IMPORTANT INVERTEBRATE AREA PROFILE

South Pembrokeshire Coast

Left: Castlemartin Range © Liam Old., Right: The ground beetle *Harpalus melancholicus* © Mark Telfer

The South Pembrokeshire Coast IIA encompasses the entire coastline of South Pembrokeshire between Tenby and Freshwater West; this includes the military ranges at Castlemartin, Manorbier and Penally, and the flooded valleys near Bosherston. Inland, the IIA also includes the diverse habitats of the historic country house of Orielton (now Orielton Field Centre) and the meadows of Brownslate Farm along the Pembroke River. The IIA includes a diverse range of habitat types including limestone cliffs, sand dunes, coastal species-rich grasslands, coastal heath, freshwater lakes, streams, hedgerows, mixed and broadleaved woodlands (including carr woodland), and rhôs pasture; collectively these habitats support exceptional invertebrate faunas.

The spectacular landscape of the South Pembrokeshire Coast, with its rugged cliffs and headlands, and golden sandy bays and dunes, form some of the finest scenery in southern Britain. Popular for tourism and recreation activities, the South Pembrokeshire Coast includes numerous popular beaches, villages and the notable historic seaside towns of Tenby and Saundersfoot. West of these popular seaside towns, the landscape becomes remoter and more windswept with nucleated settlements dispersed and linked by a network of rural roads. Several military firing ranges are found along the coastline at Castlemartin, Manorbier and Penally, the former supporting a rich variety of internationally and nationally valued habitats and species; this includes species such as the Vulnerable Marsh Fritillary butterfly (*Euphydryas aurinia*) and the rare Shrill Carder Bee

(*Bombus sylvarum*). Sandy bays are backed by sand dunes in some areas, with Broomhill Burrows and Brownslade Burrows being among the largest and best examples. These dunes support a nationally important assemblage of invertebrates that includes the Endangered Strandline Beetle (*Eurynebria complanata*) and the Nationally Rare Square-jawed Sharp-tail Bee (*Coelioxys mandibularis*). Inland from the coastal edge is a generally low-lying, gently undulating agricultural landscape of green fields, hedgerows and small enclosed, often wooded valleys. In the Bosherston area, valleys have been modified to form artificial lakes known as the 'Lily Ponds'.

Reasons for Selection

The South Pembrokeshire Coast IIA supports a nationally important assemblage of invertebrates, with 24 species of conservation concern, including the Pearl-bordered Fritillary (*Boloria euphrosyne*), Southern Damselfly (*Coenagrion mercuriale*), Strandline Beetle and the ground beetle *Harpalus melancholicus*, all of which are classified as Endangered. These important invertebrate populations rely on South Pembrokeshire's vast range of habitats, including limestone cliffs, sand dunes, coastal species-rich grasslands, coastal heath, freshwater lakes, streams, hedgerows, and mixed and broadleaved woodlands.

Key habitats for rare invertebrates in the IIA

Using the Pantheon analytical tool, it is possible to identify some of the key habitats and resources associated with these invertebrate assemblages, as well as some of the key species of conservation concern:

- **Running water** (including drawdown zone – mud/shallow litter; seepages — including soft rock cliff seepage and woodland seepage; wet woodland; wetland vegetation; and woodland streams) e.g. Southern Damselfly and the water beetle *Dryops nitidulus*.
- **Sandy beach** (including saline silt; and tidal litter) e.g. including the ground beetle *Bembidion nigropiceum* and Strandline Beetle.
- **Saltmarsh** (including saline silt; saltmarsh vegetation; and tidal litter) e.g. the long-legged fly *Sciapus maritimus*.
- **Short sward and bare ground** (including calcareous substrates; clay; dung and carrion; exposed sand; litter and ground layer; soil and roots; stones, boulders, shingle and scree; and sward/field layer) e.g. Square-jawed Sharp-tail Bee, the ground beetle *H. melancholicus* and Greater Streaked Shieldbug (*Odonotoscelis fuliginosa*).
- **Tall sward and scrub** (including calcareous substrates; dung and carrion; exposed chalk; exposed sand; litter and ground layer; scrub; soil and roots; and sward/field layer) e.g. including the scarab beetle *Amphimallon ochraceum*, Marsh Fritillary butterfly and the crab spider *Xysticus acerbus*.
- **Arboreal** (including carr/wet woodland; and flowers) e.g. the leaf-rolling weevil *Byctiscus populi* and White-letter Hairstreak (*Satyrium w-album*).

