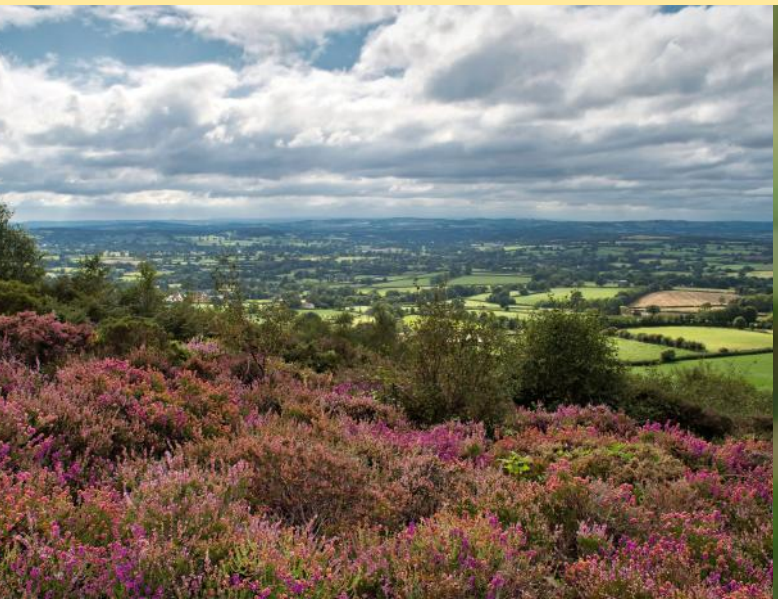
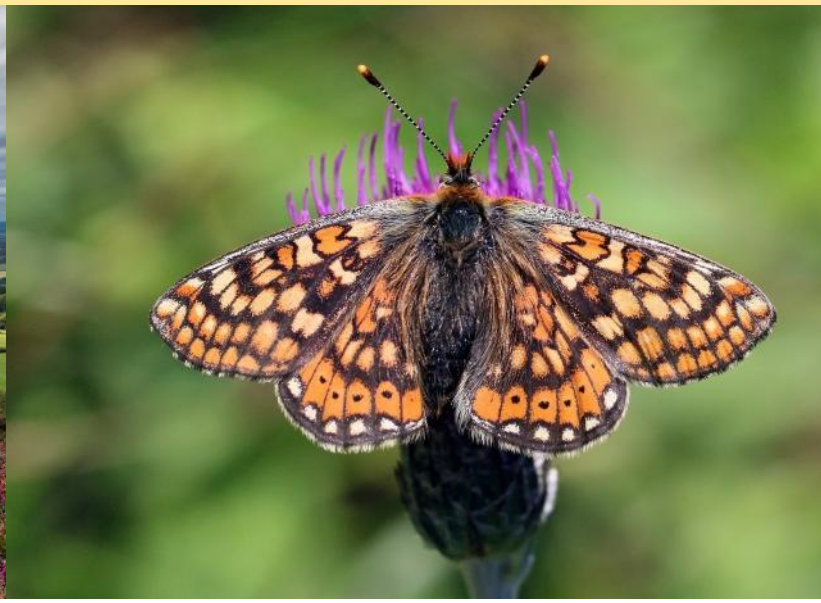
IMPORTANT INVERTEBRATE AREA PROFILE

Blackdown Hills



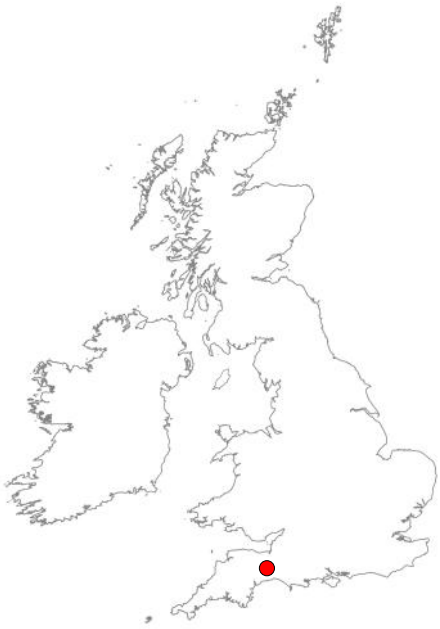


Left: Culmstock, Blackdown Hills © Alison Day (CC BY-ND 2.0). Right: Marsh Fritillary (*Euphydryas aurinia*) © Charles J. Sharp (CC BY-SA 4.0)

