DYFED INVERTEBRATE GROUP

NEWSLETTER N°. 18 Sept 1990

ISSN 0952 - 5327

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LEPIDOPTERA

ADDITIONAL NOTES ON PRE-1970 MOTH RECORDING IN CARMARTHENSHIRE -

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Since the appearance of my 'Interim Review on Pre-1970 Moth Recording in Carmarthenshire' (Morgan 1989), opportunities have arisen to examine sources of information that were not then available to the author. This additional information, some of which includes records of local or rare species, is summarised below in a chronological fashion. The scientific names are those in current usage and they frequently differ from those in the papers quoted; old synonyms are not given in this summary.

Some early records are to be found in the Entomologists' Monthly Magazine of 1869, when George Hearder, who was employed at the Joint Counties Asylum at Carmarthen (now the St David's Hospital, 22/39-20-), reported several species of interest including the brindled ochre Dasypolia templi and the deep-brown dart Aporophyla lutulenta, both of which are quite rare in Wales; he also mentions obtaining "a good series" of sand darts Agrotis ripae at Pembrey (22/30 or 22/40).

The next contribution we have is the very substantial list, which is full of noteworthy records, made by E Kaye (1871) at Laugharne (22/30-10-). In this list he records that in 1870 the death's-head hawkmoth Acherontia atropos was very common, that the privet hawk Sphinx ligustri was caught and that he had been given a specimen of the striped hawk Hyles lineata livornica (South [19611 remarks that 1870 was a notable year for this migrant). Kaye also found a larva of the small elephant hawk Deilephila porcellus and notes that the hummingbird hawkmoth Macroglossa stellatarum was "very abundant". The following moths are also listed:-

Rosy footman Miltochrista miniata; scarlet tiger Callimorpha dominula; orange swift Hepialus sylvina; waved umber Menophra abruptaria "common"; annulet Gnophos obscuratus "common"; yellow-barred brindle Acasis viretata "one specimen"; marbled beauty Cryphia domestica "very common"; coronet Craniophora ligustri; Devonshire wainscot Mythimna putrescens "two specimens at sugar"; white colon Sideridis albicolon "common"; pearly underwing Peridroma saucia "very abundant"; crescent dart Agrotis trux "common"; northern rustic Standfussiana lucernea "scarce"; Portland moth Ochropleura praecox "one at sugar"; broad-bordered yellow underwing Noctua fimbriata "common"; neglected rustic Xestia castanea "very abundant"; feathered ranunculus Eumichtis lichenea lichenea "very common"; deep-brown dart "scarce"; scorched carpet Ligdia adustata "common"; dog's tooth Lacanobia suasa "common"; sword grass Xylena exsoleta "common"; red sword grass X. vetusta "rare"; bordered sallow Pyrrhia umbria "rare"; tawny pinion Lithophane semibrunnea "common"; small purple-barred Phytometra viridaria "scarce" and shore wainscot Mythimna litoralis "one specimen at light".

Judging by the above list it must have been a favourable year for migrants and the location of Laugharne - with its low Old Red Sandstone sea cliffs, saltmarshes, rocky foreshores, ash and mixed woodlands all helped contribute to this impressive tally of moths. The list includes several local moths of coastal habitats, with the record of the Devonshire wainscot - which was only the second British record of this species (South, 1961) - being of particular interest, for this moth only occupies the mildest coasts of SW England and Wales; in the latter area it occurs from the Gower Peninsula around to Pembrokeshire.

The next list, that of M Graske (1888) around 'Llwyn Celyn', Llandovery (22/722329), is more modest but it mentions some local species such as an imago of the alder kitten Furcula bicuspis bred from a larva and similar successful rearing of lobster moths Stauropus fagi. Graske also reared a great prominent Peridea anceps from a caterpillar, three alder moths Acronicta alni were brought through from twelve caterpillars (he notes frequent parasitism by ichneumons with this species), and a miller Acronicta leporina was another breeding success.

In my 1989 note, I mentioned the existence of O S Wilson's (1880) still-unsurpassed "Larvae of the British Lepldoptera and their foodplants", which I have now had the chance to examine. The following moths, listed below, are given by Wilson as occurring in Carmarthenshire:- Annulet; yellow belle Aspitates ochrearia; golden-rod pug Eupithecia virgaureata; marbled pug E. irriguata; ling pug *E. goossensiata; white colon; hedge rustic Tholera cespitis; Archer's dart Agrotis vestigialis; northern drab Orthosia opima; blossom underwing O. miniosa; double kidney Ipimorpha retusa and the purple marbled Eublemma ostrina.

(*for discussion regarding nomenclature/identification, see Morgan, 1989)

The efforts of T B Jeffreys are also referred to in the 1989 article, but several of his notes escaped my attention. In 1895, Jeffreys relates how a male convolvulus hawkmoth Agrius convolvuli was brought to him on September 18 at Laugharne. It was not the earliest record of the species in the county for a decade or so earlier, George Hearder (1884) noted that, "one evening at dusk last September one of my boys noticed a large noisy moth hovering over a bed of Petunias" (at Carmarthen, 22/42), which, when captured, "proved to be a worn specimen of Sphinx convolvuli". Another note by Jeffreys (1898) records the occurrence of "a nice black variety" of the small engrailed Ectropis crepuscularia at Laugharne and the infestation of December moth Poecilocampa populi caterpillars with ichneumons.

In the early years of the present century, short articles entitled 'Nature Notes' or 'The Naturalist's Corner' appeared in the Carmarthen Journal, the local newspaper for the Carmarthen district; these articles were written by 'J B' (possibly John Brunker) and 'G M H'. In one of these notes, published on Friday, 23 July 1909, they state that "in and around Carmarthen", they had caught the dusky thorn Ennomos fuscantaria (September 1908), the forester Adscita statices "at Abergwili (22/43-21-) and Llanllwch (22/37-18-), the cream-spot tiger Arctia villica (no detailed locality given - June 1908 and 1909), and a black arches Lymantria monacha in August 1908. An alder moth caterpillar was found at Green Castle (22/39-16); a vapourer Orgyia antiqua at Llangunnor (22/42-19-) - "infests the London parks ... but first record for Carmarthenshire"; a death's head caterpillar was found (no locality given), "squeaking as (it was) attacked by ants". They also remark that they sometimes came across goat moth Cossus cossus caterpillars. On 30 July 1909, it was reported that the privet hawkmoth had been observed in the Llanllwch area (22/31) as had - perhaps in the environs of Cors Goch Llanllwch (22/36-18-) - five and six-spot burnets Zygaena trifolii and Z. filipendulae, foresters and cream-spot tigers. A note on 20 August 1909 includes mention of caterpillars of various species taken in Carmarthen, including again, that of the alder moth. Also there is the surely erroneous reference to the occurrence of the dotted footman Pelosia muscerda - a great rarity - which is best disregarded. Finally, on 10 September 1909, the finding of a damaged specimen of the local purple thorn Selenia tetralunaria in a spider's web attached to *a* Carmarthen lamp-post is commented upon, and an old lady moth Mormo maura was noted as taking up residence for hibernation purposes "in one house in town".

