Important Invertebrate Areas:

Putting Bugs on the Map in Wales

buglife Cymru

Port Eynon Bay, Gower Peninsula IIA © Liam Olds

What are Important Invertebrate Areas?

Important Invertebrate Areas (IIAs) are places that are home to nationally or internationally significant invertebrate populations and their habitats. They include diverse species from beetles and moths to snails and woodlice, and habitats from the shoreline, along rivers and to the uplands.

Wales is home to over 20,000 species of invertebrate. They are vital to our lives, underpinning the ecosystem services which provide us with food, fertile soils and clean water, and the wildlife-rich habitats which we all enjoy. However, many invertebrates are declining, and some are facing extinction. To secure a better future for our invertebrate populations, it is essential to know where our most threatened species and assemblages live, and how to look after these places to enable nature to survive and thrive. This is what Important Invertebrate Areas are for.

Buglife has mapped a complete network of IIAs for Wales for the first time, from the 0.29km^2 Llŷn Peninsula to the expansive 432km^2 Eryri IIAs. In total 17 IIAs have been mapped for Wales, covering an area of 1,344 km^2. Despite covering just 6.5% of the entire country, this modest network of sites is home to over 10,800 species of invertebrate. 350 of these are species of conservation concern and 7 are endemic species, found nowhere else in the world but Great Britain. Crucially, it includes 15 species which are Critically Endangered, meaning they are facing a high risk of extinction.

The complete IIA map is an important step for the conservation of invertebrates in Wales. All of these IIAs are home to their own special species or assemblages of species. They deserve to be protected, managed in the right way to enable their wildlife riches to thrive, and to be celebrated by those who live in and around them.

> “In total **17 IIAs** have been mapped for Wales, covering an area of **1,344 km^2**, or **6.5%** of the entire country.”

Why do we need Important Invertebrate Areas?

Many invertebrates have suffered drastic declines as a result of the way that land is managed by people: widespread habitat loss and fragmentation, urbanisation, changing land management practices, pollution, invasive non-native species and many other factors. It has never been more important to restore sustainable populations of invertebrates and prevent the extinction of our most threatened species.

To secure their future, it is essential to know where our most threatened species and assemblages live. Throughout Wales, many of our well-known and high-profile places for invertebrates benefit from formal protection - but we know that protecting this small selection of sites isn't enough in the face of the current pressures facing our wildlife. We need to take a landscape-scale approach to their conservation, one that encourages positive action for invertebrates across wherever it is needed.

IIAs make complex information on invertebrates understandable, useable, and readily accessible to a wide audience. This ensures that everyone is able to better understand key habitats and landscapes for invertebrates and help to make better decisions for their future - whether they are members or the public, ecologists, planners, local authorities, statutory bodies, conservation organisations, land managers or other decision makers.

IIAs are a vital tool that can direct and prioritise conservation efforts for invertebrates and ensure better decisions are made to help us restore nature. However, despite the millions of records informing IIAs, there will be important habitats outside of IIAs that are home to rare and threatened species - it is always important to carefully consider and survey for invertebrates outside of the IIA network.

> "IIAs make complex information on invertebrates **understandable, useable, and readily accessible** to a wide audience."

Pearl-bordered Fritillary (*Boloria euphrosyne*) © Anne Sorbes (CC BY-NC-SA 2.0)

The ground beetle *Lebia cruxminor*

Clubbed General Soldierfly (*Stratiomys chamaeleon*)

Wildlife-rich brownfield habitat in the South Wales Valleys IIA © Liam Olds

Selecting and mapping Important Invertebrate Areas

The network of IIAs was identified using a wealth of data from national invertebrate recording schemes - over 45 million records from 80 national expert recording groups.