The Blackdown Hills Important Invertebrate Area (IIA) is situated in the Blackdown Hills National Landscape and the Blackdowns National Character Area. The area is known for its river and spring valleys lined by broadleaved and carr woodland, steep ridges and high plateaus, with farms and villages sparsely dotted across the landscape. The characteristic Devon tree hedgerows and straight Beech avenues cut across other non-wooded habitats, including grassland, heathland, and mires.

The IIA is spread across the landscape and includes five distinct areas. Maiden Down Site of Special Scientific Interest (SSSI) in the north west is situated just south of the M5, south east of Burlescombe village. This SSSI features wet and dry lowland heathland and supports the rare long-legged fly *Neurigona quadrifasciata.* South east of Maiden Down SSSI, the River Culm supports a surviving population of the Globally Endangered White-clawed Crayfish (*Austropotamobius pallipes*). North east of here and just west of Clayhidon village, Devon Wildlife Trust's Clayhidon Turbary reserve features a mixture of heathland, scrub, woodland and mire. It supports an assemblage of rare flies including Bog Cranefly (*Tipula holoptera*) and the Great Long-tailed Winter Gnat (*Trichocera major*), which are associated with decomposing matter in wetlands and other habitats. The reserve also supports the weevil *Coelositona puberulus*, which is associated with Hairy Bird's-foot Trefoil.

Further south, a composite area around the Bolham River headwater and its tributaries is included in the IIA, stretching between Smeatharpe village in the east and Bolham Water hamlet in the west. The east portion of



the IIA here overlaps with the Southey and Gotleigh Moors SSSI, which is one of the richest mosaics of valley mire, acid wet grassland and alder-birch carr woodland found on the Blackdown Hills. Devon Globetail (*Sphaerophoria potentillae*), a rare hoverfly of culm grassland only present in Devon and Cornwall, can be found here. The area just west of this SSSI – Middleton Barton – supports the only remaining extant colony of Marsh Fritillary (*Euphydryas aurinia*) in the Hills. Both the Southey and Gotleigh Moors SSSI and Hense Moor SSSI further south, have pockets of potential habitat for Marsh Fritillary and are part of nature recovery projects delivering targeted management. Additionally, the endemic British Cave Shrimp (*Niphargus glenniei*) is found across the wider IIA, with records from water in wells and pumps that are fed by deep ground aquifers.

Reasons for selection

The Blackdown Hills IIA supports at least nine qualifying IIA species of conservation concern. The area supports the following species which are endemic, or threatened on a global or national scale:

- Endemic British Cave Shrimp (*Niphargus glenniei*)
- Globally Endangered White-clawed Crayfish (*Austropotamobius pallipes*)
- Vulnerable Marsh Fritillary (*Euphydryas aurinia*)

Additionally, this IIA is also locally important for a number of other rare or declining species (but not IIA qualifying species) including Raft Spider (*Dolomedes fimbriatus*) at Southey and Gotleigh Moors SSSI and Small Pearl-bordered Fritillary (*Boloria selene*) at Hense Moor SSSI.

These important invertebrate populations rely on the Blackdown Hills IIA's unique range of habitats from wet and dry heathland, mire, grassland and carr woodland. Whilst parts of the IIA are under some form of legal protection (e.g. SSSI), there are considerable portions that are outside of any designated areas.

Key habitats for rare invertebrates in the IIA

Using the Pantheon analytical tool, we identified some of the key habitats and microhabitats for the selected rare invertebrates, and listed a selection of invertebrates associated with them.

- **Tall sward and scrub** (sward/field layer; and acid mire seepage) e.g. Marsh Fritillary, Devon Globetail, and the long-legged fly *N. quadrifasciata*.
- **Acid and sedge peats** (including drawdown zone: mud/shallow litter, and seepages) e.g. Great Long-tailed Winter Gnat and Bog Cranefly.
- **Running water** (including unmodified fast-flowing streams) e.g. British Cave Shrimp and White-clawed Crayfish.
- **Short sward and bare ground** (including sward/field layer) e.g. the weevil *C. puberulus*.

