DYFED INVERTEBRATE GROUP

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COLEOPTERA

AQUATIC COLEOPTERA IN DYFED - G N FOSTER

A total of 158 species of water-beetles have been recorded in Dyfed, a third of which (fifty-four species) are regarded as nationally scarce. The catalogue which follows lists the Dyfed fauna with its recorded history in each of the vice-counties. It is based on extraction from the data-files of Professor Balfour-Browne and the record cards for the current national recording scheme. There are bound to be omissions and other errors which, if detected, should be indicated to the author [3 Eglinton Terrace, Ayr, KA7 1JJ, Scotland]. In particular, the catalogue must be regarded as provisional because I have neither conducted a complete literature search nor checked the records of the National Museum of Wales. Some records are dubious because of name changes - for example, I have not seen any Agabus chalconatus (Panzer) from Wales; published records probably refer to melanocornis Zimmermann.

About nine Red Data Book (RDB) species of water beetle have been recorded from Dyfed, the precise number depends upon how one defines a water beetle and on the extent to which one believes old, unsubstantiated records. They are as follows:-

Haliplus variegatus Sturm (RDB Category 3) - E J Pearce (1948) recorded the existence of a specimen from St David's in the J W Alien collection in Cambridge. He did not indicate a date for capture but Alien was active in the 1910s. This is a declining species with recent records for Somerset, Norfolk, East Sussex and East Kent. The species is mainly associated with shallow, temporary habitats in relict sites. It is possible that the species still occurs in south Wales in coastal ponds.

Hydrovatus clypealis Sharp (RDB 3) - J Balfour-Browne (1947) found this "in numbers, principally in the larval stages with a few teneral adults, in a series of shallow muddy pools near Porth Sele" in August 1946. The pools were indicated at SM 75-25- in Balfour-Browne's record card return. Price (1959b) recorded the species in "numbers in a canal near Kidwelly". He had earlier (1959) described this as the Collier's Line Canal. This has been destroyed as a habitat suitable for H. clypealis by dredging in 1986. In a recent survey, neighbouring farm ditches and similar sites on the Laugharne Sands also proved unsuitable though those at Kidwelly supported the three other species mentioned by Price (1959). H. cylpealis is well established from Somerset to East Kent and has recently been discovered in East Anglia. It is not confined to relict habitats but is usually associated with mats of vegetation in high quality ones.

Bidessus minutissimus (Germar) (RDB 3) - Jones (1949) found this species in the Rheidol in 1947 and the species was still there in 1985 (Foster and Bilton, 1985). Adrian Fowles has since found the species in the Afon Ystwyth. This brings the total number of modern 10 Km squares for this species to five. The species is restricted to sand and fine gravel

deposits in western rivers.

Hydroporus rufifrons (Muller)(RDB 2) - Price (1959) recorded this species from Cwnigaer, a field beside Kidwelly Castle. None could be found there in September 1988, but the site resembled others where the beetle has survived. This species is genuinely in decline because its habitat is so easily drained. It is, however, elusive and it could still be there. There are only two other Welsh records. The location of the old record for v.c. 49 cannot be fixed but the other record stems from the Welsh Peatland Invertebrate Survey, a single female caught on 26 June 1987 at Gwaun Garthenor (v.c. 46, 22/638558).

Graptodytes bilineatus (Sturm)(RDB 3) - The only Welsh record is for Skomer Island by Sage (1977). The specimens were collected by the warden, D R Saunders, in the South Pond on 3 September 1966 and identified by Sage (personal communication). The specimens no longer exist but the recent discovery of this species in Ireland, Dorset and the Channel Isles indicates that the species should no longer be regarded as eastern in distribution. In fact, it is part of a very specialised wet heathland fauna on the Atlantic coast extending to Spain.

G. flavipes (Olivier)(RDB 2) - Sage (1977) also reported the last record of this species in Wales, on Skomer. There are earlier records for the mainland of v.c. 45 in SM 72 by F Balfour-Browne at Rhodiad and at Dowrog Common in 1931, and by J Balfour-Browne at Rhosson, Pwll Trefeiddan and Treleddyd Fawr in 1946. The species was selected for RDB status, despite its occasional abundance in the New Forest, Dorset and the Lizard, because it is characteristic of the endangered wet heathland of southern England.

Hydrochara caraboides (L.) (RDB 1) - Carpenter (1927) recorded this species from "spring brooks" in v.c. 46. This species is declining in Britain and now appears to be confined to the turbary peat areas of the Somerset Levels. It has never been recorded from the nearest equivalent areas in the Welsh levels. The species can fly and it is possible that the record is based on a stray specimen. It is more likely that the record results from misidentification of a large specimen of Hydrobius fuscipes.

Ochthebius poweri Rye (RDB 3) - J Balfour-Browne (1947) discovered the only known site for O. poweri in Wales. His comments (p 18) bear repeating - "Ochthebius poweri.....is otherwise recorded in this country from South Devon and Dorset. There can be little doubt that the peculiar habitat of this little species accounts for the relatively restricted distribution in this country. The species is found only in the weakest trickles of water on vertical or near vertical cliffs on the coast, apparently beyond the reach of the highest tides, but within the limits of blown spindrift. The area in which I took it to the number of some 40 larvae and adults within half an hour covered some 9 square yards only and was devoid of any visible vegetation. The water coursed down it a little more than the speed and volume of condensation of steam on a window-pane. In nearby areas where the flow of water was stronger not a single specimen could be found. Similarly in the nearby areas with no free water no adults could be found but the larvae occurred in these drier areas only and could be seen in some numbers."

The Welsh find was made at Whitesand Bay in August 1946; Balfour-Browne noted in his journal that the site was on boulder clay. The species was confined to a small area of exposed glacial drift overlying the bedrock on the promontory at the north end of the bay.

