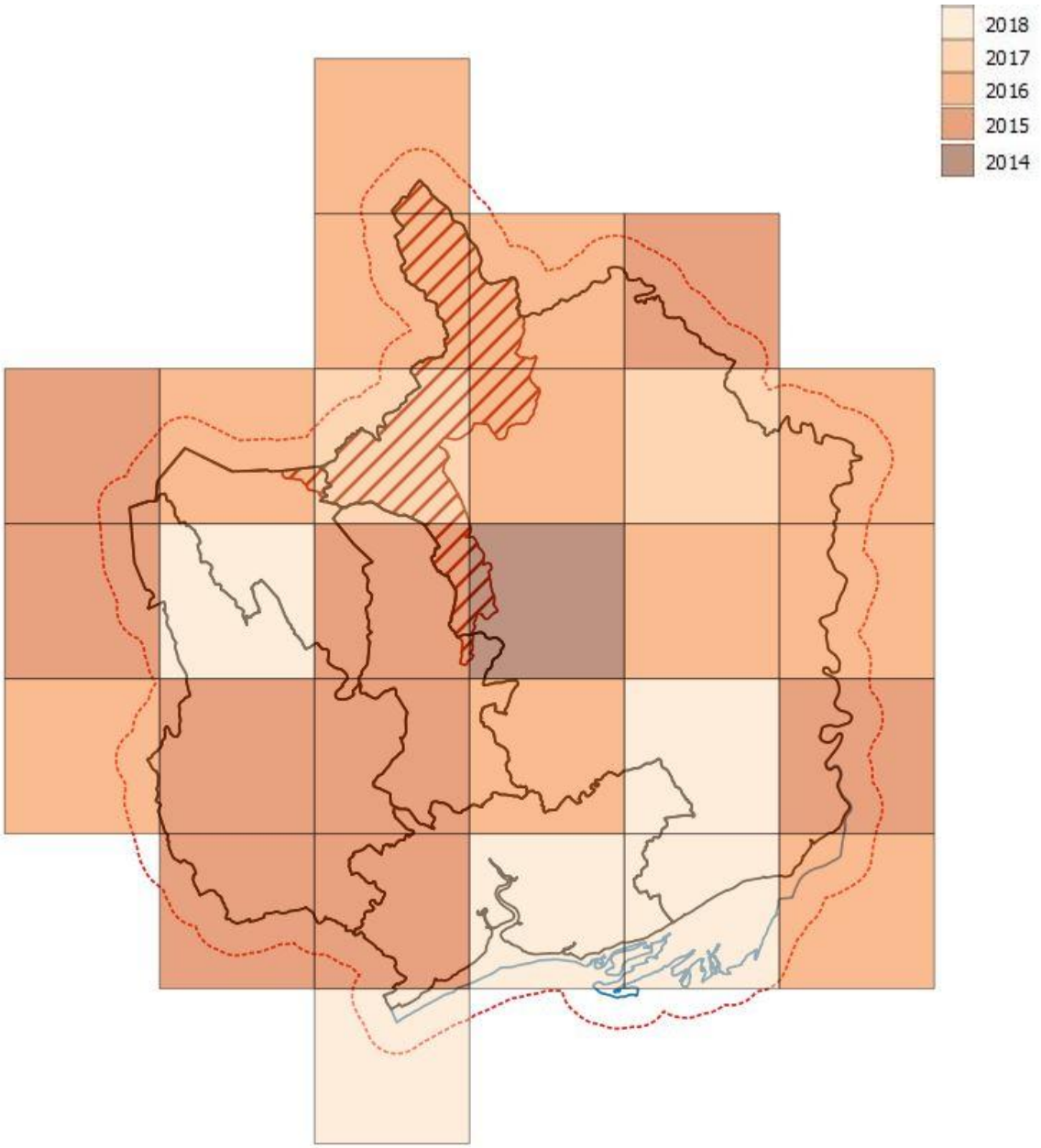
Distribution of Ash Dieback records across Greater Gwent (red), with monads with records of Ash 1970–2019 (green)

Records of Ash Dieback by date





Confirmed Ash Dieback infections[9]



Population trends: There is not enough data to determine how Ash Dieback is spreading across Greater Gwent. It is apparent that it has moved across the area in less than a decade, but the route taken is not clear. The spatial pattern of cases – whether there are isolated cases, clusters or systemic infection – is unknown.

Protected sites: Of the five individual records in Greater Gwent, one is within a SSSI (Ruperra) and one within a SINC (Pentwyn Isaf Woodlands). Large areas of broadleaved woodland are protected across Greater Gwent, from the Wye Valley Woodlands SAC to local woodland SINCs. It is likely that ash is a component of many of these woodlands.

Giant Hogweed *Heracleum mantegazzium* (Sommier & Levier)

Andy Karran

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9, Environmental Protection Act 1990.

Priority status: Long-term Management Priority (Wales)[5]

Data availability: Moderate (206 records)

Context: Giant Hogweed was introduced to Britain as an ornamental plant in the nineteenth century, but now occurs alongside lowland watercourses and on rough ground. It resembles Common Hogweed (*Heracleum sphondylium*) but can grow up to 5m tall, with basal leaves reaching over 1m. Its large size means that it can outcompete native species, and contact with its sap can cause skin to become photosensitive, leading to serious burns.

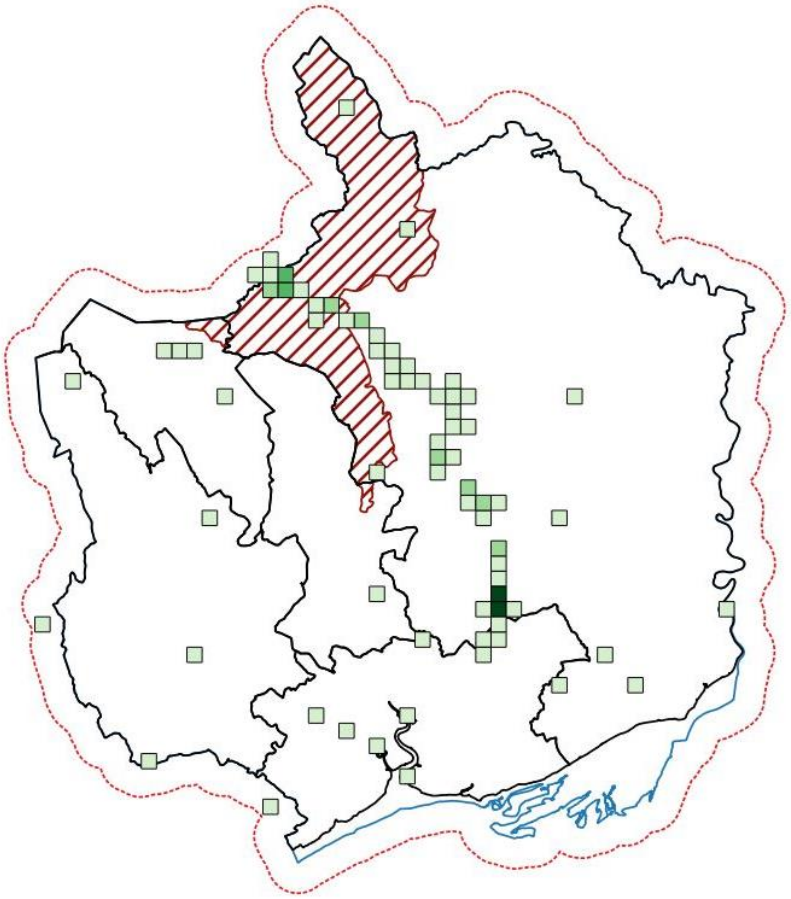
Outlook: Giant Hogweed has spread across most of the UK, with the exception of upland areas, and has been spreading rapidly, despite control measures.[14] Both flooding and warm weather can increase growth and seed distribution, making it seem likely that climate change will exacerbate Giant Hogweed spread.