Modern conservation status reviews or expert opinion were used to identify a suite of 'qualifying species'- status reviews are an internationally accepted approach to identifying whether species are threatened or rare. Across Great Britain, a hectad (or 10km x 10km square) qualifies as an IIA if it either:

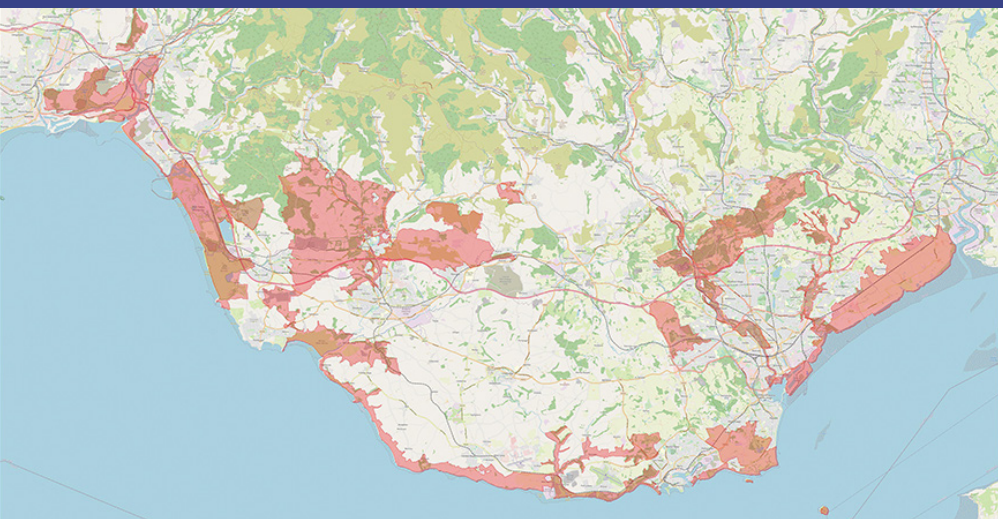
- Supports a species that is Critically Endangered nationally, Endangered at the global or European level, or is an endemic species that isn't widespread. These are our rarest or most threatened species, meaning there is a special responsibility to act and conserve them. ***Or***
- Supports a nationally important assemblage of rare or threatened species.

These hectads were then grouped into recognisable named IIA areas such as the South Wales Valleys, Eryri and Carmarthen Bay and Tywi Valley.

An IIA can encompass a range of habitats and different invertebrate species and assemblages. Each IIA was then mapped individually at the fine-scale, to properly reflect the best areas for invertebrates. Buglife sourced additional data from Local Environmental Records Centres to create maps of qualifying species records that were then scrutinised by local entomologists and naturalists. This ensured that the final IIA maps accurately reflect the key invertebrate interest and the core habitats that support them on the ground, underpinned by local knowledge.

> "Data from over **45 million** records, from **80** national expert recording groups, has been collected."

South Wales Coast IIA



Map of South Wales Coast IIA

Strandline Beetle (*Eurynebria complanata*)

High Brown Fritillary (*Argynnis adippe*)

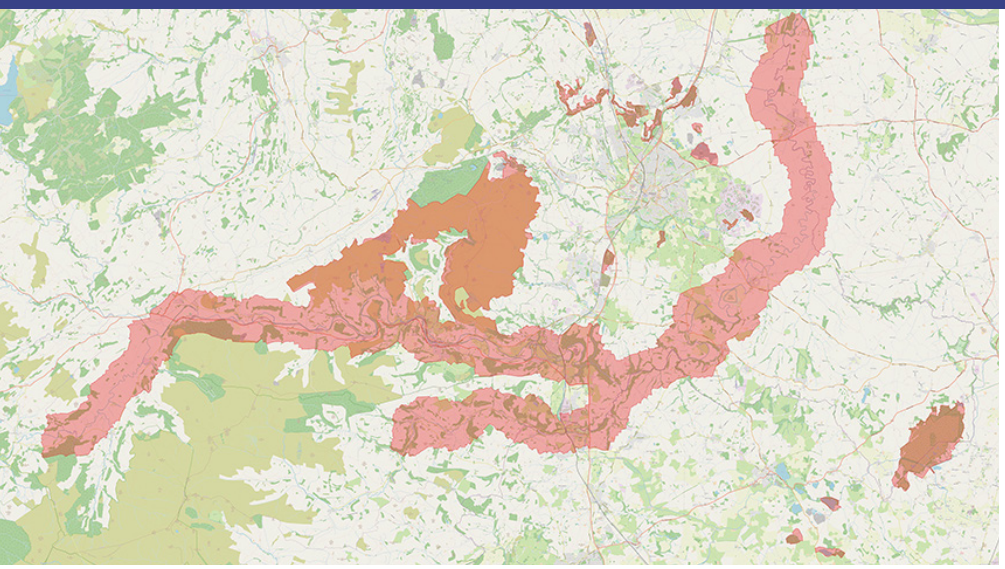
Fen Raft Spider (*Dolomedes plantarius*)

