

The Rhos Pastures of South-west Wales and their Conservation Presidential Address, 10 May 2003

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ABSTRACT

A personal view is presented of rhos pastures, the damp acid, often heathy grasslands which still occur frequently in South-west Wales. Their typical vegetation communities including examples of characteristic species and their survival, management, and social significance are described. The significance of *Carum verticillatum* (Whorled Caraway) in these grasslands, together with several other plants, are examples of species having Atlantic distributions which contribute to the particular character of rhos pastures. The history of the recording of *Carum* in South-west Wales and its distinctive character, together with its often abundant survival on the Carmarthenshire coalfield are explained but the example of the area between Cross Hands and Ammanford is given to illustrate how, in recent years, major losses have occurred due to opencast coalmining, commercial and domestic development and agricultural changes. In view of the apparent ineffectiveness of current protection measures, a plea is made to all concerned, for a concerted effort to conserve and maintain what remains.

I consider it a great honour to be addressing you today, as B.S.B.I. President. My address is on a subject very close to my heart as it was these very grasslands which fired my enthusiasm for field-botany in the early 1970s. I *should* say re-kindled as it was Barry Goater, my school biology master, who gave me my first insight into field botany, some ten years earlier. Just after that time, however, my attentions were drawn to the totally new experience of fossil-hunting, a diversion which was to shape my later life.

After leaving university having graduated in geology, it was my first step on the career ladder, that gave me my first opportunity to acquaint myself with rhos pastures. I had secured a job with the National Coal Board in South Wales and it was not long before I was sent to their outpost in the far-west of the coalfield, the Gwendraeth Fawr Valley of Carmarthenshire, where I supervised drilling-rigs, prospecting for future opencast sites. An immediate thought to strike me was the fact that all the fields in which we were drilling were full of wild flowers and included many orchids! The other concern, of course, only in the back of my mind at that time, was that wherever economic coal-reserves were proved, ultimately these flowery-fields would be destroyed when the coal was opencasted.

This address, therefore, is very much my personal view of these grasslands but I am afraid that it will be only a superficial look as the subject is so wide.

As time went by, my knowledge of the plants to be found in these fields increased, assisted, not inconsiderably, by Mrs Irene Vaughan, the then B.S.B.I. Carmarthenshire Vice-county Recorder. In fact, in 1974, one of our first outings together was to a disused colliery site at Great Mountain, near Cross Hands, which included associated unimproved pastures, where, I think, even she was impressed by the range of species I showed her (Pryce 1974).

Of course, in those far-off days, the term *rhos pasture* had not yet been coined, but looking back, that is exactly what we were examining. My good friend Stephen Evans, then the Nature Conservancy's Assistant Regional Officer in South-west Wales and a very knowledgeable all-round naturalist, tells me that it was his colleague, Chris Fuller who first used the term in order to be able to refer easily to this rather nebulous grassland habitat. It is, of course, not an invented word but is derived from the Welsh *rhos* meaning *moorland* and was intended to convey the impression, particularly amongst the Welsh farming community, of unimproved, heathy pastureland, worthy of conservation for its floral and faunal diversity.

The term was originally used to describe unimproved acid meadows or pastures which typically included an element of dwarf-shrub heath, maybe 10% or 20% *Calluna vulgaris* (Heather) which reflects the fact that they are derived from the overgrazing of heathland as has been demonstrated

at Dowrog Common in Pembrokeshire (S. B. Evans, pers. comm.). However, the term seems since to have come to be used in a wider sense, a sign of the characteristically diverse nature of these grasslands resulting from small-scale variations in such factors as hydrology, soil origin, soil chemistry and physical characters, variations which are destroyed by cultivation and intensive farming practices. The majority of sites are well on the acid side of neutral, having a pH of 4.5 to 5.5 with soils being damp and clayey and slow to warm-up in the spring. In my address I will use this wider concept as I think it important that the whole range is considered in conservation terms.

Vegetation reminiscent of rhos pasture is, of course, not confined to South-west Wales and comparable vegetation is found along the Western European seaboard from the uplands of northern Portugal and North-west Spain, through Brittany, Devon and Cornwall (where it is broadly similar and known as Culm Grassland), north to South-west Scotland and east to Belgium and Germany. But I was surprised to learn how restricted this vegetation is in most of these areas, with only the Scottish stands approaching the extent of those in South-west Wales. In all areas it remains under extreme pressure from agricultural improvement, development and neglect.

Grassland cannot be considered as climax vegetation in South Wales and depends upon man's intervention for its maintenance. Over the last 5000–6000 years the gradual removal of the native broad-leaved forest together with the introduction of domestic grazing animals have created and maintained a more open face to the landscape. The local soils are generally derived from sticky, impervious, acid, glacial boulder-clay, which blankets the bedrock and often exceeds 10m in thickness. Drainage is often further impeded by the formation of a ferruginous pan in the soil at around 20–30cm depth. Variations in topography and the inherent poor drainage also provide an opportunity for the deposition of thin peaty layers locally and may further have developed to blanket peat or even small raised-bogs where the topography is suitable. Additional diversity is provided where seepages and flushes have developed their own characteristic vegetation. Flushes, whilst generally acid, may be base-rich locally, particularly where water arises from the Carboniferous Limestone or from base-rich strata in the Old Red Sandstone or Farewell Rock. Base enriched water may also arise from pockets of glacial material derived from these rocks.

Although rhos pastures would have been considerably more extensive in the past, modern agricultural so-called 'improvement' has virtually eliminated them from all the currently intensively-farmed areas except in valley bottoms where drainage would be uneconomic. However, traditional farming practices, to some extent, even now remain a way of life in the Carmarthenshire coalfield and also still continue on parts of the northern flank of the Black Mountain (Mynydd Du). The most extensive unimproved or little-improved grasslands remaining in South Wales today are, therefore concentrated in these areas. The reason for their survival in the coalfield is because land holdings were invariably small with production only needing to provide a supplement to the main source of income from the mines or other local industries. On the flanks of the Black Mountain, however, their survival may be because the farm-holdings are linked with extensive common mountain-grazing rights which allowed less intensive use of the in-by land in summer (Bevan 1999).

The National Vegetation Classification (Rodwell 1991 *et seq*) has provided a means of characterising the range of vegetation communities typical of rhos pastures. The high rainfall of the region strongly favours the formation of damp and wet grasslands on the acid, clayey soils and it is not therefore surprising that the most extensive N.V.C. communities are Rush pastures and Purple Moor-grass mires.