The site was visited on 11 September 1988 and one specimen was found by splashing a small section of wet mud overlying the bedrock at the north end of the bay into a rockpool. No more specimens could be found at that point, at any other point around the bay, or in subsequent searches of several sections of cliff line with seepage at Newgale, Little Haven and north of Tenby. The only other modern British records are for the sandstone cliffs from Exmouth to Torquay.

Hydraena pygmaea Waterhouse (RDB 3) - There are no modern records for Wales. That for Dyfed is by Jones (1948) from the Nant Pedol in v.c. 44. in 1947. Only one specimen was recorded.

Water beetles recorded in the vice-counties constituting Dyfed. (Numbers refer to the decades, eg, 46-, reported in the 1940's, 1960's but not in the 1980's.)

		Vice-counties		
		44	45	46
Brychius elevatus		34568	38	8
Haliplus confinis		8	34-	8
H. flavicollis		8	8	478
H. fluviatilis		356-	-	48
H. fulvus		58	35-	348
H. heydeni	Nb	3-	-	-
H. immaculatus		-	5-	3-
H. lineatocollis		348	34568	348
H. lineolatus		48	-	-
H. obliquus		5-	346-	3-
H. ruficollis		38	34568	348
H. variegatus	RDB3	-	1-	-
H. wehnckei		-	38	3-
Hygrobia hermanni		58	3458	-
Noterus clavicornis		58	3458	37-
N. crassicornis	Nb	8	-	-
Laccophilus hyalinus		4-	8	34-
L. minutus		58	348	38
Hydrovatus clypealis	RDB3	5-	4-	-
Hyphydrus ovatus		58	34-	78
Bidessus minutissimus	RDB3	-	-	48
Hygrotus inaequalis		58	34568	2378
Coelambus confluens	Nb	5-	34-	-
C. impressopunctatus		-	4-	3-
Hydroporus angustatus		58	-	8
H. discretus		8	358	34-
H. erythrocephalus		8	34568	2348
H. gyllenhalii		58	3468	238
H. incognitus		8	8	28
H. longicornis	Nb	8	-	8
H. longulus		-	3568	3-
H. melanarius		-	38	8
H. memnonius		8	3458	38
H. nigrita		48	348	38
H. obscurus		-	38	238
H. obsoletus	Na	-	3-	-
H. palustris		38	3458	3478
H. planus		58	368	3-
H. pubescens		358	34568	2348
H. rufifrons	RDB2	5-	-	8
H. striola		8	38	38
H. tessellatus		568	348	38
H. tristis		8	48	348
H. umbrosus		-	348	8
Stictonectes lepidus	Nb	58	-	348
Graptodytes bilineatus	RDB3	-	6-	-
G. flavipes	RDB2	-	346-	-
G. granularis	Nb	-	3-	8
G. pictus		58	4-	348
Porhydrus lineatus		5-	-	-

		Vice-counties		
		44	45	46
Deronectes latus	Na	468	36-	2348
Potamonectes assimilis		-	-	48
P. depressus elegans		4568	34-	348
Stictotarsus 12-pustulatus		34568	348	348
Oreodytes davisii		4-		348
O. sanmarkii		34568	348	23478
O. septentrionalis		34568	34-	478
Platambus maculatus		34568	8	348
Copelatus haemorrhoidalis		58	358	348
Agabus affinis		8	3468	8
A. biguttatus	Nb	-	3-	-
A. bipustulatus		3568	345678	348
A. chalconatus	Nb	?5-	?356-	?3-
A. congener		8		8
A. conspersus	Nb	5-	C-	-
A. didymus		5-	38	34-
A. guttatus		58	36-	138
A. melanocornis		-	468	8
A. nebulosus		56-	34568	-
A. paludosus		58	348	34-
A. sturmii		8	48	348
A. unguicularis	Nb	-	-	3-
Ilybius aenescens	Nb	-	-	38
I. ater		58	3458	3-
I. fuliginosus		348	348	348
I. guttiger	Nb	-	8	-
I. quadriguttatus		58	3458	8
Rhantus bistriatus		-	-	38
R. grapii	Nb	58	348	-
R. suturalis	Nb	5-	34-	-
Colymbetes fuscus		68	3456-	34-
Acilius sulcatus		-	3-	35-
Dytiscus circumflexus	Nb	6-	-	-
D. marginalis		568	368	2348
D. semisulcatus		56-	348	34-
Gyrinus caspius		56-	38	-
G. marinus		5-	-	-
G. minutus	Nb	5-	-	6-
G. substriatus		456-	348	234568
G. urinator	Nb	56-	3-	4-
Orectochilus villosus		34568	38	48
Georissus crenulatus	Na	-	-	8
Hydrochus angustatus	Nb	-	-	3-
Helophorus aequalis		8	48	8
H. arvernicus		0-	-	48
H. brevipalpis		348	345678	348
H. flavipes		8	458	8
H. fulgidicollis	Nb	-	8	-
H. grandis		8	8	8
H. granularis		-	6-	38
H. griseus	Nb	-	?6-	-
H. minutus		-	4568	8
H. nubilus		-	6-	-
H. obscurus			8	8