At the Lancashire and Cheshire Entomological Society meeting held in Liverpool on 17 October 1910, Mr R Tait exhibited the scarce footman Eilema complana, sand dart and

Devonshire wainscot, taken that season at Pendine (22/23-07- etc), Carmarthenshire. It would be useful to ascertain whether the latter rare species still survives on the county's coastline.

Lastly, in 1915, Major Frederick Gillet devoted some time to search for the ova of the sallow kitten Furcula furcula in Carmarthenshire and notes, contrary to what was thought at that time, that the eggs were mostly found on the underside (not top) of sallow leaves.

In my 1989 summary, it was mentioned that there were a substantial number of pre-1970 dots on the distribution maps (produced by the Biological Records Centre [BRC]) included in 'The Moths and Butterflies of Great Britain and Ireland' (Heath, J; Emmet, A M and others [1976]). It has proved possible to trace only those that are on record cards submitted to the BRC, the rest being assumed to have been derived from correspondence to John Heath or other sources (P Harding, pers. comm. 1990). The cards that exist are mostly rather inadequately completed, with only the 10km square given (and often for more than one locality within that square), and also with a date class (eg 1960-1970) rather than an actual date. The traceable record cards relevant to the pre-1970 period under review are those of David Davies and R F May, the former the well-known Carmarthenshire naturalist, and the latter the author of 'A List of the Flowering Plants and Ferns of Carmarthenshire' (West Wales Naturalists' Trust, 1967).

Amongst their records, several are of interest - such as the crescent-striped Apamea oblonga (whose larvae feed on saltmarsh grass Puccinella sp.) at Tywyn Burrows (22/30) and the plain golden-Y Plusia jota at the same site (both D Davies, 1969). R F May's records include the dingy shears Enargia ypsilon and cream-spot tiger, again from Tywyn Burrows (post-1960), and the latter species also from Ferryside (22/31, 1950-60). The late T A Warren-Davis (the noted Pembrokeshire botanist) recorded Archer's darts at Tywyn Burrows in the period 1961-68.

ACKNOWLEDGEMENTS: Thanks are due to Adrian Amsden for permission to examine the card index held at the Department of Zoology, National Museum of Wales, Cardiff, which provided many reference sources. Jane Kelsall extracted some information from old issues of the Carmarthen Journal (held at the Carmarthen Library, Reference Section) and Paul Waring, Chief Scientists Directorate, NCC, provided modern synonyms for some old scientific names and answered other queries. Gratitude is also due to the staff of the Information and Library Services of the NCC, Peterborough, for copies of articles and papers. Paul Harding of the Biological Records Centre, Monks Wood, kindly extracted some useful records.

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[Includes a description of Monocentrota favonii sp. nov., the male holotype of which is a specimen collected at Stackpole Quay, VC45.]
ORMEROD, SJ, MAWLE, GW & EDWARDS, RW (1987) - The influence of forestry on aquatic fauna. In: Environmental aspects of Plantation Forestry in Wales. Ed. JEG Good. Institute of Terrestrial Ecology Symposium No. 22.
[Detailed review of the ecological effects of afforestation on aquatic ecosystems, including data from studies in the Upper Twyi catchment, VC44].

WEATHERLY, NS & ORMEROD, SJ (1987) - The impact of acidification on macroinvertebrate assemblages in Welsh streams: towards an empirical model. Environmental Pollution 46: 223-240.

WITHERS, P (1987) - The British species of the genus Suillia (Dip., Heleomyzidae), including a species new to science. Proc. Trans. Br. Ent. Nat. Hist. Soc. **20:** 91-104.
[A key to the eighteen members of this fungus-feeding family of flies. The distribution table shows no records for VC44 & VC46 but six species are known from VC45.]

Dyfed Invertebrate Bibliography, 1988 addenda

FITTON, MG, SHAW, MR & GAULD, ID (1988) - Pimpiline Ichneumon-flies. Hymenoptera, Ichneumonidae (Pimpilinae). Handbooks for the Identification of British Insects Vol 7, Part 1, pages 65-66. Royal Ent. Soc., London.
[This standard RES key contains a description of Polysphincta vexator, a hymenopterous parasite of orb-weaver spiders, which was described as new to science from specimens collected from Foulshaw Moss, Cumbria, and Borth Bog, Ceredigion. Its chief host is Araneus quadratus but the Borth specimen was reared from Lariniodes cornutus.]

Dyfed Invertebrate Bibliography, 1989 addenda

RUTT, GP, WEATHERLEY, NS & ORMEROD, SJ (1989) - Microhabitat availability in Welsh moorland and forest streams as a determinant of macroinvertebrate distribution. Freshwater Biology 22: 247-261.
[Further studies from the Upper Tywi catchment, indicating the effect of afforestation on aquatic invertebrates inhabiting marginal habitats in upland streams].