The South Wales Coast IIA covers 251km^2 from Neath in the west to Newport in the east, and is home to at least 90 IIA qualifying species.

It is home to a rich variety of habitats including sand dune systems, diverse grasslands, flower-rich brownfield habitats, saltmarsh and scrub among many others. This diverse coastal landscape and its hinterland is home to populations of High Brown Fritillary (*Argynnis adippe*), Strandline Beetle (*Eurynebria complanata*), Medicinal Leech (*Hirudo medicinalis*), Fen Raft Spider (*Dolomedes plantarius*) and Blue Ground Beetle (*Carabus intricatus*) to name a few. All of this is within one of the most densely populated areas of Wales, with a history of heavy industry and intense agricultural activity.

Although much of the coastline benefits from national and international designations, such as the western extent of the Gwent Levels Sites of Special Scientific Interest (SSSI), Kenfig National Nature Reserve (NNR) and Merthyr-Mawr SSSI, over 80% of the entire IIA remains unprotected. This includes undesignated land at the Port Talbot steelworks and extensive land surrounding Bridgend and the Cefn Cribwr group of SSSIs. Much of this is only designated as Local Wildlife Sites which does not provide statutory protection, and so large parts of this IIA are not properly recognised for their wildlife value. This leaves important habitats such as nature-rich brownfield land vulnerable to development and large swathes managed without invertebrates in mind.

The North East Wales IIA - the last refuge of the Scarce Yellow Sally?



Map of North East Wales IIA

© John Davy-Bowker

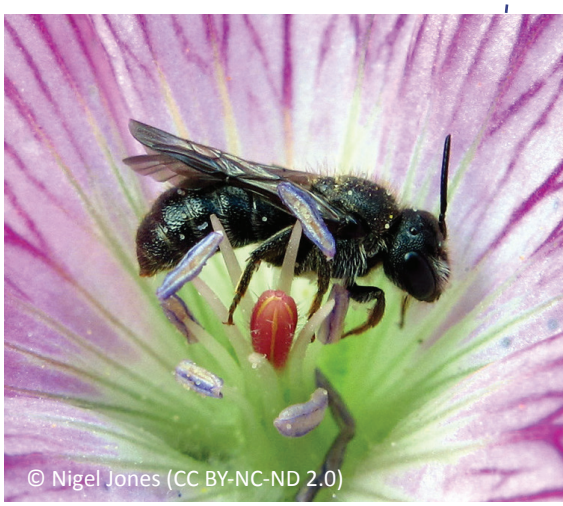
Scarce Yellow Sally (*Isogenus nubecula*)

The Critically Endangered Scarce Yellow Sally (*Isogenus nubecula*) is a stonefly only found in the River Dee in the UK. It was feared extinct having not been seen since 1995, but was rediscovered in 2017.