In Wales, the Wales Resilient Ecological Network (WaREN) project aims to develop a 'pan-Wales INNS Framework for Collaboration' to promote tackling invasive species, including Giant Hogweed, in a coordinated way.

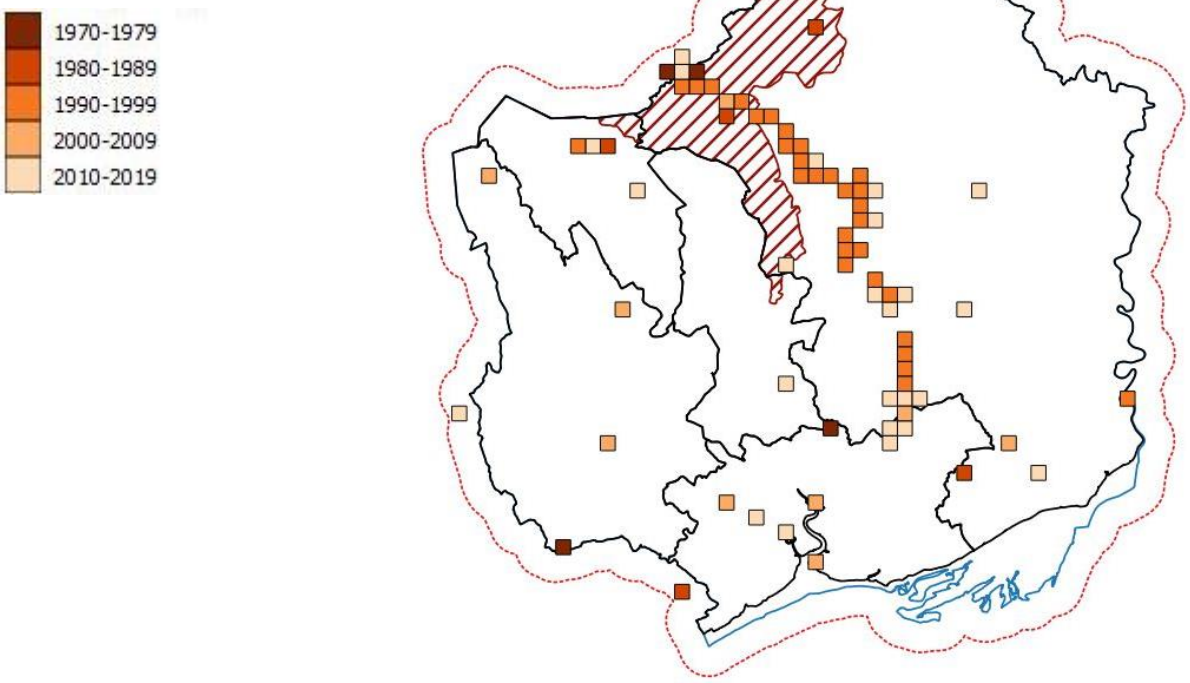
Greater Gwent range: Giant Hogweed has been found along almost the entire length of the Usk within Greater Gwent, with scattered records on other watercourses, such as the Ebbw. Note that the Usk has been the focus of intensive recording effort, particularly in the 1990s and there are 27 Usk records that may be duplicates. It is possible that Giant Hogweed is under-recorded on other watercourses, or that isolated records may be cases of misidentification.

Spread of Giant Hogweed along the Usk appears to have moved southwards, as would be expected, although recording effort has also increased during the timescale of this study.

Distribution of Giant Hogweed records across Greater Gwent (max 18/km^2)



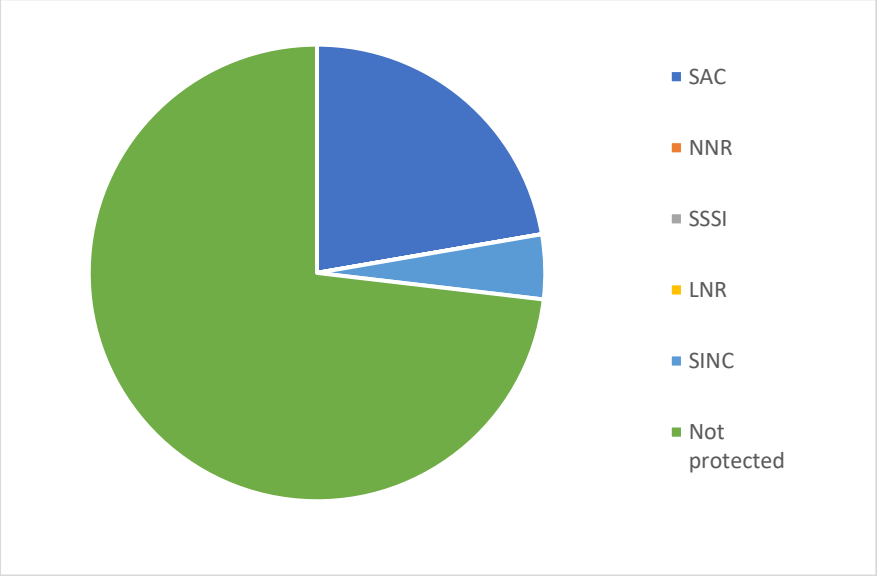
Earliest records of Giant Hogweed by decade (spread)



Control measures: The Usk has been the focus of control effort by Natural Resources Wales (formerly Environment Agency Wales) and the Wye and Usk Foundation. Giant Hogweed was one of the target species in the Wye & Usk Foundation 'Giving up the Weed' project – a three-year project running from 2007 to 2010. As a part of the project, 125km of double bank was treated (around 4,000 plants); subsequently, over 455km (3,336 stands) have been treated, and the Foundation reports that it has almost been eliminated.[15] Note that this project extends beyond the study area.

Protection: 27% of records come from protected sites, with high numbers of records from the Usk SAC. However, this is unlikely to be an accurate measure of the impact of Giant Hogweed on protected sites, as the majority of records are in close proximity to watercourses, and most main watercourses within the study area are protected to some level. This underestimate is due to protected site boundaries often only extending to the high-water mark, or a few metres to either bank. Equally, using the centre point of a grid reference can move a record away from its true location. For example, whilst 39 records fall within the Usk SAC, a further 47 records fall within 25m of it.