	44	45	46
H. porculus	-	3-	-
H. strigifrons Nb	-	-	8
Coelostoma orbiculare	8	3458	38
Cercyon impressus	-	8	8
C. lateralis	-	8	-
C. marinus	-	5-	-
C. melanocephalus	-	58	-
C. obsoletus	-	8	-
C. tristls Nb	-	8	-
C. ustulatus Nb	-	8	8
Paracymus scutellaris Nb	-	58	3-
Hydrobius fuscipes	8	345678	348
Anacaena globulus	8	3468	38
A. limbata s.s.	8	8	8
A. lutescens	8	8	8
Laccobius atratus Nb	8	6-	8
L. atrocephalus Nb	8	348	348
L. biguttatus	-	-	3-
L. bipunctatus	-	3458	38
L. minutus	8	4-	34-
L. sinuatus Nb	-	-	8
L. striatulus	-	3-	3_
Helochares punctatus Nb	-	3468	38
Enochrus affinis Nb	-	8	38
E. bicolor Nb	-	38	-
E. coarctatus Nb	-	348	38
E. fuscipennis	-	38	238
E. ochropterus Nb	-	3458	8
Cymbiodyta marginella	-	8	-
Chaetarthria seminulum Nb	8	34568	38
Berosus affinis Nb	8	3-	-
Ochthebius auriculatus Nb	-	-	38
O. bicolon Nb	-	8	3-
O. dilatatus	-	348	-
O. marinus Nb	-	3-	3-
O. minimus	-	8	-
O. poweri RDB3	8	48	-
O. punctatus Na	-	38	3-
O. subinteger lejolisii Nb	-	348	8
O. viridis Nb	0-	-	3-
Hydraena britteni	-	38	8
H. gracilis	-	3478	3478
H. minutissima Nb	34568	-	8
H. pygmaea RDB3	-	-	-
H. riparia	4-	38	23-
Limnebius nitidus Nb	68	34-	3-
L. truncatellus	-	3478	348
Elmis aenea	348	56-	48
Esolus parallelepipedus	4568	-	48
Limnius volckmarii	4568	-	248
Oulimnius tuberculatus	468	-	248
Helichus substriatus Na	48	-	8
Dryops ernesti	6-	58	8
D. luridus	-	58	48
	6-		

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LEPIDOPTERA

THE CEREDIGION ROTHAMSTED TRAPS - NOTABLE MOTHS CAPTURED DURING 1987 - IJL TILLOTSON

In spite of indifferent to appalling climatic conditions, the Rothamsted traps at Plas Gogerddan (22/629837), Tregaron (22/687618) and Aberporth (22/249520) invariably manage to turn up a few interesting species. 1987 was no exception and although there were no additions to the county fauna, a number of species were recorded which have previously been seen on few occasions.

Orthosia populeti Lead-coloured Drab - Four specimens were captured in April at Tregaron, bringing the county total to twelve.

Mythimna vitellina The Delicate - A migrant of fairly frequent occurrence in southern England, but rarely reaching Wales. One captured at Tregaron on 20 September was only the third county record.

Cucullia asteris Star-wort - A species of saltmarshes only recorded on six occasions in Ceredigion, three of them at Aberporth including one on 26 May.

Apamea ophiogramma Double-lobed - Unaccountably rare in Ceredigion where suitable habitat is fairly widespread, there are only seven records including one at Plas Gogerddan on 1 August.

Amphipoea paludis Saltern Ear - The least abundant of the 'Ears' in Ceredigion for which there are only twelve records. Two were taken this year, on 17 and 31 August at Tregaron and Aberporth respectively.

Nycteola revayana Oak Nycteoline - This extremely variable moth may be frequently overlooked as a 'micro' because of its small size. It is not common and one taken at Tregaron on 4 October was the first identified in Ceredigion since 1973.

Scopula ternata Smoky Wave - A heathland species which is locally common in Wales but only rarely recorded in Ceredigion. One at Plas Gogerddan on 9 July was only the second county record, the other being at the same location in 1977.

Euchoeca nebulata Dingy Shell - It is perhaps surprising that this species, which is not uncommon in marshy places throughout England and Wales, is not recorded more frequently in Ceredigion. However, a specimen taken at Plas Gogerddan on 12 July was only the fourth county record.

Hydriomena ruberata Ruddy Highflyer - A generally northern species inhabiting marshes and heaths and regarded as nationally notable. A single specimen taken at Tregaron was the twenty-second county record.

Dyscia fagaria Grey Scalloped Bar - Another northern species of heathland, moorland and bogs which in recent years has only been recorded from the Tregaron area where nine were taken this year between 29 May and 8 July.

Eupithecia expallidata Bleached Pug - A scarce resident known from only four localities in the county, including Plas Gogerddan and Aberporth were four were captured in August.

Eupithecia trisignaria Triple-spotted Pug - Two were recorded at Plas Gogerddan, on 12 and 15 July. There is only one previous county record for this nationally scarce inhabitant of marshy places.

DYFED SITE REPORT - Number Five - WEST WILLIAMSTON NATURE RESERVE, PEMBROKE (22/026060) - R ELLIOT.

West Williamston Nature Reserve stands at the confluence of the Carew and Cresswell Rivers near their junction with the Daucladdau River in the district of South Pembrokeshire. The site was purchased from the estate of the late Mrs Trollope-Bellew in 1978 and leased to the Dyfed Wildlife Trust (DWT) on 28 December 1979 for a period of 42 years as a nature reserve. In 1986, the Nature Conservancy Council designated the reserve as a Site of Special Scientific Interest (SSSI). The reserve is a Carboniferous Limestone promontory with a nominal area of 19.1 hectares (47.2 acres) and a maximum elevation of sixteen metres. It consists of a complex of disused quarries, tidal creeks and ungrazed saltmarsh within a former walled deer-park. There is a wide variety of habitats ranging from bare limestone rock and scree to calcareous grassland and scrub, climaxing in secondary calcareous woodland. These habitats are interlocked by five tidal creeks with their associated saltmarshes and mudflats, resulting in an exceptionally high diversity of plants.

A broadleaved, semi-natural secondary woodland of ash Fraxinus excelsior and sycamore Acer pseudoplatanus has developed on the disused limestone quarries and spoil heaps. The northern section of this woodland is largely dominated by sycamore, giving a more open canopy than the ash-dominated southern section. In this southern section is a small stand of beech Fagus sylvatica and nearby an avenue of walnut Juglans regia, both probably deliberately planted. The understorey contains species such as hawthorn Crataegus monogyna, blackthorn Prunus spinosa, elder Sambucus nigra, and holly Ilex aquifolium. Much of the ground flora is dominated by bramble Rubus fruticosus, dog's mercury Mercurialis perennis, ivy Hedera helix, and ferns such as hart's-tongue fern Phyllitis scolopendria. Orchid species such as early purple orchid Orchis mascula and twayblade Listera ovata are common with occasional stands of common spotted orchid Dactylorhiza fuchsii.