The entire modern UK range of the Scarce Yellow Sally is within the North East Wales IIA, downstream of the confluence between the River Dee and River Ceiriog, however, the source and upper stretches of the Dee are also part of the Eryri IIA to the west. The Dee Valley supporting the Scarce Yellow Sally is dominated by agriculture, with a patchwork of floodplain grazing marsh and river banks fringed with trees. Further research into the habitat requirements of the species and why it is absent from other fast flowing, stony lowland rivers is required.

The entire length of the River Dee is designated as both a SSSI and Special Area of Conservation (SAC), however, there remain a number of threats to the future of the Scarce Yellow Sally in the North East Wales IIA. A particular concern is declining water quality and pollution incidents from agriculture, as well as river channel modification, dredging, gravel removal and the clearance of bankside trees required by the adult stoneflies. There are also fears that increasing water temperature resulting from climate change might make the Dee unsuitable for its survival, while bankside and road lighting might be attracting adults away from their river habitat. Action is needed to prevent the deterioration of the small stretch of river that the Scarce Yellow Sally relies upon.

The North East Wales IIA is also important for a rich assemblage of other invertebrates, thanks to its diverse rivers, streams, limestone grasslands, cliffs, brownfield sites, parklands, woodlands, and peat bogs.



© Nigel Jones (CC BY-NC-ND 2.0)

Plain Dark Bee (*Stelis phaeoptera*)

© Mark Gurney (CC BY-NC-SA 2.0)

Sedge Jumper (*Attulus caricis*)

© Ed Tucker

Important Invertebrate Areas for everyone!

IIAs include some of our most cherished places and species, that are at the heart of our enjoyment of the natural world.

This includes iconic Welsh landscapes like the Pembrokeshire Coast, Eryri National Park, and the Gower, and star species like the Scarce Yellow Sally (*Isogenus nubecula*), Fen Raft Spider (*Dolomedes plantarius*) and Shrill Carder Bee (*Bombus sylvarum*). But they also include a host of often overlooked landscapes, habitats and species - such as our brownfields and coal spoils, and species such as the globally endemic Celtic Woodlouse (*Metatrichoniscoides celticus*) and the Maerdy Monster (*Turdulisoma cf helenreadae*) - a millipede which is new to science. IIAs shine a light on the special wildlife that lives side by side with people, helping us to develop the friendlier relationships with invertebrates that are needed to help support their recovery.

Invertebrates are complex, with thousands of species and life history strategies. IIAs take complex information gleaned from years of expert survey and recording and present them in a straight forward manner to local communities. By better understanding the importance of their local wildlife, people can feel better connected to nature and willing to advocate for its protection. The information provided by IIAs can also help local communities to make decisions that can benefit their local star species - including creatures that they might not even have previously known about. Whether it is providing the right sort of habitat in parks and gardens, making sure they are properly considered in local decision making or making sure that local habitats are better cared for with the local invertebrate interest in mind.

The Well-being of Future Generations (Wales) Act 2015 includes the goal of a Resilient Wales - **"a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change"**.

IIAs play a crucial role in helping to protect Wales' invertebrates for future generations, identifying priority landscapes for wildlife conservation, but also making it easier to visit, appreciate and understand their unique character.

> "By better understanding the importance of their local wildlife, people can feel better connected to nature and willing to advocate for its protection."

Important Invertebrate Areas in Wales

IIA areas

There are 17 named IIAs in Wales. They are shown on the map in red and are named and numbered as per below.

1. **Anglesey and North Wales Coast** / Ynys Môn ac Arfordir Gogledd Cymru
2. **Eryri** / Eryri
3. **Llŷn Peninsula** / Pen Llŷn
4. **North Cardigan Bay** / Gogledd Bae Ceredigion
5. **South Cardigan Bay** / De Bae Ceredigion
6. **North Pembrokeshire Coast** / Arfordir Gogledd Penfro
7. **South Pembrokeshire Coast** / Arfordir De Penfro
8. **Carmarthen Bay and Tywi Valley** / Bae Caerfyrddin a Dyffryn Tywi
9. **Gower Peninsula** / Penrhyn Gŵyr
10. **South Wales Coast** / Arfordir De Cymru
11. **South Wales Valleys** / Cymoedd De Cymru
12. **Black Mountains and Golden Valley** / Y Mynyddoedd Duon a'r Dyffryn Aur
13. **Wye Valley and Forest of Dean** / Dyffryn Gwy a Fforest y Ddena
14. **Mid Wales** / Canolbarth Cymru
15. **Montgomeryshire** / Sir Drefaldwyn
16. **North East Wales** / Gogledd Ddwyrain Cymru
17. **Great Orme** / Pen y Gogarth