COLEOPTERA

THE BEETLES OF YNYSLAS DUNES (22/6094), DYFI NNR, CEREDIGION (VC46) -DC BOYCE

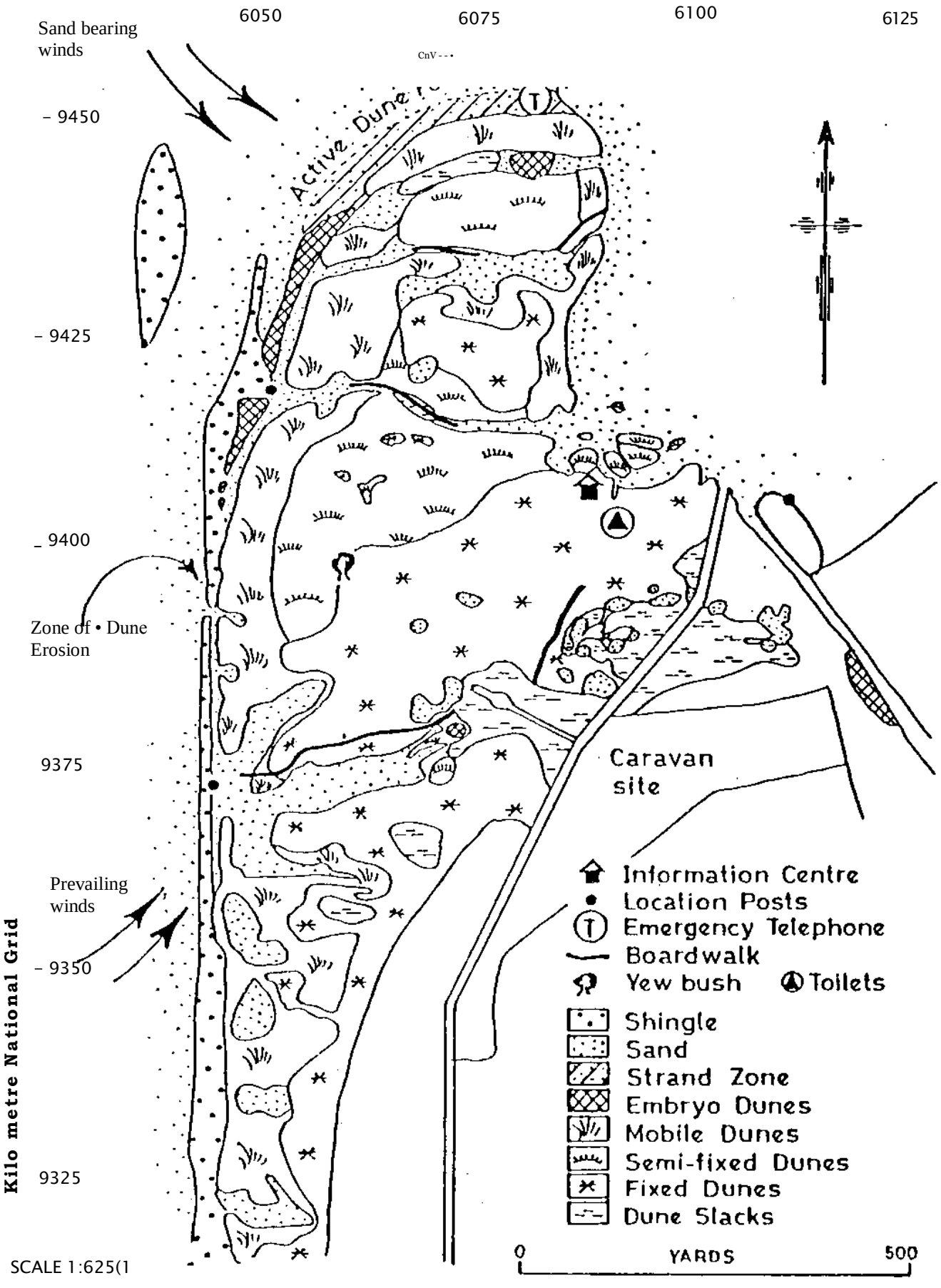
Ynyslas Dunes lie at the north end of a long shingle bar that stretches for six kilometres from Borth Cliffs. The dune system has extended northwards since it commenced development some 6000 years ago but large areas were reclaimed for agriculture and later converted to use as a golf-course. The present area of dunes, comprising some 150 acres, is probably of relatively recent origin (the oldest dunes dating from about the 15th Century) and is limited in extent by the erosive powers of the River Dyfi. Dune accretion continues today but northward progress has been halted by the Dyfi estuary and dune formation is restricted to the seaward margin (Slater 1986).

The first stage in dune formation is the embryo dune, which is generally no more than two metres high - they can be found around the northern tip of Ynyslas. Such dunes are usually formed by the deposition of wind-blown sand in the lee of obstacles such as driftwood and accumulations of seaweed. A characteristic community of plants, including sand couch, sea rocket, prickly saltwort and sea sandwort, occurs in this pioneer stage of dune formation. Inland from the embryo dunes, the next phase of development is the mobile or yellow dunes. These are generally the highest within a dune system and are characterised by the dominance of marram grass. This is the most influential plant in the sand dune succession, its extensive root-system trapping sand and hence building up the dunes. Marram reaches its greatest abundance on the mobile dunes, being mono-dominant over large areas, although other plants, such as the handsome sea spurge and Portland spurge, may also occur.

Further inland one moves into the fixed or grey dunes. By this stage in the succession there is very little in the way of open sand, the ground being well-covered by a protective skin of vegetation. As a result, this stage is much more stable and in natural systems would eventually develop into woodland. At Ynyslas, large areas of these consolidated dunes have been lost to Borth Golf Course but a substantial area still remains within the NNR. The flora reaches its greatest diversity in these dune grasslands, marram is sparsely distributed and many herbs, such as hound's-tongue, restharrow, ragwort and pyramidal orchid, add colour and variety to the sward. In low-lying areas throughout this succession, where the water- table approaches ground level, dune slacks will occur. These add further diversity to the dune eco-system with the slacks ranging from bare, sandy pools in the mobile dunes to sallow and reed dominated communities in the older slacks of the mature dunes. Most of the slacks are only flooded for part of the year and, during the summer months when the water-table recedes, the older slacks provide a spectacular display of marsh helleborines and marsh orchids *Dactylorhiza* spp.

This constitutes the range of habitats present within the dune system and together they provide a rich hunting-ground for the coleopterist. By comparison with most other sites in Dyfed, Ynyslas has been well-studied for its invertebrate fauna. The earliest beetle records are to be found in the collection of Dr J H Salter which is held in the National Museum of Wales, although so far information from this source has only been extracted for a few families. Casual visits by eminent entomologists, such as the Rev C E Tottenham, Dr M G Morris, Dr R S Key and Prof J A Owen, have provided many interesting records over the years. The University College of Wales, Aberystwyth, has used the dunes as an educational facility for many years and since 1982 pitfall-traps have been employed to demonstrate concepts of species-diversity. Dr J H R Gee has sampled an area of fixed dunes and a damp slack with two grids of pitfall-traps situated some 50 metres apart. P M Miles (1983) investigated the invertebrate fauna

VEGETATION MAP OF YNYS-LAS DUNES



of the dune succession in mid-winter by hand-collecting in quadrats along a transect, discovering several interesting beetles in the process. Over the past five years A P Fowles and myself have made a number of visits to Ynyslas, particularly to sample the fauna of the slacks and to record phytophagous beetles. The accumulated total gives a list of 218 species of beetles recorded from Ynyslas Dunes and, whilst many more species undoubtedly await discovery, this is sufficiently comprehensive to enable us to distinguish between the beetle communities of the different dune habitats.

If we start our survey on the strandline of the foreshore we need look no further than timber thrown up by the tide for the attractive Nacerdes melanura, whose larvae feed upon this seemingly unappetising pabulum. In addition to driftwood, large quantities of seaweed are cast-up along the shore and as this rots down it attracts many beetles. One of the most characteristic inhabitants of this zone is the rove-beetle Cafius xantholoma, easily recognised by the yellow flanks to the otherwise dark elytra. With it here is another rove-beetle Omalium rugulipenne, for which Ynyslas is the only known locality in the vice-county. The seaweed also supports a great profusion of amphipods which are preyed upon by the large, matt-black, ground beetle Broscus cephalotes, a voracious predator which ranges widely over the younger dunes. One species which no longer seems to be present is the nationally uncommon tenebrionid Phaleria cadaverina, primarily a strandline scavenger on carrion. Dr Salter found several specimens in the 1930's, including three underneath a dead gannet, but there have been no recent records and perhaps visitor-pressure on the foreshore has caused its demise.

Though poor in species, a characteristic feature of the foredune fauna is the high percentage of stenotopic species that specialise in eking out their existence within this harsh environment. One of the most abundant of these is the small black dung beetle Aegialia arenaria. On windy days many can be found in sandy hollows into which they have been blown. Once trapped in this situation they will labour for hours, trying to mountaineer up the sides of their sandy prison. Many perish in the attempt and it seems odd that a species which specialises in living on the foredunes is not better-adapted to its conditions. During the summer months the handsome metallic-green and brown chafer Euchlora dubia can be seen in bumbling flight throughout the foredunes. Presumably the larvae feed on grass-roots, like their relatives, with marram being the obvious food-source. Whilst they are also found elsewhere in the dune system, the tenebrionids Phylan gibbus and Melanimon tibialis and the cryptically-coloured weevils Philopedon plagiatus and Sitona griseus are especially common in the yellow dunes.