Other habitats that don't have any qualifying species but are important in supporting the wider invertebrate assemblages in the IIA include:

- **Shaded woodland floor**
- **Arboreal**
- **Wet woodland**
- **Decaying wood**
- **Marshland**

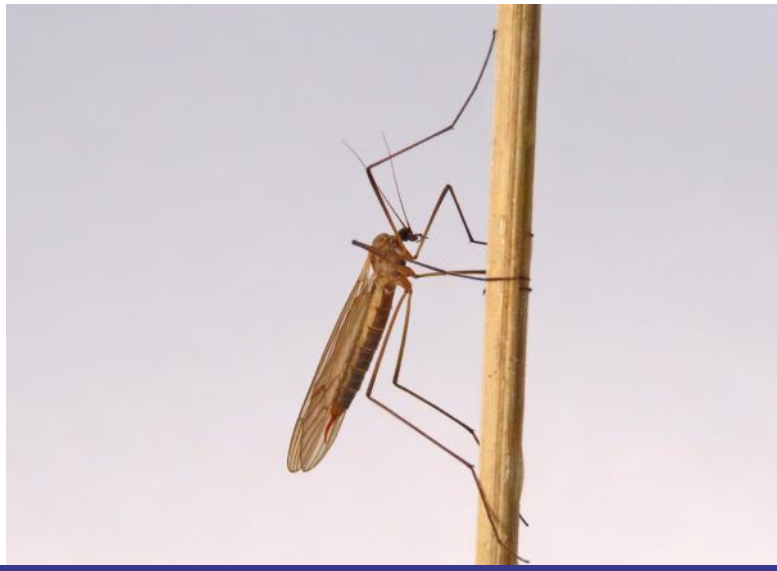
Habitat Threats and Opportunities

Heathland

Threats

- Poor management or implementation of the same management approach too widely can lead to uniform heathland habitats that lack structural and age variation, reducing their value for invertebrates.

Great long-tailed Winter Gnat (*Trichocera major*) © Иван Матершев (CC-BY-NC)



- Overgrazing can lead to a loss of heather stands, creating open grass-dominated areas and making them more prone to be invaded by competitive plants such as Bracken. Conversely, lack of management or undergrazing can lead to a loss of bare ground, soil disturbance and succession to scrub and woodland.
- The loss of wet habitat features on wet heathland sites, bog and heathland carr due to drainage or otherwise changing hydrology can significantly reduce their value for invertebrates.
- Habitat fragmentation due to development pressure or agricultural improvement can create isolated patches of habitat, making dispersal harder and lowering the genetic diversity of invertebrate populations.
- Fire is a growing threat to remnant heathland sites, with the potential for smaller sites to be irreparably damaged through a single incident.
- Footpaths receiving moderate use can be of very high value to invertebrates (e.g. by maintaining open bare ground). But excessive recreational pressure such as motorcycle activity or horse riding can alter vegetation communities through trampling, soil compaction and erosion, damaging habitat and affecting continuity.

Opportunities

- Aim to produce a mosaic of heathland successional stages to support the highest number of invertebrates. These should include bare and disturbed ground, moss and lichen-dominated areas, grasses, flower-rich areas and young heather plants, through to tall swards with establishing and established blocks of mature heather, scrub and scattered trees.
- Aim to establish grazing of appropriate stocking levels, avoiding under or overgrazing, to maintain a mosaic of heathland structure. Cattle tend to produce a more varied vegetation structure than sheep and their greater weight will suppress Bracken growth and provide areas of disturbed ground.
- Provide bare ground and early successional vegetation, which provide basking, nesting and hunting opportunities for ground-active invertebrate species as well as opportunities for key early successional flowering species. If grazing is not available, this can be achieved via rotational cutting and scraping of the soil surface to create exposures.
- Consider excluding grazing from some areas all year round to provide permanent cover and opportunities for species using standing stems and seed heads to complete their life cycle. While too much Bracken can be a problem, it does support rare sawflies and flies, so areas of Bracken, both shaded and in the open, should be retained.
- Restore degraded or damaged heathland sites, including the removal of trees from plantation sites and restore open heathland habitat mosaics across the landscape to improve connectivity and to provide opportunities for invertebrates to develop resilient populations.
- Protect existing valley mires, wet heath, streams and ponds.
- Retain dead and decaying wood.

