CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

CARMARTHENSHIRE **CERNYDD CARMEL**

Date of Notification: 1986, 1999

National Grid Reference: SN 580162

O.S. Maps: 1:50,000 Sheet number: 159
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Site Area: 360.0 ha

Description:

Cernydd Carmel is of special interest for its diverse range of habitat types which includes woodland, neutral, acidic and marshy grassland, dry and wet heath and mire systems. Additionally, an ephemeral lake at Pant-y-llyn, known as a turlough, is the only known example occurring in mainland Britain, whilst Caeras quarry, adjacent to Pant-y-llyn is also of special interest, for its pebbly sandstone deposits. The SSSI lies at an altitude of 230m and is located immediately adjacent to the village of Carmel, itself situated between the settlements of Llandeilo and Cross Hands in south-east Carmarthenshire.

Geology/Geomorphology

The geological structure of this area is reflected in its distinctive landscape and underpins much of its ecological and land use diversity. The parallel ridges of southward-dipping Carboniferous Limestone and Namurian quartzite dominate the landscape, with these ridges effectively demarcating the edge of the semi-industrialized South Wales Coalfield. In between these ridges, in the topographical hollow eroded in the Upper Limestone Shales, lies the Gwenlais Valley. Pant-y-llyn runs along the depression that follows the line of the Betws Fault that has displaced the outcrops of both Devonian and Carboniferous Limestone so that they lie on the opposite sides of the valley.

The limestone aquifer and the pattern of rock outcrops have exerted marked controls over surface and groundwater movements in the area, creating a number of karstic features unique in mainland Britain. Most notable of these is the turlough (a type of seasonal lake) at Pant-y-llyn. The aquifer feeding the turlough is extensive and extends for a length of 42km, is about 600m wide from Dyllgoed-Isaf to Pant-y-llyn, and drains in an easterly direction. On the eastern side of Pant-y-llyn the boundary of the aquifer abuts against Devonian rocks displaced southwards along the Betws Fault. This and the fashioning of a glacial meltwater channel along the line of the Betws Fault during deglaciation of the last ice-sheet between about 20 and 15 thousand years ago are effectively the cause of the Pant-y-llyn turlough. Fluctuations in its water level change according to variations in aquifer water storage on its margin. The turlough measures 160m long and the depth of water (up to 3m) reflects seasonal variations in the height of the local groundwater table. The turlough does not have a natural inflow or outflow stream but sometimes overflows through

a man-made culverted overflow when water levels are high.

Caeras Quarry is a disused quarry situated between the villages of Carmel and Pentre Gwenlais. It exposes conglomeratic sands from near the top of the Lower Old Red Sandstone Brownstones Group. The larger clasts in these deposits are of local derivation and they provide evidence of tectonic movements causing local 'basement' erosion. This contrasts with most of the Brownstones Group, which had a source area far to the north. This episode of local sediment derivation may be related to the Ridgeway Conglomerate episode in South Pembrokeshire. This pebbly sandstone is only very locally developed, and this quarry affords the only good exposure of this rock.

Biology

Seasonal Lake

Pant-y-llyn turlough is also of considerable biological interest. There is a clearly displayed sequence of bryophyte, herbaceous swamp and woody plant communities which occupy different depth zones in the basin. True aquatic vegetation is absent and instead, bladder sedge *Carex vesicaria*,silverweed *Potentilla anserina* and the desiccation-resistant moss *Fontinalis antipyretica* dominate.

The invertebrate fauna is diverse, with many crustacean species such as *Chydorus sphaericus, Daphnia pulex* and *Simocephalus vetulus* present, - these also having been recorded in classic Irish turloughs. Because of the seasonality of the aquatic system top predators such as fish are absent, but the lake is locally important for its large population of toads *Bufo bufo*.

Woodland

Situated on the limestone ridge is a series of linear blocks of woodland which are of national importance for their plant communities. The ash-dominated woods are regarded as transitional between ancient woodlands on calcareous soils in southern England and those further north. There are no other comparable woodland areas on limestone known in Wales which exhibit such a richness of flora and intrinsic diversity. There are also great ecological variations between the individual woodland blocks, reflecting both subtly-different ecological conditions and past management. The latter includes coppicing which has maintained the great diversity of plants in the ground flora.

Ash *Fraxinus excelsior* is by far the dominant tree throughout, but with a scattering of mature oaks *Quercus robur*/*petraea*, the latter often as boundary trees. Hazel *Corylus avellana* is predominant in the shrub layer, which also includes species that are regarded as more typical of calcareous woodlands in the south of England - shrubs such as dogwood *Cornus sanguinea*, buckthorn *Rhamnus cathartica*, spindle *Euonymus europaeus* and traveller's joy *Clematis vitalba*. Yew *Taxus baccata* and rowan *Sorbus aucuparia* occur on the site.

The ground flora is diverse and plants such as dog's mercury *Mercurialis perennis*, ramsons *Allium ursinum*, bluebell *Hyacinthoides non-scripta* and wood anemone *Anemone nemorosa* are common. The latter plant supports two species of fungal rust parasites *Tranzschelia anemones* and *Ochropsora ariae* which are rarely-recorded species in Britain. Pignut *Conopodium majus* is often a dominant species in the ground layer, which is unusual compared to other similar

woodlands and its presence is probably related to the effect of access of stock into these woodlands. The nationally rare mezereon *Daphne mezereum* and plants which are uncommon in a Welsh context such as herb-Paris *Paris quadrifolia,* lily-of-the-valley *Convallaria majalis*, toothwort *Lathraea squamaria* and yellowbird's-nest *Monotropa hypopitys* also grow in the woodland blocks. Over a hundred species of mosses and liverworts have been recorded, including the ancient woodland indicator species *Hylocomium brevirostre*.