HOLYHEAD
CONWAY
THE IRISH SEA
ABERYSTWYTH
ENGLAND
CARDIGAN
CAMARTHEN
PEMBROKE
SWANSEA
CARDIFF
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2
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4
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The long-toed water beetle *Pomatinus substriatus* © Andreas Haselböck

Supporting Nature's Recovery

Invertebrate conservation can be complicated - there is a huge diversity of species, all with different lives, different ecological needs, and different distributions. IIAs aim to take complex technical information and translate and distil it into a format which is accessible and useful to a wide and specialist audience. This will ensure that ecologists, planners, local authorities, statutory bodies, conservation organisations, land managers and other decision makers are able to make better informed decisions to support nature's recovery.

The completed suite of IIA maps and profiles will enable:

- The effective focusing of invertebrate conservation efforts across Wales to where it is needed most. This includes the coordinated management of specific habitats for invertebrate species and assemblages across IIAs.
- Landscape scale strategies and the work of Local Nature Partnerships to better incorporate the needs of invertebrate species, so that opportunities to support species recovery are not missed.
- The identification of priority areas to designate as new legally protected sites (SSSIs) and as Local Sites and Sites of Interest for Nature Conservation (SINC) in the landscape.
- Landowners and land managers to recognise the value of land under their stewardship that is important for invertebrates, and know what to do for them.
- The identification of opportunities to restore and create habitat to buffer and reconnect important habitats for invertebrates making them more resilient in the long term.
- Raised profiles for invertebrate assemblages, including less well-known species and groups.
- Promotion of often overlooked and small-scale habitat features that can be important for invertebrates but are often neglected.

> "IIAs aim to take **complex technical information** and translate and distil it into a format which is accessible and useful to a wide and specialist audience."

Small Plain Stiletto fly (*Thereva fulva*) © Steven Falk

Moss Carder Bee (*Bombus muscorum*) © Steven Falk

Important Invertebrate Areas in planning

IIAs alone are not a legal designation but can help to ensure that key sites for invertebrates are recognised both locally and nationally, so they are properly considered in planning decisions. Too often invertebrates have either been overlooked or are a late consideration in planning decisions. This has led to poor outcomes for nature, but a completed suite of IIA maps and profiles will enable:

- Important wildlife sites to be flagged up at the earliest opportunity within planning processes, including in Environmental Impact Assessments.
- Better planning outcomes for invertebrates, by identifying the need for invertebrate surveys to properly inform planning decisions.
- Local Authorities to better recognise sites and habitats for nationally rare and threatened invertebrates. This is particularly relevant for Local Authorities which don't have sufficient ecological expertise to support their planning teams.
- The very best sites for invertebrates to be excluded from Local Development Plans, ensuring that they are not put at risk of inappropriate land use changes or development. This will help Local Authorities to fulfil their Planning Policy Wales duties.
- Local Environmental Records Centres to share a nationally prioritised series of IIA maps, profiles and accompanying resources to support their data search outputs.
- Green and Blue Infrastructure plans to properly consider how they could support invertebrate populations by connecting, protecting and restoring habitats.
- Ecological consultants and professionals to more easily recognise key invertebrate sites, habitats and features, to produce better quality environmental reports.

Black Bog Ant (*Formica picea*) © Robbin Williams BWARS

IIAs and protecting sites for nature

Legally protected sites are the backbone of conservation - they are meant to represent our natural heritage and ensure the future for our best examples.