White-clawed Crayfish (*Austropotamobius pallipes*) © John Mason

Peatlands

Threats

- Low water tables lead to more favourable conditions for scrub and tree encroachment, which in turn leads to the loss of Sphagnum habitats through compaction, overshading and increased evapotranspiration of stored water by the scrub.
- Burning, whether controlled or uncontrolled, can lead to total destruction of this habitat and its invertebrates and is not advised.
- Historically, large areas of peatland were lost through incentivised afforestation of conifer plantations. Any peatland habitat left in the vicinity of the plantations or which is being restored from forest to bog, is under the threat of scrubbing over

in the absence of an appropriate grazing management plan.
- Competitive species (e.g. Purple Moor Grass, heather, Rhododendron, Birch) can negatively affect the vegetation and structural composition of peatland habitats.
- Nutrient enrichment through aerial deposition or water run-off can cause increased damage to Sphagnum moss.

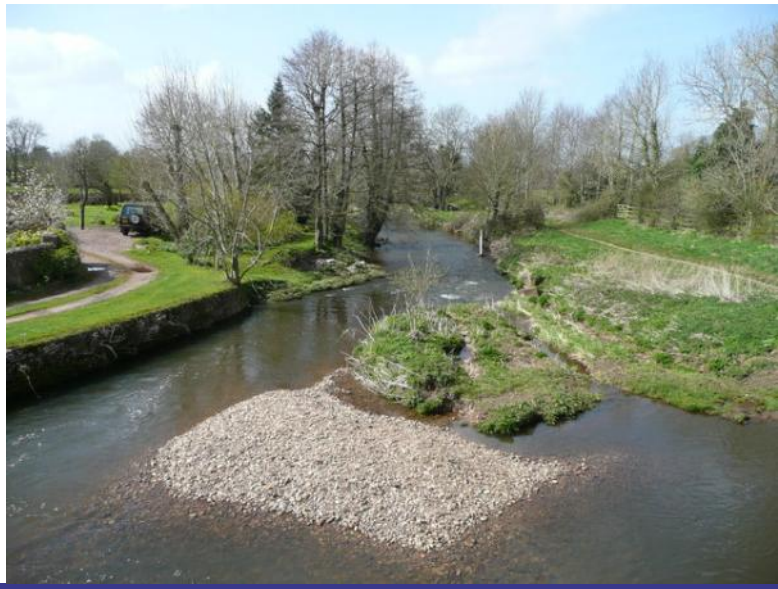
Opportunities

- Re-wet degraded peatlands to restore active hydrological processes and water tables through the blocking of ditches, purchase of additional land and removal of tree cover.
- Restore damaged and degraded peatland through the installation of peat bunds and reprofiling of sharp edges to reinstate its water-retention abilities.
- Where necessary, introduce conservation grazing to reach an appropriate grazing pressure to control competitive species and tree encroachment, and to create a diverse sward structure.
- Avoid using any kind of burning as a tool to manage vegetation (e.g. heathers) on peatlands. Instead, rewet peatland habitat which can act as a natural firebreak in the wider landscape.
- Keep peatland in favourable condition and avoid it drying out as this can exacerbate tree encroachment and the spread of competitive species.
- Target restoration work around or near to existing high quality peatland sites, to improve connectivity and to provide opportunities for invertebrates to develop resilient populations.