Threats and Opportunities

Coastal habitats

Threats

- The direct loss or damage of coastal habitats to development, sea defences, agriculture, recreation and tourism can reduce wildflower resources in the landscape for invertebrates.
- Coastal defences that interrupt natural processes can lead to the overstabilisation of sand dunes and the loss of bare sand and early successional habitats important for thermophilic invertebrates.
- Overgrazing can lead to a loss of structural variation, and a short sward that lacks the flowers and shelter needed by many invertebrates. Conversely, the abandonment of grazing can lead to scrub encroachment and the loss of important dung resources.
- Invasive non-native plant species (e.g. Rhododendron) can negatively affect the vegetation and structural composition of coastal habitats, as can some 'native' species (e.g. pines on sand dunes).
- Beach cleaning, the removal of washed-up seaweed and other strandline material (e.g. driftwood) can remove vital shelter and breeding habitat for

specialist invertebrates.

- Rising sea levels threaten to inundate key areas of habitat and lead to the permanent loss of habitat extent where land use prevents inland retreat.

Opportunities

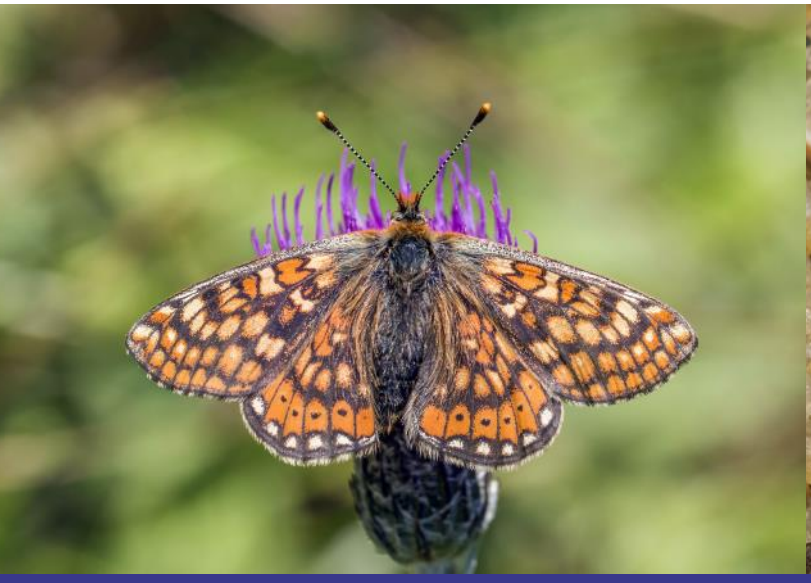
- Avoid development proposals or coastal defence works that threaten coastal habitats and their associated invertebrate fauna.
- Identify opportunities to extend and re-connect patches of coastal habitat, and where coastal habitats can move inland in line with retreating coastlines to mitigate for future losses.
- Control or remove invasive species.
- Remobilisation of sand dunes through scrub control, removal of non-native species, establishment of appropriate grazing levels, etc.
- Continue long-established grazing on coastal sites, but evaluate the level of grazing pressure and reduce where excessive poaching, erosion and loss of a diverse vegetation structure is evident.
- Discourage the burning or removal of strandline material such as driftwood and washed-up seaweed.
- Target restoration work around or near to existing high quality coastal sites, to improve connectivity and to provide opportunities for invertebrates to develop resilient populations.

Cliff top grassland and heath

Threats

- The direct loss or damage of cliff top grasslands to development, sea defences, agriculture, recreation and tourism can reduce wildflower resources for cliff specialists.
- Poor management or implementing the same management approach too widely can lead to uniform habitats that lack varied structure, reducing their value for invertebrates.
- Overgrazing can lead to a loss of structural variation and a short sward that lacks the flowers and shelter needed by many invertebrates.
- Loss of grazing management can lead to areas becoming dominated by thick grass and scrub at the expense of valuable flowery grassland and bare ground; lack of management can also lead to succession to scrub and woodland on heaths.
- The loss of wet habitat features due to changing hydrology can significantly reduce their value for invertebrates.
- Retreating cliff lines have left only a thin remnant strip of cliff top wildflower-rich grasslands, leading to coastal squeeze.
- While well structured footpaths receiving moderate use can be of very high value (e.g. by maintaining open bare ground), excessive recreational pressure can alter vegetation communities through trampling, soil compaction and erosion — this can affect habitat continuity.
- Burning, whether controlled or uncontrolled, can directly kill invertebrates, as well as eliminate food

Left: Marsh Fritillary (*Euphydryas aurinia*) © Charles J. Sharp (CC BY-SA 4.0). Right: Greater Streaked Shieldbug (*Odonotoscelis fuliginosa*) © Tristan Bantock



plants and nesting sites. Fire is a threat to remnant heathlands, with the potential for areas to be irreparably damaged through a single incident.
- Invasive non-native plant species (e.g. Cotoneaster) can negatively affect the vegetation and structural composition of cliff top grasslands and heath.