Moving further inland, plants increasingly bind the sand and produce a more stable environment for the beetle fauna. This greatly increases the diversity of species, with more eurytopic elements able to gain a foothold and the greater botanical diversity resulting in a more varied phytophagous fauna. The latter is largely composed of weevils and leaf-beetles. Pseudostyphlus pilumnus is a small, reddish weevil that feeds at the base of mayweeds Matricaria spp. Several specimens have occurred in the UCW pitfall-traps but nationally it is a scarce inhabitant of sandy habitats. Other nationally notable weevils are the handsome blue-black Orobitis cyaneus, which can be found by careful examination of the leaves and flower-heads of violets, and Apion pubescens, which probably feeds on clovers. Hound's-tongue also has its own special weevil, the squat and rather local Ceutorhynchus asperifoliarium. By comparison, the leaf- beetles are poorly-represented and most species present are widespread in dry habitats, examples being Chrysolina staphylea and Sermylassa halensis. Other abundant members of the family include the ragwort-feeding Longitarsus jacobaea and its plantain-feeding relative L. pratensis. A much more local species is Cryptocephalus aureolus which can occasionally be found in the flower-heads of yellow composites in spring and early summer. It is thought that the larvae of several members of this genus may have an obligate association with ants but whether this is true of all Cryptocephalus spp. is presently unknown.

The ground beetle fauna of the dry dunes is dominated by species of the genus Calathus, particularly C. fuscipes, C. mollis and C. erythroderus. The latter has only recently been recognised as distinct from C. melanocephalus on the form of the male genitalia and is now considered to be more closely allied to C. mollis. Although C. melanocephalus also occurs at Ynyslas, in Ceredigion it seems to favour more consolidated substrates, such as those found on coastal cliffs and upland moors. Conversely, C. erythroderus appears to be restricted (as is C. mollis) to areas with sandy substrates. A fifth, much more local, species of the genus is C. erratus which is only known in the vice-county from Ynyslas. Other carabid genera favouring dry sandy conditions are Amara and Harpalus. In addition to the ubiquitous A. aenea

and A. plebeja, more interesting species such as A. lucida, A. convexior and A. praetermissa have also been recorded. Harpalus spp. are somewhat poorly-represented but of some interest is the uncommon H. anxius. As with most beetle families, the diversity of the carabid fauna increases with the phases of dune succession. On the strandline C. mollis and Broscus cephalotes are likely to be the only species found but once into the consolidated dunes many of the carabids mentioned above become more prominent along with eurytopic elements of the fauna such as Nebria salina and Agonum muelleri.

The UCW pitfall study run by Dr Gee has been particularly useful in demonstrating differences in the fauna between wet and dry habitats in the fixed dunes. This project came to an end in 1989 and time and expertise only allowed UCW students to identify the beetles to family level but fortunately A P Fowles and myself have been able to look at the material caught in 1988 and 1989 and to identify everything except aleocharine staphylinids to species level. Specimens retained in the UCW reference collection for the project have also been determined. A grid of 25 traps was left out for about three weeks in October each year and the totals for 1988 and 1989 yielded a total of 38 beetle species from the dry dune and 51 species from the dune slack.

The rove-beetles, or staphylinidae, are the largest family of British beetles and they make up a significant proportion of the beetle fauna of the dunes. The table shows the ten commonest rove-beetles caught in 1988 and 1989 in the UCW samples, in descending order of abundance. (Number of specimens caught in brackets).

Dry Dunes		**Dune Slack**	
Quedius semiobscurus	36	Xantholinus longiventris	45
Sepedophilus nigripennis	19	Staphylinus aeneocephalus	37
Quedius tristis	17	Othius laeviusculus	23
Quedius aridulus	11	Quedius semiaeneus	18
Stenus impressus	9	Quedius schatzmayri	14
Micropeplus staphylinoides	8	Quedius aridulus	9
Staphylinus aeneocephalus	6	Gabrius keysianus	6
Staphylinus compressus	5	Gyrohypnus angustatus	5
Stenus ossium	4	Tachyporus pusillus	5
Tachyporus nitidulus	4	Othius melanocephalus	4

Whilst it would be wrong to read too much into such a limited data set it is clear the staphylinid fauna of the two habitats is radically different. For example, X. longiventris is the commonest species in the dune slack traps but is completely absent from the dry dunes, where three speciments of its close relative X. linearis have been trapped. Similarly, whilst two specimens of Q. semiobscurus occurred in the dune slack traps this is far below its abundance on the dry dunes where it is the commonest rove-beetle. Perhaps it faces stiff competition from its congeners in the dune slack environment, where five other Quedius species are present (aridulus, curtipennis, schatzmayri, semiaeneus and tristis). Only tristis and aridulus occur with semiobscurus on the dry dunes. There are very few rove-beetles that do not seem to exhibit a preference for one habitat over the other, although Q. aridulus and, to a lesser extent, S. aeneocephalus are exceptions to this general rule. In nature conservation terms, both areas have their own special interest, though the dune slack has yielded the nationally scarce staphylinids Tachyporus atriceps, Gabrius keysianus and G. osseticus. The last-named is usually found on saltmarshes and has presumably strayed from the adjacent Dyfi estuary (along with the single individual ground-beetle Dicheirotrichus gustavi taken in the dune slack traps).

As a result of its relatively recent development and small size, Ynyslas Dunes cannot boast the diversity of plants and animals known from the larger dune systems in Wales. However, one feature at Ynyslas that is of particular note is the range of dune slacks scattered throughout the system. These range from fore-dune slacks with a bare sandy bottom to slacks in the consolidated dunes which have a well-developed carpet of vegetation. The oldest slacks contain stands of reed or reed-mace and the easternmost slack has a broad fringe of willow carr. Variety is also provided by the length of time the slacks remain flooded each year as

the younger slacks in the fore-dunes are closer to the water-table and hence hold pools longer. These fore-dune slacks support the most interesting beetle fauna, containing a limited range of species consisting of a high percentage of specialists. They are most productive when sampled in early Spring as they tend to dry out rapidly in the summer and beetles are hard to find. Even in Spring they are not a visually pre-possessing habitat to anyone but the ardent entomologist, being little more than shallow, sandy 'puddles' with hardly any flowering plants. Careful examination of wet sand at the pool-margins should, however, reveal signs of life in the form of numerous tiny piles of sand. These are the excavations produced by the burrowing rove-beetles of the genus Bledius. The adults and larvae spend most of their time hidden in the sand, only emerging at night to feed on microscopic algae growing on the surface. Splashing water over the burrows will cause literally hundreds of these small beetles to scurry from their retreats and it is then a simple matter to collect specimens for identification. At Ynyslas the commonest species are B. fergussoni (which is pitchy with sandy yellow elytra) and the all-dark B. fuscipes. A couple of specimens of B. longulus have also been found.