Running water

Threats

- Water pollution and nutrient enrichment from agricultural run-off (e.g. artificial or natural fertilisers, worm treatments, herbicides and pesticides including neonicotinoids), sewage discharges or chemical water treatment can alter the composition and disrupt the lives of aquatic and semi-aquatic invertebrates.
- Engineering activities such as flood alleviation schemes, straightening of watercourses, dredging, and water storage have modified flows in some rivers and streams, lowered water tables and removed available habitat. This can also include the loss of areas of exposed riverine sediments that support specialist rare invertebrates.
- Barriers such as weirs and dams disrupt natural flow processes and prevent some species from moving freely. Walls and piling prevent the watercourse from spreading onto its floodplain, replenishing wetlands and creating damp habitats.
- Removal of riparian vegetation, particularly trees can result in increased water temperatures which affect cold-loving species. Conversely, excessive scrub encroachment on the channel through the lack of grazing or woodland management can lead to overshading and impact on the dispersal abilities of flying species to adjacent sites.
- Activities such as ploughing can increase sediment run-off into streams and rivers, which can contribute to invertebrate declines in various ways e.g. clogging of gills, changes in habitat and prey availability, oxygen and light levels.
- Non-native species such as Himalayan Balsam and Japanese Knotweed can be a particular problem to rivers and their associated wetlands, crowding out native plant species and habitats for invertebrates.
- Sedimentation and drying, caused by reduced water flow, can result in the deterioration of shingle bank habitats.
- Residues of toxic chemicals from flea treatments can occur in freshwater due to sewer network discharges and dogs entering the water. These chemicals have the potential to affect the reproduction and growth of aquatic invertebrates.



- Light pollution disrupts the lives of nocturnal aquatic insects and can contribute to insect decline.
- Solar panels adjacent to running water can attract aquatic invertebrates with reflected polarised light appearing as suitable egg laying sites.

Opportunities

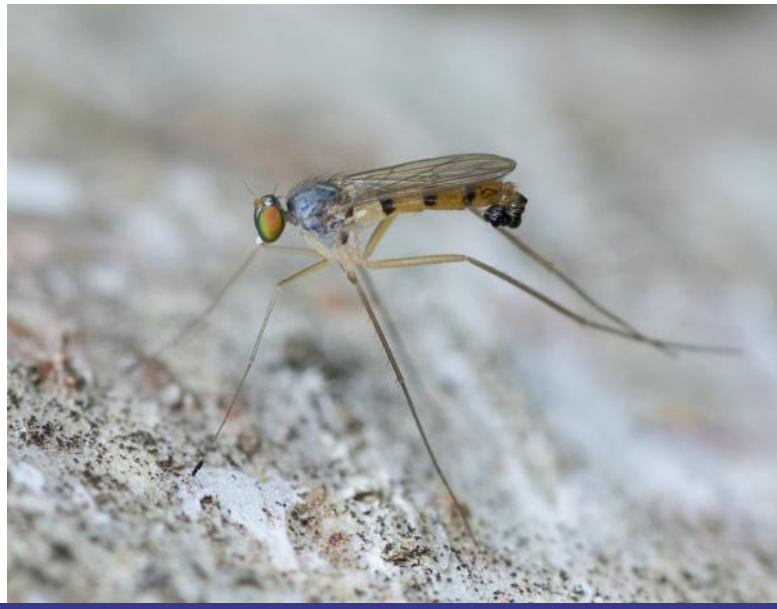
- Monitor water quality and protect running waters from land-borne pollution through negotiations with local farmers and businesses.
- Restore a more natural flow regime by removing barriers (e.g. weirs) and by re-profiling watercourses from fast-flowing, straight and steep channels to meandering shallow channels with varying speed in water flows.
- Establish vegetation buffers and woodland around running waters to improve water quality and habitat for invertebrates – this helps with trapping pollutants in run-off events, stabilises riverbanks, and creates shaded areas.
- Allow some grazing on riverbanks as this creates marginal habitat with tussocky vegetation for roosting and mating, and varied microhabitats along the water edge such as poached areas.
- Keep livestock from entering the watercourse or moving across gravel bars and beaches as this compacts the gravels, increases bank erosion and nutrient concentrations through their faeces.
- Aim to reduce or eliminate the use of artificial lighting around watercourses wherever possible.
- Control or remove invasive species such as Himalayan Balsam and Japanese Knotweed.
- To minimise the environmental impact of flea treatments, dog owners should only treat when necessary and choose products carefully considering their environmental impact and mode of application.
- Patterned, roughened or painted glass, or a horizontal light-blocking grid can be used on solar panels to reduce their attraction to aquatic invertebrates.
- Cleaning and disinfecting waterproof clothing, fishing tackle and water-sports equipment, to prevent the spread of non-native aquatic species and diseases they may carry. Guidance can be found on the Check-Clean-Dry Website.