Opportunities

- Enhance existing species-poor grasslands through changes in grazing management and overseeding/ green haying where appropriate, to improve connectivity between small and isolated cliff top grasslands within the Wales B-Line.
- Where possible, opportunities should be flexible so that they can move inland in line with retreating coastlines to maintain the extent of useful habitat.
- Although valuable in limited amounts or patches, dominant scrub on cliff top grasslands should be removed to encourage wildflower-rich grasslands.
- Review management plans with the aim to produce a mosaic of successional stages, from bare ground in short sward areas, through to tall swards with establishing scrub.
- Manage recreational pressures using fencing and signage to divert people away from sensitive areas.
- Avoid using controlled burning as a tool to manage heathland habitats.
- Create fire-breaks in landscapes vulnerable to frequent fires.
- Control or remove invasive species.

Soft rock cliffs

Threats

- Cliff and coastal protection and drainage schemes can interrupt the dynamic natural processes of erosion and slippage that shape soft rock cliffs, leading to stabilisation and the loss of friable bare ground and flower-rich pioneer plant communities.
- Local water abstraction and drainage schemes can change hydrological regimes and impact on freshwater seepages that are crucial to specialist invertebrates.
- The use of fertilisers and pesticides on adjacent land can negatively impact on water quality and vegetation communities.
- Climate change is anticipated to increase the frequency of extreme events such as winter storms, increasing coastal erosion and the frequency of landslips.

Opportunities

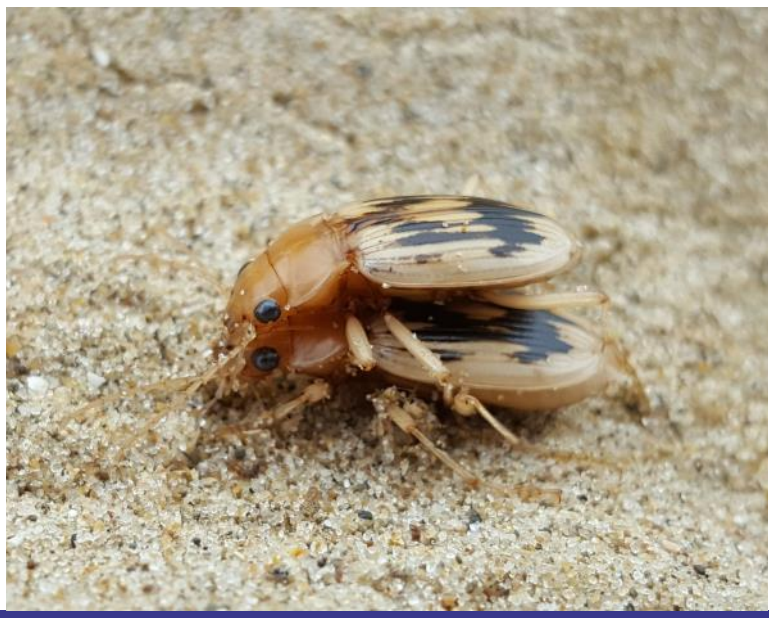
- Maintain cliffs and landslips in a natural state, avoiding any changes to the character of the vegetation (especially with respect to the pollen sources and seepages).
- Ensure Shoreline Management Plans recognise the importance of soft cliffs for biodiversity and avoid damaging management. Any activities that might significantly reduce or accelerate the rate of erosion of soft rock cliffs should be avoided.
- Protect and restore freshwater seepages, including the supply and quality of water.
- Local water companies should be made aware of the sensitivity of cliff seepages to changes in water abstraction patterns or groundwater quality.
- Identify opportunities where habitats can move inland in line with retreating coastlines to maintain the extent of useful habitat.

Running water

Threats

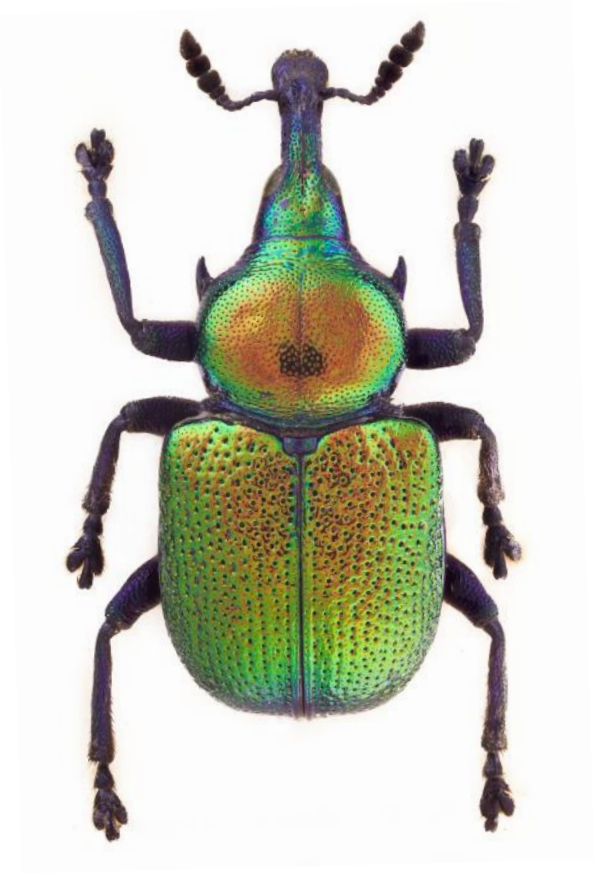
- Water pollution and nutrient enrichment from agricultural run-off (artificial fertilisers, livestock faeces, worm treatments), sewage discharges or