Giant Hogweed records from protected sites



Himalayan Balsam *Impatiens glandulifera* (Royle)

Andy Karran

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9

Priority status: Long-term Management Priority (Wales)[5]

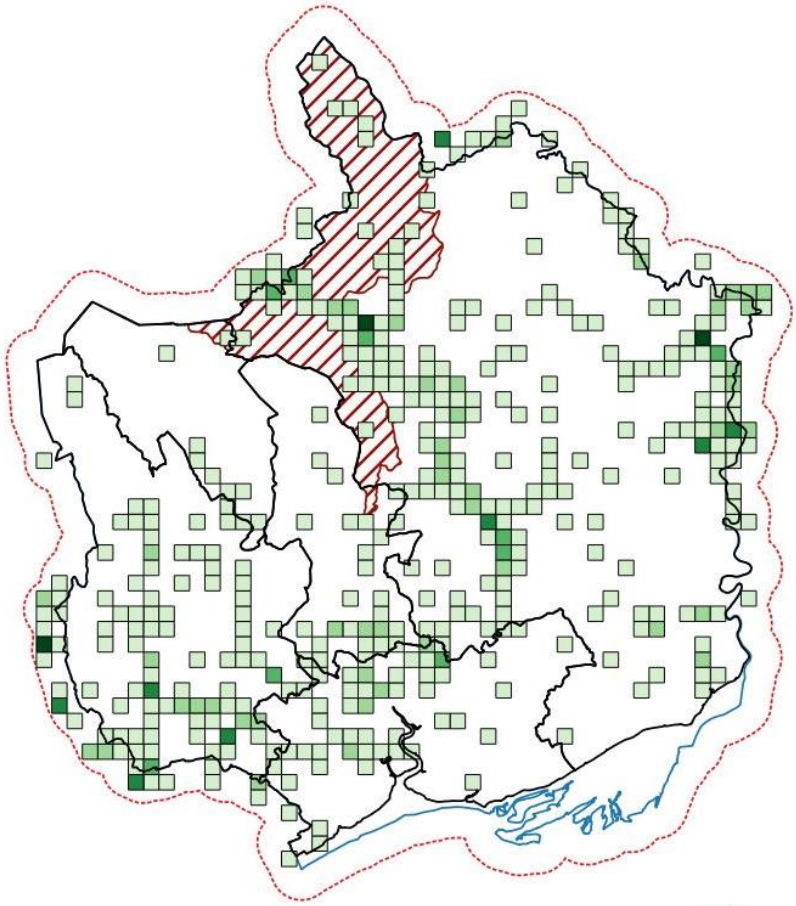
Data availability: Moderate (1034 records)

Context: Himalayan Balsam (also called Indian Balsam or Policeman's Helmet) was introduced to Britain in 1930 and spread rapidly, especially along riverbanks. An annual plant with pink flowers, it grows up to 3m tall and produces seed pods that explode when touched, firing seeds up to 7m away.[16] It forms dense stands which outcompete native species, and when it dies back in winter, riverbanks are left vulnerable to erosion. It also produces more nectar than native species, attracting pollinators away from them and reducing their fitness.[17] The cost of eradicating Himalayan Balsam from the UK was estimated at £150–300 million.[16]

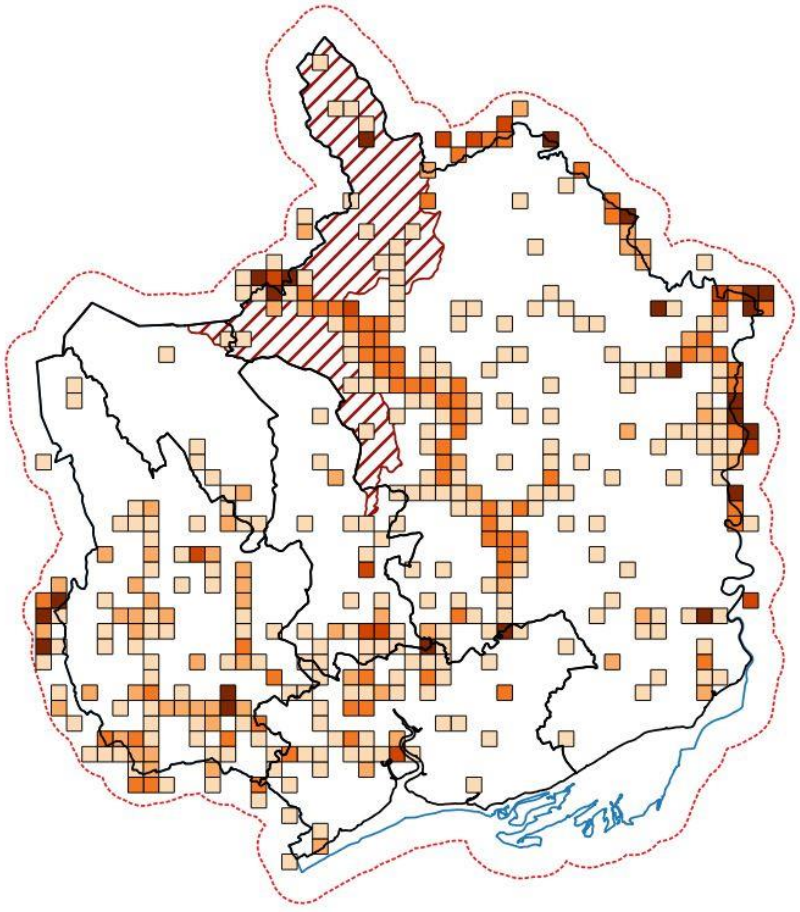
Outlook: Eradication of Himalayan Balsam seems unlikely given the cost of control methods. Many sites control balsam by manual pulling or herbicides, but without a coordinated approach at the catchment scale, recolonisation is inevitable. The Centre for Agriculture and Bioscience International (CABI) are currently researching the potential use of a rust fungus as a biological control.[18] In Wales, the Wales Resilient Ecological Network (WaREN) project aims to develop a 'pan-Wales INNS Framework for Collaboration' to promote tackling invasive species, including Himalayan Balsam, in a coordinated way.

Greater Gwent range: Himalayan Balsam is found across Greater Gwent and is particularly well recorded along the Wye and Usk rivers. More recent records are found away from the larger watercourses, although this could be attributed to increased recording rather than colonisation. It is very likely that Himalayan Balsam is under-recorded, and that it occurs throughout the study area.

Distribution of Himalayan Balsam records across Greater Gwent (max 8/km^2)



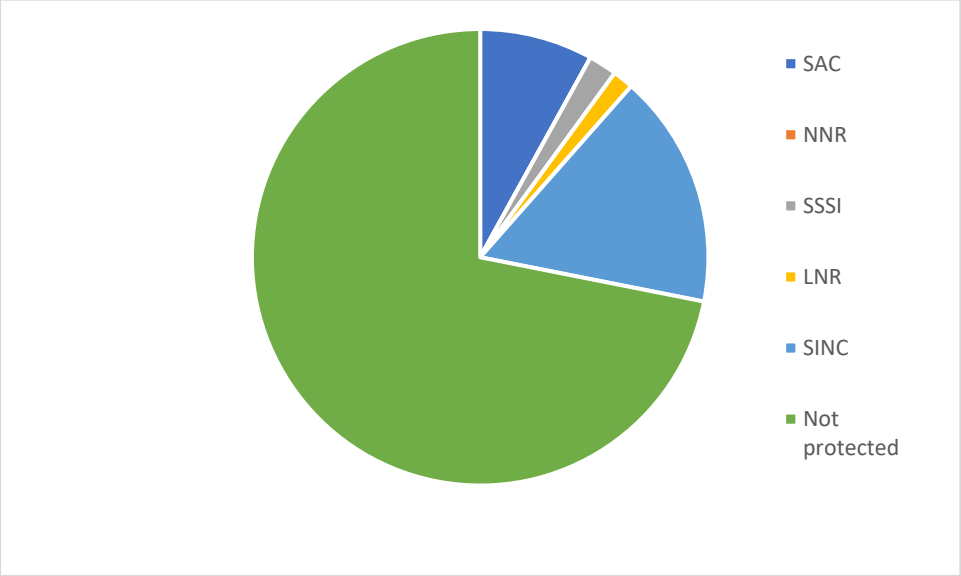
Earliest records of Himalayan Balsam by decade (spread)



Control Measures: Most control measures in Greater Gwent have taken place at the individual site level, although the Wye and Usk have been systematically removing it from the Monnow catchment for several years. Release of the biological control rust fungus at two trial sites on the River Wye was approved in 2019 as a part of the Restoring Our Amazing River project.[19]

Protection: 28% of records come from protected sites, with high numbers of records from the Wye and Usk SACs, and other watercourse SINCs. It is likely that more records are associated with protected watercourses, as records close to the watercourse may not fall within the designated area.