Quite often, whilst splashing Bledius burrows, ground-beetles of the genus Dyschirius will also appear - the nationally notable D. impunctipennis and D. politus are both recorded from these slacks. They are specialist predators of the adults and larvae of Bledius, D. impunctipennis being apparently specific to B. fergussoni whilst D. politus occurs with several Bledius species (Lindroth 1974). The related D. globosus is also present at Ynyslas but it is not an obligate predator on Bledius and can be found amongst plant-litter around most of the slacks. Splashing may also reveal specimens of the small weevil Gronops lunatus, whose bumpy irregular outline and habit of sitting motionless for long periods can make it difficult to spot under *normal* conditions. The weevils tend to occur around patches of mouse-eared chickweed, which is a likely foodplant.

It is fascinating to walk across the various slacks at Ynyslas as it quickly becomes apparent that no two are the same. As previously stated, these differences are chiefly a result of their position within the dune succession and the unique nature of each slack is reflected in the extreme localisation of a number of their associated beetle species. For example, the ground beetle Bembidion pallidipenne is found in just one of the fore-dune slacks, whilst its relative B. assimile (a species generally found in densely-vegetated fens) only finds the reed-filled slack further inland to its taste. Generally speaking, the oldest slacks have a beetle community more reminiscent of fenland with species such as Agonum fuliginosum, Philonthus micans, P. quisquiliaris and Stenus juno in addition to B. assimile. This again demonstrates that, whilst generally more diverse, the beetle fauna of mature dune habitats tends to contain fewer sand-dune specialists than the yellow dunes.

A striking feature of the slacks is the high percentage of nationally uncommon species within the beetle community in comparison to that of the dry dunes. This is primarily due to the comparative scarcity of good quality slacks in British dunes and the Welsh systems are of high repute in this regard. Many of the rarities at Ynyslas have already been mentioned but perhaps the most mysterious is the ground beetle Agonum gracilipes. The majority of the British specimens of this species have been found on the East coast and it is not clear whether it is an established resident or a vagrant from the continent. The capture of a single specimen in the early 1980's in the UCW dune slack samples only adds to the puzzle. Other scarce carabids of the slacks are the handsome, metallic-green Elaphrus uliginosus and the tiny Acupalpus dorsalis. Sifting plant-litter around the margins of certain slacks has yielded large numbers of another uncommon beetle, the scarabaeid Aphodius plagiatus, a species considered to feed on small underground fungi (Jessop 1986).

Seasonal water-bodies in the dune system provide potentially suitable habitat for a number of scarce water-beetles. These have not been as well-sampled as some other beetle families but one species of note is Dryops nitidulus. There are only two other modern Welsh records (Foster 1989) and very few in the British Isles as a whole. Several specimens have been taken in the UCW dune slack samples and yet this slack only holds water for a short period during the winter, which suggests that either nitidulus is not as reliant upon open water as other species of the genus or that it is wandering in from another, yet to be discovered, source. Some of the other slacks which hold water for longer periods have abundant populations of Dryopids but, interestingly, all those examined so far have proved to be D. luridus.

Ynyslas Dunes today face much greater pressures than at any time in the past, most obviously from the trampling and subsequent erosion of the dunes by the vast numbers of tourists. In places this is exacerbated by the huge population of rabbits, which appears to have recovered from the effects of myxomatosis. These pressures may have resulted in the loss of some elements of the fauna - for instance, the striking tiger-beetle Cicindela maritima has not been reliably recorded since 1960 - but a degree of erosion is beneficial to the sand-dune invertebrate fauna and bare sand must be recognised as an important aspect of the dune ecosystem. In particular, attempts should be made to ensure that a complete range of slacks continues to exist on the reserve, including especially the bare sandy hollows of the fore-dunes, which can seem to be superficially of little wildlife interest and hence suitable for marram- planting.

Whilst it is much smaller and younger than most Welsh dune systems, Ynyslas is nonetheless of high invertebrate interest with, for example, 27 species of nationally notable beetles already recorded. Within Ceredigion it is of outstanding importance as the only relatively intact dune system (Penbryn, Mwnt and Gwbert are all small fragments). This is reflected in the fact that approximately 50 of the 218 beetle species recorded are currently only known from Ynyslas in the vice-county. Hopefully the long tradition of entomological exploration at Ynyslas, initiated by the likes of Salter and Tottenham, will continue to thrive and with it we may further increase our knowledge of the beetles and their requirements on this fascinating site.

ACKNOWLEDGEMENTS: Thanks are due to A P Fowles, J A Owen, R S Key, and M G Morris for providing records and to ML Cox, G N Foster and M L Luff for kindly determining problem material. Lastly, special thanks must go to John Gee and staff of University College of Wales, Aberystwyth for making available material collected at Ynyslas.

COLEOPTERA RECORDED AT YNYSLAS DUNES, DYFI NNR.

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3. GEE, Dr. JHR (1982-1989)
4. ROTHNEY, E (1987)
5. KEY, Dr. RS (1984)
6. MILES, PM (1983)
7. NCC (1982)
8. MORRIS, Dr. MG (1971)
9. MILES, PM (1965)
10. MILES, PM (1960a)
11. MILES, PM (1960b)
12. MILES, PM (1959a)
13. MILES, PM (1959b)
14. MILES, PM (1958)
15. MILES, PM (1957)
16. TOTTENHAM, Rev. CE (1948-1955)
17. SALTER, Prof. JH (1923-1942)

Note: Nationally scarce species recorded at Ynyslas are indicated by the abbreviations **Na & Nb.** These designations correspond respectively to species which are considered to be present in between 15 & 30 10-km squares and 30-100 10-km squares in Britain.

Carabidae	
Cicindela campestris	4.
Cicindela maritima [Nb]	4,11,17.
Cychrus caraboides	1,3,7.
Carabus violaceus	4.
Leistus ferrugineus	1,3,7.
Leistus fulvibarbis	3.
Leistus spinibarbis	1.
Nebria brevicollis	1,3,7.
Nebria salina	1,3,7.
Notiophilus aquaticus	1,3,5,7.
Notiophilus biguttatus	1.
Notiophilus substriatus	3,6.
Elaphrus uliginosus [Na]	1.
Loricera pilicornis	1.
Dyschirius globosus	1,3,6,7.
Dyschirius impunctipennis [Nb]	1,17.
Dyschirius politus [Nb]	1,17.
Broscus cephalotes	1,4,5,14.
Trechus fulvus [Nb]	1.
Bembidion assimile	1.
Bembidion pallidipenne [Nb]	1.
Bembidion propernns	6.
Bembidion tetracolum	1.
Pterostichus nigrita s.s.	1,3,7.
Pterostichus vernalis	3,7.
Calathus erratus	3,7.
Calathus erythroderus	1,2,3,7.
Calathus fuscipes	1,3,7.
Calathus melanocephalus s.s.	3,7.
Calathus mollis	1,2,3,5,7.
Laemostenus terricola [Nb]	3,7.
Agonum fuliginosum	1.
Agonum gracilipes [Na]	3.
Agonum marginatum	1.
Agonum muelleri	1,7.
Amara aenea	5,6,7.
Amara convexior	1.
Amara lucida [Nb]	1,6.
Amara plebeja	3,5.
Amara praetermissa [Na]	7.
Amara tibialis	1,6,7.
Harpalus anxius	1,5,6.
Harpalus rufitarsis	5.
Harpalus tardus	5,7.
Dicheirotrichus gustavi	1,3.
Acupalpus dorsalis [Nb]	1,5.
Acupalpus dubius	1.
Badister bipustulatus	5.
Demetrias atricapillus	1.
Dromius linearis	1.
Dromius melanocephalus	1.
Metabletus foveatus	1,2,3,5,6,7.