On the limestone ridges dense areas of scrub have developed, consisting mainly of blackthorn, hawthorn and rose species such as field rose Rosa arvensis, dog rose R.canina and sweet briar R.micrantha, and with gorse Ulex europaeus, bramble, dewberry Rubus caesius, guelder rose Viburnum opulus and black bryony Tamus com munis. In the more open areas of this scrub some calcareous grassland species have managed to survive, such as wild basil Clinopodium vulgare, pale St. John's wort Hypericum montanum, musk mallow Malva moschata and marjoram Origanum vulgare. The richest areas of calcareous grassland are in the northwest portion of the reserve and a wide range of grasses may be found including false oat grass Arrhenatherum elatius, common quaking grass Briza media, sea fern grass Catapodium marinum, sheep's fescue Festuca ovina, yellow oat grass Trisetum flavescens and yorkshire fog Holcus lanatus, all occurring with a limestone flora including rare and uncommon species in a rich variety. The bee orchid Ophrys apifera occurs in a small area of calcareous grassland in the middle of the reserve along with the uncommon felwort or autumn gentian Gentianella amarella. In 1986, after many years in which only a few spikes had been found, over 1000 spikes of autumn gentian appeared in two seperate areas and similar numbers have appeared at the same sites in 1987 and 1988. At the edges of the calcareous grassland areas, where they border the saltmarsh, less common species such as distant sedge Carex distans and rock sea lavender Limonium binervosum can be found.

Along the north and west edges of the reserve there is a well-developed saltmarsh which continues into the interior of the reserve via the sides of the tidal creeks and the flat, silted areas which were once occupied by loading docks. The flora grades from stands of common couch grass Agropyron repens and sea wormwood Artemisia maritima at the strand-line to sea purslane Halimione portaculoides and common saltmarsh grass Puccinellia maritima at a lower level, finally grading into cord-grass Spartina anglica at the lowest level. The rare marshmallow Althaea officinalis and the uncommon bush-grass Calamagrostis epigejos can both be found at the highest levels of the saltmarsh in the north-west of the reserve. Accretion of mud around the base of the cord-grass since its arrival in the area in 1941 has increased the actual area of the reserve to an estimated 24.3 hectares (60 acres).

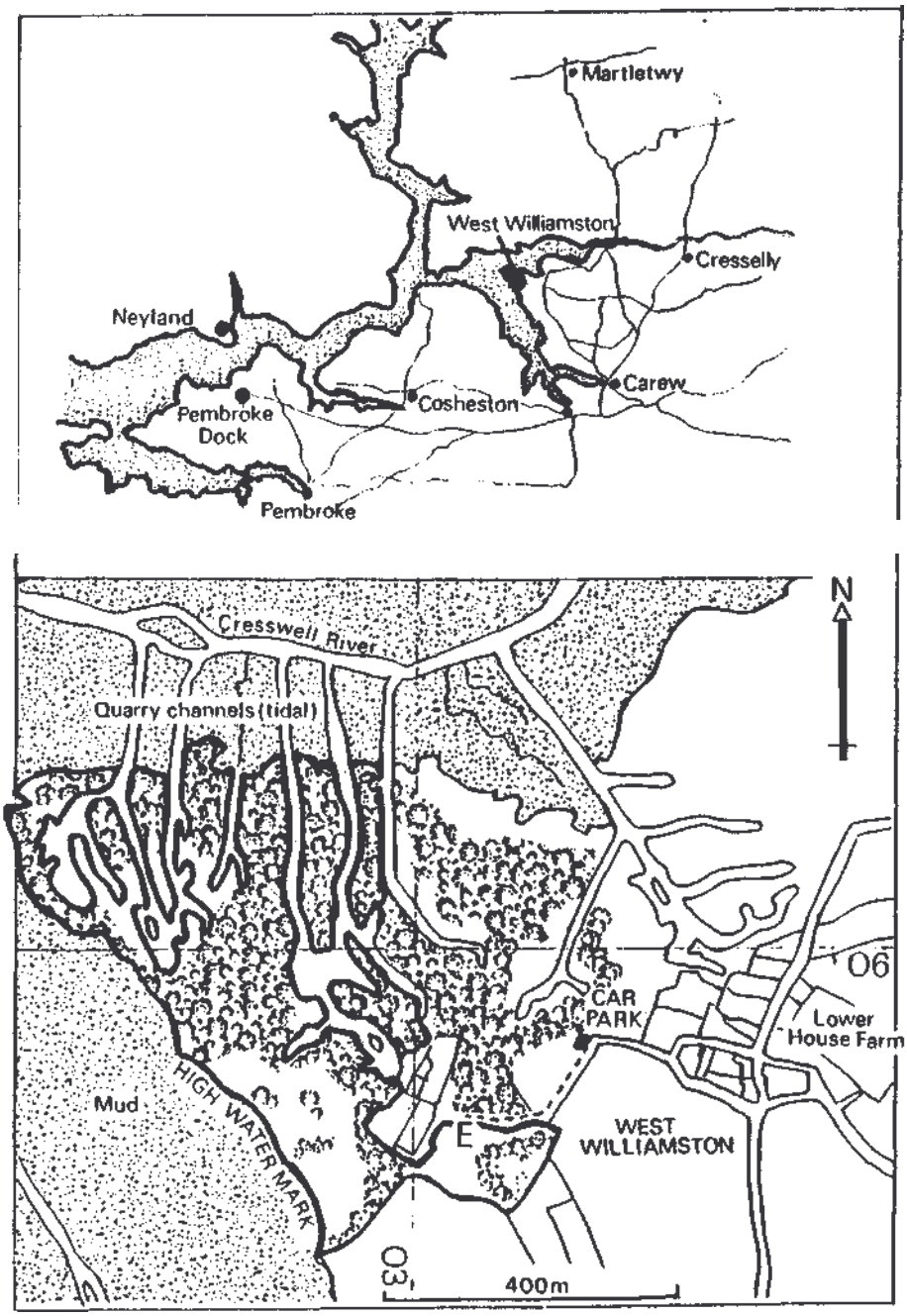
The wide variety of habitats available and the presence of so many different species of plants, has allowed a very diverse invertebrate population to develop, although it is still very much under-recorded and to date only some 310 invertebrate species are known to occur in the reserve. The best recorded group are the lepidoptera with a list of 130 species due mainly to a concerted effort by DR Rees and R Elliot during the summers of 1979 and 1980 when regular moth-trapping accounted for over 100 species. Notable species include the dingy skipper