Strandline Beetle (*Eurynebria complanata*) © Barry Stewart



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, water storage and abstraction have modified flows in some rivers and streams, lowered water tables and removed available habitat.
- 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, encroachment of scrub on the channel through the lack of grazing and woodland management can lead to overshading and impact on the dispersal abilities of flying invertebrates to adjacent sites.
- Activities such as ploughing can increase sediment run-off in to streams and rivers. Excessive sediment loading 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 other supportive native plant species and habitats for invertebrates.
- Sedimentation and drying, caused by reduced water flow, can result in the deterioration of shingle bank habitats.
- Light pollution disrupts the lives of nocturnal 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.



The leaf-rolling weevil *Byctiscus populi* © John Hallmén (CC BY 3.0)

<u>Opportunities</u>

- Restore a more natural flow regime by removing barriers such as weirs and culverts and re-profiling watercourses from fast-flowing, straight, deep and steep channels to meandering shallow channels with varying speed in water flows. Where practicable, allow rivers to use their floodplain in times of higher flows.
- Establish vegetation buffers and woodland around running waters to improve water quality and habitat for invertebrates – this helps with trapping non-point source 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 and their faeces will increase nutrient concentrations.
- Reduce excessive bank erosion through the use of stock fencing along watercourses.
- Influence and review lighting strategies around running waters, seeking to reduce or eliminate the use of artificial lighting wherever possible.
- Control or remove invasive species such as Himalayan Balsam and Japanese Knotweed.
- Patterned, roughened or painted glass, or a horizontal light-blocking grid can be used on solar panels to reduce their attractiveness to aquatic invertebrates.

Woodlands and trees

Threats

- Historical damage of woodland through industrial use and large-scale conifer timber planting resulted in direct habitat loss of native woodland, causing a slow recolonisation rate of invertebrates into some of these areas. In present days, woodlands are still lost to development, agriculture or intensive forestry.
- Loss of woodland grazing or management such as maintenance of rides or coppicing, can lead to woodlands becoming over-crowded, shaded, and lacking structural variation, which significantly impacts ground flora vegetation that provides valuable nectar and pollen sources for invertebrates.
- Overgrazing and disturbance where deer (squirrel or rabbit) populations are high prevents young trees from being recruited creating a uniform tree age structure, reduces ground layer vegetation and creates difficulties for woodland regeneration.
- Important veteran trees and decaying wood sources are often at risk from overzealous management, including the tidying-up of standing and fallen trees and collection of fallen material for firewood. Lack of spatial and temporal continuity of veteran trees can affect the dispersal ability of the associated specialist species.
- Fragmentation of woodlands can lead to inability of invertebrates to move between fragments.
- Invasive non-native species (e.g. Rhododendron, conifers) can negatively affect the vegetation and structural composition of woodlands.
- Ash Dieback and other tree diseases and pests, which are exacerbated by climate change, can result in changes in tree species and age composition.

Opportunities

- Overall, aim for a mix of dead wood, healthy live trees, young saplings, scrub areas and open spaces such as glades, rides or scallops. In addition to the increased light levels in the forest, rides create varied woodland edge microhabitats and allow grasses and wildflowers to regrow.
- Consider long-term age structure, aiming to increase the recruitment of young trees and ensuring a continuity of mature trees. This can be achieved through practices such as coppicing and thinning. Additionally, mark out 'future veteran' trees to ensure the existing veterans will be replaced in the future.
- Retain all dead wood, both standing and fallen in situ, and discourage the collection for aesthetic reasons or firewood. Additionally, retain trees showing decay features and do nothing to damage those features.
- Maintain/re-establish light grazing regimes in ancient woodlands to manage understorey vegetation.
- Promote growth of suitable tree species on land between existing woodland sites to extend and reconnect fragmented patches of woodland.
- Control or remove invasive and competitive species such as Rhododendron, Japanese Knotweed and bramble.

Authors: Liam Olds, Lucia Chmurova
Date: July 2023
Version number: 2
https://www.buglife.org.uk/our-work/important-invertebrate-areas/