Haliplidae	
Haliplus lineatocollis	1.

Dytiscidae	
Hydroporus	1.
Hydroporus pubescens	1.
Agabus nebulosus	1.
Dytiscus marginalis	4.

Gyrinidae	
Gyrinus substriatus	1.

Hydrophilidae	
Helophorus brevipalpis	1,3.
Helophorus grandis	3.
Megasternum obscurum	1,3.
Hydrobius fuscipes	1.

Histeridae	
Baeckmanniolus dimidiatus [Nb]	2.

Leiodidae	
Leiodes dubia	1,3.
Choleva fagniezi	3.
Choleva glauca [Nb]	3.
Sciodrepoides watsoni	3.
Catops chrysomeloides	3.
Catops grandicollis	2.
Catops nigricans	3.

Silphidae	
Nicrophorus humator	4.
Silpha atrata	5.
Silpha tristis [Nb]	3.

Staphylinidae	
Micropeplus staphylinoides	3.
Metopsia retusa	3.
Anthobium unicolor	3.
Acidota crenata	3.
Lesteva longoelytra	3.
Omalium rivulare	1.
Omalium rugulipenne	1.
Bledius fergussoni	1,16.
Bledius fuscipes	1.
Bledius longulus	1,3.
Anotylus maritimus	16.
Anotylus rugosus	1,16.
Stenus brunnipes	16.
Stenus clavicornis	3,7,16.
Stenus impressus	2,3.
Stenus juno	1.
Stenus ossium	2,3.
Othius laeviusculus	3,7.
Othius melanocephalus	3.
Othius myrmecophilus	16.
Gyrohypnus angustatus	1,3.
Gyrohypnus punctulatum	3.
Xantholinus glabratus	16.
Xantholinus linearis	1,3,6,7,16
Xantholinus longiventris	3.

Philonthus cognatus	1.
Philonthus marginatus	4.
Philonthus micans	1,16.
Philonthus quisquiliaris	16.
Philonthus varius	3,7.
Gabrius keysianus [Nb]	1,3,16.
Gabrius osseticus Nb]	3.
Cafius xantholoma	16.
Staphylinus aeneocephalus	3.
Staphylinus ater	7.
Staphylinus brunnipes	7.
Staphylinus compressus	3.
Staphylinus globulifer	3.
Staphylinus melanarius	2.
Heterothops binotatus	16.
Quedius aridulus	3,16.
Quedius curtipennis	3.
Quedius schatzmayri	3.
Quedius semiaeneus	3,7.
Quedius semiobscurus	3,7,16.
Quedius tristis	3,7,16.
Mycetoporus splendidulus	16.
Sepedophilus marshami	3,7.
Sepedophilus nigripennis	1,3,16.
Tachyporus atriceps [Nb]	2,3,16.
Tachyporus dispar	2,3.
Tachyporus hypnorum	1,4.
Tachyporus nitidulus	2,3.
Tachyporus pusillus	3,6,16.
Cypha longicornis	2.
Myllaena infuscatn	2.
Phytosus balticus	1,6.
Atheta graminicola	2.
Atheta triangulum	16.
Atheta trinotata	16.
Mocyta amplicollis	2.
Mocyta fungi	2.
Chaetida longicornis	16.
Zyras limbatus	7.
Aleochara lanuginosa	16.

Scarabaeidae	
Aegialia arenaria	1,4,6,15.
Aphodius foetidus	1,3.
Aphodius plagiatus [Nb]	1,5.
Aphodius sphacelatus	6.
Hoplia philanthus	5.
Phyllopertha horticola	1,4,5,7,17.
Euchlora dubia	1,5,7,14,17.

Byrrhidae	
Simplocaria semistriata	1,3.
Cytilus sericeus	1,3.

Dryopidae	
Dryops luridus	1.
Dryops nitidulus **[Na]**	3.

Elateridae	
Agrypnus murinus	1,5,10,15
Agriotes obscurus	5.
Agriotes pallidulus	5.

Cantharidae	
Rhagonycha fulva	1.

Nitidulidae	
Omosita colon	2.

Coccinellidae	
Subcoccinella 24-	1,3.
Coccidula rufa	1.
Rhyzobius litura	5.
Scymnus frontalis	1,6.
Adalia bipunctata	1.
Coccinella 7-punctata	1.
Coccinella 11-punctata	17.

Lathridiidae	
Corticaria impressa	1.

Tenebrionidae	
Phylan gibbus	1,5,7.
Melanimon tibialis	1,5,7,15.
Opatrum sabulosum	14,15.
Lagria hirta	1.
Isomira murina	1,5,13.
Phaleria cadaverina	17.

Oedemeridae	
Nacerdes melanura	1.
Oedemera nobilis	4.

Anthicidae	
Notoxus monoceros	1,3,5,17.
Anthicus instabilis	3.

Chrysomelidae	
Cryptocephalus aureolus [Nb]	1,12.
Cryptocephalus fulvus	
Chrysolina staphylea	3,9.
Sermylassa halensis	1,3,9,17.
Longitarsus jacobaeae	1,3,7.
Longitarsus pratensis	3,6.
Altica lythri	1,7.
Crepidodera ferruginea	1,3,5.
Chaetocnema arida [Na]	3.
Sphaeroderma	1,5.
Cassida rubiginosa	3.
Cassida viridis	4.

Attelabidae	
Caenorhinus aeneovirens	1.

Apionidae	
Apion atomarium	1
Apion apricans	1,4.
Apion carduorum	1
Apion dichroum	1
Apion ononis	1
Apion pubescens **[Nb]**	3
Apion virens	17
Curculionidae	
Otiorhynchus atroapterus	5
Otiorhynchus ovatus	1,3,7.
Otiorhynchus sulcatus	7
Phyllobius roboretanus	1
Phyllobius viridaearis	1,5.
Barypeithes araneiformis	5
Philopedon plagiatus	1,5,6,8,14,15,17.
Sitona cambricus [Nb]	17
Sitona griseus	1,3,5,6,8.
Sitona hispidulus	3
Sitona lepidus	3
Sitona lineatus	3

Curculionidae (cont.)	
Hypera nigrirostris	1,6,8.
Hypera plantaginis	1,3,6.
Hypera punctata	3
Hypera venusta	7
Gronops lunatus **[Nb]**	1
Pseudostyphlus pilumnus [Nb]	3
Ceutorhynchidius troglodytes	1,3,5,6,8.
Ceutorhynchus asperifoliarium	1
Ceutorhynchus assimilis	17
Ceutorhynchus litura	1
Orobitis cyaneus **[Nb]**	6
Anthonomus rubi	1
Mecinus pyraster	1,5.
Ramphus pulicarius	5

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FIELD MEETING - LAUGHARNE BURROWS (22/20 and 22/30) VC44, 10 JUNE 1990 - I K MORGAN

Long recognized to be of great botanical and ornithological interest, the expanses (1580+hectares) of duneland, fen and open-water at Laugharne Burrows ('MOD Pendine') has received but scant and irregular entomological investigation. It was to start to redress this imbalance that the site was chosen for the June 1990 DIG field meeting, probably the first of several such meetings that will ultimately be held on this diverse site.