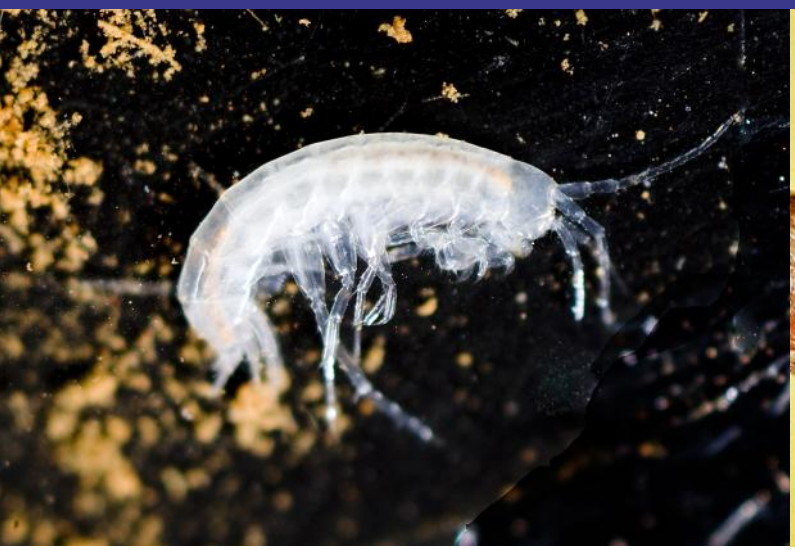
Wet grassland (including culm grassland)

Threats

- Water pollution through chemicals, nutrients and sediment from agriculture, sewage discharges and road run-off can directly kill or alter populations of invertebrate and plant species.
- Grassland 'improvement' through drainage, ploughing, re-seeding, fertiliser and slurry application, and conversion to arable reduce invertebrate biodiversity through direct habitat loss and reduction in foodplants, flower and pollen resources.
- Lack of grazing management or abandonment leads to an excessive spread of Purple Moor Grass, scrub and thatch, eventually turning sites into wet scrubland and woodland. This causes the loss of structural mosaic in the sward and reduction in flowering-plant diversity and associated invertebrates.
- Over-stocking or bringing heavy machinery onto sites, especially in the wetter months can cause soil compaction, leading to excessive spread of competitive species such as rush and docks, at the cost of other wildflowers.
- Extensive grazing, especially with sheep and over the spring and summer months, can cause a short uniform sward and inability of wildflowers to bloom and set seed.
- Changes in the water levels as a result of land drainage, flood alleviation engineering, or gravel and surface and ground water abstraction can lead to drying out of the sites and removal of valuable

The long-legged fly *Neurigona quadrifasciata* © Vladimir Bryukhov (CC-BY-NC)






Left: British Cave Shrimp (*Niphargus glenniei*) © Andrew Lewington. Right: the weevil *Coelositona puberulus* © djbich (CC-BY-NC)

seasonal and permanent wet habitat features for invertebrates.
- Endectocides used in the treatment of livestock parasites can negatively affect dung beetles and other dung invertebrates.

Opportunities

- Avoid grassland-damaging practices such as drainage, ploughing, re-seeding, fertiliser treatment and slurry application.
- Establish conservation-led grazing regimes which avoid excessive poaching or scrub establishment and aim to create a mix of taller tussocks of Purple Moor Grass as well as open and shorter areas favouring other flowering plants. This structural diversity will support the widest diversity of invertebrates, including rare species such as Marsh Fritillary, which is dependent on the presence of both grass tussocks and Devil's-bit Scabious.
- If possible, avoid grazing by sheep and use ponies or cattle instead, ideally hardy breeds that are lighter in weight and can cope with wetter ground and feeding on rush and Purple Moor Grass.
- Avoid compaction by lowering stocking densities during the wet months and perform any mechanical works required in the dry months of the year.
- Restore natural hydrological processes to re-wet drained grasslands through blocking of ditches and removal of tree cover. Local water companies and landowners should be made aware of the sensitivity of wet grasslands to changes in water abstraction patterns or groundwater quality.

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https://www.buglife.org.uk/our-work/important-invertebrate-areas/