Erynnis tages, grayling Hipparchia semele and brown hairstreak Thecla betulae butterflies and the red-necked footman Atolmis rubricollis and chalk carpet Scotopteryx bipunctaria moths. The dingy skipper has been recorded on six seperate occasions between 1979 and 1985, usually on the more open calcareous grassland areas of the reserve where its foodplant, bird's-foot trefoil Lotus corniculatus, is common. Graylings in Pembrokeshire are very much associated with coastal regions and the records for the reserve are the most inland so far. In the reserve the species is seen only on the bare limestone areas of calcareous grassland where the female lays her eggs in small crevices in the rocks. The brown hairstreak was first recorded in September 1979 when a male and female were caught within a short distance of each other on the same day. There were no further records until late in 1987 when R Elliot, P Brown and H Taylor found the distinctive eggs of this species on blackthorn just above the saltmarsh on the western edge of the reserve. Subsequent searches by P Brown a few days later found eggs laid on several other blackthorn bushes in the same area. The red-necked footman is known only from a single record when an adult was found in bright sun on an umbellifer flower-head and the chalk carpet was recorded when a specimen was taken during the visit of a group from the Dale Fort Lepidoptera course in July 1986. The chalk carpet is another species whose larvae feed on bird's-foot trefoil. Many of the more common species of moths and butterflies have been recorded at various times but some groups, such as the fritillaries, are poorly-represented with only a few records for a single species, the silver-washed fritillary Argynnis

Spiders are another group which have been given some attention. In May 1980, JR Parker brought a group from the Orielton Field Centre's Spider course and recorded thirteen species, including Trochosa ruricola which is thought to be a new record for Pembrokeshire. Subsequently, CM Merrett from the National Museum of Wales paid two visits to the reserve in 1986 and found a further twenty-seven species of spiders and three species of pseudoscorpions. The 1988 Orielton Spider course visited the reserve in August and added another twelve species to the list, including Pardosa purbeckensis. The total spider list for the reserve now stands at fifty-five species.

There are thirty species of Diptera recorded from the reserve, a very small number when compared to the known British total of over 5000. Twenty species were recorded by MN Pugh during a Diptera Group visit in July 1986 and a further six by I Perry during the same visit. The list of Hymenoptera recorded includes two gall-wasps, Biorrhiza pallida and Diplolepsis rosae, both identified from the galls found on oak Quercus sp. leaves and wild rose Rosa sp. plants respectively. Four of the remaining seven species listed are ants which were recorded when the National Trust Biological Survey took place on the reserve in May 1981. Coleoptera are another grossly under-recorded group on the reserve with only sixteen species listed at present. These include the thick-legged flower-beetle Oedemera nobilis, the summer chafer Amphimallon solstitialis and the green tiger-beetle Cicindela campestris.

Sixteen species of molluscs have been recorded, mostly by NR and RH Lowe, and these include the slug Boetgerrilla pallens. This species is a small slug, pale grey in colour and almost transluscent; it is of eastern European origin and has only recently been discovered in Britain although it is now spreading rapidly. The record for the reserve in April 1984 was, at the time, only the fourth record for Wales. Woodlice are represented by two species, both recorded by KNA Alexander in May 1981 - Armadillidium vulgare and A. nasatum. Four other groups are represented in the species lists for the reserve - Thysanura with a single species, Orthoptera with six species, Hemiptera (7 species), and Neuroptera (one species). With its rich diversity of habitats and its poorly-recorded invertebrate life, the reserve could richly repay much more intensive study of almost all of the groups mentioned above.



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OPILIONES

THE HARVESTMEN OF CORS FOCHNO, 1986 - 1988 - A P FOWLES

This is the third paper in a series which has so far looked at the distribution of ground-beetles (Fowles 1987) and ants (Chater 1988) on the raised mire at Borth in relation to the major fire of February 1986. The present paper differs slightly from its predecessors in that results are now available for the third year of sampling and this additional data has therefore been incorporated into the discussion. Sampling methodology for 1988 was the same as that used in 1987, ie, a transect of pitfall traps employed across the mire between April and October inclusive - the reader is referred to the earlier papers for further details on the background to this study.

Harvestmen are a group of scavenging carnivores related to spiders but, unlike them, lacking the ability to produce silk. All species (there are about twenty-five in Britain) are therefore active hunters, roaming around in search of their prey - which they are said to kill by dropping down upon the victim "like a miniature pile-driver" (Sankey and Savoury 1974). They do not appear to have any specific prey preferences and will feed upon practically any edible arthropods within a suitable size range (although the two scarce members of the Trogulidae specialise in snails). Harvestmen are prone to dessication and are therefore commonest in damp sites where they are active mainly at night when there is greatest humidity. Most species hatch during the spring and early summer from eggs laid in moist situations and develop to maturity from July onwards; the adults eventually dying off with the winter frosts. Two species are common on Cors Fochno and it is interesting, in light of the present study, that they differ in their overwintering strategies: Rilaena triangularis nymphs hatch out in early autumn and attain maturity in the following spring, whilst Phalangium opilio follows the normal pattern of hatching out in spring from eggs laid the previous autumn. Both species develop through their early instars at ground level but spend increasingly more time hunting amongst the canopy of the field layer as they mature.