The site comprises a major spit and sand dune system (the largest in south-west Wales) lying on the western side of Carmarthen Bay. It is of outstanding importance for its rare coastal plants and extensive dune slacks, which merge into fen and swamp near the Witchett Pool, a nine-hectare calcareous freshwater/brackish lake resulting from impeded drainage and a man-made embankment. The botanically-diverse dry dune ridges attain heights of 20 metres in places, whilst the intervening deep and damp hollows are also exceptionally rich in rare and uncommon plants, as well as being of invertebrate interest.

Two main areas were examined in the limited time available - the large area (22/281076) of wet slacks, fen and carr (with some dry dunes) northwestwards of the Witchett Pool and later, a more general search was made in the seemingly endless area of carr, slacks, ditches and dunes to the SE of the Witchett Pool, in the general direction of - but not reaching - Ginst Point.

On the tall, dessicated dunes (22/282079) north of the lake, robberflies were much in evidence, dominated numerically by the grey Philonicus albiceps, but Dioctria rufipes and the large Pamponerus germanicus were also noted, the latter noticeable with the whitish basal wing-patches of the male. A varied range of hymenopterans were also present, including several species of solitary wasps and ample numbers of Osmia aurulenta nesting in old Cepaea snail shells. Occupied shells were easily discerned as they had a green algal coating, the growth of which was promoted by pollen/nectar accidentally deposited by the bees. Yellow belles Aspitates ochrearia and a single black-necked moth Lygephila pastinum were flushed from herbage, whilst 5-spot burnets Zygaena trifolii were common and some scarlet tigers Callimorpha dominula were noted around lush fen-vegetation. One observer drew the party's attention to exit-holes bored in the stems of Phragmites - almost certainly due to one or more of the wainscot moths. It was recognized that regular light trapping in the environs of the Witchett Pool and the nearby fens and dunes, would be most productive and help reveal a true picture of the site's nocturnal lepidopterous fauna. Other moths noted on the day were a single (very early) white-line dart Euxoa tritici found hiding in vegetation and colourful larvae of the mullein moth Cucullia verbasci on growths of water figwort at the pool's edge.

The season's first meadow browns Maniola jurtina had emerged and wall browns Lasiommata megera, small heaths Coenonympha pamphilus, small coppers Lycaena phlaeus, common blues Polyommatus icarus, small blues Cupido minimus, grizzled skippers Pyrgus malvae, dark-green Argynnis aglaja, small pearl-bordered Boloria selene and one or two marsh fritillaries Eurodryas aurinia (seen in the area to the east of the lake) were also on the wing. Of the latter, there must be a small colony (or colonies) on the very limited areas of devil's-bit scabious growing on a few of the damp slacks.
Attempts to locate aquatic Coleoptera in the Witchett Pool or other ditches proved unsuccessful (spring or autumn would be a better time for this group), but the corixid ('water boatman') Sigaria falleni (det. R N Stringer) was super-abundant in the lake. Above the Witchett Pool and the other unpolluted water-courses, flew various Odonata including ample numbers of the local hairy dragonfly Brachytron pratense.

The moss bladder snail Aplexa hypnorum collected by Arthur Chater from one of the wet slacks was only the third county record of the species. Aplexa is a local species in Britain, living in shallow ponds and ditches and is resistant to drought. Arthur also found Pupilla muscorum and Vallonia pulchella which are otherwise only known in the county from Tywyn

Burrows (22/30) on the other side of Carmarthen Bay. Pupilla was found associated with other typical dry grassland species such as Candidula intersecta, Vallonia excentrica and the 'Atlantic species' Cochlicella acuta; Vallonia pulchella was discovered in a damp, mossy slack.

At least one slack (eg 22/281078) held the brown form of the scarce chrysomelid Cassida murraea, whilst other local leaf-beetles were Phyllobrotica quadrimaculata (on skullcap), the mostly red Chrysomela populi (on creeping willow) and Donacia clavipes, which is believed to be exclusively associated with reeds. The metallic blue-green Cryptocephalus aureolus was noted on yellow composite flowers. The yellow flowers of Hieracium pilosella produced the notable phalacrid Olibrus affinis for Dave Boyce; this is a small beetle with a shiny convex body usually found in flowers. Dave also tackled the Scirtidae, collecting two (rather common) species of Cyphon - hilaris and ochraceus; this group (which are badly under-recorded in the county) have aquatic larvae which resemble woodlice; the adults possess weakly-chitinized elytra.

A nothworthy beetle record was also made by another member - Adrian Fowles - who collected the 'click-beetle' Cardiophorus asellus, new to Dyfed (and only its fifth Welsh site). Like several other clicks, the adults and larvae are believed to feed on the roots of plants, with C. asellus favouring less stable sand dune habitats usually with a sparse covering of marram grass; it is confined to southern Britain and is everywhere scarce. Amongst the weevils identified by Adrian was an uncommon species - Rhynchites tomentosus (associated with willows) and the carabid Harpalus rufitarsis which, like Dyschirius luedersi collected by D C Boyce, was new to Carmarthenshire.

Examination of the supra-littoral foredunes and the foreshore (around 22/301070 etc) provided some invertebrates of note - the white 'pillbug' Armadillidium album and the appropriately sandy-coloured Eurynebria complanata, which - as a British species - is confined to arenaceous coastal habitats around the shores of the Bristol Channel. The 'tiger beetle' Cicindela maritima was active in the foredunes but more careful searching was required to find Nacerda melanura which breeds in strandline timber. Landwards, sheets of kidney vetch held good numbers of small blues and the convincing wasp-mimic hoverfly Chrysotoxum cautum lurked around stands of sea buckthorn. Chorthippus brunneus and the very variably-coloured Myrmeleotettix maculatus were the dominant orthopterans but the rare Tetrix ceperoi was not found in its mossy slack habitat on this occasion (though T. undulata was noted). Dark bush-crickets Pholidoptera griseoaptera were occasionally seen (or heard) in rank vegetation and one speckled bush cricket Leptophyes punctatissima was noted.

Acknowledgements

Thanks are due to D C Boyce, A O Chater, J R Ellis and A P Fowles for providing records upon which this account is based. Gratitude is also forthcoming to the Superintendent MOD Pendine for permission to visit the site and to Mr John Rees for escorting the party.