Himalayan Balsam records from protected sites



Japanese Knotweed *Fallopia japonica* (Houtt.) Ronse Decr.

Andy Karran

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9, Environmental Protection Act (1990)

Priority Status: Long-term Management Priority (Wales)[5]

Greater Gwent data availability: Good (2617 records)

Context: Japanese Knotweed was introduced in the mid-nineteenth century and spread rapidly across Britain. It has a rhizome structure and extraordinary regenerative ability: tiny fragments of stem and rhizome can quickly regrow into a new plant,[20] and the entire population is believed to be the clones of a single plant.[21] Because it spreads so easily, Japanese Knotweed quickly colonises rivers, railways and other waste ground. Concerns that Japanese Knotweed could damage building structures have had negative impacts on the property market, although recent research suggests that it is no worse than other plant species.[22]

In terms of biodiversity impact, Japanese Knotweed forms monoculture stands, outcompeting native species. It can impact aquatic ecosystems through shading, and production of leaf litter, as well as leaving banks vulnerable to erosion in the winter. It can block sluices and drains, as well as paths, leading to a negative impact on recreation. Growth next to roads and railway lines can cause safety issues by obscuring signs and signals. Japanese Knotweed costs Great Britain an estimated £165 million every year.[3]

Outlook: CABI trials with the sap-sucking psyllid *Aphalara itadori* have had limited success so far. Although the psyllid has been shown not to affect native plants, there have been difficulties in establishing self-sustaining populations.[23] Japanese Knotweed control is further complicated by an unwillingness from landowners to publish records, for fear of legal action, as experienced by Network Rail.[24] This also means that control efforts may prioritise protection of property over biodiversity issues.

Also of concern, Japanese Knotweed can hybridise with Russian Vine and Giant Knotweed, and the resulting hybrids can back-cross with the parent plants. There are indications that *Fallopia x bohemica* is more vigorous and persistent than either parent and can produce viable seed in certain climatic conditions. *F. x bohemica* is already present in Newport.[25]

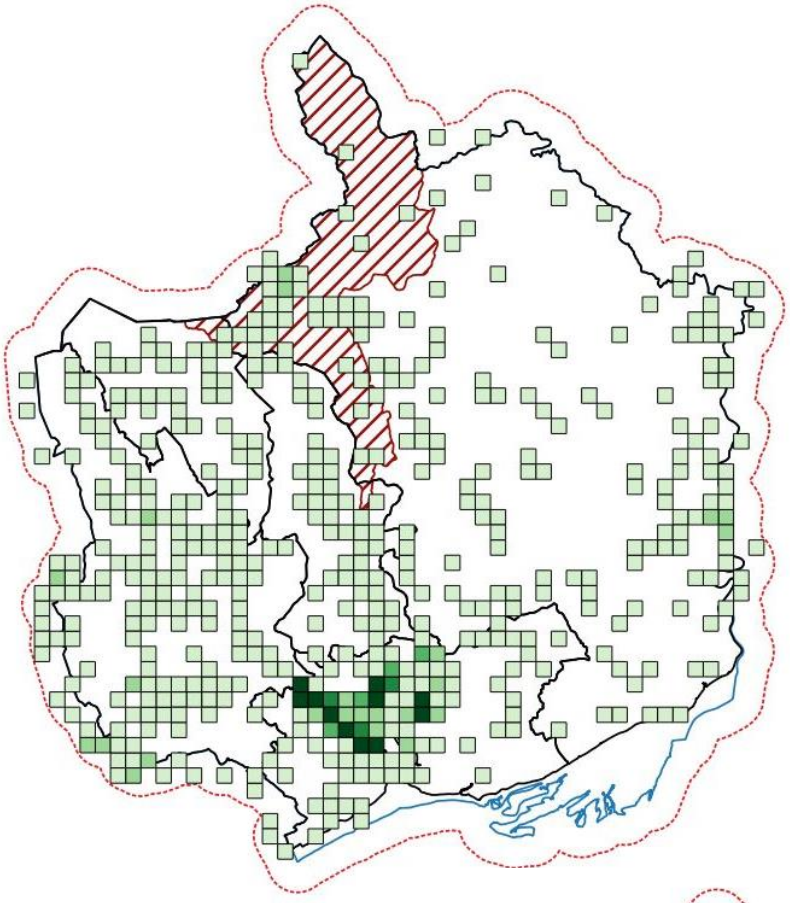
In Wales, the Wales Resilient Ecological Network (WaREN) project aims to develop a 'pan-Wales INNS Framework for Collaboration' to promote tackling invasive species, including Japanese Knotweed, in a coordinated way.

Greater Gwent range: Japanese Knotweed is found across Greater Gwent, with greater concentrations in the south and west – corresponding to the more urban areas (although this may also be a factor of recorder effort). Newport has a higher concentration of records due to recent county-wide dedicated surveys. When viewed in detail, the Newport records showed linear distribution of Knotweed along the Monmouth and Brecon Canal and River Ebbw, and along the

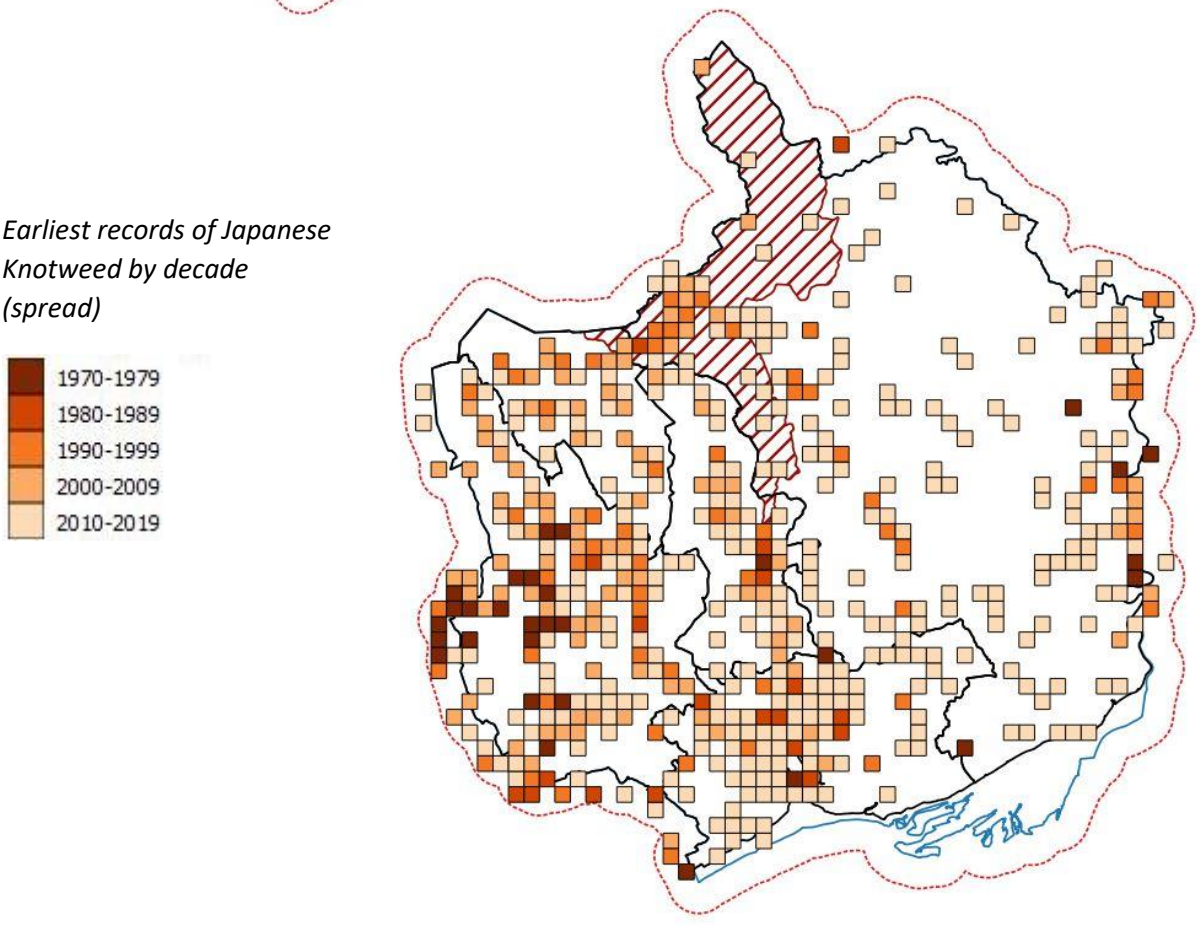
railway lines, as well as isolated sites varying from single plants to large, dense stands. It is likely that this pattern is similar in other urban areas.