The trapping programme began too late in 1986 (18 June) to catch the peak period of activity for Rilaena and only ten adults were recorded in the study traps. However, all ten were caught in traps set within the unburnt mire and even from this small sample it was evident that the fire had affected the over-wintering nymphs. In 1987 the earlier start date resulted in a total of seventy-two adults being caught, mainly in April but continuing through to July. The sub-totals indicated that just one year later Rilaena had begun to recolonise the burnt mire with forty-three caught on the unburnt mire and twenty-nine on the burnt area. The figures for 1988, however, suggest a reversal of this trend as all but ten out of a total of ninety adults trapped were captured on the unburnt mire.

The fire apparently also affected the Phalangium population to some extent, although presumably a proportion of the over-wintering eggs were laid in situations damp enough to give them some protection. In 1986, sixty-seven Phalangium were recorded in the study traps with fifty-three on the unburnt and fourteen on the burnt sections of the mire. The]987 traps began to catch Phalangium in June and maximum numbers were caught in August (there was a similar pattern of activity in 1988) - the season's total of ninety individuals was distributed fifty:forty in favour of the unburnt mire. It appeared as if Phalangium was well-adapted to survive in the post-fire conditions and was rapidly beginning to regain its former status. In terms of the results of the pitfall-catches, however, there has been something of a set-back in 1988 as the relative proportion on the burnt mire has declined. Eighty-one adults were caught during the season, a total composed of fifty-six on the unburnt mire and just twenty-five on the area burnt two years previously.

If we were to take the hypothesis that the fire had no effect upon the distribution of harvestmen on Cors Fochno and that both species were randomly distributed across the whole of this comparatively homogenous tract then it would be anticipated that more adults would be trapped on the burnt mire as they would be forced to forage at ground level more frequently as a result of the removal of the field layer. The fact that the opposite is true (more adults are caught on the unburnt mire despite the presence of a complex vegetational structure enabling them to hunt out of reach of the traps) suggests that the fire has indeed reduced populations on the area burnt in 1986. The figures suggest that these effects are worse for Rilaena than Phalangium as there is a much greater disparity between the results for the former on a comparison of the catches of the burnt and unburnt sections of the transect. It would appear, therefore, that harvestmen nymphs are relatively more vulnerable to winter fires than over-wintering eggs. There are three possible reasons for their vulnerability - (1) the nymphs are killed directly by the fire, (2) major changes in the micro-climate of the peat surface result in nymphs succumbing to subsequent frosts, or (3) food sources are seriously depleted, leading to starvation and a reduction in the Rilaena population.

Clearly, more detailed investigations would be required to determine which of the possibilities is of the greatest importance. Unanswered questions are also raised by the 1988 reversal of the trends of recolonisation which were apparently well under-way in 1987. One possibility is that climatic conditions of the 1987/88 winter (which was not particularly harsh) were unfavourable for harvestmen on the burnt mire - certainly the Sphagnum and litter layers are still poorly-developed there in comparison with the unburnt mire and most peatland invertebrates over-winter in one form or another in these micro-sites. The one certainty is that much more needs to be known about the ecology of harvestmen before we can begin to successfully interpret the results of pitfall-trap studies. The sampling programme has begun to give us an insight into the effects of fire upon peatland harvestmen; only broader-based research will provide the answers for the whole story.

Four other species of harvestmen have been recorded so far in the pitfall-traps on Cors Fochno - two specimens each of Leiobunum blackwalli, Paroligolophus agrestis, and Lacinius ephippiatus, and a single Mitostoma chrysomelas - all of which were captured on the unburnt mire.

References:

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LETTERS TO THE EDITOR

I read with interest the comment on finding Trachys troglodytes on a peatland in Ceredigion and the suggestion that sweeping might turn it up at other sites (DIG 9:18). I have had some experience with this beetle in Oxfordshire and thought that my observations may help your members to find this buprestid elsewhere. In August 1985, whilst surveying the invertebrates of a hay meadow, I noticed unusual feeding damage on the leaves of devil's-bit scabious Succisa pratensis; each leaf had a series of small semi-circles eaten out of the leaf-margins.

Closer inspection of the plants revealed small metallic-blue beetles which were presumed to be chrysomelids but proved to be Trachys troglodytes. The adult beetles were present on the leaves but rapidly leapt onto the ground if disturbed. The low growth form of Succisa and the active escape-mechanism of the beetles makes sweeping an inefficient method of capture. I have since found Trachys at another Oxfordshire site by first locating the signs of feeding-damage and then searching the plant with a pooter at the ready and I would recommend that this method is employed at peatland sites in Dyfed.

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DEADWOOD BEETLES IN CEREDIGION (VC46) - DC BOYCE

The existence of a distinctive invertebrate community associated with over-mature timber has been well-known for many years and in recent decades there has been a growing realisation that these communities are increasingly under threat and warrant urgent conservation measures. Information on beetle (and lichen) communities has been summarised by Harding and Rose (1986) for those areas of woodland which have served the dual-purpose of timber production and grazing by deer and other livestock. Such a system allowed stands of over-mature trees to develop as they provided shelter for livestock. This type of woodland has been termed "pasture-woodland" and consits of four major types - forests and chases; parks; wooded commons; and winter-grazed woodlands.

The first two categories are associated chiefly with influential estates dating from the medieval period and there has been no such tradition in Ceredigion, with most woodlands being owned by freeholders until the eighteenth century when some larger estates, such as those at Hafod and Plas Gogerddan, were established (Lister & Whitbread, 1987). Similarly, there are no commons in the area with a long continuity of woodland cover and winter-grazed woodlands are the only category that is relatively well-represented. Allied to the scarcity of pasture-woodlands in the vice-county, there is also a dearth of over-mature timber in other wooded sites, due to the heavy exploitation of woodland from the Iron Age onwards and culminating in their decimation during the two World Wars.