However, many important invertebrate habitats and sites are under-represented and do not receive the protection that they deserve, leaving their special species at risk.

Buglife has analysed how much of its IIAs are within the SSSI network to to highlights gaps and where further designation of sites is required.

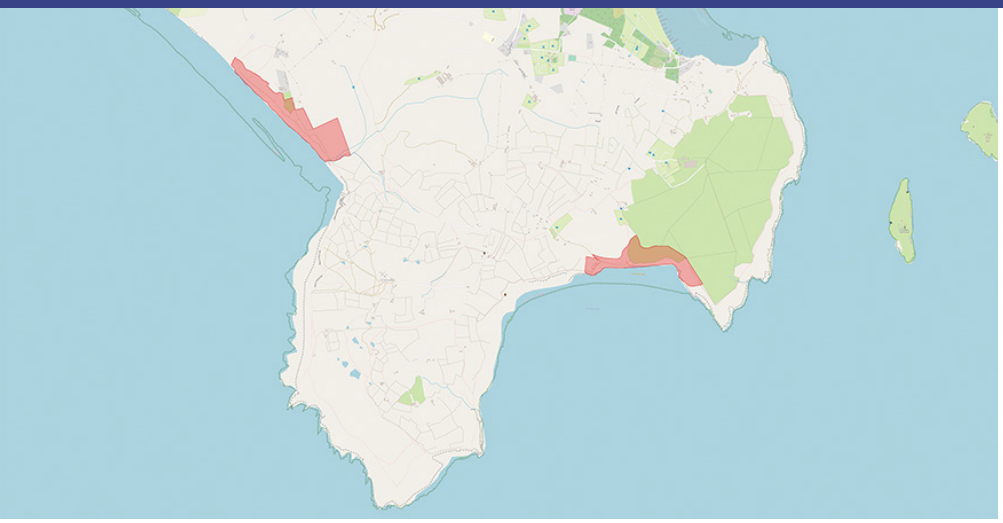
Across Wales 43% of the area of IIAs are within the SSSI network, but there a large disparities between them.

The best protected IIA is Great Orme, with over 96% of its area appropriately designated as a SSSI, but in stark contrast the Montgomeryshire IIA benefits from protection across less than 8% of its area.

The IIA maps are a network of the best sites for invertebrates in Wales, which should form the foundation for a review of the SSSI network across the country. But there is also an important role for IIAs in helping to improve how invertebrates are included in the networks of Local Sites and Sites of Interest for Nature Conservation (SINC) across Wales. Local designations help local decision makers to understand the best wildlife habitats in their local area and guide nature's recovery.

IIA name	Total area of IIA (km^2)	Total area of SSSI within the IIA (km^2)	Percentage of IIA which is SSSI (%)
Great Orme / Pen y Gogarth	3.5	3.4	96%
Llŷn Peninsula / Pen Llŷn	0.3	0.3	89%
Anglesey and North Wales Coast Ynys Môn ac Arfordir Gogledd Cymru	29.1	24.3	83%
South Pembrokeshire Coast / Arfordir De Penfro	35.7	27.8	78%
North Cardigan Bay / Gogledd Bae Ceredigion	19.1	14.2	74%
Gower Peninsula / Penrhyn Gŵyr	57.9	38.2	66%
Eryri / Eryri	432.9	235.3	54%
North Pembrokeshire Coast / Arfordir Gogledd Penfro	101.8	54.2	53%
Black Mountains & Golden Valley Y Mynyddoedd Duon a'r Dyffryn Aur	24.6	12.8	52%
Wye Valley and Forest of Dean Dyffryn Gwy a Fforest y Ddena	16.8	8.5	50%
Carmarthen Bay and Tywi Valley Bae Caerfyrddin a Dyffryn Tywi	53.7	24.6	46%
South Cardigan Bay / De Bae Ceredigion	6.4	2.5	39%
North East Wales / Gogledd Ddwyrain Cymru	233.7	73.2	31%
Mid Wales / Canolbarth Cymru	18.7	5.6	30%
South Wales Valleys / Cymoedd De Cymru	43.9	8.8	20%
South Wales Coast / Arfordir De Cymru	250.3	49.1	20%
Montgomeryshire / Sir Drefaldwyn	16.0	1.2	8%
Total	**1,344.6**	**584.1**	