Historically, Knotweed has been present in urban areas and the Wye Valley since the 1970s. Spread seems to have been outwards from these urban centres, although recording and awareness of Japanese Knotweed have also both increased over the same time period.

Distribution of Japanese Knotweed records across Greater Gwent (max ≥50/km²)



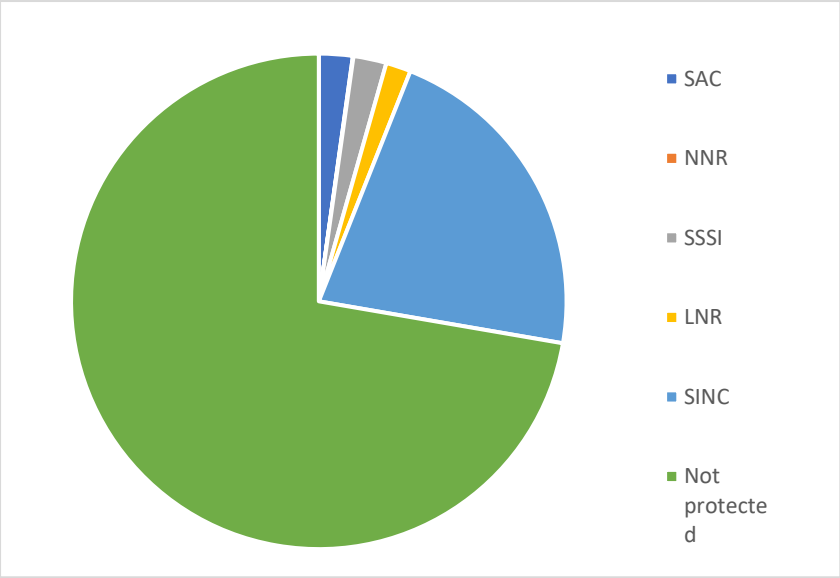
Earliest records of Japanese Knotweed by decade (spread)



Control measures: Each local authority in Greater Gwent has a programme of Knotweed control although the extent covered varies considerably. Stakeholders such as Network Rail and South Wales Trunk Road Agent (SWTRA) also have control programmes. However, coordinated approaches at the catchment level may be prohibitively expensive.

Protection: 24% of records come from protected sites, with high numbers of records from SINCs, particularly the River Ebbw, River Sirhowy, River Rhymney and the Monmouth & Brecon canal. There are smaller numbers of records from the River Usk SAC at Newport, and scattered records from the Gwent Levels SSSIs. SINCs may be particularly vulnerable as they are less likely to be in public ownership, and have fewer resources available for their management.

Japanese Knotweed records from protected sites



Signal Crayfish *Pacifastacus leniusculus* (Dana, 1852)

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9, The Prohibition of Keeping Live Fish (Crayfish) Order (1996).

Priority status: Long-term Management Priority (Wales)[5]

Greater Gwent data availability: Poor (12 records)

Context: Signal Crayfish were introduced to Britain in the 1970s as a commercial farmed species but escaped and spread rapidly across England and Wales.[3] Signal Crayfish are larger than the native White-Clawed Crayfish (*Austropotamobius pallipes*), which has declined by 50–80% across Europe[26] and is classified as Endangered at the global level.[27] Competition and transmission of fatal crayfish plague from Signal Crayfish is a significant cause of this decline.

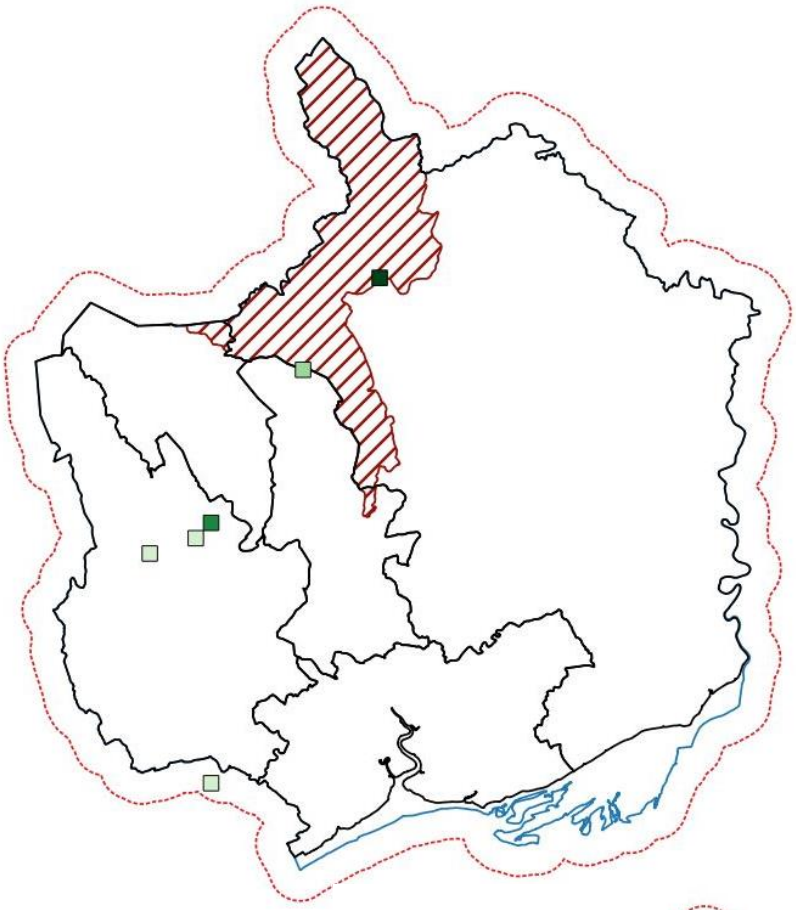
Signal Crayfish also damage riverbanks by burrowing and predate fish eggs, affecting wild and commercial fish stocks.[3] There is also evidence that the presence of Signal Crayfish has a negative impact on aquatic invertebrates, lowering invertebrate density and species richness.[28] The annual cost of managing and mitigating Signal Crayfish is estimated at £2.7 million in the UK, and just over £500,000 in Wales.

Outlook: Options for Signal Crayfish control include trapping, biocides and barriers to limit colonisation of new areas. However, all have implications for other species, and most are only effective at suppressing, rather than completely eradicating, the population.[31] Current campaigns include promoting biosecurity (for example, the 'Check, Clean, Dry' campaign) and the selection of isolated 'Ark' sites for White-Clawed crayfish.[32] It is not known whether any targeted attempts at Signal Crayfish control have taken place in Greater Gwent, although some projects have taken place elsewhere in Wales.

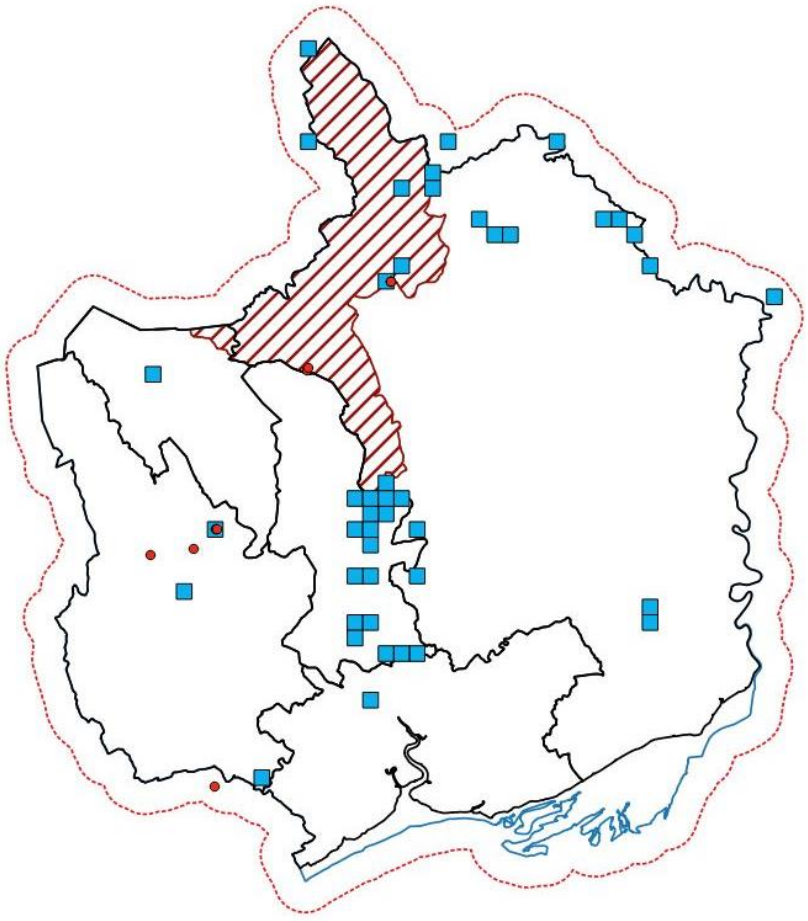
Greater Gwent range: Signal Crayfish have been found in six locations within the study area (five within Greater Gwent), but each site has very few records, and some records appear to be duplicates. The records date from 2000 and refer to both ponds and watercourses. Records of the native White-Clawed Crayfish are much more widespread, especially in central Greater Gwent. However, this should be treated with caution, as older records may not reflect recent losses:[29] only 6 of the 111 Greater Gwent records are within the last decade. There are two sites (Pen y Fan pond and Mardy) where both species have been recorded.

It is very likely that this is not an accurate picture of distribution for either species. Crayfish are unlikely to be recorded casually, and dedicated survey requires specialist trapping equipment and a licence. Additionally, chances of recording crayfish vary, depending on the population density and the time of year.[30]

Distribution of Signal Crayfish records across Greater Gwent (max ≥50/km^2)

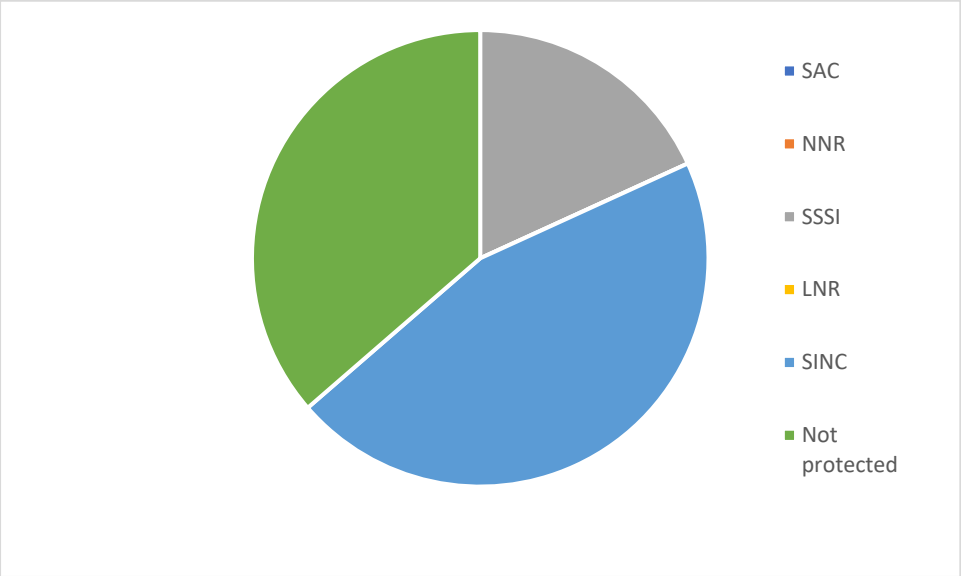


Records of Signal Crayfish (red) against monads with White-Clawed Crayfish records (blue)



Protection: 64% of records come from protected sites, with records from Keepers Pond within the Blorenge SSSI, and SINCs at Pen y Fan Pond, Blackwood Riverside Woods and the river Rhymney. It is important to note that a large portion of the river network within Greater Gwent is protected to some level.

Signal Crayfish records from protected sites



References

17. DEFRA. 2020. UK Biodiversity Indicators 2020. DEFRA, London.
18. GB Non-Native Species Information Portal. 2017. GB Non-native Species Report Card 2017: http://www.nonnativespecies.org/factsheet/index.cfm
19. Williams F, Eschen R, Harris A, Djeddour D, Pratt C, Shaw RS, Varia S, Lamontagne-Godwin J, Thomas SE and Murphy ST. 2010. The Economic Cost of Invasive Non-native Species on Great Britain. CABI, Wallingford.
20. Great Britain Non-native Species Secretariat. 2015. The Great Britain Invasive Non-native Species Strategy. DEFRA, Scottish Government and Welsh Government.
21. WBP INNS Group. 2019. Invasive Non-native Species (INNS) – Priority Species for Action in Wales. Welsh Biodiversity Partnership.
22. DEFRA. 2014. Protecting Plant Health – A Plant Biosecurity Strategy for Great Britain. DEFRA, Forestry Commission, Welsh Government and Scottish Government.
23. https://planthealthportal.defra.gov.uk/
24. https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/ash-dieback-hymenoscyphus-fraxineus/ (accessed 06/09/2020).
25. Adapted from the national Chalara (*Hymenoscyphus fraxineus*) infections map, published by Fera, Natural Resources Wales and Forestry Commission. http://chalaramap.fera.defra.gov.uk/ (accessed 06/09/2020).
26. Jenkins T and Jones C. 2016. Chalara Dieback of Ash – Response for Wales 2016. Wales Tree and Plant Health Steering Group.
27. National Forest Inventory. 2013. NFI Preliminary Estimates of Quantities of Broadleaved Species in British Woodlands, with Special Focus on Ash. National Forest Inventory, Forestry Commission.
28. Mitchell RJ, Bailey S, Beaton JK, Bellamy PE, Brooker RW, Broome A, Chetcuti J, Eaton S, Ellis CJ, Farren J, Gimona A, Goldberg E, Hall J, Harmer R, Hester AJ, Hewison RL, Hodgetts NG, Hooper RJ, Howe L, Iason GR, Kerr G, Littlewood NA, Morgan V, Newey S, Potts JM, Pozsgai G, Ray D, Sim DA, Stockan JA, Taylor AFS and Woodward S. 2014. The Potential Ecological Impact of Ash Dieback in the UK. JNCC Report No.483.
29. Grosdider M, Scordia T, Ioos R, Marçais B. 2020. Landscape Epidemiology of Ash Dieback. Journal of Ecology 108(5): 1789–1799.
30. GB Non-native Species Secretariat portal – species information for Giant Hogweed Heracleum mantegazzianum: http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1705 (accessed 04/09/2020).
31. https://www.wyeuskfoundation.org/the-giving-up-the-weed-project (accessed 04/09/2020)
32. Environment Agency. 2003. Guidance for the Control of Invasive Weeds In or Near Fresh Water. Environment Agency, Bristol.
33. Chittka L and Schürkens S. 2001. Successful Invasion of a Floral Market. Nature 411: 653.
34. Ellison CA, Pollard KM and Varia S. 2020. Potential of a Coevolved Rust Fungus for the Management of Himalayan Balsam in the British Isles: First Field Releases. Weed Research 60(1): 37–49.
35. Wye and Usk Foundation. 2019. https://www.wyeuskfoundation.org/news/new-project-to-tackle-himalayan-balsam (accessed 27/09/2020)
36. Brock JH and Wade N. 1992. Regeneration of Japanese Knotweed (Fallopia japonica) from Rhizome and Stems: Observation from Greenhouse Trials. In Proceedings of the IXth International Symposium on the Biology of Weeds (Dijon Frans September 1992) European Weed Research Society Dijon France, 85–94.

37. Hollingsworth ML and Bailey JP. 2008. Evidence for Massive Clonal Growth in the Invasive Weed Fallopia Japonica. Botanical Journal of the Linnean Society 133(4): 463–472.
38. Fennell M, Wade M and Bacon KL. Japanese Knotweed (Fallopia Japonica): An Analysis of Capacity to Cause Structural Damage (Compared to Other Plants) and Typical Rhizome Extension. PeerJ 6:e5246 https://doi.org/10.7717/peerj.5246
39. CABI. 2015. Progress with Weed Biocontrol Projects May 2015. CABI, Egham.
40. Network Rail Infrastructure Lte v Stephen Williams and Robin Waistell. 2018. EWCA 1514.
41. Bailey JP, Child LE and Conolly AP. 1996. A Survey of Fallopia x Bohemica (Chrtek & Chrtová) J Bailey (Polygonaceae) in the British Isles. Watsonia 21: 187–198.
42. Buglife: https://www.buglife.org.uk/resources/species-hub/crayfish-hub/crayfish-for-everyone/ (accessed 5/10/2020).
43. Füreder L, Gherardi F, Holdich D, Reynolds J, Sibley P and Souty-Grosset C. 2010. *Austropotamobius pallipes*. *The IUCN Red List of Threatened Species* 2010: e.T2430A9438817. https://dx.doi.org/10.2305/IUCN.UK.2010–3.RLTS.T2430A9438817.en. (Downloaded on 05/10/2020).
44. Crawford L, Yeomand WE and Adams CE. 2006. The Impact of Introduced Signal Crayfish Pacifastacus Leniusculus on Stream Invertebrate Communities. Aquatic Conservation: Marine and Freshwater Ecosystems 16(6): 611–621.
45. Buglife & Environment Agency. undated. Crayfish Identification, Distribution and Legislation: https://cdn.buglife.org.uk/2019/07/Final-Crayfish-ID-distribution-and-Legislation-23–06–15_JG.pdf (accessed 06/10/2020).
46. Gladman Z, Adams C, Bean C, Sinclair C and Yeomans W. 2009. Signal Crayfish in Scotland. Crayfish Conservation in the British Isles. Proceedings of a conference held on 25th March 2009 at the British Waterways offices, Leeds, UK.
47. Stebbing P, Longshaw M and Scott A. 2014. Review of Methods for the Management of Non-indigenous Crayfish, with Particular Reference to Great Britain. Ethology Ecology & Evolution 26(2–3): 204–231.
48. Buglife & Environment Agency. undated. Crayfish Ark Sites and Conservation: https://cdn.buglife.org.uk/2019/07/Crayfish-Ark-Sites-and-conservation-Final.pdf (accessed 06/10/2020)

Appendix 1: Technical Methodology

Scope

The scope of the Greater Gwent State of Nature was set by the project steering group as species found within the Greater Gwent area, plus a 2km buffer ('the study area'), within a timeframe of 1970 to 2019.

The list of species included was developed in consultation with the steering group, local experts, and Local Nature Partnerships according to presence within the study area, data availability, and local interest. The aim was to produce a State of Nature that reflected the character of the area and showed a sample of species ranging from widespread to rarities, across different taxonomic groups, and from a variety of different habitats.

Methodology

Species records for Greater Gwent and the Welsh part of the buffer zone were sourced from the South East Wales Biodiversity Records Centre (SEWBReC) and other Welsh Environmental Records Centres through Aderyn, whilst records from the English part of the buffer zone were sourced from Gloucester Ecological Records Centre (GERC), Herefordshire Biological Records Centre (HBRC) and the National Biodiversity Network (NBN) Atlas. Additional records for certain species were sourced from Project Splatter and Natural Resources Wales (NRW) for the entire study area. Whilst NBN also covers Wales, it was felt that combining NBN and SEWBReC records would lead to more duplicate records than new records.

Records were processed to remove duplicates (where possible) and records outside of the timeframe, and records were grouped by decade. Records with a date range were only included if the start date was after 1970, and the end date used for grouping by decade. Where available and appropriate, records of interest, such as road mortalities, high abundance or breeding records were highlighted.

For each species or species group, density of records per square kilometer and most recent record per square kilometer was plotted in using the FSC Tom.Bio Tool. Records with low resolution grid references were placed at the centre of the grid reference. Note that records may be of one individual or many, so results refer to density and distribution of records, not individuals. Relative mobility of species is not considered in this report but should be noted.

To analyse records from protected areas, GIS layers of protected areas were edited and combined to remove overlapping and multiple designations, with priority being given to higher levels of protection. Records from protected areas are presented as a pie chart of the total number records. Note that the reasons for designation are not considered, so a species may be within a protected area, but not be a listed feature or meet designation criteria itself.

Where a species or species group was covered by a national recording or monitoring scheme, efforts were made to obtain records for the study area. This data was used to indicate levels of participation in such schemes, and, if the data was suitable, provide population trends. In most cases, the sample size of the data was too small for robust statistical analysis, so these should be treated with low confidence.

Where relevant, species records were measured against national and local criteria, such as the Wildlife Sites Criteria for South Wales,[1] to identify important sites or areas for that species or taxonomic group. Where relevant, reference is made to spatial work carried out by conservation organisations at the national level, such as the identification of priority areas. These are shown if they fall within the study area.

All GIS work was carried out using QGIS.

References

1. Gwent Wildlife Trust (2004) *Guidelines for the Selection of Wildlife Sites in South Wales*.The South Wales Wildlife Sites Partnership.

Appendix 2: Data Sources

Reference

Local Authority boundaries (high and low water mark) From Lle.gov.wales Contains public sector information licensed under the Open Government Licence v2.0.

Protected Areas and Sites Special Areas of Conservation (SAC), Special Protected Areas (SPA), National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI), Local Nature Reserves (LNR), National Parks, and Areas of Outstanding Natural Beauty (AONB)

All from Natural Resources Wales, via Lle.gov.wales. Contain Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right 2021.

Sites of Importance for Nature Conservation (SINC) Provided by South East Wales Biodiversity Records Centre, except those within Brecon Beacons National Park, which were provided by Brecon Beacons National Park Authority.

Geology British Geological Survey. 2020. BGS Geology 625K Bedrock dataset. Contains British Geological Survey materials © UKRI (2020)

Rivers Main Rivers dataset. 2005. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right 2021.

Flood zones Flood Map: Flood Zone 3 dataset. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Some features of this information are based on digital spatial data licensed from the Centre for Ecology & Hydrology © NERC (CEH). Defra, Met Office and DARD Rivers Agency © Crown copyright. © Cranfield University. © James Hutton Institute. Contains OS data © Crown copyright and database right 2015. Land & Property Services © Crown copyright and database right 2021.

Ecosystems

Grassland Data from Terrestrial Phase 1 Habitat Survey 1997. Showing acid, neutral, calcareous and marshy grassland below 300m Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.

Farmland Post 1988 Agricultural Land Classification (Wales) Surveys. Welsh Government. 2017. © Crown copyright. Mapping derived from soils data © Cranfield University (NSRI) and for the Controller of HMSO 2021 © Crown copyright 2020, the Met Office. Contains OS data © Crown copyright and database right 2021. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved.

Provisional Agricultural Land Classification (ALC)(England) Natural England Open Data (2018) © Natural England copyright. Contains Ordnance Survey data © Crown copyright and database right (2021).

Upland Data from OS Terrain 50. Contains OS data © Crown copyright and database right 2021.

Urban Built-up Areas (Wales) dataset. Office of National Statistics. © Crown Copyright and database right 2021. Ordnance Survey 100021874.

Woodland National Forest Inventory Woodland Wales 2018 dataset. Broadleaf, Conifer and Mixed woodland. Contains information supplied by the Forestry Commission. © Crown copyright and database right 2019 Ordnance Survey (100021242).

Freshwater & Wetlands Natural Resources Wales. 2021. Water Watch Wales. River Waterbodies Interim Assessment 2018. Water Watch Wales: https://waterwatchwales.naturalresourceswales.gov.uk/en (accessed 14/03/2021).
Main Rivers dataset. 2005. Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.

Coastal Saltmarsh extents dataset (2009–2016). Contains Natural Resources Wales information © Natural Resources Wales and database right and Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves (NNR) and Special Sites of Scientific Interest (SSSI) datasets Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights Reserved. Contains Ordnance Survey Data. Ordnance Survey Licence number 100019741. Crown Copyright and Database Right.

Species records

Provided by the South East Wales Biodiversity Records Centre (SEWBReC), Gloucester Centre for Environmental Records (GCER), Herefordshire Biological Records Centre and the National Biodiversity Network Atlas (NBN Atlas).

The following organisations gave permission to use their records on the NBN Atlas:

Amphibian and Reptile Conservation (ARC), Bat Conservation Trust (BCT), Botancial Society of Britain and Ireland (BSBI), British Dragonfly Society (BDS), British Trust for Ornithology (BTO), Butterfly Conservation, Joint Nature Conservation Committee (JNCC), Natural England (NE), Natural Resources Wales (NRW), People's Trust for Endangered Species (PTES), Project Splatter, Royal Society for the Protection of Birds (RSPB), The Biological Records Centre (BRC), The Mammal Society, Welsh Government.

The following organisations also kindly provided data from national recording schemes:

Amphibian and Reptile Trust: National Amphibian and Reptile Recording Scheme

Bat Conservation Trust: National Bat Monitoring Scheme

Botanical Society of Britain and Ireland, UK Centre for Ecology & Hydrology, Plantlife & Joint Nature Conservation Committee: National Plant Monitoring Scheme

British Dragonfly Society: Clubtail Count

British Trust for Ornithology: Breeding Bird Survey, Wetland Bird Survey

Butterfly Conservation, UK Centre for Ecology & Hydrology, British Trust for Ornithology and JNCC: UK Butterfly Monitoring Scheme

Game & Wildlife Conservation Trust: National Gamebag Census

Natural Resources Wales: Electrofishing data, National Otter Survey of Wales

People's Trust for Endangered Species: National Dormouse Monitoring Scheme, Hedgehog Street, National Water Vole Monitoring Program

Project Splatter: Project Splatter

Appendix 3: Abbreviations

AONB	Area of Outstanding Natural Beauty
AOO	Area of occupancy
ARC	Amphibian and Reptile Conservation Trust
ASNW	Ancient Semi-Natural Woodlands
BAP	Biodiversity Action Plan
BBNP	Brecon Beacons National Park
BBS	Breeding Bird Survey
BDS	British Dragonfly Society
BNM	Butterflies for the New Millennium
BOU	British Ornithologists Union
BRIG	Biodiversity Reporting and Information Group
BSBI	Botanical Society of Britain and Ireland
BTO	British Trust for Ornithology
CABI	Centre for Agriculture and Bioscience International
CBC	County Borough Council
CCW	Countryside Council for Wales
CEH	UK Centre for Ecology and Hydrology
CPLD	Catch Per Licence Day
CUOP	Cardiff University Otter Project
EOO	Extent of occupancy
ERLoB	European Red List of Birds
ERLoB	European Red List of Birds
FCS	Favourable conservation status
GERC	Gloucester Ecological Records Centre
GG	Greater Gwent
GOS	Gwent Ornithological Society
GWCT	Game and Wildlife Conservation Trust
HBRC	Herefordshire Biological Records Centre

IAPA	Important Arable Plant Area
IFA	Important Fungus Area
INNS	Invasive Non-native Species
IPA	Important Plant Area
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
LERC	Local Environmental Record Centre
LNR	Local Nature Reserve
MMBG	Monmouthshire Moth and Butterfly Group
MTAC	Make the Adder Count
NARRS	National Amphibian and Reptile Recording Scheme
NASCO	North Atlantic Salmon Conservation Organization
NBMP	National Bat Monitoring Programme
NBN	National Biodiversity Network
NDMP	National Dormouse Monitoring Programme
NEA	National Ecosystem Assessment
NMRS	National Moth Recording Scheme
NNR	National Nature Reserve
NNSS	Non-native Species Secretariat
NPMS	National Plant Monitoring Scheme
NPS	National Pond Survey
NWVMP	National Water Vole Monitoring Programme
PRR	Potential Reinforcement Region
PTES	People's Trust for Endangered Species
RDB	Red Data Book
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SEWBReC	South East Wales Biodiversity Records Centre
SEWRT	South East Wales Rivers Trust
SINC	Sites of Importance for Nature Conservation

SPA	Special Protected Area
SPG	Supplementary Planning Guidance
SQI	Species Quality Index
SSSI	Site of Special Scientific Interest
SWTRA	South Wales Trunk Road Agent
UKBAP	UK Biodiversity Action Plan
UKBMS	UK Butterfly Monitoring Scheme
WaREN	Wales Resilient Ecological Networks
WCBS	Wider Countryside Butterfly Survey
WeBS	Wetland Bird Survey
WWT	Wildfowl and Wetlands Trust