It is clear from the above that Ceredigion is unlikely to have a deadwood beetle fauna of great note. Indeed, of the 195 beetle species listed by Harding & Rose (loc.cit.) as being indicative of ancient/pasture-woodlands, only eleven have been recorded so far in the vice-county (Table 1). Furthermore, these are all in saproxylic fauna group 3, ie. species associated with dead and dying timber "which occur widely in wooded land, but which are collectively characteristic of ancient woodland with deadwood habitats". Harding and Rose have compiled their list of indicator species from a national perspective but there is a marked regional variation in the value of such indicators throughout the country. Garland (1983) has produced a list of beetles that he considered to be indicative of primary woodland in Yorkshire and Derbyshire and this includes twenty-six species which have been found in Ceredigion (Table 2). Although this list is not entirely applicable to Ceredigion, it does seem to be more relevant than that of Harding & Rose and appears to be much more useful in identifying sites that may be of some interest in a local context. It would be of great value to construct a list of indicator species for the primary woodlands of Dyfed but at present there is insufficient information available.

Much the best-studied element of the deadwood fauna in the vice-county is the community of beetles that live underneath bark, however, even here the picture is far from complete. The difficulties of removing bark from recently-fallen timber or from wood that is not yet dead means that the pioneering beetles in the under-bark succession (the bark-beetles (Col: Scolytidae) being most important) are very poorly-known. Common bark-beetles recorded from Ceredigion include Drycoetinus villosus (usually associated with oak), Leperisinus varius (an ash-feeder), and Scolytus multistriatus (one of the bark-beetles responsible for Dutch Elm disease). A much scarcer species of this family is Xyloterus signatus which, although associated with old timber, has only been recorded in a pitfall-trap on the raised bog at Cors Fochno (22/635915).

After a time, usually within one or two years, the bark becomes loosened by the action of the beetles and fungi and a number of very commonly encountered species may now be collected. One such beetle is Cerylon ferrugineum which, in Ceredigion, has been found under the bark of oak, ash, elm, beech, sycamore,

walnut and sitka spruce. Other ubiquitous species in these habitats are Rhizophagus dispar, Bembidion harpaloides, Atrecus affinis and Gabrius splendidulus. The small aleocharine rove-beetles have not been well-studied but Homalota plana, Bolitochara obliqua, Leptusa fumida, and the nationally-notable Leptusa pulchella are amongst the species that are likely to be widely-distributed.

There is a second echelon of species that, whilst still being widespread, do appear to be more restricted to old woodland areas. The melandryid Orchesia undulata is one example, having been found in seven sites so far, all of which are regarded as being ancient woodland. However, it does not seem to be too specific as to the trees in which it lives as it has been found beneath the bark of oak, elm, sycamore, cherry and sitka spruce. Despite being somewhat frowned upon by woodland conservationists, sycamore does seem to shelter a surprising diversity of beetles beneath its bark. On the Cilgwyn estate near Newcastle Emlyn (22/317415), besides O.undulata sycamore also yielded the only county records of Litargus connexus and Triplax aenea (the latter was also found under elm) and the only recent records of three Dromius species of ground-beetle - D.agilis, D.quadrimaculatum, and D.quadrinotatus. Other beetles that have so far been restricted to deadwood habitats on ancient sites are the staphylinid Siagonium quadricorne, the lymexylid Hylecoetus dermestoides and the rhinocerus beetle Sinodendron cylindricum.

The longhorns (Col: Cerambycidae) are a family that chiefly utilises dead and dying wood in the larval stage. In addition to the very common species Strangalia maculata, Clytus arietis, Grammoptera ruficornis, Rhagium bifasciatum and R.mordax there are several other species in Ceredigion that appear to be restricted to sites with ancient woodland cover. These include Leiopus nebulosus, Alosterna tabacicolor, and the nationally notable species Judolia cerambyciformis and Saperda scalaris. The latter species is only known in the county from one old record (Salter 1933) in Cwm Einion (22/68-94-). Strangalia quadrifasciata is regarded as an ancient woodland indicator by both Harding & Rose and Garland but in west Wales it appears to show an affinity with old willows in sites that are not necessarily connected with old woodland. This situation is also true of Melandrya caraboides, which in Ceredigion is only known from floodplain sites on the Dyfi and Teifi.

A number of other supposed ancient woodland indicator beetles are also found outside this habitat in VC46. The click-beetle Ampedus balteatus is associated with old woodlands but it is also believed that it may be able to feed on peat as a larva (Garland loc.cit.). In Ceredigion it is known only from the raised bogs of Cors Caron and Cors Fochno, where peat seems the more likely food source, although old birches and willows on the bog-fringe could be utilised. The bee-chafer Trichius fasciatus and the fungus-beetle Tetratoma fungorum (which feeds on the fruiting bodies of the birch polypore Pitoporus betulinus) are "both probably reliant upon dead and dying birch though not necessarily in association with old woodland.

It is clear that, due to the geographical position and management history of woodland in Ceredigion, existing lists of indicator species for ancient woodland habitats are of limited value in site assessment. The deadwood beetle fauna is undoubtedly impoverished, consisting largely of species that are, in national terms, of marginal importance in suggesting a long history of woodland continuity. Further work is required within Ceredigion, and Dyfed as a whole, to establish which species can be reliably used as indicator species in a regional context.