Cliff Mason Bee in the Llŷn Peninsula IIA



Map of Llŷn Peninsula IIA

© Steven Falk

Female Cliff Mason Bee (*Osmia xanthomelana*)

© Steven Falk

Male Cliff Mason Bee (*Osmia xanthomelana*)

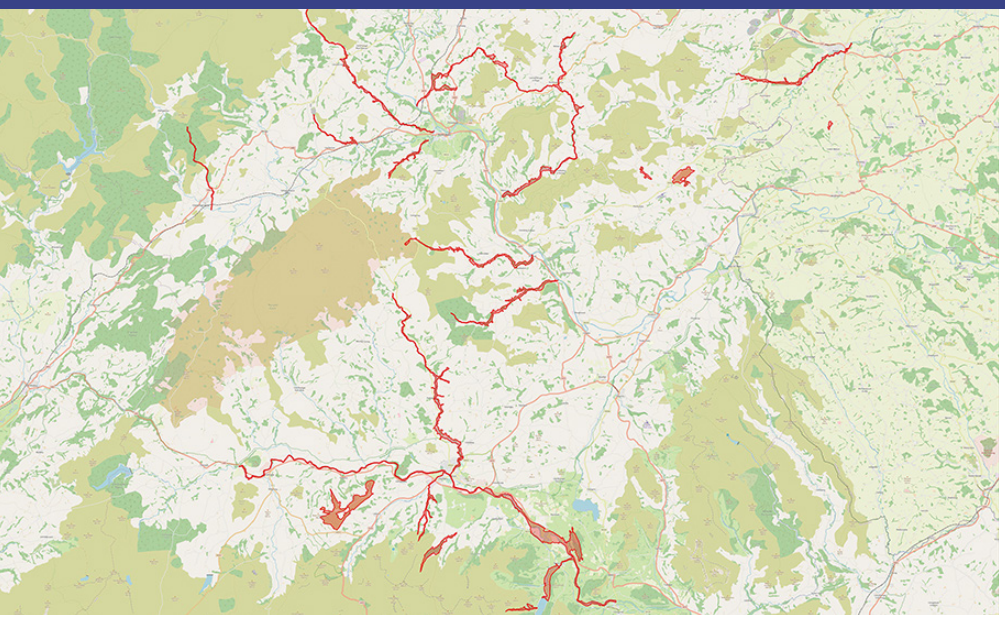
© Liam Olds

Porth Neigwl, Llŷn Peninsula

Jutting into the Irish Sea from North West Wales, the Llŷn Peninsula is home to one of Britain's rarest bees - the Cliff Mason Bee (*Osmia xanthomelana*). This threatened bee is a specialist of coastal soft rock cliffs, where it uses the wet mud from seepages to construct its nest in the cliff face. It forages on the flowers of the cliff slopes and clifftop grasslands. Formerly found around the English and Welsh coast, it now hangs on in just two sites, both on the Llŷn Peninsula.

The Llŷn Peninsula IIA includes Porth Ceiriad and Porth Neigwl, both of which are part of the Porth Ceiriad, Porth Neigwl ac Ynysoedd Sant Tudwal Site of SSSI. The IIA covers the entire modern UK range of the Cliff Mason Bee. However, cliff and coastal protections and drainage schemes have interrupted the dynamic natural processes of the cliff landscape. Coupled with the loss of flowers from the intensive management of clifftop grasslands and coastal erosion, the habitat for the Cliff Mason Bee is very restricted. Climate change poses a further risk, with the potential for increased water abstraction affecting the essential freshwater seepages, while the potential for extreme events such as winter storms and increased coastal erosion and landslips could lead to the sudden loss of this very localised bee. Action is needed to restore wildflower-rich clifftop grassland mosaics and to allow them to move inland in response to our changing, dynamic coastline.