The M23 *Juncus effusus/acuteiflorus* – *Galium palustre* rush pasture community is the most extensive and is characteristically dominated by either *Juncus effusus* (Soft Rush) or *J. acuteiflorus* (Sharp-flowered Rush) with other species generally at much lower cover. Poaching by livestock often leads to the creation of less diverse stands and this may be exacerbated by applications of lime or basic-slag. *Juncus conglomeratus* (Compact Rush), *Molinia caerulea* (Purple Moor-grass), *Holcus lanatus* (Yorkshire Fog) and *Agrostis canina* subsp. *canina* (Brown Bent) are often abundant or frequent components, as are various characteristic sedges including *Carex panicea* (Carnation Sedge), *C. echinata* (Star Sedge) and *C. viridula* subsp. *oedocarpa* (Common Yellow-sedge). Herbs generally include *Galium palustre* (Marsh Bedstraw), *Lotus pedunculatus* (Greater Bird's-foot Trefoil), *Angelica sylvestris* (Common Angelica), *Lychnis flos-cuculi* (Ragged Robin), *Ranunculus flammula* (Lesser Spearwort), *Cirsium palustre* (Marsh Thistle) and *Dactyloriza maculata* subsp. *ericetorum* (Heath Spotted-orchid) and less frequently *Scutellaria minor* (Lesser Skullcap), *Wahlenbergia hederacea* (Ivy-leaved Bellflower), *Anagallis tenella* (Bog Pimpernel) and *Serratula tinctoria* (Saw-wort).

The next most common community is the M25 *Molinia caerulea* – *Potentilla erecta* mire. It tends to be very variable and the degree of dominance of *Molinia* depends to a great extent on its management. Neglected and poorly-grazed stands quickly become tussocky to the exclusion of most other species although *Potentilla erecta* (Tormentil) is generally present even in the most impoverished examples. *Molinia* dominance is kept in check by grazing and when moderately or even heavily grazed, species-richness is preserved. The species I've mentioned as being associated with the rush-dominated grasslands are also common here. Some stands include a heathy element with the presence of *Erica tetralix* (Cross-leaved Heath) and *Calluna vulgaris* (Heather) reflecting their original conversion from dwarf-shrub heath into pasture by intense grazing and burning. Indeed, where the cover of this dwarf-shrub element increases, M25 mire can grade into M15 *Scirpus cespitosus* – *Erica tetralix* wet heath. The wettest M25 stands may include significant amounts of *Sphagnum* and *Polytrichum commune* mosses and support extensive populations of *Narthecium ossifragum* (Bog Asphodel). Flushed stands may commonly grade into M6 *Carex echinata* – *Sphagnum recurvum/auriculatum* mire or, rarely, where the seepages are more base-rich, M10 *Carex dioica* – *Pinguicula vulgaris* mire.

Where a degree of base-enrichment is present in the soil, the M24 *Molinia caerulea* – *Cirsium dissectum* fen meadow may occur. This is a less common community in the dominantly acid, boulder-clay derived soils of the region but where present, *Cirsium dissectum* (Meadow Thistle) can form dense stands with an additional suite of characteristic base-demanding sedges including *Carex flacca* (Glaucous Sedge), *C. hostiana* (Tawny Sedge), *C. pulicaris* (Flea Sedge) and *C. pallescens* (Pale Sedge). The most diverse stands may also include less frequent species such as *Serratula tinctoria*, *Anagallis tenella*, *Genista anglica* (Petty Whin), *G. tinctoria* (Dyer's Greenweed) and *Carex montana* (Soft-leaved Sedge).

In better-draining soils which, for example, may occur on the crests or slopes of drumlins or other glacial features or where the drift is less clayey, typical wet rhos vegetation may give-way to N.V.C. MG5 *Cynosurus cristatus* – *Centaurea nigra* grassland where, as well as *Cynosurus cristatus* (Crested Dog's-tail) and *Centaurea nigra* (Common Knapweed), *Agrostis capillaris* (Common Bent), *Anthoxanthum odoratum* (Sweet-Vernal-grass) and *Festuca rubra* (Red Fescue) may be abundant and species such as *Lotus corniculatus* (Common Bird's-foot Trefoil), *Rhinanthus minor* (Yellow Rattle), *Trifolium pratense* (Red Clover), *Sanguisorba officinalis* (Greater Burnet), *Danthonia decumbens* (Heath Grass) and *Briza media* (Quaking Grass) may also be prominent. Similar damp grasslands managed traditionally as hay fields, now very reduced in number, characteristically have often included abundant dactylorchids, *Vicia orobus* (Wood Bitter Vetch), *Ophioglossum vulgatum* (Adder's-tongue), *Platanthera chlorantha* (Greater Butterfly-orchid), *P. bifolia* (Lesser Butterfly-orchid) and *Genista tinctoria*.

Succisa pratensis (Devil's-bit Scabious) is often common in these grassland types and is present in varying amounts, generally dependant upon the management to which the fields have been subjected. It may be greatly favoured by the selective grazing of horses and ponies to which it is unpalatable. *Succisa*, of course, is the food plant of the rare and declining Marsh Fritillary Butterfly, the larvae of which, after hatching in August, spin themselves protective webs. They forage on the *Succisa* leaves and grow to a sufficient size before hibernating in the shelter of the vegetation particularly at the bases of *Molinia* tussocks or in leaf-litter close to the soil. They emerge on sunny days in February and March before feeding-up and pupating to metamorphose into adults which appear in late May or early June. Grassland management is critical for the butterfly as too little grazing results in the dominance of tussocky *Molinia* and extermination of the *Succisa*, whilst too heavy grazing, particularly horse grazing, although favouring *Succisa*, will not maintain the vegetation structure required for larval shelter during winter.

Several plant species which I have mentioned can be regarded as having purely Atlantic distributions although many dominants such as *Molinia caerulea* tend to be more widespread. It is, however, the association of the Atlantic species which contributes to the character of rhos grassland vegetation. These include, for instance, *Cirsium dissectum*, *Erica tetralix*, *Genista anglica*, *Scutellaria minor*, *Vicia orobus* and *Wahlenbergia hederacea*, as shown on Fig. 1, but, without doubt, the most characteristic species in South-west Wales is *Carum verticillatum* (Whorled Caraway) which when growing abundantly, may turn fields white with its flowers in summer (Photograph 1).

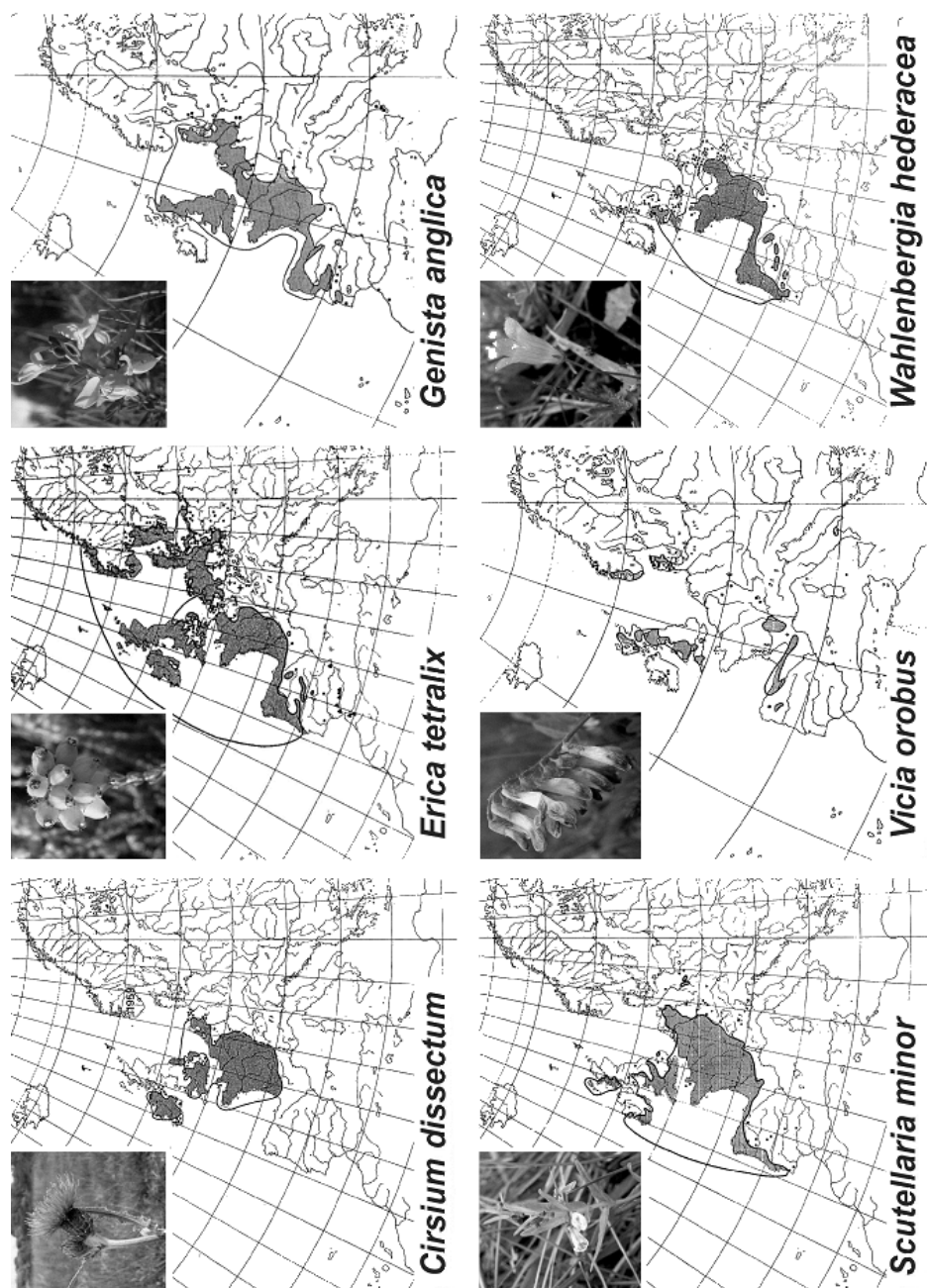


FIGURE 1. Some characteristic rhus pasture species showing their Atlantic distributions. (from Meusel *et al.* 1976, 1978, 1992).



PHOTOGRAPH 1. Hay-meadow with abundant *Carum verticillatum* (Whorled Caraway) on the Carmarthenshire coalfield.

Carum was first recorded in the region on Friday 23 July 1773 by the Rev. John Lightfoot and Sir Joseph Banks, during their botanical tour of Wales. A few years previously, Joseph Banks had undertaken important botanical and astronomical work during Capt. Cook's voyage to the southern hemisphere. But safely back on British shores, he and Lightfoot travelled westwards through South Wales, enjoying accommodation in Carmarthenshire with the Williams family at Edwinsford near Talley, before continuing on to Pembrokeshire. They noted "*Sison verticillatum* [*Carum verticillatum*] in a low moist meadow on the left hand of the Road adjoining to a small bridge call'd Pelcombe Bridge 1½ miles from Haverford West in the way to St. Davids, in Abundance in Flower". During their return on Monday 26 July, they again noted the abundance of the species at Narberth, Lanreed near St. Clears, and then "*the same afterwards for 6 miles together in almost all the low moist meadows between St. Clears and Carmarthen*". They made notes on the abundance of the plant between Llandeilo and Llandovery and also in the area around Edwinsford. They concluded that "*it is a common plant in moist and boggy meadows in the 2 Counties of Pembroke and Carmarthen*". A specimen collected by them at the time is now in the herbarium of the Natural History Museum in London (BM).

Lewis Weston Dillwyn of Penllergaer near Swansea, an accomplished botanist in the Victorian tradition and President of the Royal Institution of South Wales, which was founded as a result of his sponsorship, in his *Materials for a Fauna and Flora of Swansea and the Neighbourhood* of 1848 also made reference to the frequency of *Carum verticillatum* and that it was "*Abundant in moist pastures throughout the neighbourhood*".

And so recording of *Carum* and its associates continued over the succeeding years.

Carum verticillatum is an umbellifer, a member of the Apiaceae, which generally grows to about 0.5 m in height with very distinctive, simply divided, pinnate leaves which give the impression of being whorled. The plant is a biennial or short-lived perennial and can be recognised at most times

of the year, except in the dead of winter, as the leaf rosette appears early, being usually recognisable by late February. The main flowering season is from the end of June and through July but some flowers are often produced though into October.

Carum verticillatum reaches its greatest abundance in the traditionally managed fields of the Carmarthenshire coalfield, and although it is often frequent into east and north Pembrokeshire, Ceredigion, west Breconshire and west Glamorgan it seldom attains such profusion. *Carum* occurs in all the N.V.C. communities I have mentioned with the possible exception of M10 but reaches its greatest abundance in M23 rush pasture. The best shows I have seen have occurred in meadows where stock has been excluded prior to their being cut for hay in July or August. This allows the plants to flower profusely. The hay-cut is then followed a few weeks later by young cattle being turned out to enjoy the aftermath grazing. Spring, summer and autumn grazing by cattle or ponies has also been cited as a good method of maintaining the vegetation but in my experience this practice may result in the fields becoming degraded in time, due to poaching and selective grazing, particularly if ponies are used. Unless periodically rolled and mown, rushes and undesirable coarse species will increase in dominance to the detriment of species-diversity. Furthermore, if grazed throughout the season, these fields will obviously never flower as profusely as those shut-up for hay!

Fig. 2 shows that *Carum* is strongly Atlantic in its distribution and decidedly western in Britain but it only occurs in a few areas in Ireland. However, the Carmarthenshire distribution as shown by the tetrad map is misleading in as much as, although the species occurs in virtually all tetrads in the coalfield area (ie the south-east of the county), the map-dots would indicate a similar occurrence of the plant elsewhere. This is in fact not the case, as although there *are* meadows away from the coalfield where *Carum* is abundant, they are much fewer in number and the majority of populations are confined to relatively few plants in relict valley mires or field corners or to even fewer plants in flushes at stream heads and water-collects.

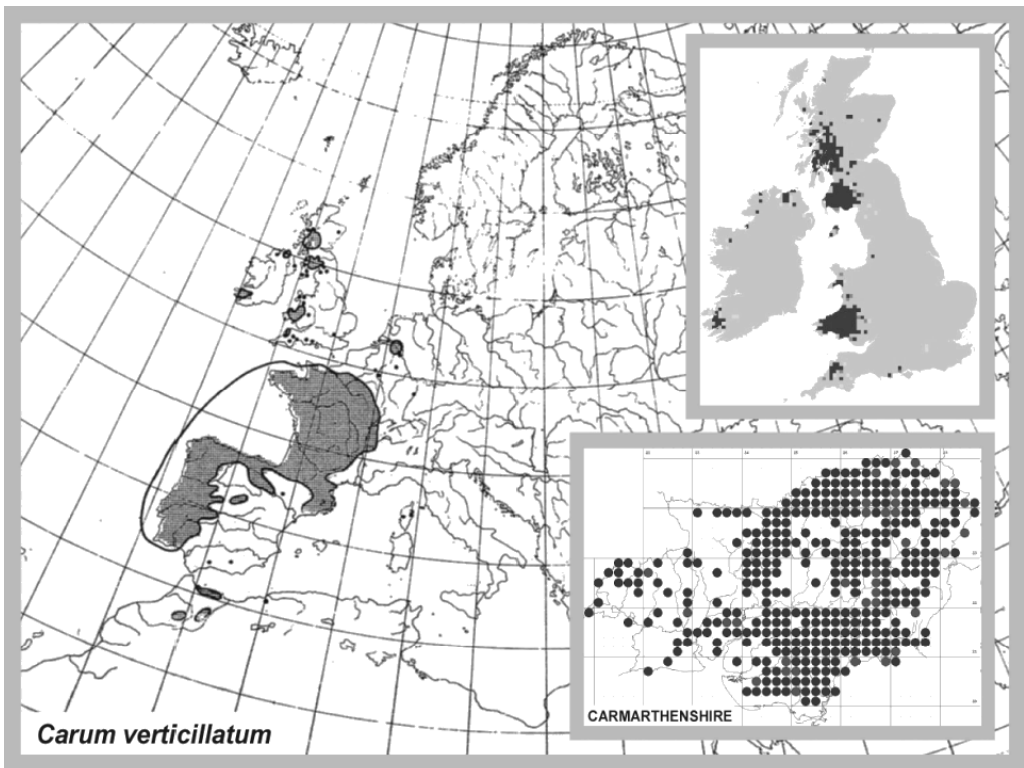


FIGURE 2. Distribution maps of *Carum verticillatum* (Whorled Caraway).

Carum will tolerate a degree of agricultural improvement and a field, which produced one of the most impressive displays of flower that I can remember, was one having received light doses of inorganic fertilizer over the years and which was very species-poor. It supported abundant *Juncus*, *Holcus lanatus* (Yorkshire-fog), *Carex ovalis* (Oval Sedge) and *Carum* but little else!

We are fortunate in South-west Wales to have retained a relatively extensive unimproved grassland resource but as I intimated earlier, it is under extreme pressure from agricultural improvement, commercial development and neglect.

As an example of the demise of rhos pastures and unimproved grasslands in general, I will concentrate on a small area of the Carmarthenshire coalfield between Cross Hands and Ammanford, which includes an area known historically as Mynydd Mawr and which, currently, has a particular abundance of rhos pastures and unimproved grassland (Fig. 3). A map of the same area dated 1813 shows Mynydd Mawr as unenclosed commonland, presumably dominated by woodland, scrub and wet-heathland (shaded on Fig. 4). Enclosure facilitated the intensification of farming practices with burning and heavy grazing converting the natural vegetation to grassland as the 6 inch Ordnance map of about 1860 shows (Fig. 5). Up until the 1950s these grasslands would have been managed traditionally without inputs of artificial fertilizers and would have retained their floristic diversity. And for many years since that date, the majority remained traditionally managed.

In response to perceived losses as agricultural intensification and other pressures gained ground, a *Survey of Wet Pastures Characterised by Whorled Caraway* (*Carum verticillatum*) in the *Carmarthenshire Coalfield* was commissioned in 1978 by the then Nature Conservancy Council (Jones & Hill 1978). The survey map is difficult to interpret in its raw state so, to make it more clear, I have shaded the enclosures examined (Fig. 6). Although carried out prior to the characterisation of the vegetation by the N.V.C. and using a simple classification system, this first survey provides a valuable baseline inventory of the resource at that time.

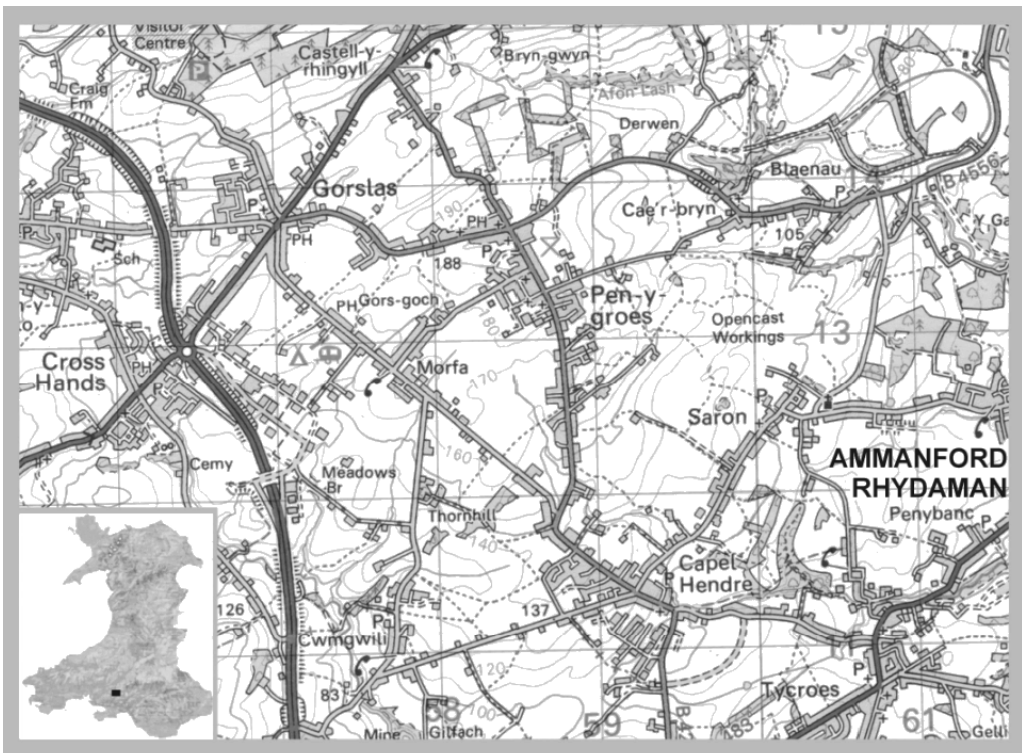


FIGURE 3. Location of Mynydd Mawr in relation to present day topographic features.

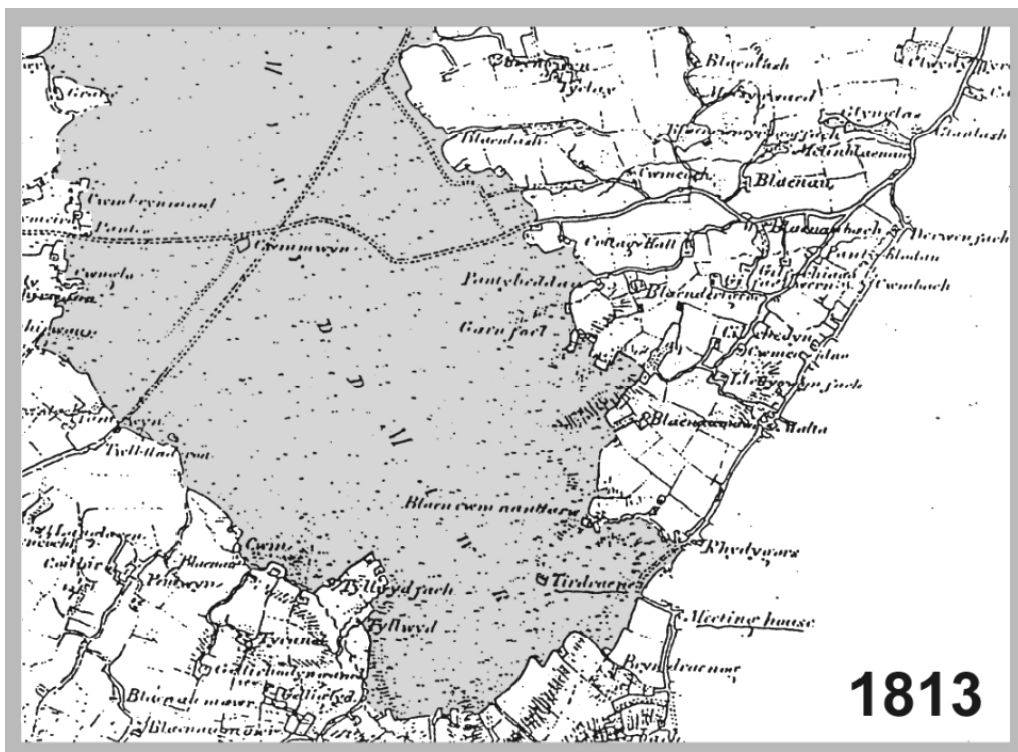


FIGURE 4. Mynydd Mawr common as depicted on a map of 1813.

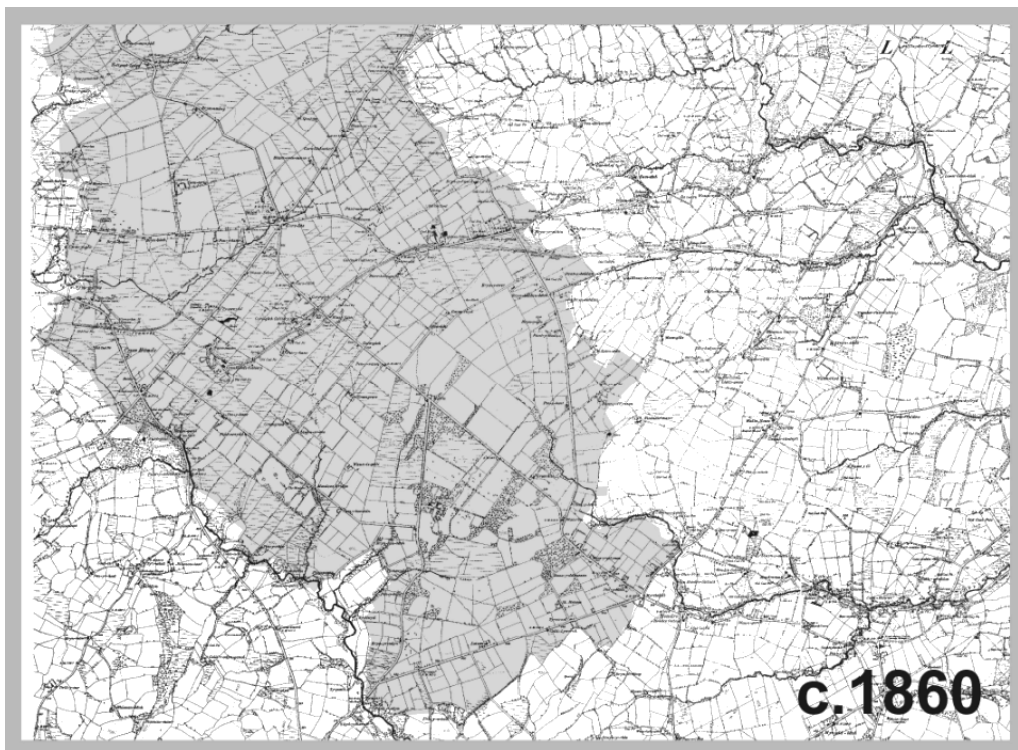


FIGURE 5. Mynydd Mawr after enclosure (shaded) as shown on the Ordnance Survey map of c. 1860.



FIGURE 6. Extent of the *Carum* survey carried out by the Nature Conservancy Council in 1978.

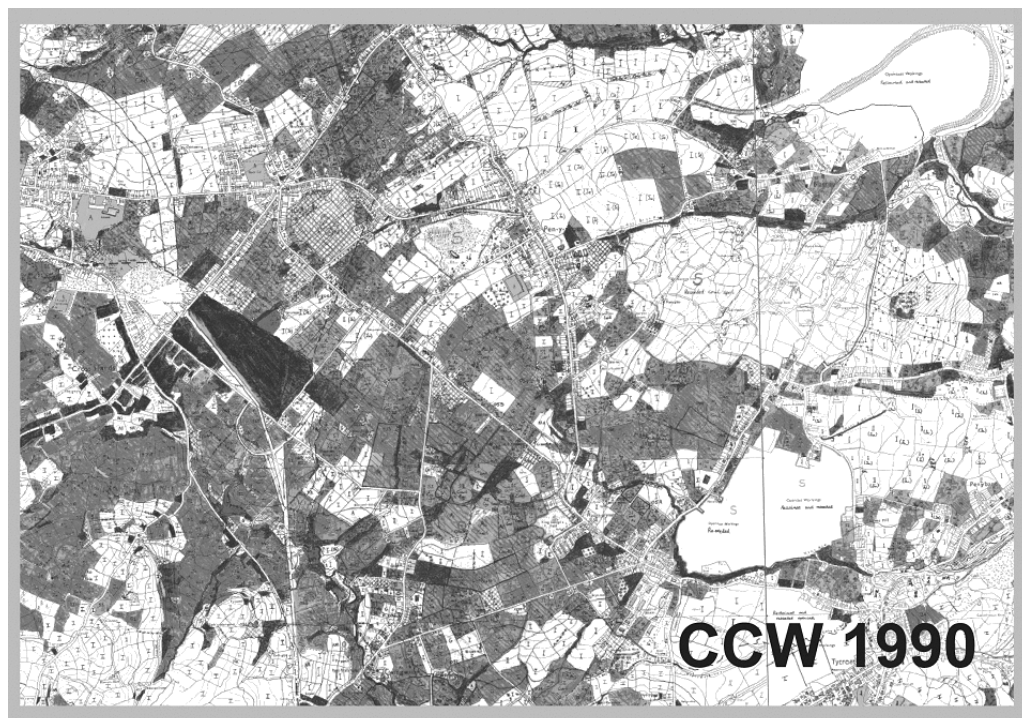


FIGURE 7. Phase 1 survey, N.C.C., 1990.

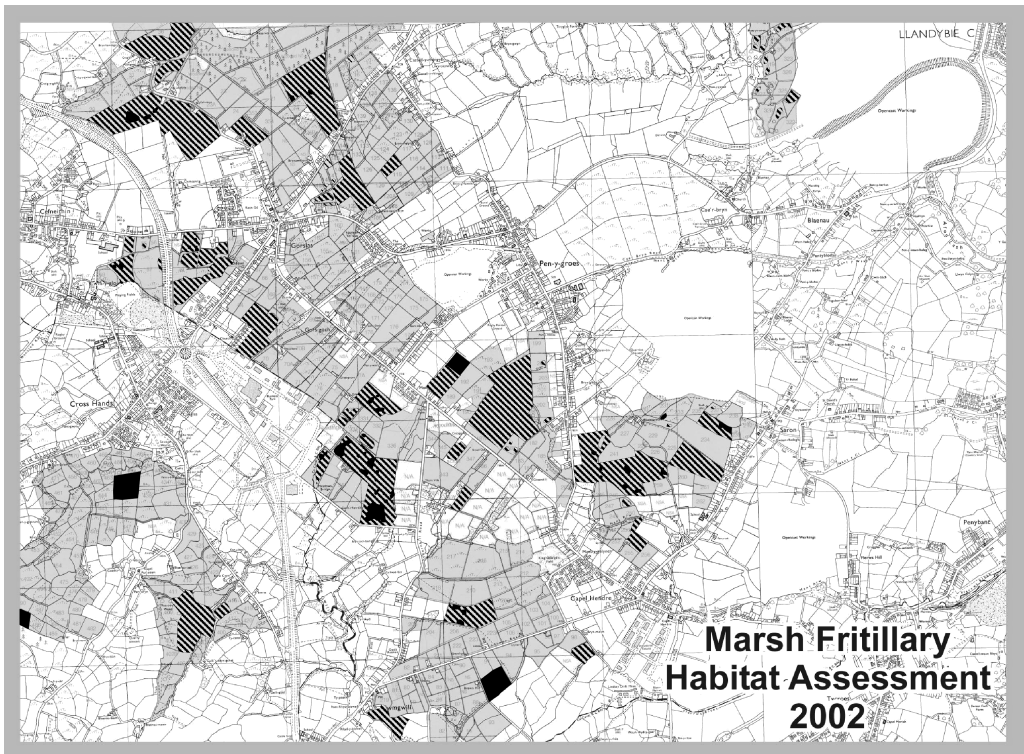


FIGURE 8. Grassland habitat assessment, winter 2001/2. Fields examined shown grey, those in favourable condition, black and those capable of relatively easy re-instatement, hatched.

The area was examined again in 1989 when the Nature Conservancy Council undertook its Phase 1 survey of the district (Fig. 7) but, with the exception of detailed N.V.C. surveys of the best sites and some site examination by field botanists recording for the Carmarthenshire Flora Project and by me as B.S.B.I. Recorder, there has been no comprehensive update since that time except that selected areas were re-surveyed in winter 2001–2 with a view to determining their suitability for designation as a candidate Special Area of Conservation for the declining Marsh Fritillary butterfly population. I must emphasise that this survey was not a botanical survey but can be taken as a measure of habitat quality in terms of species diversity and vegetation structure. It covered much the same ground as the 1978 *Carum* survey and this result confirmed that very few of the enclosures examined were in a favourable condition for the butterfly, and it may be implied, therefore, that the state of their vegetation communities was also poor. On Fig. 8 the grey areas indicate the fields surveyed but only the few black areas were found to be in good condition whilst the hatched areas were judged to have potential for straightforward restoration. The tiny extent of the black and hatched areas is alarming.

What this succession of surveys has confirmed is the extent of the losses to these unimproved grassland habitats in recent years. A few sites have been protected by their notification as Sites of Special Scientific Interest (S.S.S.I.) (Fig 9) but the system of designation of so-called second tier sites in Local and Unitary Development Plans (variously known as *Sites of Importance for Nature Conservation*, *Sites of Nature Conservation Importance* or just *Wildlife Sites*) has not so far caught up with the Local Authorities in West Wales, although, in England, some Authorities have been using such designations for at least the past twenty years. The designation of these sites can provide a very important early warning of inappropriate development located in sensitive sites.

Opencast coal mining, a major cause of losses from the 1960s to mid 1990s has now subsided considerably, largely as a result of more strict legislation, the public objection to its impact on the environment, the demise of British Coal and, not least, because suitable shallow coal reserves are



FIGURE 9. The locations of Sites of Special Scientific Interest in the area.

largely exhausted. It was always argued that opencast mining cleared dereliction by greening the land and returned it to its former state. While that was true to an extent, another primary reason was because it was a cheap source of coal and was very profitable. Generally a far greater area than just the derelict land was taken in to provide a mine of economically workable size, which, of course, invariably meant the loss of peripheral fields of high nature conservation value. Restoration on the completion of mining invariably consisted of sowing the site with Rye-grass and clover leys of minimal ecological value. These were difficult to manage because of the lack of soil structure which resulted in waterlogging in winter and excessive drying-out in summer. With traditional low-key farm management, the result after twenty or thirty years is an N.V.C. MG10-like coarse, rush-dominated grassland comprising of Soft Rush and mosses and a few common forbs such as *Cardamine pratensis* (Lady's-smock) and Creeping Buttercup (*Ranunculus repens*). Agricultural productivity is also minimal. Experiments to restore some species diversity by the introduction of turves, containing *Carum* and other rhos pasture species to restored land, were unsuccessful. The plants did not grow well and soon died-out, and the little seed which was produced, would not easily germinate in the alien conditions (Medcalf 1989 & 1990). Where restored land is more intensively farmed, there is also little likelihood of traditional rhos pasture vegetation becoming re-established due to the changed hydrology and topography, frequent high nutrient inputs and the high sheep-grazing intensity needed to control the constant threat of rush infestation. Furthermore, the restored fields, being of a size to facilitate more efficient agricultural working, are completely alien to the traditional small field pattern of the pre-opencasted land and therefore have an adverse landscape impact.

Another major cause of rhos pasture destruction has been the large-scale development of business parks, often joint ventures between Local Authorities and the Welsh Development Agency. Again the emphasis has been given to the clearance of derelict land and, in my example area, the Cross Hands Colliery tips have been re-contoured to provide the development plateaux for the Cross Hands Business Park. However, large areas of adjacent unimproved grassland, including some former Marsh Fritillary butterfly breeding sites, have also been destroyed in

association with the scheme. Here, as elsewhere, the wildlife may have a last stand, albeit temporary, as these new open sites are colonised by protected or Biodiversity Action Plan breeding birds and mammals including Little Ringed Plover, Lapwing, Curlew, Skylark and Brown Hare.

So have we come full circle with the unenclosed common of 200 years ago now being replicated, to some degree, by the replacement of the many small fields by expanses of restored open-cast land and development plateaux? Fig. 10 shows the extent of such land in my example area with the light shading representing the unenclosed land of the pre 1813 Mynydd Mawr Common, the dark shading in the eastern half of the map showing the extent of habitats lost to open-cast, and the medium shading in the west, the Cross Hands Business Park and the A48 dual carriageway. This figure does not show the amount of land lost to new housing development.

Locally, house building has, in recent years, also caused considerable losses especially along road-frontages where the Local Planning Authority has been notorious for allowing ribbon-development, seemingly unchecked, which now links most of the previously discrete villages. This practice has resulted in many examples of unimproved grassland being lost or damaged, including a rhos pasture S.S.S.I. This problem continues, not least, because much of this land has been designated in the past as development land in the Local Structure Plan, and therefore might expose the local authority to compensation payments to the land owner should its designation be reversed.

The small farms were always barely viable or merely provided a supplement to the main income and now that their owners are getting older or passing-on, they are too work-demanding and not large enough or sufficiently productive to sustain a viable living. The neglect of appropriate management has now, therefore, taken over as possibly the most damaging factor causing rhos pasture losses. Absence of grazing allows scrub colonisation and *Molinia* domination. Reinstatement of this neglected land is expensive and requires many years' commitment as well as management-awareness and even then may not be entirely successful. Mechanical trashing of tussocky *Molinia* generally requires the employment of specialist equipment and scrub clearance is equally expensive, time consuming and laborious.

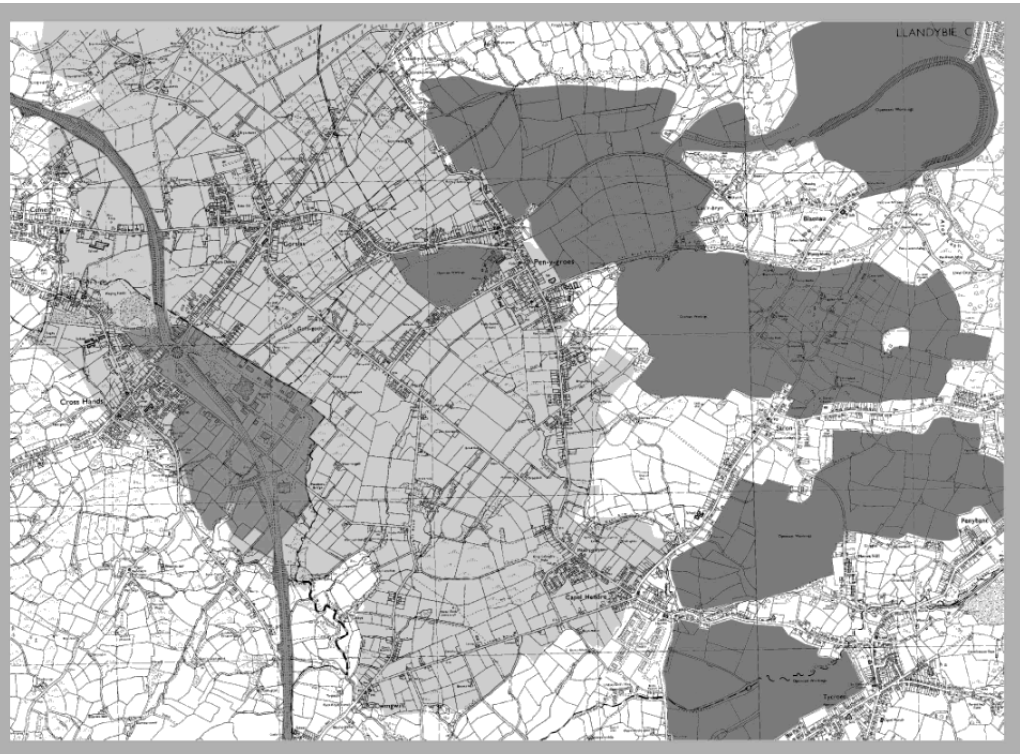


FIGURE 10. Areas lost to open-cast (dark grey, generally in the east) and business parks and dual-carriageway (medium grey in the west) compared with the original Mynydd Mawr Common (in light grey).

Although a few fields have been designated as S.S.S.I.s and should, in consequence, be relatively safe from degradation, it might be expected that Tir Gofal, the whole-farm, Wales-wide countryside stewardship scheme, would be instrumental in conserving rhos pastures and unimproved grassland by encouraging the farming community to do just that, I have no doubt that it is of benefit. We hope that the days are gone when countryside stewardship meant excavating a pond or tree-planting on the most species-rich wet areas on your farm. Nowadays, the Tir Gofal budget is £16.8m per year for spending on such things as fencing, increasing access, woodland maintenance and planting, set-aside and less intensive grassland management but I fear that the most important targets for conservation – the areas which need the most care in their management and protection – are not being thoroughly addressed. There certainly appears to be little feedback on how such payments have actually benefited the conservation or re-instatement of our valuable grasslands.

Contrast this £16.8m per year with the mere £2.6m being spent in Wales to maintain our Sites of Special Scientific Interest, the sites which we are constantly being told are the ‘*Jewels in the Crown*’ of our wildlife heritage. Even worse, only £15000 is being spent on S.S.S.I.s in Carmarthenshire, most of which will be accounted for by existing management agreements, ie annual payments, and many of these will not be grassland sites. This leaves very little scope for new management works which are so desperately needed to arrest the decline of sites through neglect. It also begs the question as to whether available money is being channelled towards the most urgent and effective conservation targets.

It was intended that the Countryside and Rights of Way Act, which has been in force since January 2001, would give added protection to existing S.S.S.I.s by requiring landowners to manage them appropriately and not allowing their decline by neglect. But what do we find?

Schedule 9 section 28P (6) of the Act states “*A person who without reasonable excuse intentionally or recklessly destroys or damages any of the flora, fauna, etc is guilty of an offence*”. The key to the interpretation of this paragraph is the phrase “intentionally and recklessly” and this is where any competent barrister would interpret “neglect” as not constituting a positive action, rather, it is an inaction and deemed not to be intentional and reckless. Not surprisingly, S.S.S.I.s are still being lost by neglect. This loss, of course, takes no account of the far more extensive losses being allowed to occur at other important, but undesignated, sites.

I am afraid that nature conservation continues to be a very poor relation to any enterprise which might make or potentially make money or bring in jobs or votes. I acknowledge that we in South-west Wales may be better off than many areas where losses have been so severe as to have all but eliminated these habitats, but this fact alone, must only increase our duty to conserve and preserve what we have left.

At the root is the fact that the vast majority of the population is becoming increasingly divorced from the natural environment, has no idea what is necessary for its continued well-being, is now too young to remember the flower-rich countryside, is ignorant of the facts and, as a consequence, doesn’t care. The education system provides little, if any, instruction in such matters and even enthusiastic teachers of the subject are stifled by the sheer lack of time allowed in the national curriculum and over-zealous safety regulations which frustrate field studies. There continues to be a massive under resourcing of “whole-organism” biology teaching, although the government has at last recognised a, so-called, “*Taxonomic Impediment*”. This is resulting in, for example, many environmental assessments for developments being of very poor quality and recent conservation directives and legislation being made unworkable as a consequence of the shortage of people with the necessary field-skills essential for their implementation.

The picture that I have painted is not encouraging and I appear to have introduced more problems than solutions. In order to address this continuing decline, the Welsh Assembly must ensure that the S.S.S.I. “*Jewels in the Crown*” are comprehensively funded and effectively managed through C.C.W. Furthermore, the S.S.S.I. series must be extended to reflect the need for wide-ranging rhos pasture conservation. A comparison of Figs 6, 7 and 8 with figure 9 shows the poor degree of protection given to our rhos pastures by the present series of S.S.S.I.s. I’m forced to say, that maybe the saving grace will be the precarious state of the Marsh Fritillary butterfly. This has precipitated action to propose the best remaining rhos-pastures and unimproved grassland sites in the Cross Hands area as a Special Area of Conservation in an attempt to maintain the butterfly population.

But it is no good just to declare areas as protected sites. Constant monitoring and resurvey must also be introduced, maybe under the umbrella of the Tir Gofal whole-farm countryside stewardship scheme. This would ensure that farmers who have received payments are actually producing the required results.

Local Authorities should, as a matter of urgency, introduce the designation of second tier nature conservation sites in their Unitary Development Plans. These embody a degree of protection and development control planners could easily access them through their GIS systems. They should not, as in the case of Carmarthenshire, delete from the Draft Unitary Development Plan, the few Sites of Importance for Nature Conservation which are already identified and accepted in a current, adopted Local Plan which relates to part of the county.

Developers, local authorities and the W.D.A. should ensure that basic ecological assessment is undertaken *prior* to site acquisition and areas found to be of ecological importance should be left untouched.

Both central and local government should ensure that basic education at all levels includes teaching on the appreciation and fundamentals of the natural environment. Central support of the National Botanic Garden of Wales would go some way to achieving this.

But to try to conclude on a positive note,

- C.C.W. have in the past designated several rhos National Nature Reserves in Ceredigion, and S.S.S.I.s elsewhere and they are pressing ahead with proposals for the Mynydd Mawr c.S.A.C.
- There are many farms within the Tir Gofal scheme that include areas of rhos grassland which presumably are being managed appropriately (although it is often the case that only the more intensive farms are entered into the scheme whilst the unimproved grasslands in the ownership of smallholders or less-commercial enterprises, do not receive payments, resulting in their continued loss).
- Plantlife International continues to grow in stature with a rapidly increasing membership and has acquired an important rhos pasture holding at Cae Blaen Dyffryn in Carmarthenshire
- Butterfly Conservation own a rhos-grassland site in the Cross Hands area which it manages for its Marsh Fritillary butterfly population and as a result ensures the well-being of the habitat
- the Wildlife Trust of South and West Wales manages several nature reserves which include rhos grassland
- practical management and restoration techniques have been tried and documented by the Shared Earth Trust at Denmark Farm near Lampeter and courses are offered for those who are interested in promoting or practicing traditional grassland management with nature conservation as a primary objective.
- There appears to be increasing awareness amongst developers and planners of biodiversity constraints and commitments, largely brought about by new legislation and the Welsh Assembly's and Local Authorities' obligations to the implementation of Biodiversity Action Plans.

So where do we stand? We have lost a major part of the resource but at least we have a reasonably good idea of the extent of what remains and are aware of the urgency of protecting it. Substantially more money is now being directed towards nature conservation and wildlife legislation is much stronger than in the past but I fear that currently we are in no better a position to conserve the remaining resource than we were thirty years ago when I first started this ramble.

I feel, therefore, and I strongly urge, that we must continue with our uphill struggle to ensure that at least a substantial proportion of those rhos pastures which remain, will be maintained in good condition into the future and we must make sure that decision makers are made aware of the situation and that the issues are satisfactorily resolved.

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