FIELD MEETING - RHOS GELLIE (22/371536) VC46, 7 JULY 1990 - A P FOWLES

Even with the scarcity of entomologists in west Wales it is rare that the chance arises to explore a site of high conservation value which has never been surveyed for invertebrates before. It was disappointing, therefore, that overcast and drizzly weather persuaded just a select band of DIG members to attend this field meeting. Rhos Gellie is a classic example of traditionally-managed farmland on the coastal plateau of south-west Ceredigion, consisting chiefly of thirty hectares of sedge-rich acidic grassland ('rhos'), poor-fen and lightly-grazed wet heath. This is broken up by neglected hedgerows into a mosaic of twenty-six enclosures and the whole area provides a rich haven for wildlife as a fragment of a forgotten time when agriculture and conservation had a more harmonious relationship.

The early rain dictated a slow start and severely limited sampling opportunities but as the weather gradually improved there was a significant increase in the activity rate of invertebrates and invertebrate zoologists alike. The damp conditions were well suited to the survey of molluscs and a respectable total of twenty-one species was recorded. There were no surprises amongst the fauna but it was pleasing to find the whorl snail Vertigo substriata (a. good indicator of undisturbed wetland) amongst the poor-fen and a few specimens of Zenobiella subrufescens were found at the edge of hedgebanks or willow carr.
Although overcast for the whole day, the warm air did allow some insects to take to the wing, including seven species of butterflies. The early emergency of marsh fritillaries Eurodryas aurinia in Wales this year meant that we were unable to determine whether a colony is based at Rhos Gellie. There were records from adjacent pastures (long since ploughed up) in the mid 1970's and it seems most likely that Gellie should support a healthy population, but we must wait another year for confirmation. Marsh fritillaries are part of a characteristic assemblage of butterflies and moths present on the better examples of 'rhos' pasture. This assemblage includes four other species recorded during the field meeting - scarlet tiger Callimorpha dominula, five-spot burnet Zygaena trifolii, silver hook Eustrotia uncula and small pearl-bordered fritillary Boloria selene.

The few species of Diptera identified during the day were mostly common and widespread in Ceredigion, however, a single specimen of the dumpy Acrocera globulus was beaten from willow foliage. The eggs of this local fly are laid on vegetation and the subsequent larvae then seek out a spider to sustain them. As internal parasites the larvae feed inside the spider until they emerge to pupate on the spider's web. There is only one previous record of the species in Ceredigion - on Cors Caranod (22/565645) in 1987 - but this unobtrusive fly is probably quite widespread on heaths and 'rhosydd' in the district.
Coleoptera were more comprehensively sampled and accounted for almost half of the invertebrate species recorded (56 out of 119). A small Sphagnum-filled pool on the wet heath yielded a number of typical water-beetles along with a specimen of the nationally scarce Helochares punctatus (still frequent in Wales but much-declined in England with the loss of heathland pools). Two new vice-county records were provided by the weevils Apion spencii and Rhynchites nanus. A. spencii is probably fairly local on tufted vetch in wetlands but R. nanus should be widely-distributed and has previously been overlooked. The scarce soldier-beetle Cantharis figurata was found in the ranker areas of poor-fen and a single Phyllobrotica quadrimaculata was discovered on lesser skullcap Scutellaria minor. The usual foodplant of this handsome, orange-and-black, leaf-beetle is greater skullcap S. galericulata and nationally it is a rather uncommon inhabitant of fens. Finally, the distinctive larval mines of the buprestid Trachys troglodytes were found on the leaves of devil's-bit scabious. This used to be regarded as quite a rarity but recent identification of its larval and adult feeding-damage has shown it to be much more widespread than previously thought. The adults are very wary and drop off the foodplant when approached and this is a clear example of how knowledge of the life-history of our invertebrates can lead to a more realistic assessment of their conservation status and management needs.

Trachys troglodytes is one of a suite of species that feed upon devil's bit scabious and contribute to the invertebrate richness of the wet pastures of Dyfed. The comparative abundance of such grasslands in west Wales is one of the strong points of our wildlife heritage and deserves our utmost efforts in terms of their protection and management. Invertebrate surveys can be of considerable significance in this regard as sites with a long history of traditional management are readily identified by their faunistic complement. Such sites are ecologically more complete and should be seen as a high priority for conservation effort. The range of species recorded under somewhat unfavourable conditions at Rhos Gellie shows that this site clearly falls into that top rank. Further survey at different times of the year, and preferably with a little sunshine, will undoubtedly produce other species of interest and confirm that Rhos Gellie is amongst the best wet pasture sites in Dyfed.

I am grateful to Dave Boyce, Arthur Chater, Ian Francis and John Steer for providing records and would like to pass on our collective thanks to Dr Glyn Jones for arranging access and to Mr Sharples, Ffynnon-berw, for parking facilities.

FIELD MEETING - ROSEBUSH PLANTATION (22/0730) VC 45, 12 AUGUST 1990 - S J COKER

Situated on the southern slopes of the Preseli Hills, the conifer plantation at Rosebush is probably the second largest block of woodland in Pembrokeshire. Habitats visited during the field meeting included the forest rides, areas of abandoned slate quarries, wet pastures bordering and within the plantation, and the route of the old abandoned railway line.

The morning was spent on the lowest part of the plantation and on the adjacent, horse-grazed, wet pastures. The wettest open area between the Afon Syfni and the railway embankment supports a series of small ponds which are said to have resulted from bombing practice during the Second World War. This is a known site for the small red damselfly Ceriagrion tenellum and several were seen amongst the long grass around the ponds. Other Odonata included the common blue damselfly Enallagma cyathigerum, which was scattered throughout the site, and the golden-ringed dragonfly Cordulegaster boltoni seen patrolling the river. Along the forest tracks within the plantation several common darters Sympetrum striolatum were seen.

During the afternoon the quarry and the lower slopes of the plantation were explored. A total of thirty-two species of hoverflies were recorded during the meeting, with high numbers of Meliscaeva cinctella particularly noticeable along the forest tracks. Brambles and ragwort proved attractive for Didea fasciata, which appears to be quite common throughout the Preseli Hill conifer plantations. This species is usually considered to be associated with ancient deciduous woods but records from Carmarthenshire and Pembrokeshire indicate that it is widely-distributed in West Wales in conifer plantations. Another hoverfly restricted in Pembrokeshire to the Preseli plantations is the wasp-mimic Chrysotoxum arcuatum, several were seen during the day flying low over stands of bilberry along the forest tracks and on the open slopes of the slate quarry. Arctophila fulva, a scarce but widespread hoverfly in Pembrokeshire, was found in a small willow-filled quarry to the north of the main quarries. The conopid fly Conops flavipes proved to be quite common on ragwort flowers.

Eleven species of butterflies were recorded, including the comma Polygonia c-album which is locally rather scarce but several were seen on the brambles which line the rides within the plantation. Recording of other groups was generally rather unproductive and yielded only examples of ubiquitous species. For example, the recent drought made investigations under stones in the quarry particularly unrewarding and produced records of such common species as the centipede Lithobius melanops and the woodlice Oniscus asellus and Porcellio scaber.

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