References:

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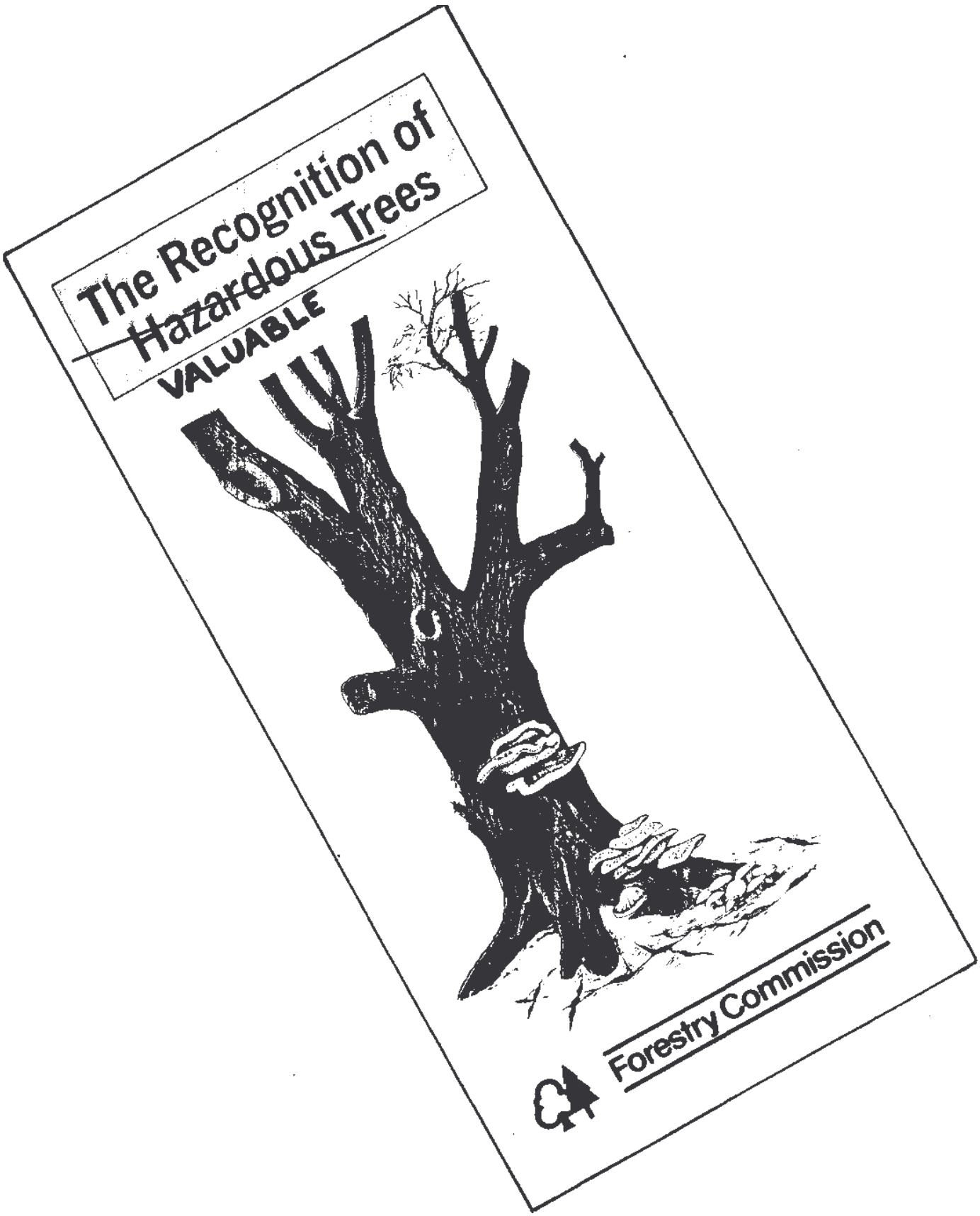
SALTER, JH (1933) - Saperda scalaris L. and Pachyta cerambyciformis Schrank. North-western Naturalist 8:322-323.

TABLE 1: BEETLES KNOWN FROM CEREDIGION (VC46) WHICH ARE NATIONALLY REGARDED AS HAVING ANCIENT WOODLAND INDICATOR STATUS. (All species listed belong to the saproxylic fauna group 3, Harding & Rose 1986)

Calosoma inquisitor (Carabidae)
Sinodendron cylindricum (Lucanidae)
Hylecoetus dermestoides (Lymexylidae)
Triplax aenea (Erotylidae)
Tetratoma fungorum (Tetratomidae)
Orchesia undulata (Melandryidae)
Melandrya caraboides (Melandryidae)
Strangalia quadrifasciata (Cerambycidae)
Saperda scalaris (Cerambycidae)
Mesites tardii (Curculionidae)
Xyloterus signatus (Scolytidae)

TABLE 2: BEETLES KNOWN FROM CEREDIGION (VC46) WHICH ARE REGARDED AS HAVING ANCIENT WOODLAND INDICATOR STATUS IN THE COUNTIES OF YORKSHIRE AND DERBYSHIRE (after GARLAND 1983)

CARABIDAE
Calosoma inquisitor
LEIODIDAE
Anistoma humeralis
Agathidium nigripenne
SCAPHIDIIDAE
Scaphidium quadrimaculatum
Scaphisoma agaricinum
STAPHYLINIDAE
Siagonium quadricorne
LUCANIDAE
Sinodendron cylindricum
ELATERIDAE
Ampedus balteatus
LYMEXYLIDAE
Hylecoetus dermestoides
NITIDULIDAE
Glischrochilus hortensis
EROTYLIDAE
Triplax aenea
CERYLONIDAE
Cerylon ferrugineum
MYCETOPHAGIDAE
Litargus connexus
TENEBRIONIDAE
Cylindronotus laevioctostriatus
TETRATOMIDAE
Tetratoma fungorum
MELANDRYIDAE
Orchesia undulata
Melandrya caraboides
CERAMBYCIDAE
Alosterna tabacicolor
Judolia cerambyciformis
Strangalia quadrifasciata
Leiopus nebulosus
Saperda populnea
Saperda scalaris
CURCULIONIDAE
Mesites tardii
SCOLYTIDAE
Dryocoetinus villosus
Xyloterus signatus



This leaflet, which is available free from the Forestry Commission, is a useful guide to the types of tree that provide important micro-habitats for our threatened deadwood invertebrate communities.