Mid Wales IIA



Map of Mid Wales IIA

The Mid Wales IIA lies between the north portion of the Usk Valley and the Bannau Brycheiniog National Park. It is dominated by extensive wind-swept upland moorland hills, intersected by pastoral valleys and fast-flowing streams. Its many river valleys and wetland habitats, often lined by steep wooded slopes and flatter rolling grassland fields enclosed with mature hedgerows, support at least 27 IIA qualifying species.

The River Usk and its tributaries are fast flowing rivers that support aquatic species such as the Vulnerable winter stonefly *Rhabdiopteryx acuminata*, Globally Endangered White-clawed Crayfish (*Austropotamobius pallipes*) and a rich assemblage of mayflies. Meanwhile the River Wye and its tributaries form an extensive complex of habitats, including for specialist beetles and flies of shingle and sand features. The mature woodlands and hedgerows around both of these rivers are home to decaying wood specialist beetles such as the Scarce Cardinal Beetle (*Schizotus pectinicornis*).

Although both the Usk and Wye and their tributaries are SSSIs and SACs, they suffer from water pollution and nutrient enrichment from agricultural run-off, sewage discharges and chemical water treatment that kill or disrupt the lives of their invertebrates. River engineering, barriers and water abstraction have also interrupted the dynamic processes that support these special habitats. Urgent action is needed to help restore the habitats supporting the special species of the Mid Wales IIA, including more natural river flow, features and improved water quality and restoring bankside and riverside habitats.

Scarce Cardinal Beetle (*Schizotus pectinicornis*)

Hairy-saddled Colletes (*Colletes fodiens*)

The winter stonefly *Rhabdiopteryx acuminata*

© David Palmar

IIAs and invertebrate recording

IIAs would not be possible without the expert knowledge, dedication and guidance of the recording community. The data from over 80 invertebrate recording schemes and from local environmental records centres has underpinned the entire process - using millions of individual species records. Mapping IIAs also relied on the outputs of detailed species status reviews and expert opinion of national species experts. Finally, the IIA process relied on the knowledge and support of local experts who understand the invertebrates in their local areas and the network of sites and habitats where they are found.

However, despite the wealth of invertebrate data in Wales, there are still many recording gaps with some areas less surveyed and some species groups neglected. This makes it important to be aware that areas outside of the IIA network can still support regionally or potentially nationally important populations. The IIA work uses the best knowledge, data and assessments available at the time to identify the best places for invertebrates. The state of knowledge of invertebrates is always changing, with species colonising new sites or undergoing local extinctions, changing ranges and new populations being discovered.

To help ensure that IIAs remain relevant and updated, the mapping process has been designed to be repeatable. The whole network can be re-mapped both nationally and at the fine-scale level in future, to take into account the most recent data, expert knowledge and species status reviews. Until then it is hoped that IIAs can be a catalyst for further recording and a platform for promoting invertebrate conservation.

“The IIA process relied on the knowledge and support of local experts who understand the invertebrates in their local areas and the network of sites and habitats where they are found.”

Gregynog National Nature Reserve, Montgomeryshire IIA © John Trefonen

Grayling (*Hipparchia semele*) © Patrick Clement, butterfly-conservation.org

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This report is available in Welsh from the Buglife website.

Front cover photos: Blue Ground Beetle (*Carabus intricatus*) © John Walters, Cliff Mason Bee (*Osmia xanthomelana*) © Steven Falk, Fen Raft Spider (*Dolomedes plantarius*) © Liam Olds, Marsh Fritillary (*Euphydryas aurinia*) © Darren Bradley

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