Generally, the open structure of the woodlands, combined with a great variety of plants, has resulted in a diverse invertebrate assemblage with, for example, Blomer's rivulet *Discoloxia blomeri* occurring on wych elm *Ulmus glabra*. Other invertebrates of interest include the very localized harvestman *Sabacon viscayanum* (which is only known from the Pyrenees and Wales), and the woodland snail *Acicula fusca*. The scarce bee-fly *Bombylius canescens* can be quite frequent in open, sparsely-vegetated areas and there is a recent record of the hornet robberfly *Asilus crabroniformis*.

Neutral Grassland

Most of the grassland areas between the woodland blocks has been subjected to varying degrees of agricultural improvement, but a large expanse of dry, neutral grassland survives at Pwll Edrychiad in the western part of the site. Here, the vegetation is rich in herbs with frequent to abundant common knapweed *Centaurea nigra*, devil's-bit scabious *Succisa pratensis*, common bird's-foot-trefoil *Lotus corniculatus*, tormentil *Potentilla erecta*, eyebright *Euphrasia officinalis* agg. and yellow-rattle *Rhinanthus minor*. Locally frequent species include whorled caraway *Carum verticillatum*, great burnet *Sanguisorba officinalis*, burnet-saxifrage *Pimpinella saxifraga* and betony *Stachys officinalis*. A sizeable population of greater butterfly-orchid *Platanthera chlorantha* is also present.

Additional interest is provided by areas of secondary calcareous grassland associated with old quarrying activities. Prominent species include mouse-ear hawkweed *Pilosella officinarum*, wild thyme *Thymus polytrichus*, fairy flax *Linum catharticum* and glaucous sedge *Carex flacca*.

Pwll Edrychiad is also considered to be of regional importance for its 'waxcap' fungal community, as such communities have declined dramatically in Europe due to the application of inorganic fertilisers. Eleven *Hygrocybe* species have been recorded, including *H. insipida* and *H. quieta*, both of which are included in the European Red Data List. Of special note, however, is the occurrence of the olivaceous earth tongue *Microglossum olivaceum*, a rare fungus which is currently known from only six localities in Wales.

Heathland etc

Lying south of, and parallel to the limestone outcrop, the Millstone Grit quartzite ridge is also of high nature conservation interest. The crest of the ridge is dominated by a mixture of dry heath, bracken and a little scrub, with additional areas of wet heath, damp pasture and locally, dry acidic grassland on the flanks. Areas of bare rock are covered with an interesting and diverse calcifuge lichen flora which includes *Parmelia saxatilis*, *P. glabratula* ssp. *fuliginosa*, *P. omphalodes*, *P. mougeotii* and *Umbilicaria polyphylla*. Stands of dry heath occur extensively over the crest of the ridge where freely draining soils prevail. The vegetation is generally dominated by a sub-shrub community of heather *Calluna vulgaris*, bilberry *Vaccinium myrtillus* and western gorse *Ulex gallii*, with common bent *Agrostis capillaris*, sheep's fescue *Festuca ovina*, heath bedstraw

Galium saxatile and tormentil *Potentilla erecta* present at low cover. Deeper soils support areas of bracken *Pteridium aquilinum* and purple moor-grass *Molinia caerulea*. The latter is extensive on the poorly drained areas at the base of the ridge where heather, cross-leaved heath *Erica tetralix* and deergrass *Trichophorum cespitosum* are frequent.

Mires

Two linear depressions occur south of the main ridge along outcrops of shale where the drainage is impeded and this gives rise to mire type vegetation. Purple moor-grass and common cottongrass *Eriophorum angustifolium* are dominant with bog asphodel *Narthecium ossifragum* and marsh lousewort *Pedicularis palustris* scattered throughout. Lesser butterfly-orchid *Platanthera bifolia* and common twayblade *Listera ovata* have also been recorded from the fringes of this mire. One of the bogs has a well developed 'pool and hummock' topography, with pools supporting floating carpets of the moss *Sphagnum cuspidatum* and the hummocks supporting a variety of other mosses such as *Sphagnum papillosum*, *S. subnitens* and localised occurrences of *S. tenellum*. White-beak sedge *Rhyncospora alba* and the insectivorous round-leaved sundew *Drosera rotundifolia* are also common in such areas. Clumps of royal fern *Osmunda regalis*, a markedly calcifuge species which only thrives in wet acidic and peaty conditions in western Britain where a mild oceanic climate prevails, also occur throughout these mire areas. The local black darter *Sympetrum danae* and the four-spotted chaser *Libellula quadrimaculata* are dragonflies typically associated with these mire systems.

Marshy Grassland

Bordering the mire systems are extensive areas of marshy grassland where the soils are moderately acid. Here, soft rush *Juncus effusus* and sharp-flowered rush *J. acutiflorus* predominate, with marsh bedstraw *Galium palustre* locally abundant. As peat depths increase and waterlogging becomes more frequent the community is replaced by purple moor-grass and tormentil.

Much of the area, especially the limestone ridge, has been exploited in the past for its mineral resource. This has resulted in the formation of numerous quarries over the last 200 years; all of which are at various stages of re-colonisation. Llwynyfran quarry is noted for the presence of the rough horsetail *Equisetum hyemale*, which is only found in scattered localities in Britain.

The caves within the site are known to support both Natterer's bat *Myotis nattereri* and the rare greater horseshoe bat *Rhinolophus ferrumequinum*; it is believed the latter utilise the caves for mating purposes.

Remarks:

Turloughs are listed in Annex 1 of EC Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna.