

Upland Archaeology in Dyfed

A Preliminary
Assessment



**UPLAND ARCHAEOLOGY IN
DYFED**

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PRELIMINARY
ASSESSMENT**

EDITED BY

D. G. BENSON



Dyfed Archaeological Trust
1989

ACKNOWLEDGEMENTS

The Trust gratefully acknowledges the assistance of many individuals and organisations in the preparation of this assessment. Organisations supplying particular information included the Dyfed County Council Planning Department, the National Trust, the Royal Commission on Ancient and Historical Monuments (Wales), the National Museum of Wales, the Welsh Water Authority, the Central

Electricity Generating Board, the Royal Society for the Protection of Birds, the Nature Conservancy Council, the Welsh Office Agricultural Development and Advisory Service, the University College of Wales, Aberystwyth, and the Departments of the Brecon Beacons and Pembrokeshire Coast National Parks.

Text: Don Benson and Ken Murphy with contributions and assistance from George Williams, Muriel Bowen Evans, Astrid Caseldine and Chris Musson.

Copy editing by Don Benson and Chris Musson.

'Desk-top' analysis and illustrations: Ken Murphy; Computer analysis John Crockett

Typing: Margaret Lewis

Design and Layout: Terrence James

Laser typeset in Times New Roman® and Helvetica® Bold using Ventura Publisher 2™

Printed and published by the Dyfed Archaeological Trust Ltd, 1989, The Old Palace, Abergwili, Carmarthen, Dyfed. SA31 2JG

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ISBN 0 948262 20 6

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1. THE ARCHAEOLOGICAL RESOURCE

1.1. The Physical background

Upland, for the purpose of this study, is defined as land over 244m (800ft). At this height lowland intensive farming and enclosed land usually gives way to unenclosed rough pasture (Countryside Commission 1978, 3). There are 1208 sq.km. of upland in Dyfed, representing about 21% of the total land area of 5777 sq.km.

Within the Dyfed peninsular, the uplands are not contained in a single mass. The majority lie to the east, divided into blocks by river valleys, whilst Mynydd Preseli forms an isolated upland block in the south west of the county.

Geologically, the Dyfed uplands are dominated by soft sedimentary rocks of Ordovician and Silurian age (George 1970). In the south of the county a more complex geological situation prevails, with Old Red Sandstone, Carboniferous Limestone and Coal Measures outcropping in close proximity. Igneous intrusions in north Pembrokeshire have been instrumental in creating the distinct Mynydd Preseli moor and tor landscape. Much of the solid geology is overlain by glacial and fluvio-glacial deposits, creating conditions conducive to water-logging.

The soils of the uplands are influenced by altitude and geology. Ferric stagnopodzols are the dominant soil type, but on the highest ground raw oligo-amphorophous peat soils are more common. On the upland fringes typical brown earth podzolic soils are found with pockets of stagnohumic gley soils (Soil Survey of England and Wales 1983).

All the uplands in Dyfed receive at least 1600mm of annual rainfall, with the highest parts suffering over 3200mm; it rains on at least 200 days of the year. Snow is uncommon in comparison to the other upland areas of Wales with, on average, apart from the very high ground, only 20-40 mornings a year when snow lies on the ground. This is because of the relatively mild climate; on only 60 days of the year is the mean air temperature below freezing point (Jones 1980). There exist considerable physical differences between areas of the Dyfed uplands. Mynydd Preseli, The Black Mountain and Mynydd Pencarreg are typified by rounded, open moorland, with igneous tors on Mynydd Preseli and escarpments on the northern edge of The Black Mountain. Further north, on the Cambrian Mountains and Pumlumon, altitudes are on average higher and the landscape is more craggy.

1.2. Natural resources: past exploitation

In common with other upland areas the natural resources available in Dyfed have been of considerable significance in prehistoric and historic times. Some of Dyfed's natural resources have had an importance in the past far beyond the region's boundaries, and in some cases the evidence for this exploitation is of national and European significance.

(1) Stone

Stone is a common commodity in all upland areas and numerous quarries of various sizes testify to the former importance of the stone extraction industry. Large quantities of good quality building and roofing stone were quarried from Mynydd Preseli, chiefly in the last century, and on The Black Mountain remains of extensive but largely undated lime quarrying and burning can be easily detected. Elsewhere stone was quarried for local building purposes.

In the prehistoric period the exploitation of dolerite from Mynydd Preseli - the source of the Stonehenge 'bluestones' and a manufacturing centre of axes and hammers - gives the area a significance and status unmatched elsewhere in Wales in terms of archaeological importance and research as well as in terms of the public imagination.

(2) Coal

The South Wales coalfield extends into the Dyfed uplands in the extreme south-east of the county, and the past exploitation of this resource is attested by many small drift mines on the periphery of Mynydd y Bettws.

(3) Mineral ores

The long and at times extremely profitable exploitation of metalliferous ores in the Dyfed uplands finally came to a halt in the early decades of this century. Recent excavations suggest that copper may have been mined in the Bronze Age at Cwmystwyth (Timberlake 1987), and contemporary exploitation of the same ore may have taken place at other locations in northern Ceredigion. It has been suggested that the Romans worked lead

in the Dyfed uplands, but the only hard evidence for mineral exploitation in this period is for gold at Dolau Cothi. The actual mining site at Dolau Cothi is below 244m OD, but the aqueducts that feed the mine run for several kilometres across the uplands. This is a complex of international importance.

Cardiganshire was the premier region of Wales for the mining of lead and silver/lead in the Mediaeval and Post-Mediaeval periods, and it is this industry that has bequeathed the most numerous and distinctive industrial monuments in the uplands. The impact this industry had upon the landscape was considerable. Not only was it instrumental in creating new settlements, roads, tracks and tramways, but was also the foundation of wealth, enabling many large estates to control the agricultural regimes of vast areas of upland.

(4) Wood

Palaeoenvironmental studies have demonstrated that woodland once clothed all but the highest peaks (Moore 1972); in prehistory, timber formed an important resource for fuel and building. Kelly (1988) has suggested that the depletion of the upland woodland resource in Gwynedd led to the rebuilding of Iron Age timber settlements in stone and a similar speculation might be in order for Dyfed. As the area of upland woodland decreased dramatically in the later prehistoric period its value as a timber resource would have increased, but perhaps more importantly, with the increasing depletion of upland soils under cultivation, woodland would have indicated land that could have been profitably cleared for agriculture. This factor may account for the apparently extensive felling of woodland around Tregaron Bog in the Iron Age (Turner 1964).

(5) Peat

Dyfed possesses large reserves of upland peat. It is clear from surface evidence that many areas of even quite shallow peat have been cut for fuel at some time in the past. The date, extent, distribution and value of these turbaries is not known. But with limited supplies of timber, peat must have been of great local and regional importance as a fuel, especially before reduced transport costs made coal a viable alternative in the latter part of the 19th century. Also, with the absence of growing timber, bog oak was extensively used in the construction of humble dwellings.

(6) Water

Water in the uplands is now treated as a national resource, but in the past it was used in industries as a power source to drive machinery and, in the case

of hushing, for mineral prospecting as at Dolau Cothi.

1.3 Past upland land use and settlement patterns

(1) Introduction

There are a number of sources of information on the archaeology of the uplands. The first are the field monuments themselves: in earlier periods these were largely ritual but there were increasing numbers of settlements through time, particularly in historic periods (an analysis of the distribution and density of all known archaeological sites is provided in Appendix I and the information is shown graphically on Maps 10-14). Inferences from pollen analysis provide our main source of information on land-use in the Dyfed uplands in the prehistoric period and, indeed up to the later Mediaeval times. After this, increasing reliance is placed upon historical sources, place-name analysis and the study of contemporary and ethnographic data.

There are problems involved in the correlation of palynological and archaeological studies in the uplands, and these apply to both prehistoric and historic periods. There is often a failure to integrate the evidence obtained from different disciplines. On the one hand, the evidence from field monuments is often employed by palynologists to support very generalised or sweeping statements on settlement patterns and land-use based on limited pollen evidence. On the other hand, some archaeologists feel able to offer major papers on upland economy and settlement with little or no reference to palynological evidence. There is sometimes apparent conflict between the two types of evidence and one suspects that pollen information sometimes survives in unrepresentative contexts. Much pollen work is based on sampling of areas of bog, and the results may reflect fairly localised environments - perhaps unrepresentative ones as far as settlements are concerned. A further problem, fully appreciated by some palynologists is a lack of a secure radiocarbon framework for many pollen diagrams of the Bronze Age and later.

A detailed survey of the evidence for the past environment in Wales is currently being carried out by Dr. A. Caseldine. In its draft form, this has been freely drawn on below. Only a very short and selective summary of environmental aspects will be presented here, merely to isolate points of agreement and disagreement between the various types of evidence. The environmental evidence from Dyfed has not been considered separately from the changes which affected Wales as a whole: Dyfed

sites are included in the analysis of most of the periods involved.

The following period summaries draw heavily on a number of descriptive and discursive texts, which are separately identified in the Bibliography at the end of this Report.

(2) Problems of prehistoric upland settlements

As far as prehistoric settlement is concerned, further general observations can be made and problems raised by way of introduction: a general statement is made necessary given the lack of dating evidence for many of the monuments in question.

One problem is the overwhelming lack of settlement in the core of the uplands, where the majority of known monuments are of a ritual nature. Sites which can claim to be indicators of prehistoric settlement include 'field clearance' cairnfields; these are found throughout Dyfed, though relatively sparsely. Settlements consisting of enclosures and round houses, which sometimes occur in conjunction with cairnfields, appear to have a relatively restricted distribution in Dyfed, being confined to Mynydd Preseli, SE Carmarthenshire and The Black Mountain. This may, in part, be a reflection of fieldwork and also differential survival: Briggs has drawn attention to an early account of hut circles and enclosures on Craig Philbo on the Carmarthenshire/Cardiganshire border and sites similar to the unenclosed platform settlements of Northern Britain may exist in Cardiganshire. But the distribution may have a basis in environmental differences between areas, as discussed below.

There are also problems of dating these settlements. It has been suggested that the two types, enclosure/round house and cairnfield, may be successive developments. The cairnfields are perhaps Early Bronze Age, or even possibly late Neolithic: they may occur in the same area as cairns of a more likely ritual nature. Until recently one may have suggested that the enclosure/roundhouse settlements belonged somewhat later in the Early Bronze Age or in the Middle Bronze Age, but recent work from NW Wales suggests that a proportion attributed to the Middle Bronze Age may be of Iron Age date.

Other problems concern the basic economy of these settlements - the relative importance of arable and pastoral farming. Briggs has marshalled the non-palynological evidence for upland arable farming in Wales in antiquity. However, its *relative* contribution to the economy in prehistoric times remains uncertain: for example, cairnfields may point to a degree of arable farming but also be a by-product of pastoralism; they are, in any event,

relatively rare. The upland enclosure systems likewise may have been involved in agriculture, although they do not seem to show the developed lynchetting associated with more lowland, and later, NW Welsh systems. There are also likely to be considerable differences between various areas of Dyfed in regard to settlement and economy, in response to climatic factors which themselves are likely to have changed through time. These factors may be invoked to explain the presence of more developed upland settlements on Mynydd Preseli. If, indeed, the more developed upland settlements belong to the 1st millennium BC this may be especially significant: differences in economy between areas are likely to have been enhanced following climatic deterioration.

(3) Mesolithic

Pollen analysis has shown that at around 5,000 bp only the highest mountain tops would have been clear of trees. Human impact on the forest began in the Mesolithic and may have resulted in soil degeneration. The increasing appreciation by palynologists of the effect on the forest cover of the uplands of 'Mesolithic Man' draws at least in part from sites in Wales, including possible examples on Mynydd Preseli. Apart from the question of the nature of Mesolithic clearances, attention has been drawn to upland finds of Mesolithic material in Wales, and to the likelihood of transhumant exploitation of animals in the uplands in this period. There seems no reason why areas of upland Dyfed should not have been exploited, particularly those where adjacent lowland Mesolithic occupation is known. There are two parts of Dyfed where man's presence in this period might be sought in particular: Mynydd Preseli, which is relatively close to a coastal concentration of Mesolithic sites, and has possible palynological evidence of Mesolithic activity; and The Black Mountain (similar in many respects to the location of woodland clearance at Coed Taf and to the known concentration of upland Mesolithic site in North Glamorgan).

(4) Earlier and Late Neolithic

The evidence for man's presence (again largely represented by ritual monuments) is overwhelmingly lowland in its distribution - mainly coastal and riverine. Although there is evidence of increasing, albeit small-scale, upland clearance in the Welsh Neolithic, with a limited element of arable farming, an exploitation mainly dependent on lowland settlement can be envisaged. Nevertheless, the effects of clearances on upland soils may have been widespread and long lasting, instigating the formation of blanket bog.

Mynydd Preseli again requires particular mention. The area is well-known as the suggested source of igneous rocks for stone axe production and also of the Stonehenge bluestones. Amongst many new sites recorded in recent fieldwork, some *may* be the result of Neolithic activity. These might include some small rectangular structures, whilst the first origin of the hillfort on Carn Ingli may also be reconsidered. Approaching the problem from a different (and lowland) point of view, the girdle of chambered tombs on the foothills of Mynydd Preseli allows the possibility that the societies which constructed these monuments included in their economies at least a portion of upland, bearing in mind the ease of access into the monadocks of Mynydd Preseli from the surrounding lowland.

But the suggested evidence for Neolithic activity on Mynydd Preseli is not without its problems. The extent of exploitation of bluestones for axes (Group XIII) in the Neolithic has been questioned, the majority of bluestone artefacts being of beaker or later types, corresponding to the date of the Stonehenge bluestones themselves. Although the source of the bluestones is known, factory or quarrying sites have not yet been located. The provenance of other axe sources (defined as Group XXIII) is much more general - and both these and Group XIII have been considered as the products of a widespread industry involving the igneous rocks of North Pembrokeshire as a whole. The diffuse sources of these axes raises the possibility of glacially-distributed rocks being used for axe manufacture. The lowland fringes of Mynydd Preseli are littered with erratics, many of which presumably originate from the hills themselves, and these could be seen as a source of both axe material and the Stonehenge bluestones. These possibilities are given some credence by the recent discovery on the SE fringe of Mynydd Preseli near Crymych of a site involved in axe manufacture (possibly Group VIII), probably using local erratic material.

(5) Early Bronze Age

It is the Early Bronze Age which generally saw the major colonisation of the uplands, demonstrated by the presence of very high numbers of ritual monuments. The number and distribution of these monuments are discussed in detail in Appendix 1 and shown graphically on Maps 12 and 13. Much argument has been devoted to questions of morphological variation and classification, and, - while patterning undoubtedly exists - there is a great complexity of form.

The nature of the settlements which might be expected to be associated with the ritual monuments is uncertain. Outside the limited areas of

Preseli and SE Dyfed, the lack of permanent settlements in the form of enclosures and round houses may be taken to indicate a less settled, perhaps transhumant or nomadic economy. But the presence or absence of surviving settlements may not be strict guidelines to the existence of permanent occupation, and there may be some indirect evidence of the latter. Thus, the arrangement of ritual monuments in regularly distributed groups in some upland areas of Dyfed may point to some form of permanent settlement. Moreover, ritual monuments can be found at all altitudes and on all types of terrain, even in areas which are now considered quite remote. This may indicate different forms of land and territorial organisations in the Bronze Age compared with any other time in prehistory or history: there might perhaps, have been societies exploiting wholly upland environments, as opposed to lowland and upland areas in concert.

Differences certainly exist in the distribution of different forms of monument in lowland and upland areas, differences which do not seem to be purely chronological. The distribution of standing stones and variant rings is a particular example. This raises interesting questions concerning the relationship of colonists with lowland kin groups and ancestral territories.

For this period there is palynological evidence for increasing woodland clearance, for the detrimental effects of these clearances on upland soils, and for an increased importance of arable farming. But clearance, although increasingly widespread, was still often relatively small-scale. Judging purely from the numbers of monuments that survive, evidence of a more drastic impact on the forest cover might have been expected.

In the earlier part of the period, there appears to be a continuing interest in the exploitation of igneous rocks. In addition, of great interest is the recent evidence for copper mining dating from the end of the Early Bronze Age/Middle Bronze Age, from Wales in general and Dyfed in particular, making it an area of early mining of probably European importance. The 'hammer stone' technology involved was once considered to be of Romano-British date, but now seems likely to be Bronze Age, with radiocarbon dates of the period from Copa Hill.

(6) Later Bronze Age/Iron Age

At the end of the Early Bronze Age the whole suite of ritual and funerary monuments in use for almost a millennium was abandoned and not replaced until hillforts and defended enclosures appeared some time in the first millennium BC. There was obviously a major abandonment of the

uplands, at least for permanent settlement. Various factors were no doubt involved, including the effects of man's clearance and land utilisation on the soil, exacerbated by climatic deterioration; these factors set in motion a series of events which eventually led to the creation of heathland and ultimately of blanket bog. The process took place over a long period of time and the effects in particular areas varied in time in response to limiting factors including microclimates. But the eventual outcome, in some areas at least, appears to have been catastrophic. Whatever the factors involved, the increasing incidence of blanket bog ensured that the environment of the uplands was never again as favourable as it had been in the Early Bronze Age and earlier periods. The onset of colder and wetter conditions is marked by renewal of peat growth at some sites in Dyfed and by some evidence of late Bronze Age regeneration of forest.

There was apparently an eventual recovery with an increased exploitation of marginal land. In the Iron Age for instance, renewed and intensified clearances are noted at a number of Welsh sites, both in and beyond the uplands. Evidence from sites in Dyfed including that from Tregaron Bog may suggest an attack on fairly poor marginal land which, during the period of Early Bronze Age expansion, had been by-passed in favour of the better upland terrain then available.

Judging by the distribution of hillforts and other defended enclosures, Late Bronze Age and Iron Age settlement in upland areas of Dyfed concentrated in the valleys and the flanking hill-slopes and foothills. Some of these enclosures however, often major hillforts, are situated on the fringes of the uplands. Here, they may have been sited to exploit defensive positions afforded by hilltops but also no doubt to 'dominate' lowland territories: an element of display can be widely seen in the location and construction of Iron Age defended settlements. The positions of sites such as Moel Trigarn, Carn Ingli and Caer Cadwgan for instance are particularly striking when viewed from adjacent lowlands, and it was probably these latter areas which housed the majority of the of the population and formed a major element in the economy.

For this economy we have little direct evidence. Nor is there detailed information on the nature of the settlements of these upland Iron Age communities - only recently has there been any major excavation on an upland Iron Age hillfort - that at Caer Cadwgan near Lampeter. In the Dyfed uplands, indirect evidence suggests that pastoralism was dominant: arable field systems seem to be lacking on marginal upland areas, in contrast with both the coastal areas of SW Wales and the fringes of the uplands in NW Wales. The clearances men-

tioned earlier seem to have been for pastoral farming, not arable. However, carbonised grain was recovered from Caer Cadwgan, although this comprised a relatively small proportion of floated samples.

In itself, the concentration of larger hillforts on the fringes of the uplands - when contrasted with the smaller but apparently pastoral sites of the W Wales lowlands may suggest that the basically unpopulated uplands were nevertheless of major importance in the economy. These larger sites, located at the junction of upland and lowland, may have controlled hafod-type exploitation of the higher ground.

In N Pembrokeshire the major hillforts (Moel Trigarn, Carn Ingli, and Gaer Fawr) may have possessed distinct blocks of upland or rough grazing - Mynydd Preseli, Carn Ingli Common with its adjacent uplands, and Pen Caer respectively. But, one might hesitate to suggest the *direct* involvement of upland hillforts in transhumance, given the evidence for permanent occupation in some of them and the alternative reasons for an upland siting suggested above. Some of the upland hut-groups on Mynydd Preseli and in other parts of Wales may well represent later prehistoric hafodydd.

(7) Roman

Apart from some knowledge of the Roman conquest and military occupation, very little is known about the Dyfed uplands in the Roman period. Environmental evidence for the period is largely absent and the form and location of civil settlements is unknown.

In some lowland areas of SW Wales major changes may have taken place *before* the conquest, leading to an abandonment of hillforts and the construction of smaller enclosures. In the Dyfed lowlands, perhaps because of the collaboration of political leaders, the pre-Roman settlement pattern appears to have suffered little disruption. In the uplands, a very different situation may have obtained. It is here that the Roman military campaign concentrated, with a network of roads and forts in the valleys, to facilitate operations against tribal dissidents and guerrilla groups. We cannot doubt the considerable disruptive effects of such campaigns - of which the marching camps of Y Pigwn and Arosfa Garreg are a physical legacy - nor the effect of the whole military system superimposed across the pre-existing Iron Age territories and routeways, disorganising native social structures and economies. What is unknown is the subsequent pattern of native settlement, its organisation and economy, even the extent and nature of the *vici* which developed in the garrisoned areas.

One of the objectives of the conquest of the upland areas, no doubt particularly so in Dyfed was the obtaining of minerals. As described above, early mining on a number of Dyfed copper mining sites, once believed to be Romano-British, may in at least one case (Copa Hill, Cwmystwyth) be of earlier date, though a continuation or renewal of activity in later periods may be expected. Gold mining in the Roman period is well-known at Dolaucothi where operations are likely to have been controlled by the nearby fort at Pumpsaint.

In the absence of available evidence, the best that can be suggested is that the indigenous utilisation of the uplands continued into the Roman period, albeit with increasing modifications. In NW Wales and other areas this is suggested by the continued occupation of upland hillforts. In Dyfed, confirmatory evidence for this is lacking, Moel Trigarn being the only upland hillfort from which Roman material is known. The rarity of 'homestead' sites in upland Dyfed has also been mentioned although some of the many rectangular buildings may prove to be Romano-British. Climatic amelioration potentially allowed renewed expansion into the uplands although the lack of Romano-British material may indicate that this did not happen in Dyfed.

(8) Early Mediaeval

There is little information on settlement in the uplands in the immediately Post-Roman period, either in Dyfed or in Britain as a whole. The reasons for this are controversial. One model would see a shift in the location of settlement to sites where the evidence is obscured by continuing occupation in the Mediaeval and later periods. Another model sees climatic decline as a factor, again with a catastrophic effect on population and settlement patterns. In as much as there is any evidence, the latter model may be supported by woodland regeneration at a number of sites in Dyfed and by further evidence of soil decline and blanket bog formation.

In the Early Mediaeval period the lack of hard archaeological information is supplemented by a certain amount of documentary evidence regarding tenurial organisation, some of which may relate to early post-Roman times. This is discussed below (see *Multiperiod aspects*).

(9) Mediaeval

Whilst the roots of Mediaeval exploitation of the uplands are obscure, this exploitation was undoubtedly extensive: the hafod/hendre system is well documented. It is generally agreed that settlement occurred at higher altitudes than in earlier

and later centuries: this is accounted for by an ameliorating climate up to the 14th century coupled with an increasing population. A rapid decline, both in climate and upland exploitation in the late Mediaeval period is equally well documented.

The political and military situation prevailing in the 12th and 13th centuries is often neglected when considering land use and settlement patterns. These were periods of extreme instability in Wales, and the function of the uplands as relatively attractive areas for refugees and a displaced population should not be neglected. A dispute over Mynydd y Bettws in the 13th century demonstrates the political importance of the uplands. Here the expansion of Welsh Is-Cennen was halted when the English of Gower constructed a small castle, Penlle'r Castell, - in an isolated upland situation at the extreme northern end of their territory.

In the Mediaeval period additional forms of information become available for the study of the uplands. Unfortunately, very few integrated studies using historical sources, place-name analysis, archaeological excavation and survey and environmental work have been completed. A basic problem lies in identifying upland settlements in Dyfed which are of Mediaeval date amongst the plethora of upland sites which could be of this period, eg long huts and other rectangular structures with associated enclosures and field systems (see Appendix I).

There have been some excellent studies based on one or two sources of information that indicate possible areas of future research, such as an analysis of field-names in relation to periods of agricultural expansion in Gwynedd, and the excavation and survey of platform-houses and long-houses on moorland in Glamorgan and Powys. In Dyfed, extensive survey and documentary analysis, coupled with selective excavation and radiocarbon dating, has been applied with some success in recent years at Bryn Cysegrfan.

Generally, land use and settlement in the Welsh uplands in the Mediaeval and Post-Mediaeval periods, have been defined by the hafod/hendre model. This is a system of transhumance based on a lowland permanent settlement (the hendre) and upland summer pasture (the hafod). Literature and tradition clearly indicate a element of transhumance in the Welsh economy of the past but it is difficult to relate this in detail to the archaeological evidence in the Mediaeval period. Much of the place-name and documentary evidence used in defining hafodydd relates to a much later period, and permanent structures may not have been constructed on upland grazings until a late date. It is also difficult to relate the system to excavated Mediaeval upland archaeological sites and this is

compounded by problems of dating. The social and economic status and function of many Mediaeval upland sites remains uncertain - at Bryn Cysegrfan rabbit farming was of major importance.

Other possible forms of upland agricultural exploitation and the impact of industry on the landscape (eg the effect of lead mining on the settlement pattern of Cardiganshire) have by and large been ignored or subsumed into the hafod/hendre model. Certain sites with 'hafod' place-names may have been involved in arable farming suggesting climatic deterioration as a factor in the change to a more intensely stock-rearing upland economy in later periods. There may be considerable potential for differentiating, in the palimpsest of upland settlement, between settlements and exploitation which pre-date and post-date the climatic decline of the Late Mediaeval period and the disruption in settlement which undoubtedly occurred at the time.

(10) Post-Mediaeval

The hendre/hafod model of land use predominates into the 18th century. After this time permanent settlements based on sheep farming appeared, followed by a gradual depopulation of the uplands. However, lead mining and associated industries increased in importance up to the 19th century, with concomitant effects on settlement.

Even though our knowledge of lead mining is far from complete, this aspect of upland exploitation has probably received more attention from archaeologists and historians than any other topic, particularly the study of individual sites. Our present knowledge of Post-Mediaeval archaeological sites is described in Appendix I, and their distribution shown on Map 14.

(11) Multiperiod aspects: territories, boundaries and routeways

No study of upland Dyfed has attempted to define or trace the territorial history of any area across the whole time span of human activity, yet unless an attempt is made to define, describe and map the territorial organisation of the uplands, the purpose and function of individual sites within the landscape will never be properly understood. Some pioneering work on pre-Norman territories has been undertaken, demonstrating that communities, by pooling resources and exploiting both upland and lowland environments were able to be self-sufficient - the 'multiple estate' concept. But there seems little hope of establishing pre-conquest land divisions over large areas of Wales. Welsh land tenure, based on a hierarchical system of *tref* (township), *maenor*, *commote* and *cantref* was superseded in the uplands by the English structure of

parishes and shires, probably in the 13th and 14th centuries. The earlier system was not, however entirely swept aside; it has for instance proved possible to plot the major Welsh land divisions of all S Wales at a time when the English shire system was beginning to predominate.

Little is known of the smaller community divisions, and over what geographical areas lowland settlements and townships had rights in the uplands. It may be possible to define these smaller territories by reference to Mediaeval documents, the study of Post-Mediaeval manuscript maps and even the examination of 1st-edition Ordinance Survey maps - administrative units often covered the same area in the 19th century as in the Mediaeval period.

Associated with the establishing of territories is the defining and locating of boundaries. Where boundaries crossed open, moorland, pre-existing artificial features such as cairns or standing stones were employed as markers, or new markers were established. Thus, a perambulation of the Commote of Perfedd in 1754 refers to numerous cairns and standing stones on moorland on The Black Mountain. And even a casual perusal of estate and tithe maps of upland areas reveals that boundaries often changed alignments at these type of markers. These rather informal methods of defining territories may have been supplemented by more permanent bounds, such as the digging of a ditch or the throwing up of a bank. But whatever the style of boundary employed in the past the definition and location of boundaries should be possible for many upland areas through the scrutiny of documents assisted by careful fieldwork.

Routeways may be defined as those of purely local importance, those of regional importance and those of national importance. Identifying tracks of the first category may give some indication as to which lowland settlements possessed land in the uplands. Routeways constructed to provide access to distant holdings fall into the second category. Examples of these may be tracks constructed to connect Strata Florida Abbey with its upland granges, tracks and tramways built to service lead mines, and modern roads laid to provide access to remote areas of improved upland pasture. The third category eg Drovers' roads and turnpike roads provided access from one lowland area to another, with peripheral effects upon the uplands through which they passed.

4. Previous archaeological work in the uplands

This section is divided into three parts: excavation, survey and environmental. The location of all

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UPLAND ARCHAEOLOGY IN DYFED: A PRELIMINARY ASSESSMENT

Introduction

In 1984 the Countryside Commission produced a report on uplands in England and Wales: *A better future for the Uplands*. The absence of an archaeological input to this document led to the production by the Council for British Archaeology and the Royal Commission on the Historical Monuments of England of *The Archaeology of the Uplands: a Rapid Assessment of Archaeological Knowledge and Practice* (Darvill, 1986). This was accompanied by a shorter and more popular report *Upland Archaeology: what future for the past?*

Drawing on material and information from Wales as well as England, these reports re-focused attention upon certain issues and problems long appreciated by workers in upland areas, but to the resolution of which relatively little energy had been devoted - the full extent and nature of the upland archaeological resource (consisting not only of individual monuments but whole landscapes) the lack of public awareness, the full extent of the pressure upon upland archaeology, and the lack of comprehensive policies for its conservation, management and interpretation.

The reports prompted Cadw/Welsh Historic Monuments to launch its own 'Uplands Initiative' in late 1987. Following discussions with a variety of professional archaeologists and archaeological organisations in Wales, Cadw commissioned each of the four regional Welsh Archaeological Trusts to undertake an initial assessment of upland archaeology in their individual areas, and to complete a summary report for the Welsh Uplands as a whole. It was understood that these individual assessments would provide the basis for a more detailed debate, initially amongst archaeological organisations, about the scale and nature of the problems and the way forward.

This present Dyfed survey is very much in the nature of a technical report. Collaboration between the Trusts has ensured that certain minimum data have been collected and presented in the same format to allow easy comparison between regions. Such data includes that on land use, ownership, designated land and conservation opportunities, threats, the distribution and density of recorded archaeological sites, past work in the uplands, pres-

ent methods, techniques, and resources. In some cases, the minimum data collected are plainly deficient. Figures on changing land use, for example, were difficult to obtain because of problems of confidentiality and inaccessibility. The value of the assessment of site densities and distributions is inevitably reduced by the knowledge that the basic archaeological record is itself totally inadequate. The computations required for comparative purposes may be useful in highlighting some significant differences between the Welsh regions, deficiencies which are likely to reflect unevenness in stages of data-base compilation and data manipulation as least as much as the historic impact of man upon the upland landscape in each region.

In any case, in our current state of knowledge, assessments based on statistics derived from site data in the regional record are unlikely to make a significant contribution to our *understanding* of the region's upland archaeology. For this reason some emphasis is given in this report to current approaches to the archaeology of the uplands and to the kind of information required to identify and provide explanations of the changes that occurred through time: our objectives must be pitched at a higher level than the mere addition of dots on the map, even in the face of the many and varied threats to the very existence of the archaeological resource.

Cadw's brief for the assessments included the clear identification of areas of 'key archaeological importance' for future work based on criteria which included academic and conservation benefit, the degree of short and long-term threats, and the opportunity to maximise archaeological and other available protective agencies and fieldwork resources. Accordingly, such areas are suggested at the end of this report (Appendix VII). But the drafting of this review has identified other issues which need urgent attention - eg the framework within which the uplands initiative is to proceed; the need for an overall agreed 'upland plan' to provide a context within which priorities can be agreed and collaborative projects developed. In extending the scope of the original considerations, too, some issues are identified and discussed which are peculiar neither to Dyfed, Wales, nor even to upland archaeology - the need for new archaeological legislation is one example. Such issues need to be addressed in the

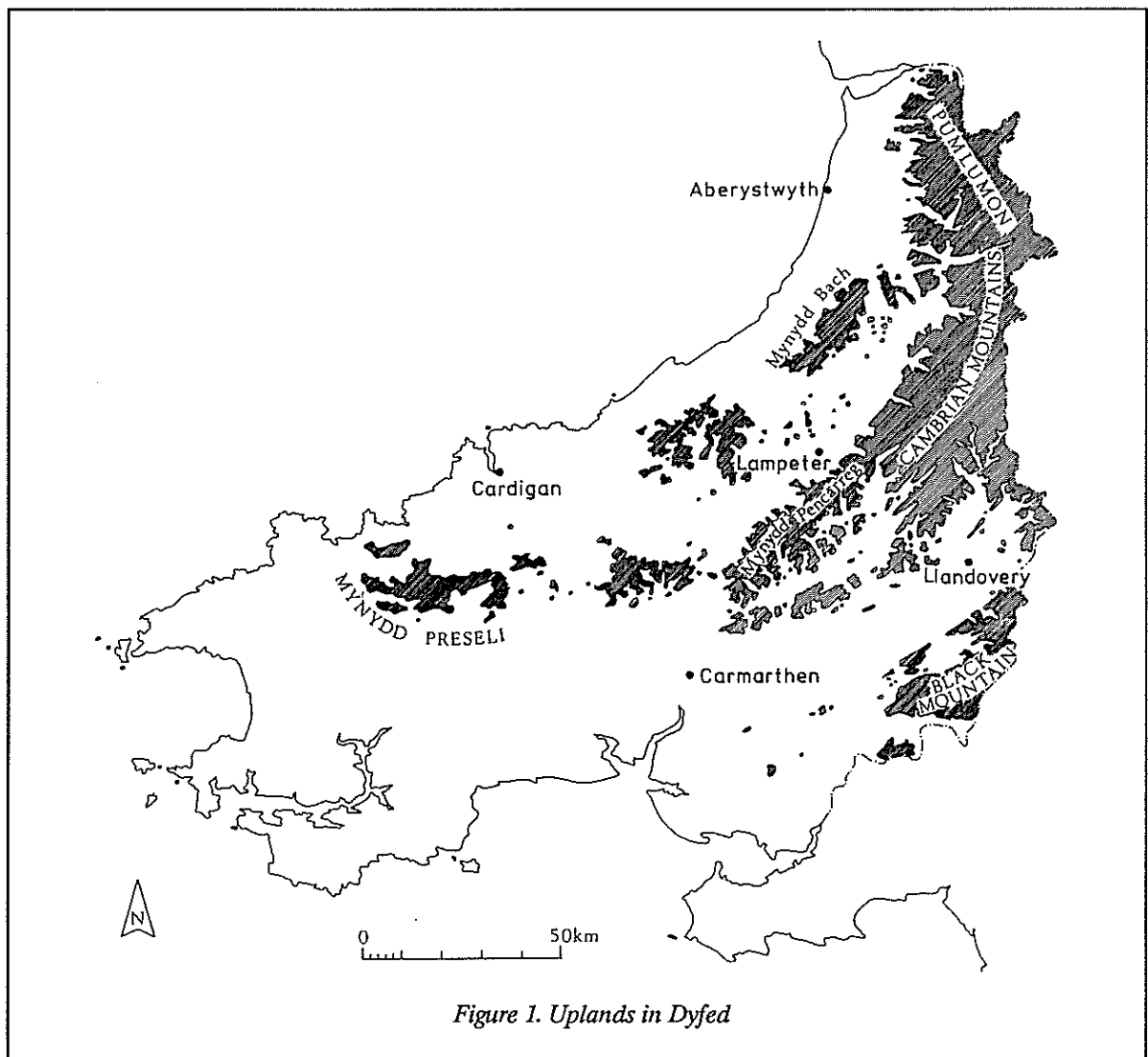
specific context of upland archaeology as well as in many other areas.

Methodology and presentation: maps and archaeological site data

Information on the area of the uplands, quantity of forestry and amount of enclosed and unenclosed land was collected from Ordnance Survey maps of various scales and tabulated in blocks of 25 sq.km; equal to one Ordnance Survey 1:10,000 quarter sheet. Information on archaeological sites was tabulated by OS quarter sheet from the Dyfed Archaeological Trust's sites and monuments record (SMR), enabling site densities per sq.km. for every 25 sq.km. block to be calculated. Archaeological sites known only through documentary sources and

place-names have been omitted from all the figures quoted in this report. Other information contained in this survey has been gleaned from published sources or from correspondence with public organisations.

The maps contained in a pocket at the end of this report have been so devised that similar and disparate data may be compared and contrasted. Two base maps, one representational (Map 1) the other schematic (Map 2), are provided, over which one or more of the transparent information maps may be placed. The majority of the maps are schematic, either computed to densities or percentages for every 25 sq.km., although where the information is unsuitable for this treatment it has been shown in a representational form.



Date	Area		
	<21 sq. m	21-100 sq. m	101 sq. m
1980-	1*	-	2*
1970-79	1	2	-
1960-69	1	2	1
1950-59	-	1	-
1940-49	-	-	-
1930-39	2	-	-
1920-29	-	2	-
1910-19	-	1	-
1900-09	-	1	-
1890-99	-	-	1
1880-89	-	-	-
1870-79	1	-	-
total	6	9	4

Areas approximate only.

* = re-investigation of earlier excavation (2 sites in total).

Table 1. Number and size of excavation over 244m per decade.

past archaeological work is shown on Map 15 and detailed in Appendices II, III and IV. Lest a false impression be gained from the apparently large number of symbols on Map 15 it should be pointed out that only 1% of all archaeological sites over 244m have been subjected to some form of excavation and less than 10% of the uplands have been archaeologically searched or surveyed.

Table 1 lists all the excavations undertaken in the Dyfed uplands, apart from the small diggings of 18-19th century antiquaries. An exception was the large-scale investigation of Moel Trigarn hillfort just before the turn of the century; unfortunately, it is clear that the excavators were mainly concerned with the recovery of finds and scant attention was paid to stratigraphy and structural remains (Baring Gould et al 1900).

In the 1960s and 1970s scientific excavation of a ring cairn and kerb cairn at Nant-y-môch, Trefeirig (Hogg 1977; Marshall and Murphy forthcoming), and of two standing stones at Mynydd Llangyndeirn (Ward 1983) greatly increased our knowledge of these types of monuments. Similarly, the recent sample excavations at Cwmystwyth mine (Timberlake 1987) have re-kindled interest in Bronze Age mining sites; more may be investigated in the future. The largest and probably the most important excavation in the Dyfed uplands is the just-completed

project by St. David's University College, Lampeter, at the hillfort of Caer Cadwgan. This project of excavation and survey is supported by a wide range of scientific and environmental analyses.

It is only in the past 20 years that any significant amount of survey work has been undertaken in the Dyfed uplands (Table 2), and most of this has been limited in scope, often concerned only with a small geographical area, a group of closely related monuments or a single site. The pioneering work of Ward (1976, 1987) in identifying small peaks of moorland in SE Dyfed as important prehistoric centres falls into the first category. Briggs (1975) and Leighton (1984) have surveyed areas rich in Bronze Age monuments. The comprehensive accounts of lead mines by Hughes (1981), Palmer (1983) and Bick (1986) are more historically than archaeologically based. Surveys encompassing all periods are currently being undertaken by Leighton on The Black Mountain, and by Muckle at Carron-is-clawdd. Briggs and Murphy (1984) have carried out initial work around Nant-y-môch reservoir. The only large-scale 'blanket' survey is Drewett's on Mynydd Preseli.

Twenty-five locations in upland Dyfed have been examined by pollen analysis, and two archaeological sites have had some form of environmental investigation. It is worth noting, however, that much of the pollen analysis was carried out with the aim

date	Type of survey				
	site specific	thematic	none-intensive	small area	large
area			area	blanket	blanket
1985-	1	2	3	1	-
1980-84	2	-	1	1	1
1975-79	2	1	6	-	-
1970-74	4	-	-	-	-
1960-69	1	2	-	-	-
1879	-	-	1	-	-
total	10	5	11	2	1

Table 2. Number of archaeological surveys over 244m per decade.

of elucidating late glacial and early post-glacial environments, and is therefore of limited value to archaeology. Also, many of the pollen diagrams constructed prior to the 1970s are unsupported by radiocarbon dates, again limiting their usefulness.

1.5. Data-base deficiencies

The existing data-base for upland archaeology in Dyfed is severely deficient. In Appendix I, attention is drawn to many examples of imbalances in the numbers of recorded sites, whether by period or type. In many cases these imbalances are plainly due to lack of fieldwork. In all areas where intensive searches have been made, site densities have been increased, in some cases dramatically. From Fig 15 it is clear that a large proportion of the Dyfed uplands has never been subjected to systematic intensive archaeological search; there are also many areas which have received little or no casual investigation in the last 20 years or more.

Even in areas where sites have been identified through structured survey, for example by the staff of the Ordnance Survey, subsequent intensive search invariably identifies greater numbers of monuments; this may, in part be due to the recording restrictions imposed upon OS Investigators for mapping purposes, to disregard features less than 0.5m in height. Furthermore, as archaeological knowledge has increased, so perceptions and requirements have changed: elements, features and some whole classes of monument now regarded as important are unlikely to have been recorded or even recognised 60 years ago - the time of the last published RCAHM inventory for any part of Dyfed - or in some cases even 10 years ago.

The failure in the past to achieve anything approaching a consistently-observed record of the archaeological content of the uplands across the whole of Wales means that archaeological analysis and synthesis is effectively limited to very small areas where more recent observation has been carried out in a concerted manner. Even the earlier surveys of the RCAHM, or in more recent times the former Archaeology Division of the Ordnance Survey, involved inspection only of those locations or areas for which some record or suggestion of the presence of an archaeological monument already existed. Over the majority of the uplands, those areas with no previously recorded archaeological content have not been subjected to intensive search. Such a situation emphasises the unreliability of the present data-base and consequentially, the fragility of current syntheses.

1.6. Approaches to upland archaeology

Although there are many research problems in each major period which need to be addressed, the utilisation and exploitation of the uplands through time should be a consistent theme. Even in those periods where environmental factors narrowed the differences between the uplands and lowlands (Darvill 1986, 74) it cannot be assumed that archaeological remains in the uplands represent better-preserved examples of what may have formerly existed in the lowlands.

In answering the problems of cultural, social and economic identity, the relationship between up-standing remains, environment and territory is all-important. The relationship between the upland and the lowlands is especially critical to an under-

standing of upland archaeology: the history of the uplands should not be seen only in terms of contraction and expansion of lowland activity but also in terms of cultural, social and economic systems which transcended the upland/lowland divide.

Two further aspects of upland archaeology require attention. The first is the nature of the resource. Upstanding remains represent the most readily recognisable expression of man's former activities, but not the only one: the nature of the environment itself - the vegetational patterns, the tracts of moor and blanket bog - reflect in part man's effect upon the landscape. Sources for illuminating man's past activity are not exclusively locked up in individual monuments.

The second aspect requiring emphasis is the historical constraints imposed by upland relief and topography, especially locally, on settlement and land use. These constraints stand in stark contrast to the lowlands, where many marginal and lesser topographical barriers have been removed or obliterated over millennia. In the uplands, local patterns of relief and topography have formed a persistent restraint upon certain forms of land utilisation, carrying with it the possibility that some forms of land use may have been impossible in certain areas. This has implications for our approaches and methods of upland study which are addressed further in Section 4.

1.7 Description and definition of the archaeological resource

Recording and analysis of upland archaeological remains has invariably been monument-dominated. Records relate mostly to the location, form, shape, and other details of *upstanding* structures. Surrounding vegetational patterns, the presence or extent of any localised peat deposits, local topographical impediments and restraints, are rarely

shown on published plans. Yet, as indicated in para 1.6 above, these other elements are of prime importance in the understanding of past environments and land use history. The emphasis given to 'sites' hinders appreciation of what is archaeologically relevant and affects discussion and agreement on recording priorities.

The use of 'site' in its restricted sense by archaeologists and non-archaeologists alike is unlikely to disappear. But in 'characterising' the archaeological resource, greater emphasis must be given to the inclusion of the other elements which together define an 'area of archaeological importance'. Similarly, current archaeological data storage and retrieval techniques must be expanded to encompass all constituents of the archaeological resource in any one location. In addition, ways and means must be found of integrating and retrieving historical and territorial data for such locations.

1.8 Assimilation, analysis and dissemination of data

The rate at which new data is integrated into the Regional Record (SMR), disseminated and analysed is poor. In a few cases this is due to long delays between field recording and submitting results to the SMR, but the greater problem is the lack of resources to deal with the volume of data requiring indexing and subsequent dissemination. Equally, and perhaps more importantly, there are no resources at a regional (or national) level to allow for the production of basic statements of the overall content of the uplands at any one time. Such statements (for example, in the form of up-to-date distribution maps by period or type, with minimal commentary) are essential for construction of regional and national overviews, and as a basis for the proper organisation and direction of the limited resources for fieldwork.

2. THREATS TO UPLAND ARCHAEOLOGY

2.1. Introduction: current land use.

Land use is important in assessing the nature of the archaeological resource and the likely pressure upon it. Upstanding archaeological sites are often encountered in outstandingly good states of preservation on unenclosed moorland. Hence, archaeological damage will be potentially far greater if the land is to be agriculturally improved or afforested, compared with those sites on already-enclosed land. But within these enclosed or developed areas, there is considerable archaeological potential, and even within forestry plantations certain types of monuments may survive, especially in areas where the original ground preparation was less intensive than it might be nowadays. Such sites then become vulnerable to clear-felling and replanting programmes.

Agriculture (unenclosed and enclosed land) and Forestry together account for 99% of land use in the Dyfed uplands. The remaining 1% is made up from reservoirs, lakes, and a very small amount of mineral extraction. Whilst forestry, 'enclosed' land and unenclosed land are considered here to be mutually exclusive because of the limitations of the study, it should not be assumed that all unenclosed land equates with rough pasture and moor, or that all enclosed land is better-quality farmland.

In passing, it should also be noted that because of their aspect, topography, land use, relief and geology there are many areas in Dyfed below 244m which can be categorised as 'of upland character'. An attempt has been made to map these by identifying blocks of unenclosed land in the whole of Dyfed (Map 5). Outside areas above 244m, large parcels of unenclosed land are restricted to the coasts, in particular the west and south-west coasts of Pembrokeshire.

2.2. Forestry Map 3

(1) General

About 234 sq.km, 19% of land over 244m in Dyfed is under woodland, of which virtually all is commercial coniferous plantation.

The small proportion of 'semi-natural' deciduous woodland is confined to a few steep valley sides. The main concentrations of forestry are on the Cambrian Mountains, Pumlumon and the

southern slopes of Mynydd Pencarreg (the Forest of Brechfa), with negligible amounts on The Black Mountain, Mynydd Preseli and Mynydd Bach. Mynydd Preseli and The Black Mountain are within areas of National Parks (Pembrokeshire Coast and Brecon Beacons) and this partly accounts for the lack of afforestation on these two mountain blocks. The National Parks and the Forestry Commission have a voluntary agreement to limit the amount of new planting in these areas. Also, the presence of large tracts of common land has been instrumental in confining the spread of coniferous forestry.

Whilst it has been noted by the Countryside Commission (1978, 69-76) that upland common land possesses great potential for blanket forestry, no afforestation has occurred on undisputed upland commons in Dyfed, although some small areas of disputed common have been planted. By comparing Maps 3 and 9 it can be seen that there is little forestry where there are extensive areas of common land.

Elsewhere, beyond the bounds of rough pasture, land more intensively farmed has hitherto acted as an economic barrier to large-scale coniferous plantations. A recent survey of the mid-Wales uplands in Dyfed and Powys demonstrated that since 1948 98.8% of all primary coniferous afforestation has taken place on land previously used for rough pasture. The main period of afforestation was between 1948-64 when 121 sq.km. of bare land was planted. From 1964-70 49 sq.km. were planted, 46 sq.km. between 1970-78 and only 6 sq.km. between 1978-80 and 1980-83 (Parry and Sinclair 1985, 26).

As the majority of the Cambrian Mountains/Pumlumon area has been designated an Environmentally Sensitive Area (ESA), and Mynydd Preseli and The Black Mountain are in National Parks, the amount of land in the core of uplands on which future new forestry planting is likely to take place may be severely restricted. Outside these core areas future afforestation is constrained by designated land, common land and intensive agricultural regimes. There are, however, quite substantial blocks of upland on the western periphery of the Cambrian Mountains, on Mynydd Bach and Mynydd Pencarreg, which are physically, environmentally and economically suitable for new coniferous blanket forestry. These must be treated as areas with a potentially high archaeological risk factor.

(2) Forestry Commission

Forestry Commission District Office Programmes for 1989/90 were not available at the time this survey was compiled. No bare-ground planting in Dyfed is apparently planned by the Commission in the immediate future. Without several weeks' further research at District Offices, sufficient details of felling/thinning programmes are not readily obtainable, but in the Brechfa District, 1.7 sq.km. of felling is planned and 5 sq.km. of thinning. Since in this District, and in all others, no detailed archaeological surveys were undertaken prior to the original planting, archaeological sites may still await discovery. It is especially important that such areas be investigated during the penultimate thinning cycle, so that a strategy for any surviving archaeology may be devised prior to clear-felling and replanting.

In recent years liaison with the Forestry Commission has improved substantially. The establishment of the Liaison Committee on Forestry and Archaeology has provided an excellent medium for the airing and resolution of mutual problems, but Trust liaison with Forest District Offices should be improved. The nature of some of the records held by the Offices also means that certain types of information are not always readily available.

(3) Woodland Grant Scheme

From April 1985 to April 1988 60 applications were made to the Forestry Commission for grants for new afforestation and felling licences in the Dyfed uplands. The majority of these applications, totalling 11.58 sq.km. were for new planting, and only 0.21 sq.km. for felling. A breakdown of these figures is shown in Table 3. Of the 60 applications 50% were for areas less than 0.05 sq.km. 22% (13 applications) for areas between 0.06-0.30 sq.km., 15% (9) between 0.31-0.50 sq.km. and the remaining 13% (8) were for areas over half a sq.km. All grant applications in Dyfed under this scheme are

referred to the Trust by the County Planning Department, and some are also sent directly to the Trust by the Forestry Commission. This partial duplication is unnecessary. The Trust wishes to continue to be notified of all WGS applications, even though manpower resources permit only a limited number of field searches. Experience has shown that even where very small schemes are involved, archaeological interests may be affected: for example, abandoned Post- Mediaeval and Mediaeval settlement sites, often lying within small enclosures and sometimes covered in naturally regenerated pieces of woodland, have on several occasions been the subject of new planting, or felling and re-stocking applications. One other cause for concern is the difficulty in ascertaining the final outcome of applications in cases where the Trust may have suggested that archaeologically sensitive areas be excluded from new planting: action is required to improve communication in this respect.

2.3. Agriculture

(1) Unenclosed land

This is the largest of the land classes with 55% (664 sq.km.) of the total land area of the uplands. Unenclosed land cannot be directly correlated with rough pasture and moorland as the method of data-collection method took no account of land use. Generally, however, unenclosed land equates with the areas of less favoured farmland, and it can be assumed that where a large proportion of open land exists a large percentage of it will be rough pasture and moorland. A very high percentage of the core of the uplands, Pumlumon, the Cambrian Mountains, The Black Mountain and Mynydd Preseli, consists of unenclosed land, with lower values at the periphery and on smaller blocks of land over 244m (Map 4). Most of the existing rough pasture and moorland in upland Dyfed is

year	Number of applications	total area in sq. km	average area of application
1985-6	7	2.69	0.38
1986-7	30	1.84	0.06
1987-8	23	7.26	0.32
total	60	11.79	0.20

Table 3. Applications for grant-aided forestry and felling, April 1985 to April 1988.

represented by unenclosed land (55%, 664 sq.km., of the total upland area) though some rough pasture, whether 'original' or reverted, is present in the enclosed land. It is also likely that at least a small part of the unenclosed land shown on Map 4 will be recently-improved pasture.

The amount of rough pasture has declined rapidly over the past 40 years. The rate of reclamation has been tabulated by Parry and Sinclair (1985, 15-23) for the Cambrian Mountain/Pumlumon area of Dyfed and Powys. Whilst between 1948 and 1964 81% of the 1.22 sq.km. of land converted per year was for afforestation, between 1978 and 1983 75% of the 8.63 sq.km. per year was for improved pasture. The stimulus for large-scale land improvement of unenclosed rough pasture has now been removed following the withdrawal of Welsh Office Agriculture Department (WOAD) capital grants. Thus this particular threat to areas of best-preserved archaeology has been virtually eradicated, although it remains to be seen if pressure from afforestation will take its place.

(2) Enclosed land

In total, some 306 sq.km. (25%) of the Dyfed uplands are enclosed. The majority of the enclosed land over 244m occurs on the periphery of the uplands. The hills of W Ceredigion and N Carmarthenshire are almost 100% enclosed, and are not now of upland character. Indeed, cereals are grown on some of the Ceredigion hills, albeit in very small quantities.

The height at which enclosed fields give way to open rough pasture and moorland varies according to many factors: geology, aspect, steepness of slope, the presence of common land, to name but a few, but on average the change occurs at the 244m contour. Locally there may be some dramatic differences to this rule. Thus, on the north side of The Black Mountain enclosed pasture is found at over 300m, but on the south side open moorland runs down to well below 200m.

Within older intakes of formerly unenclosed land, agricultural improvement continues to present problems for archaeology. Former intakes, many witness to a relatively short-lived expansion into unenclosed upland in the Mediaeval and especially Post-Mediaeval periods, remain particularly vulnerable to land improvement, assisted by WOAD capital grants for draining and re-seeding. The remains of these intakes - the former field boundaries, with their associated permanent or temporary habitation sites - are both numerous and archaeologically valuable in their own right. Some may be based on upland settlements of even earlier origin. Moreover, because of the low level of agricultural technology at the time of intake, earlier

archaeological deposits and in some cases, up-standing monuments still survive.

(3) Land improvement consultations

How much land improvement takes place without grant aid is unknown; the amount is likely to be negligible. A more serious problem is presented by the confidentiality, outside the National Parks, of WOAD-assisted schemes. This makes it impossible to identify in advance areas of improvement, assess the archaeological implications, provide any comment on these, seek opportunities for recording or investigation, conduct salvage operations or watching briefs, or record the number and extent of areas of known or potential archaeological importance being lost. This also applies to the management agreements negotiated with WOAD for semi-natural rough grazing within the ESA.

Within the National Parks, the consultative requirements for WOAD-assisted schemes provide opportunities, through liaison between the National Park Departments and the Trust, for assessment and response. In the last 3 years, 3 schemes have been submitted for Trust consideration from the Brecon Beacons National Park, but none from the Pembrokeshire Coast National Park. How far these consultations reflect the level of applications is unknown.

Given full opportunity to assess and comment upon improvement schemes, even single applications may present considerable problems in providing an adequate archaeological response, as a recent study by DAT in response to planned improvement adjacent to Carn Goch hillfort, Llanddarog, has shown (DAT 1989).

The implications are that not only is it imperative that consultative arrangements for notification and assessment of all WOAD-assisted improvement schemes be instituted, but also that attention should be given to the resourcing of the necessary archaeological response.

2.4. Peat extraction

Blanket peat is an important source of environmental and archaeological data. It has been demonstrated at many locations that blanket peat only began to form in substantial quantities after the Early Bronze Age, and its growth therefore may have masked archaeological sites of this date and earlier. On Arran it has been shown that the detection rate of archaeological sites decreases as the depth of peat increases (Ray and Chamberlain 1985). Areas of deep and shallow peat in the Dyfed uplands are shown on Map 7 (after Taylor 1983, Fig. 2). There is a correlation between deep peat

and low densities of known archaeological site (Maps 7, 11). This may be due to a variety of factors: simple 'masking' of earlier structures, lack of detailed archaeological exploration, or a lack of exploitation of the highest and least accessible upland areas in the past. Notwithstanding the lack of archaeological information from the highest and deepest deposits, the preservative qualities of peat provide outstanding opportunities for the correlation of environmental change with past human activity.

Recently, there has been a renewed interest in commercial peat cutting in Dyfed. Peat extraction is classed as a form of mineral working and is therefore subject to planning control by the Minerals Planning Authority, the Dyfed County Planning Authority. Through existing consultation arrangements archaeological considerations can be taken into account. This does not of course include unauthorised extraction. There is also an outstanding consent for an area of peat cutting on The Black Mountain. This area should have priority for an archaeological and environmental sampling programme.

2.5. Quarrying and mineral exploration

The area of active quarrying in the Dyfed uplands is at the moment very small; Hendre Quarry, Ceredigion, is the only working quarry of any consequence - a site of about 25ha, of which only 3ha remains un-worked. However, there are considerable areas on The Black Mountain, which lie variously within the National Park, within SSSIs and on common land, yet which have outstanding planning permission for the extraction of minerals. These areas total about 4.3 sq.km., with the largest single block measuring 2.95 sq.km. These areas should be given high priority for archaeological survey.

2.6. Reclamation projects

The nature and extent of these projects, usually involving the Land Authority for Wales, the Welsh Development Agency, Local Authorities and other organisations, has not been fully assessed. Of special interest is the commissioning by Dyfed County Council of a study of Derelict Metal Mines in the Cambrian Mountains (Dyfed County Council 1989). The report has been completed but is not yet

publicly available. Of particular concern to archaeology will be the proposed treatment of the more important sites, and recommendations for the recording, survey and protection of these, and the implications for survey and recording work arising out of proposals for the remainder of the 300 or so sites studied.

2.7. Public utilities

Both the Central Electricity Generating Board (CEGB) and the Welsh Water Authority (WWA), as well as Wales Gas may be involved in works causing archaeological problems. The two former industries together own some 17 sq.km. of land in the Dyfed uplands, excluding the areas covered by reservoirs. Co-operation between the Trust and the CEGB has been fruitful and links are being developed with the WWA. The likely situation after privatisation of these industries is far from clear.

An unusual but specific archaeological problem exists at the CEGB's Nant-y-môch Reservoir where work by the Trust has clearly demonstrated that considerable damage is being caused to sites on the periphery of the reservoir as a result of fluctuating water levels (Briggs and Murphy 1986). Because of the rate of erosion, high priority should be given to the recording and selective excavation of these sites, preferably as part of a broader archaeological and environmental investigation of the reservoir environs.

At Capel Cynon, near Synod Inn, the CEGB has applied for consent for a demonstration wind park, on a site covering some 300 ha (CEGB, 1989). Some 3.5 ha will be taken up by turbines and working area, with approximately 6.6km of permanent and temporary roadways, and about 8.4km of underground cabling. The proposal is subject to Environmental Assessment. Outside the National Parks, much of upland Dyfed (and western Powys) have the areas of high windspeed necessary for the development of wind parks (ibid, Fig. 2.1).

2.8. Visitor erosion

Visitor erosion is a minor threat, but quite serious on certain sites which experience a large number of tourist visits, such as Moel Trigarn on Mynydd Preseli.

3. RESTRAINTS AND CONSERVATION (Map 8)

3.1. General

In the uplands, as elsewhere, the 1979 Ancient Monuments and Archaeological Areas Act is the only legislation specifically designed to protect archaeological sites. The shortcomings of this Act, and its application to the protection of the archaeology of the uplands are discussed below. It is something of an irony that better opportunities are often afforded for protection and conservation of upland archaeology through the use of powers afforded to statutory bodies such as the National Parks, through a variety of other legislation - for example the Town and Country Planning Acts, and the Wildlife and Countryside Act, through the historical persistence of common land, or through the positive approaches to the management of the archaeological heritage by such private landowners as the National Trust.

Land designated for a broadly conservation purpose, or over which certain conservation controls may be exercised, provides *inter alia* a framework within which positive measures may be adopted for the conservation of the archaeological resource. Such areas in the Dyfed uplands are shown on Map 8. Ideally, given the limitations of present archaeological legislation, the best set of circumstances that could be envisaged for an area of archaeological importance is that it would be (a) owned by the National Trust, or lie on common land, (b) be situated within an SSSI, (c) lie within a National Park, (d) be designated as an area of archaeological importance within a local plan.

Very few, if any, areas of upland archaeology in Dyfed enjoy such an ideal situation. Some have the advantage of one or more forms of surrogate protection, but there are extensive tracts of important upland archaeology which are unable to benefit from any of these controls. In essence this means that the powers that may be afforded for archaeological conservation in the Dyfed uplands are very unevenly distributed, and are likely to remain so until adequate legislation, specifically designed to deal with modern perceptions of the archaeological environment is introduced and applied on a more even basis.

3.2. National Parks

The Brecon Beacons National Park (BBNP) administers 127 sq.km. of Dyfed Upland (11% of the

total Dyfed Uplands) and the Pembrokeshire Coast National Park (PCNP) 51 sq.km. (4%). The upland area of PCNP constitutes only 14% of the Park area, whereas uplands in the Dyfed section of BBNP constitutes 56% of the Park area in that county.

Under Schedule 17.5 of the Local Government Act 1972 the National Park Authorities are also the Local Planning Authorities for their respective Park areas. PCNP has delegated responsibility for Local Plan preparation; in the Dyfed section of BBNP, the County Planning Authority is responsible for Local Plans. Both Park areas are subject to the strategic planning framework provided by the Dyfed Structure Plan. The Government's proposed changes to the development plan system would considerably enhance the powers of the National Parks: each Park would be responsible for its own development plan including strategic statements (DOE/WO 1989).

Within these upland areas, both Parks have extensive areas designated as SSSIs, along with extensive tracks of common land. BBNP have recently acquired a large area of land on The Black Mountain, approximating to the area of common and representing almost the whole of the unenclosed land over 244m. in the Dyfed section of the Park.

The powers and controls exercised by the National Parks over moor and heath under the Wildlife and Countryside Act 1981, and also through the administration of grant notification for Agricultural Improvement Schemes are particularly important for the protection of sites and areas of archaeological importance. Both National Parks have policies for Management Agreements and also for purchase and leaseback schemes, and a number of such agreements and schemes have been concluded for particularly vulnerable areas. Lack of resources for new management schemes is likely to present problems in future as well as for monitoring the effectiveness of existing schemes (PCNP 1989, 6, 7, 14). There is also concern about the overall lack of management of moor and heath on the upland area of PCNP (PCNP 1989, 5).

PCNP and BBNP are at different stages in Park Plan Reviews. PCNP published its first Plan Review in 1981 covering the period 1981-7. Work on the second Plan Review is programmed for 1989/90. BBNP published its first Plan Review in 1987. As part of the new arrangements for the preparation of bids for National Park Supplementary Grant, complementary Functional Strategies

covering a three-year period are produced annually by each National Park.

Although historic remains are not specifically mentioned in the National Parks Act, there has been a significant growth in recent years in appreciation of the importance of the historic heritage by the National Park Authorities. In Dyfed this is reflected in Plan Review policies and annual Functional Strategies. The most recent Review (BBNP 1987) implicitly recognises the need to extend protection and conservation of historic sites and features far beyond the current protection afforded by the Ancient Monuments legislation. Policies (see Appendix V) specifically accept the need to take into account all historic features and sites, historic landscapes, and groups of sites. The importance of the Park maintaining its own data base is recognised, as also the need for rescue archaeology. The need for survey is accepted although the responsibility for resourcing this activity is considered to lie mainly with other bodies, and the Park's commitment to contributing to such survey is weak (BBNP 1987, S17.15). Nevertheless, since the Review, the Park has now appointed an archaeological warden, with special responsibilities for The Black Mountain area of Dyfed; 50% of the warden's time will be spent on archaeology throughout the Park area.

PCNP's first Review also recognised the need to consider areas of archaeological importance, although proposed informal designation of parts of Mynydd Preseli has not been pursued. The Review's protective policies for archaeological monuments were written in accordance with the then current Dyfed Structure Plan policies, primarily aimed at protection of Scheduled Ancient Monuments. The latest Functional Strategy objective (PCNP 1989, 19) is broader in scope and reflects the more wide-ranging position adopted towards the archaeological heritage in the Revised Dyfed Structure Plan. Archaeological data-base and survey requirements need to be taken into account in the second PCNP Park Plan Review.

Since the first plan Review, the PCNP's input into archaeology has been further enhanced by the appointment of an Archaeological Officer. This is a very welcome development, although in the short-term the Carew Castle excavation will outweigh all other demands on this officer's time; no input to the upland archaeology of the Park is envisaged in the immediate future.

In addition, as already noted, all grant-aided land improvement schemes are subject to National Park controls and, through consultation with the Trust, archaeological implications may be taken into account.

3.3. Cambrian Mountains Environmentally Sensitive Area

The Cambrian Mountains Environmentally Sensitive Area covers 573 sq.km. of Dyfed upland (47% of the total uplands in Dyfed).

The ESA was established under powers from the European Commission (Directive 797/85, Article 19) and Section 18 of the Agricultural Act 1986. Five-year management agreements are arranged with individual farmers to maintain or adopt low-intensity farming regimes to help preserve environments. Archaeological sites alone cannot be used as a basis for such agreements. There has been a high take-up of these management schemes by tenants and land-owners but details of areas involved remain confidential. The Resource Planning Group, ADAS, Trawscoed, has been willing to take into account existing knowledge of archaeological sites, and the Trust has supplied information from relevant sections of its Sites and Monuments Record. But the Trust has no knowledge of how this information is being used by the Resource Planning Group, nor how sites or areas of archaeological importance are defined in management agreements; nor does it know what arrangements are made for protection of sites, or how these will be monitored.

3.4. Sites of Special Scientific Interest

Most of the Sites of Special Scientific Interest (SSSIs) in the Dyfed uplands lie within the boundaries of the ESA and National Parks. In total 225 sq.km. (19%) of upland have been designated SSSIs (this figure includes 22 sq.km. on Mynydd Preseli not yet been notified under the 1981 Wildlife and Countryside Act). Most SSSIs are on land in private ownership and attract no financial support from the Nature Conservancy Council as the farming techniques are already compatible with nature conservation. Where this is not the case the NCC may enter into management agreements, lease land, or purchase land to preserve habitats.

The need for collaboration between archaeological and nature conservation interests was recognised over 40 years ago (Streeter 1986, 77). Unfortunately, there still remains a lack of co-operation between archaeologists and biologists over the conservation of field sites and historic landscapes (Ibid.77). In terms of statutory protection in the Dyfed uplands, this is vividly illustrated by comparison of the relationship between SSSIs and Scheduled Ancient Monuments (Map 8). The existing situation not only reflects the different legislative history of ecology and archaeology, but also is witness to a still significant failure of com-

munication between these two interests: on the one hand archaeologists have failed to secure statutory recognition for areas of important historic environment; on the other, ecologists have failed to appreciate the significance of the historic dimension in the designation of areas of ecological significance.

In parts, though not in all of the Dyfed uplands, SSSI designations reflect the incidence of important tracts of blanket bog. The archaeological potential and importance of such areas has already been mentioned. It is essential that the *archaeological component* in the *scientific importance* of existing designated areas be fully appreciated by the NCC (in terms of the description of the SSSIs) and that in designation and description of future SSSIs in the upland area of Dyfed the *scientific value* of archaeological components be regarded as a substantial element. Equally, it is important that pressure is applied to extending legislative protection for archaeological areas and landscapes, with due regard for the relationship between ecological and archaeological interests. Reviews of the archaeology of existing SSSIs in the Dyfed uplands should be undertaken by the NCC, and undesignated areas of significant archaeological and historic ecological importance should be identified and submitted to the NCC for future designation.

3.5. Nature Reserves

There are only 5.8 sq.km. of nature reserves in the uplands of Dyfed, of which 5.5 sq.km. is a reserve on Mynydd Mallaen owned by the Royal Society for the Protection of Birds.

3.6. Common Land

There are 291 sq.km. of common land over 244m in Dyfed, 24% of the total upland area (information from Rural Surveys Research Unit 1988). No undisputed common land has been afforested (some small areas of disputed common have been) and common is also resistant to the pressures of land improvement - in the whole of the ESA, including Powys, 98% of all common land is under rough grazing (Parry and Sinclair 1985, 43).

A comparison of the distribution of common land (Map 9) with the distribution of forestry and enclosed land (Maps 3, 6) clearly demonstrates the importance commons have had in maintaining areas of open rough pasture. The presence of common land has probably had a greater effect in proscribing areas of blanket coniferous plantation and preventing the gradual spread of improved pasture than any other type of land designation. Common land is also an important historical

source on its own account, indicating territorial rights, tenurial rights and land use in the historic period.

The large blocks of common land fall within other designated areas - the National Parks and the Cambrian Mountains ESA. A very large proportion of upland common land within the PCNP also lies within SSSIs - the boundary of the common land and the SSSI on Mynydd Preseli for example, is virtually co-terminus. As noted in the PCNP's first Review, common land status is not necessarily a barrier to land improvement, and disputed claims and disputed rights over commons utilisation are not infrequent. The Common Land Forum proposals, providing a basis for new legislation, do not specifically mention archaeological interests. But management proposals present an opportunity for those interests to be taken into account. Because of the historical importance of commons, and the opportunities they provide for elucidating earlier land use activities, it is essential that some provision be made for archaeological survey of common land areas, so that conservation opportunities under any new legislation may be maximised.

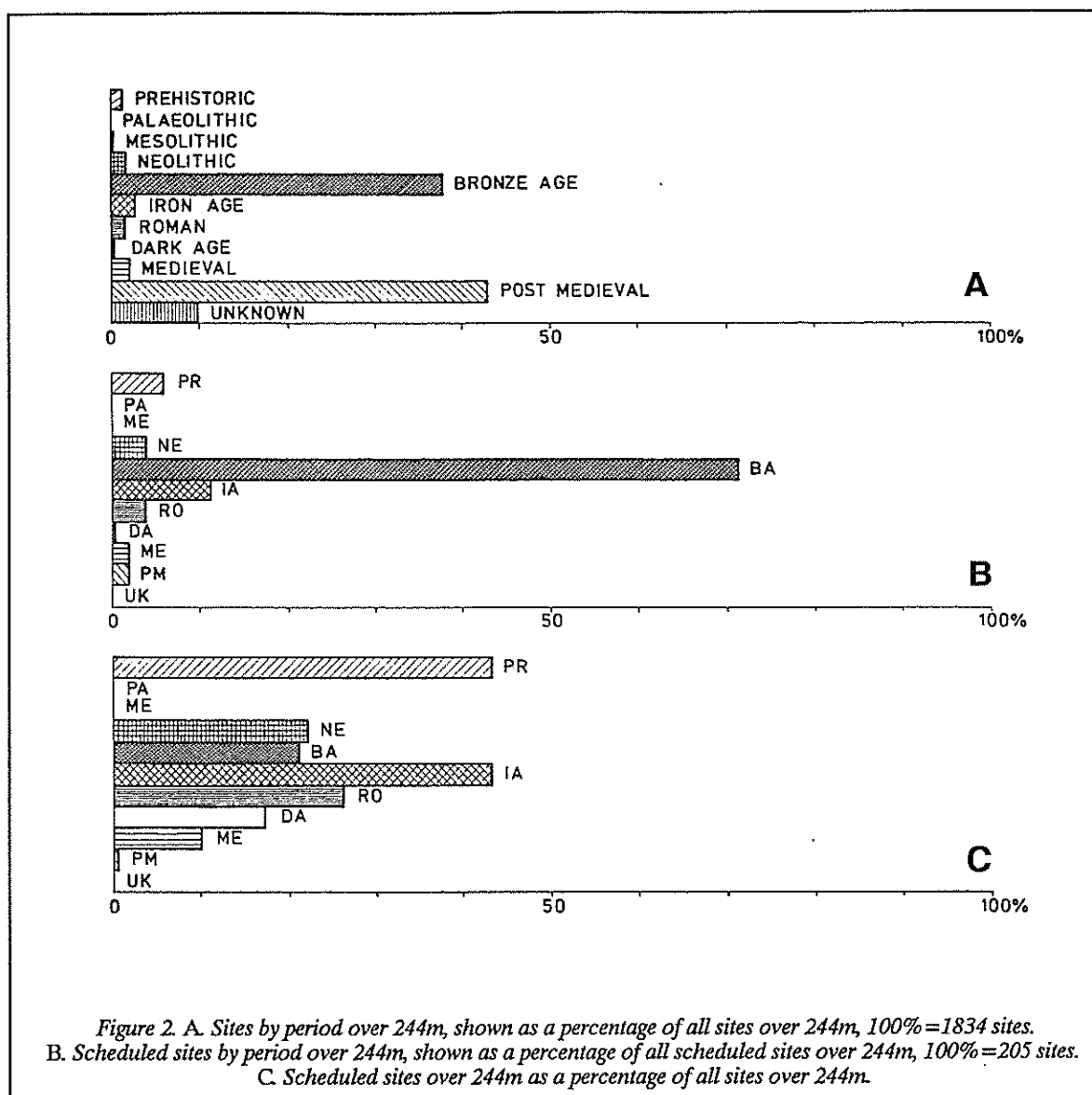
3.7. Scheduled Ancient Monuments

Under the 1979 Ancient Monuments and Archaeological Areas Act 133 monuments are scheduled in the uplands, out of a total of 747 for the whole of Dyfed. Under this Act consent must be obtained before any work is undertaken that may damage or destroy a Scheduled Ancient Monument (SAM). Many of the 133 SAMs include more than one site; often several Bronze Age round barrows or cairns are listed under a single heading. For instance, as the name of the site implies, there are three Bronze Age cairns within the defences of the Iron Age hillfort of Moel Trigarn; all three cairns, plus the surrounding hillfort are scheduled as one monument. Including such 'multiple' sites, the total number of scheduled sites in Dyfed over 244m is 205, 11% of the total number of known sites. There is some potential within Part II of the 1979 Act for the protection of landscapes, but in no area of the Dyfed or any other uplands have the provisions of Part II been applied, nor indeed in any other part of Wales.

Table 4 divides the 205 scheduled sites by period and this information is shown diagrammatically in Fig. 2.

Prehist	Neo	BA	IA	Ro	DA	Med	PM
11	8	146	23	8	1	4	4

Table 4. Scheduled sites above 244 metres
(Bronze Age = 127 round barrows; 12 standing stones; 7 ring barrows)



Altogether 71% of all scheduled sites over 244m are of Bronze Age date, but this is only 21% of all upland sites of this period. By contrast 43% of all known upland Iron Age sites are scheduled. Only 0.5% of the 784 known upland Post-Mediaeval monuments are scheduled (two pillow mounds and two lead mines). Whilst the percentages of scheduled/unscheduled sites must be treated cautiously (since only a proportion, at present indeterminate, of unscheduled sites may be schedulable), the discrepancies show the need for a major re-assessment of the schedulable stock of monuments. Moreover, as demonstrated in Fig 2, there are gross period imbalances within the existing scheduled monument stock. In the vast majority of cases too, the scheduled area relates to obvious upstanding monumental elements and little con-

sideration has been given to the archaeological potential and importance of the surrounding area.

Cadw projections for scheduling throughout Wales (upland and lowland) envisage a rate of only 40 monuments per year in 1987-8, rising to a projected 70 monuments per year by 1991-2 (Cadw 1987, 20). Clearly, more resources need to be allocated if significant additions are to be made to the scheduled list of upland monuments. Whilst ongoing search and survey programmes are needed to provide for selection of the most important elements of upland archaeology, explicit criteria also need to be developed as a basis for such a selection.

3.8. Planning Authorities

Much of the pressure upon upland archaeology

in Dyfed is not subject to control under the Town and Country Planning legislation. Nevertheless, under the present Development Plan system, planning authorities can have an important influence upon the conservation and protection of upland and lowland archaeology. Formal statutory plan policies for archaeology in Structure, Local, and other Plans have an important effect in enhancing perceptions of the importance of the archaeological resource and in encouraging positive attitudes towards its conservation.

The Secretary of State has now approved, with modifications, the Proposals for Alteration of the Dyfed County Structure Plan. New policies (see EN1A, Appendix V) extend the protective scope for archaeological sites and monuments beyond those defined in the 1979 Ancient Monuments and Archaeological Areas Act. Under the present Development Plan System, the policies of the National Parks and District Planning Authorities must be in conformity with the Dyfed Structure Plan.

Because of growing interest in many aspects of the archaeological and historic resource a Subject Plan should ideally be prepared by the County Planning Authority, within which the particular needs of the archaeology of the Dyfed uplands should be taken into account. Such a subject Plan would be particularly welcome in view of proposed changes to the present Development Plan system.

Dyfed County Planning Authority was responsible for the only existing Local Plan affecting an upland area in Dyfed - The Black Mountain Local Plan (DCC 1984). This plan also defined 'Areas of archaeological importance' within the plan area. Whilst these areas were suggested by the Trust, their number and extent are now in need of revision, to take into account the results of recent survey.

PCNP has delegated responsibility for Local Plan preparation. It is unlikely that a Local Plan will be prepared specifically for the Preseli Hills, but the outstanding archaeological importance of this area would need to be dealt with in detail in any Local Plan for the whole Park. District Planning Authorities, with substantial tracts of uplands - eg Ceredigion, Dinefwr, Carmarthen - should be encouraged to produce Local Plans for upland areas.

The most important Development Control functions in relation to Dyfed upland archaeology are exercised by the County Planning Authority, as the minerals authority. The existence of the amendment to the General Development Order provides a powerful basis for the Authority to take into account archaeological considerations in the face of mineral applications. The initiative of the DCC in commissioning a study of derelict mineral work-

ings in the Cambrian Mountains is to be welcomed. Moreover the Council's own studies of afforestation in the Cambrian Mountains, and the consultative arrangements over Woodland Grant Schemes, also take into account archaeological factors. Nevertheless there is a need for all historical and archaeological considerations, over all the upland area of Dyfed, to be brought together by the County Planning Authority in a single planning review.

The Government's proposed changes to the Development Plan system may make it more difficult for a uniform planning approach to be applied to the upland archaeology of Dyfed. The proposed Statements of Strategic County Policy (SSCPs) will not be part of the plan system: the current statutory obligation for Local and other plans to conform with Structure Plan policies, will be replaced by a requirement for Unitary Plans to be consistent with SSCP. This strengthens the need for preparation of an overall planning study of the upland archaeology of Dyfed so that the appropriate balance between SSCP and Unitary Plan policies for archaeology may be developed, and consistently applied in all Unitary Plans.

3.9. Other ownerships and land uses

The vast majority of the Dyfed uplands is in private ownership. The Forestry Commission is by far the largest public owner and manager of upland, controlling approximately half the 234 sq.km. of afforested land. The other 50% or so of forestry is in many private hands. The quantity of land owned by public bodies other than the Forestry Commission amounts to only 4% of the uplands (Table 5). Some organisations like the National Trust acquire land for conservation purposes, others conserve land by default. This is the case with the Welsh Water Authority, which maintains areas of open moorland to preserve the purity of water.

Welsh Water Authority	23 sq. km.
MAFF	11
CEGB	6
National Trust	6
RSPB	5

Table 5. Quantity of land in the uplands owned by public bodies.

Not included in Table 5 is the land only recently acquired by BBNP on The Black Mountain. This approximates to the area of common; this is almost all unenclosed land over 244m.

The approach of the National Trust in its employment of its own archaeological surveyors, not

only to determine the archaeological content of the Trust's holdings, but also to provide recommendations for managing the historic resource as part of a management plan for each property, is highly commendable. Other major landowners should be encouraged to follow this example.

For the many, smaller, individual landowners the best basis for encouraging conservation is to ensure that sufficient information is given on the nature of individual monuments and areas of archaeological importance. Despite the efforts of Cadw Field Monument Wardens, the flow of information to individual owners (and to the local community) is inadequate. A greater effort must be made to ensure that the results of field survey and aerial reconnaissance are supplied to owners and tenants, and in a form in which the significance and importance of the archaeological remains can be readily appreciated. Some years ago, as part of an MSC scheme, the Dyfed Archaeological Trust began such a project; unfortunately this was not completed. Since then, attempts to secure Cadw funding for a similar kind of initiative involving District and Community Councils have been unsuccessful. Efforts to involve local communities and volunteers (perhaps linked to the 'Common Ground' initiative supported by the Countryside Commission) should be revived. CBA Group II (Wales) could be approached to take a lead.

3.10. Data-base requirements

Recent years have seen a growth of awareness and interest in archaeology by local planning auth-

orities and also by other statutory and non-statutory organisations. *Unscheduled* as well as scheduled archaeological sites are generally recognised as representing some form of constraint, and some organisations have developed positive policies for the protection and conservation of the archaeology of their areas.

Yet, even the most elementary descriptive information - for example the archaeological content of any one area - is generally lacking, and the establishment of initial constraints and the subsequent process of selection, involving decisions on what should be protected or conserved and what should not, has a very poor basis. Priority should be given to rapid search programmes to establish the basic archaeological content of any given area.

Over and above this, existing records of archaeological sites do not contain the additional information which is required for management purposes - for example details of condition, details of existing land use and agricultural or other regime, amenity aspects and potential. Neither the regional nor the national data-base is at present capable of producing this kind of information.

Pilot studies by the now-defunct Ceredigion Archaeological Survey addressed this problem. The extra time involved in recording and processing this additional data suggests that it would be impractical to attempt to make this a part of routine recording, unless the work is undertaken to produce a specific management plan for a particular area - as in the exemplary surveys of the archaeological content of its properties by the National Trust.

4. THE ARCHAEOLOGICAL RESPONSE

4.1. Methods, techniques and sources

(1) *Documentary work*

As noted in Section 1.6 a variety of approaches must be adopted if man's past use of the uplands is to be adequately assessed and explained. Documentary research is an essential technique in the study of upland archaeology for two reasons:

- i. It may provide an historical framework for a particular area within which otherwise undated remains may be interpreted,
- ii. Given information or clues to land organisation in historic times, persistent uses and constraints may be identified which may illuminate these aspects in earlier periods.

There is a wealth of historical data available for the study of the uplands, but it is of a disparate nature, and coverage is not even, spatially or temporally. Thus, a particular geographical area may possess very good documentary evidence from the Mediaeval period up to the present day, whilst its neighbour possesses no historical data to speak of. Notes on the nature of the evidence, and on areas of good documentary coverage in the Dyfed uplands are contained in Appendix VI.

(2) *Place-names*

The absence of coherent Welsh place-name analyses is a great obstacle in the study of landscape archaeology. In several papers (1973-4, 1980) C. Thomas has demonstrated the usefulness of place-names to the study of the historic landscape, but very little work along similar lines has been undertaken in Wales.

Recently, Carmarthenshire Antiquarian Society has launched an initiative for the recording of place-names in the historic county, and assistance is being provided by DAT in development of a suite of computer programmes as part of this initiative. Also, discussions have taken place with the Montgomery Place Names Survey together with Antur Tanat Caen with a view to standardising methods of data collection. Support for place-name projects is also being provided through a Board of Celtic Studies Sub-Committee.

(3) *Aerial photography*

(a) *Vertical photography*

Existing collections of vertical air photographs are of special value in studying upland archaeology

and no ground study programmes should be initiated without prior examination of vertical air cover. Vegetational conditions may sometimes, but not always, hinder recognition of individual monuments, but vertical photographs generally allow the recognition of former field systems and settlement foci, as well as providing an invaluable source of data on changing land use. Collections of vertical aerial photographs relevant to the Dyfed uplands are held by many different bodies. BBNP has coverage for The Black Mountain. A colour survey of the whole of Pembrokeshire commissioned by PCNP is deposited in Pembrokeshire Record Office. A collection of different surveys covering the area of the ESA is held by the Resource Planning Group, ADAS, Trawscoed, near Aberystwyth. Several surveys are deposited with RCAHM, Aberystwyth, including RAF surveys from 1946 onwards, and a selection of OS cover from 1964 onwards. The Dyfed Archaeological Trust holds collections relating to Carmarthenshire and Pembrokeshire including RAF (1946) and Meridian surveys for the CEGB (1955).

The largest collection of vertical cover is held by the Welsh Office Central Registry of Air Photography. There is little doubt that there are many collections of vertical photographs which have not been investigated and the Registry should be approached to see if an annual schedule of collections can be made available. Not all vertical air cover will necessarily be suitable for archaeological purposes, but existing and new collections need to be initially assessed for their potential archaeological value and photographic quality. The results of such assessments should be then disseminated to archaeological agencies.

Satellite imagery represents an unexplored resource for archaeological application in upland Dyfed and its use may offer considerable savings in some aspects of survey work. Attention should be given to investigating access to satellite imagery especially for monitoring land use changes in the Dyfed uplands on at least an annual basis.

(b) *Oblique photography*

Recent oblique photographs taken by the Dyfed Archaeological Trust of Mynydd Preseli and The Black Mountain have proved invaluable in enhancing information on known sites and discovering

new monuments and relict landscapes. This technique may not be suitable for all upland areas. A recent upland survey by the Clwyd-Powys Archaeological Trust (1987, 5) found aerial photographs of little use in identifying new sites in an area apparently lacking this kind of 'continuous' settlement archaeology.

Within the region, current programmes of oblique archaeological photography are restricted to DAT's work for the Cadw-funded Scheduled Ancient Monument Aerial Monitoring programme, and the RCAHM's servicing of requirements for inventory and general reconnaissance purposes. Outside these two on-going programmes, there is only sporadic exploratory survey. Greater targeting of oblique air photography is required in the Dyfed uplands, with specific objectives linked to programmes of ground-based rapid search or detailed survey. There should also be on-going programmes aimed at filling the gaps in the general coverage of upland Dyfed.

(c) General reconnaissance.

Ground-based survey and record staff rarely participate in aerial reconnaissance. This position should be redressed so that such staff have an opportunity, whether as photographers or observers, to obtain an aerial perspective. Aerial observation represents one of the most economical ways of establishing a familiarity with upland topography and has clear gains in assessment of archaeological potential and corroborating and recording land use information.

(4) Ground survey

(a) General

The fundamental data-base deficiencies and data-base requirements noted in Sections 1.5 and 3.10 establish an overwhelming need for survey work in the Dyfed uplands. How this survey work should be carried out, to what level, using what methods, where and by whom, remains the most difficult and controversial issue in the response to the archaeological problems of the Dyfed uplands. Within this issue, the main objectives requiring survey work may be readily defined and it follows that the level and methods of survey applied in each case should be determined by what is most appropriate to serve those objectives. Having established this 'specification', there remains the problem of how to rank needs in terms of priority, what resources are required, and how existing resources of personal and technical expertise might be or

should be better applied, irrespective of existing institutional and organisational restraints.

These questions are not resolvable at this point in time without discussions between all parties involved or interested in Welsh upland archaeology. Moreover, it is unlikely that some of the survey issues will be resolved until an overall archaeological strategy for the uplands is determined and agreed. Such a strategy should include the establishment of nationwide and/or geographically limited survey programmes over specific time scales. Such matters are discussed further below.

(b) Rapid Search

The deficiencies of the existing data-base are such that irrespective of the specific purposes for which searches may be undertaken, priority must be given to establishing the basic archaeological content of the majority of areas of the Dyfed uplands. Whilst 'rapid search' may and should involve aerial reconnaissance, the ground survey element is essentially a field-walking and 'minimal recording' exercise.

The methods employed should be based on the *minimum input* required to establish the *existence, location and basic character* of the archaeological resource: mapping, where it goes beyond simple spatial 'fixing' of elements in the landscape, should be at quite a small scale (1:2500 to 1:5000), with sufficient supplementary records to provide a basis for a summary assessment of the resource. As indicated earlier, this resource should not be viewed merely in terms of upstanding monuments but should also pay attention to basic topographical and vegetational patterns: the potential for environmental studies must be considered and assessed. This approach in itself requires a fundamental adjustment of attitudes in the field. The questions to be asked are not 'where and what are the upstanding archaeological 'sites' in this area?' but 'what is there in this area which will elucidate its land-use history?'

Since the objective of rapid search is to establish the content and character of the archaeological resource of as wide an area as possible in the shortest possible time, the temptation to carry out detailed survey of individual elements of the resource must be resisted: it is all too easy to fall into the trap of more detailed recording and analysis than the brief for rapid search requires. In any rapid search programme, considerable discipline is required to ensure that such programmes *remain* rapid. Programmes must be geared to formulation of specific time scales and accurate assessments of manpower and other resources in order to maintain the necessary momentum. Maintaining momentum

in any long-term programme of rapid search may present problems and it may be advisable to ensure that such programmes are broken down into smaller individual areas or projects capable of achieving annual or biennial/triennial targets. Given clear agreement on objectives and methods, it may also be worthwhile considering the apportionment of geographical areas or search projects to separate archaeological organisations, drawing on a common pool of up-to-date survey equipment.

Rapid search programmes, almost by definition, involve a *total* search of the area under investigation. As such, field-walking must be in regular traverses, the width depending on a number of factors including the nature of the terrain and the state of vegetational cover. From 25-30m up to 50m intervals are likely to be the most efficient. Sketch surveys of individual 'sites' should not be necessary, except perhaps in cases where their form and nature is entirely unfamiliar. Essentially, the 1:2500/1:5000 scale map record should be supported by short descriptions, using dictaphones in the field. For photographic records, particular attention should be paid to the illustration of topography and setting, though for this purpose a video film record may be of much more value.

Within the time constraints of rapid search programmes, the necessary tools to do the job in the most efficient manner should be available. Whilst the initial capital cost of electronic survey and logging/plotting equipment is high, such equipment is now standard in general survey work outside the archaeological sphere. Spread over the normal survey equipment depreciation period the revenue implications are relatively low compared to manpower costs. But there is little use in utilising such equipment (or any other) unless the rapid searcher has the basic skills and experience to recognise and assess the archaeological content of a given area. Such skills and experience are of paramount importance in rapid search projects, and attention needs to be devoted to the promotion of specific selection training programmes, linked to experience opportunities, to provide the necessary corps of trained personnel.

There is little information from Dyfed upon which assessments can be made of likely time factors involved in rapid search: most attempts to quantify this are related to more detailed survey programmes (see below). But on the basis of the latter, rates in the region of 10-15ha per man-day, including preliminary research and subsequent report work, should be regarded as the minimum achievable.

As a speculative assessment it would take a two-men team 20 to 25 years to rapidly search the *whole*

of the Dyfed uplands if it is assumed that 10ha per day is a realistic area of ground to cover. The six areas initially suggested for rapid search total approximately 205 sq.km. (Appendix VII). To cover these with a two-man team at 10ha per man-day would take 4 years (at 265 days per year). In reality, it might take twice as long since it must also be borne in mind that given vegetational conditions in the uplands, less than six months of the year may be devoted to survey and that the optimum period is generally restricted to between February and mid April.

(c) Detailed survey.

The requirements of survey beyond rapid search programmes will be related to *specific purposes* and *objectives*. For archaeological and environmental research purposes the level of survey and recording must be appropriate to the resolution of the particular questions or hypotheses posed: this will determine the level of survey and record-detail required. Similarly, resource management requirements, including more detailed consideration and recording of aspects not covered by rapid search, will dictate their own level of survey detail.

By and large, these more detailed and much more expensive surveys will complement rapid search programmes. In some cases they may be a follow-up to the latter; in others they may be combined with rapid search programmes, although to a certain extent they are bound to compete with one another for the allocation of resources within the limited amount available for survey work as a whole.

Whilst no doubt there is still some scope for detailed morphological surveys of particular monument or site types, the value of these, especially if unrelated to excavation and other kinds of investigation is questionable. Far more value is likely to come from detailed multi-disciplinary survey and investigation programmes of particular *areas*. In terms of methodology, the Central Excavation Unit of the Scottish Development Department has developed some interesting approaches involving systematic topographical recording in 50m squares (grouped into 250x250m blocks) each 50m square being systematically walked at 5m intervals (SDD, CEU 1987, 35-38). Plotting is done by volunteers, and checked by experienced staff. A variety of specialist environmental survey work is included and test excavations are also carried out. Such an approach would be appropriate for a detailed research programme, as a detailed evaluation of an area under threat, or as the first stage in the investigation of an area of archaeological

importance the ultimate destruction of which could not be avoided.

No information on time/manpower involved in these SDD surveys is to hand. Some information on recent surveys within and outside Dyfed is available, however, and is of some interest for comparative purposes. In the first two years of Drewett's survey on Mynydd Preseli (Drewett 1983, 1984) approximately 2700ha were surveyed in 288 man-days: 9.4ha per man-day, for the field-work. Field walking was undertaken at 1/3km intervals by 4 teams of 2 students. Sketch plans of a sample of individual monuments, reproduced at scales ranging between c 1:50 and c 1:4000 (for large complexes) were produced. In monitoring Woodland Grant Schemes the Dyfed Archaeological Trust visited 12 locations, totalling 260ha, in 22 man-days: 11.8ha per man-day. In its Caersw-Llanbrynmair survey the Clwyd-Powys Archaeological Trust surveyed 1500ha in 30 man-days: 50ha per man-day. None of these figures includes consultation, archive work, drafting and report preparation. Inclusion of these and other aspects in the CPAT project would reduce the overall figure to 11.5ha per man-day.

The current survey by Muckle of Caron-is-clawdd has been subject to a variety of input in terms of manpower and specialist resources. Quantitative assessment is still required, although in terms of methodology some useful information has been obtained.

With the exception of the Caron-is-clawdd survey, systematic mapping of environmental archaeological data and potential has not been a feature of the other surveys listed. Plainly, from the outline information available on the SDD topographic surveys, a considerable amount of post-fieldwork resources will be required to complete the report stage for these specialist aspects.

(d) Post-Survey Requirements

Many tasks remain to be completed after the fieldwork has been done, and these need to be subjected to the same rigorous evaluation, assessment and control as applied to the fieldwork itself. Paramount should be the speed and effectiveness with which information collected in the field can be made available to a wider range of users for a variety of purposes. First, the time taken to translate field survey data into basically usable records, as location maps and accompanying descriptions or assessments, must be taken into account at the initial programme planning stage: few attempts at quantifying this have been made, but estimates range from twice to four times the time allocated

to actual field work. In the case of rapid searches, further assessment is needed to establish the time taken to provide this minimum basic record, so that such calculations may be built into estimates for rapid search programmes.

Secondly, there is the question of the time and resources required to transfer, translate and disseminate data into a form which is most suitable for a whole variety of 'clients', whether those concerned with archaeological research or those involved in conservation and management of the archaeological resource.

Whilst some of this process may imply divisions in function (eg between field survey data, SMR entry, dissemination), it is essential to separate out and assess each stage of the process within a defined comprehensive overall strategy with its functional components.

(e) Excavation

The techniques and costs of excavation are well known, and it is not proposed to describe them here. Excavation should be considered, as a last resort, if all methods of preserving a site fail, or if it forms part of a well-structured research programme. For threatened areas, current resources are insufficient to meet all excavation needs, and selection on the basis of research priorities is necessary. In some cases small-scale assessment excavation is desirable in order to determine archaeological potential and whether or not certain parts of threatened areas should be preserved, as for example, in afforestation schemes. Such situations often present difficulties, since invariably the core elements of say, a settlement, may be excluded from afforestation, whilst the associated landscape elements and boundaries are destroyed or damaged. Should excavation effort be therefore expended on investigation of such latter features in order to provide a body of research data to illuminate a subsequent investigation of the core areas currently excluded from the threat? Such a partial approach is hardly satisfactory, but this is an issue that deserves further consideration.

(f) Environmental work

Environmental archaeology is a vital technique in aiding our understanding of past land use and palaeoenvironments. In general terms, sources of potential environmental data must be taken into account in identifying (cf. SDD, CEU 1988, 40), conserving and investigating the archaeological resource and should form a key element in formulation of strategies for upland archaeology.

4.2. Current archaeological organisation and resources

(1) General

A variety of organisations and individuals contribute to upland archaeology in Dyfed, but despite close liaison and co-operation in some upland areas there is a general lack of co-ordination of activity throughout upland Dyfed. No detailed assessment of the annual financial input into the archaeology of the Dyfed uplands exists; an assessment of expenditure on archaeological conservation, research and rescue archaeology would be of value in critically examining the existing application and apportionment of resources. Despite this it is plain that the annual level of resources is inadequate and needs to be increased.

(2) Dyfed Archaeological Trust Ltd (DAT)

The Trust is established as a private company, limited by guarantee, with no share capital - it is also a registered charity. Roles relevant to upland archaeology include: maintenance of a regional Sites and Monuments Record, involving storage and indexing of archaeological data and its dissemination to a variety of organisations and individuals; identification of threats through monitoring of planning applications, forestry schemes and other proposals likely to affect the archaeological resource; site visits, search, survey, and excavation in response to threats; liaison with planning authorities and other statutory and non-statutory organisations to promote and encourage protection and conservation; general educational and promotional activities. In addition, a limited amount of aerial photography is undertaken annually.

Resources for these activities are largely provided by Cadw on the basis of annually approved projects. Cadw funding in 1988/9 included that for the preparation of this upland assessment; on-going SMR work, threat identification and limited response; support for a detailed survey of the Caron-is-clawdd area, in conjunction with University Colleges at Cardiff and Lampeter; on-going aerial photography of Scheduled Ancient Monuments including a limited upland input. Cadw-approved projects for 1989/90 include continuing SMR, SAM air photography, provision for responding to Forestry and Woodland Grant Schemes, and a small contribution to upland survey. No funds are provided from organisations or private interests involved in changing areas of the upland environment. A small amount of funding is provided by RCAHM for other aerial photography, whilst sup-

port for educational and promotional activity is utilised through Employment Training resources.

In terms of future work in the uplands, the Trust has a number of *regional* roles to fulfil: monitoring of upland change; initiating rescue responses where protection and preservation proposals fail; collation and dissemination of upland data; rapid search projects and enhanced aerial reconnaissance.

(3) The Royal Commission on Ancient and Historical Monuments in Wales (RCAHM(W))

The Commission is established by Royal Warrant and has the status of a non-departmental public body funded from the Welsh Office. The Commission's activities include archaeological and architectural field survey and recording, aerial photography, and maintenance of the National Monuments Record (Wales).

Major archaeological survey resources are directed towards the publication of County Inventories; the last of these for any region of Dyfed appeared more than 60 years ago. Other survey resources are channelled through the National Archaeological Survey team (NAS) whose survey brief includes supply of information for OS maps, survey of selected areas for research purposes and work in support of Inventory programmes. The NAS is currently in its fifth year of survey in an upland area including parts of SE Carmarthenshire (The Black Mountain region). Survey in response to rescue archaeology problems and planned protection cannot at present be easily met (Houlder 1987, 6).

RCAHM(W) has, along with the English and Scottish Commissions, been subject to a recent detailed review by management consultants, whose report (K.P.M.G. 1988) was critical of several aspects of the Commission's survey programmes. Suggestions included the channelling of funds for local SMRs through RCAHM(W), similar consideration of funding for Rescue Archaeology, and a closer relationship between RCAHM survey activity and recommendations for listing and scheduling, and the need to give more priority and resources to the NMR.

As the principal archaeological survey organisation in Wales, the Commission is in a prime position to take a lead in responding to the problems of the Welsh uplands over the next two decades. This should include the co-ordination of aerial photography projects and the targeting on the uplands of at least *some* of the Commission's own reconnaissance work; the co-ordination of upland data from regional and other records; the initiation of rapid search programmes by its own staff; and

the undertaking of contract survey work on behalf of other agencies.

(4) Cadw: Welsh Historic Monuments

Established in 1986, Cadw is a division of the Welsh Office, with statutory functions in relation to Historic Buildings and Ancient Monuments. It is likely to become an independent Managing Agency in 1991. It already has a Commercial Branch with staff mostly seconded permanently to Cadw from the Wales Tourist Board. Cadw also has responsibility, as sponsor division in the Welsh Office for RCAHM(W). The Division contains the Inspectorate of Ancient Monuments and Historic Buildings.

As already indicated, Cadw provides almost all the resources for DAT's work in the uplands. In addition, Cadw resources for upland archaeology in Dyfed include the monitoring of Scheduled Ancient Monuments by part-time Field Monument Wardens. One full-time Ancient Monuments Inspector is allocated for the whole of Dyfed, with two Field Monument Wardens covering an area greater than the County. Cadw also maintains records relating to Scheduled Ancient Monuments and has power to negotiate management agreements to prevent damage to sites.

Although the actions and activities of other organisations can be effective in the preservation of upland archaeology, Cadw has the principal responsibility for its protection on at least a selective basis, through the use of scheduling: this is likely to remain the most important Cadw function in improving the position in the uplands. But since much of the Government's funding for archaeological work in Wales is channelled directly or indirectly through Cadw, the agency also acts as an 'enabler', as it has already done in establishing the Uplands Initiative. In this role Cadw is in a strong position to encourage co-ordination of activity in the uplands and to ensure that programmes are developed in accordance with well-considered strategies and policies.

(5) The Universities.

The archaeological departments or sections of the University Colleges of Cardiff (UCW Cardiff), St. David's, Lampeter (SDUC) and of the University of London have been or are currently involved in survey work in the Dyfed uplands. In addition, Botany and Geography Departments, from several universities, but most notably Aberystwyth, have carried out upland projects in the County. In most cases DAT has been directly or indirectly involved. For example, the Caron-is-Clawdd survey project

is funded by the Trust and is being undertaken by a Cardiff post-graduate student, under the joint supervision of UCW Cardiff and SDUC. Archaeology students from UCW Cardiff are also involved in this project on a short-term basis. Final assessment of London University's survey of Mynydd Preseli 1983-8 is still awaited. The resources and contribution of University Extra-mural Departments is considered under voluntary work below.

University Departments have a considerable contribution to make to upland archaeology in Dyfed, through individual departmental or post-graduate research projects, and to a lesser extent undergraduate teaching and student dissertations. Because of the constraints of the University teaching year, resources can rarely be directed towards immediate rescue problems, but establishment of longer-term projects and advice and input into strategic planning is invaluable.

(6) National Trust (NT)

Since the early 1980's two archaeologists have been employed by the NT in Wales to prepare detailed inventories of archaeological sites and vernacular buildings within Trust ownership. The Trust is the only major landowner in Wales to compile such records, with a specific view to improved management of properties. Holdings in upland Dyfed are however, small. From time to time it would be useful if the Trust could review the effectiveness of this work and publicise its assessments to encourage other major landowners to undertake similar survey work for management purposes.

(7) National Parks (NP)

The recognition of the 'indivisible legacy of natural and man made assets', the 'unity of natural and man made interests' (Yoemans 1986, 73) has been increasingly reflected in National Park Plan reviews and policies in Dyfed, and in turn, an enhancement of resources for the historic environment in both the PCNP and the BBNP. This has recently been recognised in the appointment of archaeologically qualified staff in both Parks, though for various reasons their input into upland archaeology in Dyfed is likely to be limited. Nevertheless these recent appointments create a basis for further expansion in future. In the meantime, given the implications of the emphasis on the historic environment in policy reviews, there is no reason why Crew's statement that 'The Parks are primarily users, rather than creators, of archaeological records' (Crew 1987, 21) should not be altered. The logic of the policy reviews is surely that additional NP

resources should be applied to the identification of the archaeological resource in the first instance, whether via NP specialist staff or commissioning other archaeological organisations to carry out the necessary work.

(8) Local societies and voluntary activity

There is little voluntary activity in the Dyfed uplands, the umbrella provided by the Carmarthenshire Antiquarian Society and the activities of individual society members being an exception. In other cases individuals employed within organisations listed above, or other organisations elsewhere, are involved in various research projects in their own time.

There are substantial opportunities for a whole range of voluntary contributions to be made to Dyfed upland archaeology. But there is an overwhelming need for interests to be channelled through adult education groups, especially through local history workshops and other courses. Experience in many parts of England has shown the value of such local studies organised and directed by University Extra-Mural Departments: in West Yorkshire for example, much of the basic research into the historical documentation for upland and other areas, providing a considerable input into the West Yorkshire Archaeological Survey, was based on work over a number of years by Extra-Mural classes (Faull and Moorhouse 1981, xv, xvi).

In Dyfed, the efforts of the Swansea University Extra-Mural Department in providing courses in archaeology and local history should be encouraged and extended. The Aberystwyth Extra-Mural Department, is by comparison, less active in Dyfed archaeology, but has a particular opportunity to provide classes which will enhance the study of the history and archaeology of the uplands, and needs to take a far more positive lead in this direction. Attention should be given to increasing provision for local courses, the organisations of day schools and residential weekend conferences to focus attention on upland archaeology and encourage active participation in local survey programmes.

4.3. The Way Forward

(1) General: the need for an upland forum

From the preceding section it is obvious that although there are several organisations and individuals contributing to upland archaeology in Dyfed, and despite close liaison in certain geographical areas, there is a general lack of *co-ordinated* activity. This situation however, is not peculiar to Dyfed and it is clear that some sort of

Forum needs to be established on an all-Wales basis to remedy the situation. Initially, such a Forum should be confined to archaeological agencies and individuals, so that perceived interests, functions and objectives may be made explicit and discussed.

(2) The case for an upland strategy

Little is likely to be achieved unless organisations, institutions and individual interests reach some agreement on a defined strategy for the uplands. Ideally, such a strategy should be devised for the uplands of Wales as a whole and then narrowed down to a regional, and if necessary a sub-regional level.

(3) Creating a strategy

Archaeology is essentially a physical (as well as a cultural) resource. There is therefore no reason why the methods and techniques long established in Town and Country Planning, should not be applied. First and foremost, there should be an agreed archaeological Plan for the uplands, with clearly stated strategic objectives embracing the primary aims of uplands archaeology. In such a Plan, conservation and protection must be the foremost considerations, but attention also needs to be paid to education and research. The hierarchy of objectives needs to be resolved and a relationship between national, regional and local objectives and initiatives needs to be defined.

(4) Responsibility for plan-preparation

Since no single body has overall responsibility for the archaeology of the uplands, any Plan must be the subject of agreement between all parties involved, through some sort of Forum, as suggested above. A draft Plan should be commissioned by such a Forum, utilising a participating organisation, or an independent agency. Whatever the machinery chosen, resources will have to be allocated to this task and a realistic timescale established for its completion.

(5) Monitoring progress and achievements

Without an overall Plan (in this context, a document specifying policies for the treatment of the physical archaeological resource), there can be no effective monitoring of progress or achievements in upland archaeology. Plainly, given such a Plan, some method of monitoring progress in relation to objectives, and of assessing and identifying the changing financial resource requirements, still

needs to be introduced. Here, the present procedure adopted by all National Park Authorities may be a useful example. Each year, using an agreed set of headings, each Park is required to produce a *functional strategy*, targeted for a three-year period. This also serves as a basis for bids for resources. Such a strategy may include: a statement of objectives; a statement of activities by which these objectives may be achieved (with cross reference to Plan policies); a statement of achievements in relation to objectives; a definition of new issues and statement of perceived needs; a strategy to be pursued; and finally, a statement of resource requirements. Subject to the preparation of an overall Plan, an annual review of changes and progress, could be conducted by the Forum on the basis of submissions by participating organisations along the lines indicated above. This is one method of tackling the problems of upland archaeology that all interested and involved agencies should consider.

(6) Resources

The current resources for upland archaeology in Dyfed and Wales as a whole are inadequate. Yet merely to complain, or assert that given more resources a better response could be provided, is not a recipe for resolving the problem. A strategy is required both to *rationalise* and *broaden* the existing resource base. The following elements should be considered:

- *make better use of existing archaeological resources*
- *secure greater input from other conservation agencies*
- *vigorously pursue the 'developer pays' principle*
- *seek sponsorships*
- *seek research grants*
- *aim at multi-funding for specific projects*

(a) Existing archaeological resources

There will be little prospect of broadening the resource base for upland archaeology unless existing archaeological organisations are clearly seen to be devoting their own resources to the uplands and attempting to tackle the problems in a co-operative and coherent manner. This is an issue that a forum should firmly take on board: an agreed plan for the uplands may be a necessary precursor for rationalising existing efforts.

All existing agencies and organisations with resources for archaeological work have briefs which

extend far beyond upland archaeology, and in some cases archaeology may be only a part of an organisation's function. Capacity to re-focus or re-direct resources towards the uplands may be thought to be limited. Some attention should therefore be given to mechanisms by which more of the existing resources can be brought to bear on the problem.

The Government, through the Welsh Office contributes the largest proportion of funds directly channelled into archaeology in Wales - to Cadw, the Welsh Archaeological Trusts, and RCAHM(W). Assuming that the priority in the Welsh uplands is the initiation of rapid search programmes by ground and air the first task is to encourage co-ordinated use of these resources towards such programmes. To this end discussions should be held between the above organisations at an appropriate time each year to examine each agency's own proposals for rapid search projects. At this stage, too, the potential contribution from other organisations (for example the Universities, Local Authorities, National Parks) should be explored. Such discussions may be best organised within the framework of the proposed Forum, but it is important that the discussions be held so as to allow individual agencies time to translate agreements into funding estimates for the following financial year.

Cadw has a critical role to play in this process, since the allocation of part of its available resources towards upland archaeology can provide the trigger for re-direction of other funds. Whilst it is understood that Cadw is not intending to earmark any rescue archaeology funds specifically to the upland initiative in 1990/91, some allocation should be made for 1991/2 for rapid search projects to be carried out by the Trusts. However, this should be conditional upon input to rapid search programmes by other agencies, and this should be discussed well before autumn 1990.

(b) Conservation agencies

Many organisations and agencies now recognise the importance of archaeology and this is reflected in the increasing number of policy statements concerning the conservation of the archaeological resource. Yet the development and adoption of such policies imply at least some measure of responsibility for translating these into action. In many cases, the resource implication are not fully appreciated: it is often assumed, for example, that existing archaeological agencies can be prevailed upon not only to carry out the necessary survey work, but also to cover the costs. Unfortunately, this is rarely possible without abandoning other

work programmes, and it should be agreed that whilst the necessary archaeological manpower and expertise can be made available on a commission or contract basis the obligations implicit in adopting policies should involve the funding of, or contributions to the funding of, the necessary survey work.

(c) The principle of 'developer pays'

The increasing acceptance of the developer's responsibility to pay for or substantially contribute to necessary archaeological work should be vigorously encouraged in all those circumstances where change in the uplands will plainly result in damage or destruction of archaeological evidence. Conditions on planning consents have provided the principal platform for 'developer' funding, but the majority of rescue archaeology problems in the uplands are not related to developments within the scope of the Town and Country Planning Acts. Instead, grant-aided changes of one form or another present the main problem and there should be a concerted effort to establish the principle that where grant-aided work creates problems for archaeology, extra provision must be made to deal with the latter. The argument (often advanced by the grant-aiding body) that more central resources should be made available for archaeological agencies to respond should be resisted: the necessary funding should be linked directly to the specific threat and extra costs taken into account in the level of grant paid to the applicant. Alternatively the applicant himself should be expected to make a larger contribution towards the necessary archaeological work. What archaeological agencies need to consider, however is whether funding should be sought for the assessment/survey work, rather than any necessary subsequent excavation. Some may consider both, but attempts to apply this principle universally would be unrealistic. On the whole, and given the present state of knowledge of upland archaeology, funds for the initial assessment and survey are a greater priority, since without this activity there is little basis for determining which of a suite of options ranging from preservation to excavation should be subsequently pursued.

(d) Sponsorship

Whilst upland archaeology might not seem an obvious target for sponsorship, the remote nature of the uplands and the way in which uplands encapsulate a popular if misconceived image of the 'unaltered' environment are features which may be turned to advantage for commercial and other organisations with interests in or outside upland

areas. Targeting could include commercial forestry concerns and associations, organisations involved in energy supply, the exploitation of 'natural' resources including mineral ores, as also those manufacturers and suppliers of equipment and material whose products or services could be tested or applied in a 'hostile' environment.

(e) Research grants

Substantial funding from this source may prove difficult to obtain, but prospects are likely to be enhanced if projects can be presented as part of a coherent overall upland strategy. Equally, it is important that grant applications should be made in full knowledge of all current upland initiatives in Wales, so that duplication of effort and other resources is avoided.

(f) Multi-funding

Attempts to obtain funds from any single new source to cover the whole costs of a project will probably be less successful than offering funding partnerships. Furthermore, the more existing archaeological agencies and organisations are prepared to commit funds and resources to a common enterprise or project, the more chance there is of securing resources from fresh sources. This kind of 'packaging' necessarily takes time and effort, not least because of the need to devise co-ordinated programmes which offer to each participating agency a return in keeping with its own functions and objectives. For this reason it is not a suitable response to short-term or immediate problems. An 18-month or 2-year 'lead time' may be required. But given the vast number of areas where both rapid search and detailed survey is required, there should be few problems in identifying and constructing suitable projects. Discussion with National Park Authorities, for example, might identify an independent need for work in particular areas as part of plan preparation strategy. One corollary to this however, is that in pursuing such a package approach, archaeological agencies must be prepared (and able) to give commitment to expenditure perhaps two years in advance of the start of a project.

(7) Maintaining the momentum

If the stimulus initially provided by Cadw to tackle the problems of upland archaeology in Wales is to be developed, upland issues must be kept to the forefront amongst the conflicting requirements and competition for archaeological

resources in the Principality: ways and means of maintaining the attention of archaeologist themselves on upland problems must be found. In addition to the other proposals in this section, a triennial Welsh Upland Archaeology Conference should be instituted. Such a conference should be specifically devoted to reviewing progress in knowledge and understanding of the archaeology of the uplands, rather than dealing with resource-management or methodological issues. The conference should be developed as a major archaeological event and external sponsorships should be sought (eg Countryside Commission, Forestry Commission, Water Authority, CEEB, EEC). Responsibility for organising the Conference should initially devolve upon the uplands Forum. It could be successively hosted by regions, perhaps in association with the relevant Archaeological Trust, Local Authorities, or University Extra-Mural Departments.

(8) *The Way Forward - a summary*

Notwithstanding the many individual recommendations contained within this report, some of which could be immediately acted upon, others being more suitable for improvement over a longer time scale, the following are regarded as priority tasks in maintaining the 'uplands initiative'.

- *the establishment of a Forum for upland archaeology in Wales*
- *the development of a Plan for upland archaeology*
- *a critical review of existing resources with the aim of securing re- allocation to rapid search programmes by 1991/2 and beyond, and also the broadening of the resource base*
- *the establishment of a triennial Conference on upland archaeology in Wales.*

5. SUMMARY STATEMENTS AND RECOMMENDATIONS

This section consists of 'summary position statements' referred to earlier sections of the Report, with linked recommendations for future action.

POSITION STATEMENT	RECOMMENDATION
<ul style="list-style-type: none"> • Upland site densities are substantially lower than those in lowland area of Dyfed. This is considered, in part at least, to reflect the relative lack of fieldwork in many parts of the uplands. (1.5; 1.6) 	<p>Rapid search projects are needed to improve the basic data-base. There may be opportunities to combine these with work commissioned by conservation agencies, but elsewhere the responsibility for such surveys must devolve upon existing archaeological agencies.</p>
<ul style="list-style-type: none"> • Within the Dyfed uplands, there are areas of relatively high and relatively low site densities, which clearly relate to the lack of archaeological fieldwork. (1.5) • There is a period imbalance in existing knowledge of the Dyfed uplands as well as an imbalance in types of sites represented in the existing data-base. Within present patterns of work this situation is unlikely to be substantially improved over the region as a whole though intensive surveys and localised studies may continue to alleviate the problem in specific areas. (1.6) • Understanding of the dynamics of utilisation of the Dyfed uplands in the past is very weak. Territorial aspects and lowland relationships have not been adequately addressed, nor has their importance been recognised. (1.3 (9); 1.6) 	<p>Individual programmes need to address this problem through broadly-based projects involving a combination of rapid search, detailed field recording of upstanding remains, identification and sampling of associated areas of environmental potential, and documentary research.</p>
<ul style="list-style-type: none"> • Description of the archaeological resource in the Dyfed uplands in terms of individual sites and monuments is no longer satisfactory. Description in these restrictive terms hinders full understanding of what is archaeologically relevant and affects discussion and agreement on priorities. (1.7) 	<p>Agreement on new definitions of the archaeological resource is required, to encompass, as of equal value to upstanding remains and their contents, the other sources of evidence available for the past environment and land usage.</p> <p>Archaeological agencies at regional and national level should devote more attention to the collection, registering and indexing of data which reflect this broader definition of the archaeological resource.</p> <p>Specific attention should be devoted to the development of techniques and methods of handling this expanded data-base.</p>

- New information on upland archaeology in Dyfed supplied from external sources is not assimilated quickly enough into the regional SMR, nor is it efficiently and rapidly transferred to the National Monuments Record. Basically this is a problem of manpower and related resources, but technical aspects are also involved (1.8).

Emphasis should be placed on the production and dissemination from the regional SMR and the NMR of up-to-date information analysis and position statements on the archaeological content of the Dyfed uplands.

Financial resources and technical problems should be discussed with the Royal Commission and Cadw.

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- Whilst the rate of large-scale coniferous plantation has substantially declined in recent years, afforestation still represents a source of significant pressure upon the archaeology of the Dyfed uplands (2.2(1)).

Monitoring of all proposals for new planting should be maintained.

Opportunities should be taken in conjunction with thinning cycles to examine areas of existing afforestation not subjected to search prior to their initial planting.

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- Despite increased liaison, there has been some difficulty in readily obtaining details of new planting and felling programmes. (2.2(2))
 - Consultative arrangements are mostly satisfactory, though there is difficulty in discovering the outcome of decisions. (2.2(3))

These matters should be brought to the attention of the Liaison Committee on Forestry and Archaeology in Wales, and be discussed with local Foresters.

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- Difficulties exist in determining the full extent of land improvement in the Dyfed uplands. Very few schemes have been notified from the BBNP, none from PCNP, and none from within the ESA. Land improvement schemes which are not subject to grant aid cannot be monitored. The 'confidentiality' of WOAD - assisted schemes makes it difficult to assess archaeological implications and to monitor the effect of such schemes. (2.3(3))

The reasons for this apparently low level absence of grant-aided schemes within the National Parks need to be investigated

The number and scale of non-grant-aided schemes needs to be determined. Cadw should initiate discussions with WOAD over arrangements for notification and assessment of all grant-aided land improvement schemes.

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- Peat deposits are an invaluable potential source of environmental and archaeological information. Recent renewed interest in peat cutting in the county reinforces the need for vigilance in ensuring that archaeological considerations are taken into account. (2.4)

The archaeological importance of peat deposits should be brought to the attention of the County Planning Authority, as the Minerals Authority for the area.

An outstanding area of consent on The Black Mountain should be given priority for an archaeological and environmental sampling programme.

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- Whilst the area of active quarrying in the Dyfed uplands is very small, a number of areas have outstanding unimplemented consents. (2.5)

These areas should receive high priority for archaeological search.

<ul style="list-style-type: none"> Some 300 sites of derelict metal mines in the Dyfed Cambrian Mountains are the subject of a recent study commissioned by Dyfed County Council. (2.6) 	<p>The resulting available proposals will need to be studied in detail as soon as they are publicly available.</p>
<ul style="list-style-type: none"> Liaison with public utilities over projects affecting upland Dyfed has been limited. Although there are prospects of closer links with such organisations as the WWA, the effect of privatisation makes it uncertain how archaeological interests will be accommodated in future. (2.7) 	<p>The Trust and Cadw should further investigate and improve their liaison with public utility organisations.</p> <p>Proposed amendments to the Water Bill, to take into account archaeological needs, should be supported.</p> <p>Particular priority should be given to survey and excavation of the remaining sites affected by water-level changes at Nant-y-moch reservoir.</p>
<ul style="list-style-type: none"> Visitor erosion appears to be a relatively minor problem for the archaeology of the Dyfed uplands, though some specific sites are being adversely affected. (2.8) 	<p>Where appropriate, specific problems, should be brought to the attention of the Local Planning Authority.</p>
<ul style="list-style-type: none"> At present, opportunities for conservation of the archaeological resource in upland Dyfed are limited and unevenly distributed. This situation is unlikely to alter in the foreseeable future. (3.1) 	<p>In the long term, revised Ancient Monuments legislation is the only way a satisfactory basis may be provided for uniform conservation strategies. In the meantime, agreement on an overall Plan for the archaeology of the Welsh Uplands may play a part in promoting such strategies.</p>
<ul style="list-style-type: none"> Within the Dyfed uplands the National Parks' plans and policies provide the best opportunities for a balanced conservation strategy for areas of archaeological importance within the areas so designated. (3.2) 	<p>Recent policies within the BBNP Plan Review should be supported and encouraged.</p> <p>The forthcoming Review of the PCNP Park Plan should take into account revised Structure Plan Policies, and policies similar to those in the BBNP should be introduced.</p> <p>In both National Parks, the concept of informal 'areas of archaeological importance', as suggested in the first Review of the PCNP Plan, should be introduced and such areas determined.</p>
<ul style="list-style-type: none"> Existing arrangements for archaeological conservation in the Cambrian Mountains ESA are far from clear, and it is not possible at present to judge the effectiveness of management agreements upon the archaeological resource. (3.3) 	<p>The Archaeological Trusts and Cadw should discuss ways of improving this situation with the Resource Planning Group, ADAS.</p>

- There is little existing correlation between the archaeological resource and SSSIs. The need for collaboration, first highlighted over 40 years ago, remains just as acute today. (3.4)

In the designation of new SSSIs the special scientific significance of archaeological features should be taken into account.

Within existing SSSIs the importance of the archaeological resource should be explicitly recognised and taken into account in any management agreements.

Cadw should seek to arrange discussions at an all-Wales level between the Trusts, Cadw and the NCC to improve the appreciation and status of the archaeological resource within SSSIs.

-
- Common land is an important part of the archaeological and historical resource in the Dyfed uplands. (3.6)

Provision should be made for the rapid search of all upland common land in order to identify archaeological elements.

In management proposals based on any new Common Land Legislation, opportunities should be specifically sought to protect the archaeological heritage.

-
- Existing Ancient Monuments legislation does not reflect present perceptions of the archaeological resource. It provides an unsatisfactory basis for conservation of that resource, especially in relation to the protection of areas and landscapes of archaeological importance. (3.1, 3.7)

In concert with a variety of relevant organisations pressure should be brought to bear for new legislation.

-
- The present schedule of Ancient Monuments in upland Dyfed is unrepresentative in terms of known archaeological remains, site types, and periods. (3.7)

The Schedule should be enhanced at a rate appropriate to the demand.

Cadw's annual targets for scheduling in its 5-year Corporate Plan be substantially increased to accommodate upland requirements.

Systems should be developed to establish criteria for inclusion in the schedule, and such criteria should be made explicit.

-
- The present schedule is inadequate in its protection of areas of archaeological importance, and the extent of existing scheduled areas around individual sites is insufficient. (3.7)

Particular attention should be paid to enhancing the extent of scheduled areas, and the application of scheduling to wider areas of archaeological importance.

-
- Whilst revised Dyfed County Structure Plan policies create a better platform for the conservation of the archaeological resource, a more specific analysis of this is required. (3.8)

Dyfed County Council should be encouraged to prepare a Subject Plan for Dyfed's historic environment and resources, within which the special requirements of the uplands should receive attention.

- The County Planning Department has recently commissioned assessments of former mineral workings in the County, and have taken the initiative in discussions of forestry policy in the Cambrian Mountains. Both these topics have included some assessment of archaeological requirements. (3.8)

In any further studies of the County's resources the County Council should be given every encouragement to include assessment of the impact of resource development upon the upland archaeological resource.

- The County Planning Authority as a mineral authority has a special opportunity to take into account archaeological considerations in determining mineral strategy and in determining individual applications. (3.8)

In view of outstanding consents affecting the archaeological resource in the uplands, the County Planning Authority should be asked to pay particular attention to archaeological requirements.

- Proposed changes to the Development Plan system will, if implemented, impose upon Districts the obligation to prepare Unitary Plans. (3.8)

Every effort should be made to persuade District Planning Authorities to cover archaeological considerations in the preparation of such plans.

- Only one adopted Local Plan exists for any upland area in Dyfed, for The Black Mountain. (3.8)

District Planning Authorities with significant areas of upland (Dinefwr, Carmarthen, Ceredigion) should be encouraged to produce Local Plans for their upland areas, incorporating adequate policies for archaeological conservation.

PCNP, with delegated responsibility for Local Plan preparation, should be similarly encouraged to produce a Plan for Mynydd Preseli.

At the earliest opportunity the defined areas of archaeological importance within The Black Mountain Local Plan should be updated to reflect current archaeological knowledge.

- The National Trust is the only major landowner to carry out its own archaeological surveys with a view to including all of the identifiable historic and archaeological features in the management policies for its properties. (3.9)

Other major landowners, such as the Forestry Commission and the Welsh Water Authority should be encouraged to follow this example.

- Insufficient information on individual monuments and areas of archaeological importance is fed back from regional and national data-bases to the points where is likely to provide the best encouragement for conservation - the individual landowner and the local Community Council. (3.9)

A special effort should be made to ensure that landowners and tenants receive information on the results of ground-based and aerial surveys of their holdings.

There needs to be a renewed initiative to supply information on the archaeological resource to Community Councils. CBA Group II (Wales) with the collaboration of the Countryside Commission, might be asked to investigate ways and means of achieving this.

- The existing data-base is inadequate for the implementation of conservation policies and in particular is unable to provide even the most elementary information for determining and defining archaeological constraints in some areas. (3.10)

Priority should be given to improving the basic data-base by instituting rapid searches.

-
- Documentary research has a key role to play in understanding the past use of the uplands. Historical records represent a valuable resource in the interpretation and explanation of historic landscape in upland Dyfed. (4.1(1))

More attention should be paid to sources of documentary information on upland Dyfed.

Some further work is required to complete the assessment of the range and character of available records; the state of existing indexing of collections needs to be examined further.

-
- The lack of place-name studies is a severe handicap in upland landscape research in Dyfed. (4.1(2)).

Current initiatives by the Carmarthenshire Antiquarian Society should be further supported and developed.

Ways of expanding and further resourcing the CAS/Montgomeryshire Place Names Survey/Antur Tanat Caen/and BCS initiative should be explored.

-
- Collections of vertical air photographs are of special value in definition and assessment of the archaeological resource and in recording land use information. (4.1(3a))

Greater use should be made of existing collections of vertical air photographs.

No ground survey programmes should be initiated without prior examination of vertical air cover.

- There are extensive collections of vertical air photographs for the Dyfed uplands, but knowledge of the full extent and utility of the various collections is deficient. (4.1.(3a))

The Welsh Office Central Registry of Air Photography should be approached to see if an annual schedule of vertical air-photo collections can be made available.

Existing, and especially new, collections of vertical air photographs should be initially assessed for their archaeological potential and the results of such assessments disseminated to archaeological agencies.

- Satellite Imagery represents an unexplored resource for archaeological applications in upland Dyfed, and its use may offer considerable savings in some ground survey work. (4.1(3a))

Attention should be given to investigating possibilities of access to satellite imagery, especially for monitoring land use changes in the Dyfed uplands.

- Within the region, current programmes of oblique photography are focused on Scheduled Monument Monitoring and the NAS Survey, with only sporadic exploratory survey. (4.1(3b))

Greater targeting of oblique air photography in the Dyfed uplands is required, with specific objectives linked to a variety of programmes.

Whilst identification of specific areas for concentrated oblique photography should be linked to ground survey requirements, there should also be on-going programmes of general reconnaissance aimed at filling the gaps in coverage for upland Dyfed.

- Ground-based survey and record staff rarely participate in aerial reconnaissance. There are clear gains from aerial reconnaissance in establishing familiarity with upland topography, initial assessment of archaeological potential and in corroborating land use information. (4.1(3c))

Opportunities for ground survey and record staff to participate in aerial reconnaissance should be positively sought.

- There is an overwhelming requirement for survey work of all kinds in the Dyfed uplands. In general terms it is unlikely that this demand can be effectively met without the formulation of an overall plan for upland archaeology over Wales as a whole. (4.1(4))

Within an agreed overall plan, specific objectives need to be defined and agreed, together with resource requirements, so that priority areas and the most appropriate survey response may be determined.

- Rapid Search is priority if the basic archaeological content of upland Dyfed is to be established. It is essential that effective methods and management are applied to ensure that rapid search programmes remain rapid. (4.1(4b))

Within an agreed overall plan, priority areas for rapid search need to be identified. On the basis of low site density and other factors, a number of possible areas in upland Dyfed are indicated in Appendix VII.

Further attention should be given to pilot studies to provide an adequate basis for estimating and determining time/cost factors, and rapid search methods.

The methods employed should be based on the *minimum input* required to establish the *existence, location* and *basic character* of the archaeological resource. Mapping should be at a 1:2500 to 1:5000 scale. Attention should also be paid to topography and vegetation, and to the assessment of potential for environmental archaeology.

In selected areas, rapid search should involve *total* search by methodical field-walking.

Electronic survey and logging equipment should be employed. Attention should be given to training in the recognition and assessment of archaeological content.

Attention must be given to methods and management control, to ensure effective use of time and resources.

- There are many reasons why detailed survey should be carried out, but the methods and 'level' of survey will essentially be dictated by carefully considered objectives and purposes. (4.1(4c))

Proposals for detailed survey should be reviewed against the background of an overall Plan and strategy for the Welsh uplands as a whole.

Detailed survey should not be regarded as a substitute or alternative for 'rapid search' programmes. Detailed survey should complement rapid search and should be undertaken as a part of a comprehensive research strategy, as part of detailed evaluation exercises, or as the first stage in response to unavoidable archaeological damage.

- Insufficient consideration is generally given to post-survey requirements and at present the basis for assessment and evaluation of time and cost factors is weak. (4.1(4d))

Rapid and effective dissemination of data should be seen as a major priority.

The precise stages in post-survey work need to be isolated and assessed in order to ensure efficient management of manpower and resources.

Post-survey requirements should be subject to the same levels of critical evaluation and control as those required for survey work.

- No detailed assessment of financial input into Dyfed upland archaeology exists. (4.2(1))

It would be useful to assess the present financial input in terms of expenditure on archaeological conservation, research, and rescue archaeology, so that the existing application and apportionment of resources may be critically examined.

- Despite this lack of assessment, it is plain that the overall level of resources applied to all aspects of Dyfed upland archaeology is inadequate. (4.2(1))

The overall level of resources needs to be increased, but existing patterns of involvement by the various institutions need to be critically examined. Some of the possibilities have been outlined in the main body of the report.

- A variety of organisations and individuals contribute to upland archaeology in Dyfed, but despite close liaison in certain geographical areas there is a general lack of co-ordination of activity. (4.3(1))

Some sort of Forum for upland archaeology needs to be established for Wales as a whole.

- Without an overall Plan for upland archaeology throughout the Principality little is likely to be achieved. (4.3(2))

Since archaeology is a physical resource, the methods of Town and Country Planning should be applied.

Strategic objectives need to be determined and agreed, and translated into regional policies.

The mechanisms and resources for Plan production, and for subsequent monitoring of progress, should be a first priority for the proposed Forum.

- Unless the archaeological organisations and agencies seek and are seen to seek a better use of their existing resources, attempts to increase funding and attract input from fresh sources are unlikely to be successful. (4.3(6a))

Those organisations mainly relying on government grants for archaeological work in Wales should consider how existing resources might best be addressed to rapid search programmes throughout Wales as a whole.

At an appropriate time in 1990 and later years proposals for annual programmes of rapid search should be presented by the archaeological organisations in receipt of Welsh Office grants. These should be considered together with assessments of potential contributions from other agencies and sources.

-
- Though unevenly distributed in geographical terms, opportunities exist for a greater input to upland archaeology by those organisations responsible for pressure upon the upland resource, and also by those organisations holding broad or specific conservation briefs. (4.3(6b-c))

In attempting to broaden the archaeological resource base, the responsibility for funding the necessary rescue work should be linked to the source of the rescue threat – the principle of ‘developer pays’.

The National Parks, the NCC and other organisations with conservation objectives should be encouraged to allocate funds for the undertaking or commissioning of rapid searches in support of their own conservation policies. This also applies to Local Planning Authorities in the preparation of Local and Subject Plans.

Discussions should be held with the Resource Planning Group, ADAS with a view to securing contributions to survey work.

-
- Sponsorships and research grants constitute a source of potential funding for longer-term projects. (4.3(6d-e))

The opportunities for attracting sponsorships to a variety of upland archaeology projects should be further investigated.

Where the opportunity arises, research grants for work within the region should be sought. Applications should seek whenever possible to take into consideration ways in which research funds can be linked with other initiatives in order to maximise the resource base.

-
- Longer-term objectives are likely to be more easily attained if projects utilise funding partnerships. (4.3(6f))

All archaeological organisations and agencies operating in Wales should positively seek to devise collaborative projects which will open the way to a variety of funding sources and support.

Such projects will require a ‘lead-in’ time of up to 2 years, and the principal archaeological funding agencies, such as Cadw, should be prepared to give conditional commitments of financial support so as to provide a platform for negotiations over funding from other sources.

- In view of the conflicting requirements and competition for archaeological resources within the Principality, little advance is likely to be made in resolving problems of upland archaeology unless the subject continues to be the focus of special attention by archaeologists.
(4.3(7))

In addition to the establishment of an upland Forum and the development of an upland Plan, a triennial Conference should be established with the specific intention of reviewing progress in the knowledge and understanding of upland archaeology in Wales and communicating this to a wider audience.

External sponsorship for this Conference should be sought and consideration given to its hosting on a regional basis.

APPENDICIES

APPENDIX I: ARCHAEOLOGICAL SITES IN THE DYFED UPLANDS: NUMBERS AND DISTRIBUTION Maps 10-14

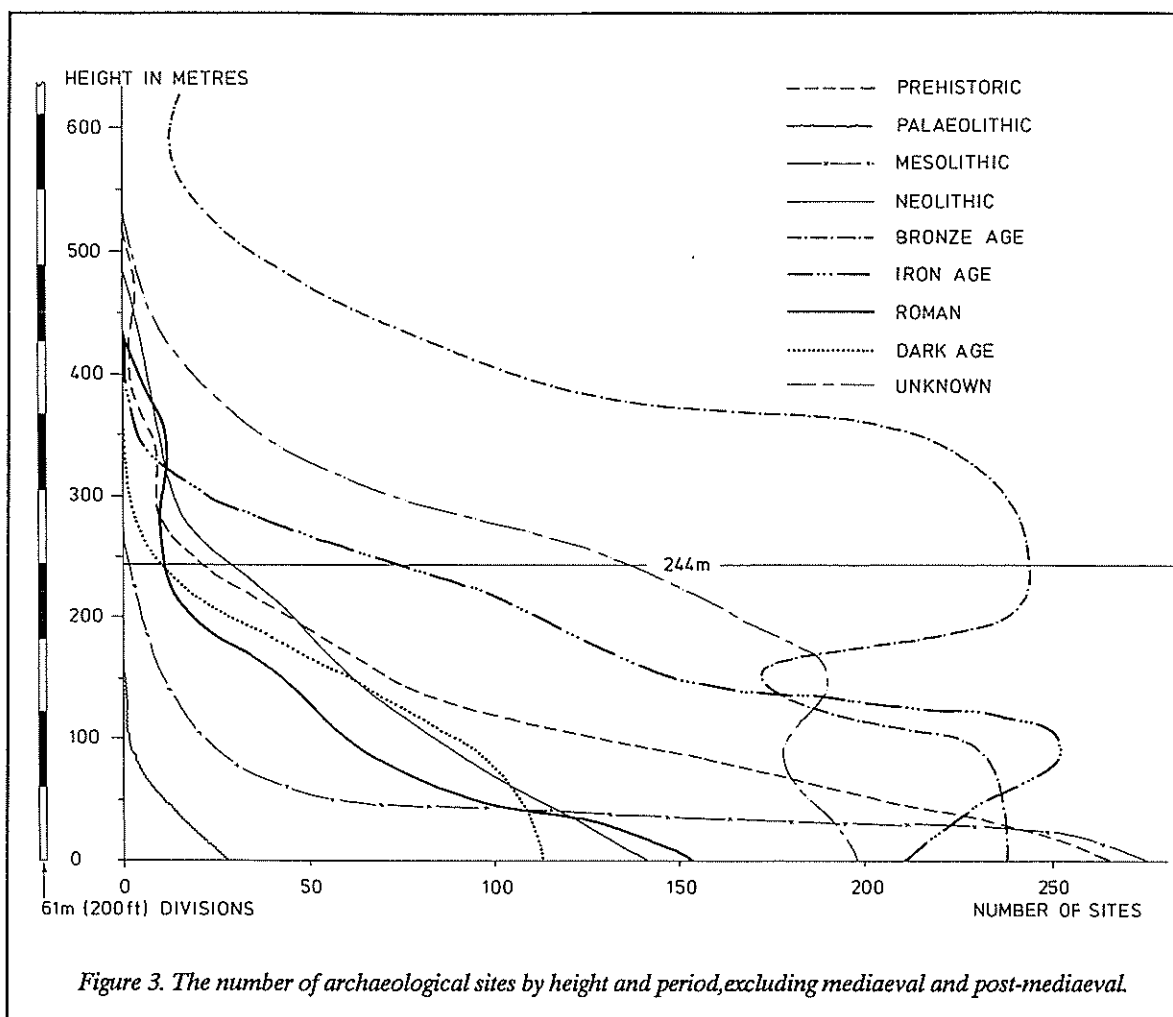
1. All the information on archaeological sites has been machine-sorted and selected from the Dyfed Archaeological Trust's Sites and Monuments Record (SMR). For comparison with the other Trusts' records, sites that are known only through place-names and documentary sources have been omitted from the figures quoted below; this accounts for the discrepancy in the figures quoted in this report and those given by Darvill (1986, 18, Table 2).

2. It is clear from the figures below that there is an imbalance in the SMR: particular periods and classes of monument are well represented, others poorly. What is not clear is the different nature of the archaeological resource in the uplands and lowlands. In the uplands prehistoric archaeology is characterised by upstanding, often intact, stone-built monuments (both funerary and ritual), and settlement sites. Upstanding prehistoric monuments in the lowlands are proportionally rarer,

usually of earth rather than stone construction, and often severely damaged by past and present farming practices. In the Mediaeval and Post-Mediaeval periods the once thriving sites of upland settlements, farms and industries are now usually deserted and represented by foundations, field walls and spoil tips, alternatively, they are known only through documentary sources and place-names. In contrast the majority of lowland Mediaeval and Post-Mediaeval sites are still occupied or utilised in one form or another, and thus have been modified to meet modern requirements. Clearly, with these differences in character and degrees of preservation, there is a greater likelihood of intact prehistoric and later settlements and landscapes surviving in the uplands than in the lowlands.

3. Excluding placename and many lesser sites, there are 14,980 archaeological sites on the SMR for Dyfed, of which 1,834 are above 244m - 12% of the total. For the whole of the county this represents 2.6 sites per sq.km.,

altitude	PR	PA	ME	NE	BA	IA	RO	DA	ME	PM	UK	TOTAL
611m	0	0	1	0	15	0	0	0	1	8	0	25
550-610m	0	0	0	0	13	0	0	0	2	7	0	22
489-549m	0	0	0	0	27	0	1	0	1	5	2	36
428-488m	3	0	0	3	58	1	0	0	3	28	7	103
367-427m	2	0	1	6	108	2	5	1	4	88	20	237
306-366m	9	0	0	10	219	7	12	1	9	211	44	522
245-305m	12	0	0	17	240	44	10	4	18	437	107	889
184-244m	38	1	3	41	243	91	14	21	61	756	155	1424
123-183m	70	1	1	63	171	146	42	60	116	1394	191	2255
62-122m	147	2	21	97	231	252	63	92	274	2079	177	3435
0-61m	237	18	232	124	238	222	127	110	538	3994	192	6032
total >244m	26	0	2	36	680	54	28	6	38	784	180	1834
total <244m	492	22	257	325	883	711	246	283	989	8223	715	13146
grand total	518	22	259	361	1563	765	274	289	1027	9007	895	14980
% above 244m	5%	0%	1%	10%	43%	7%	10%	2%	4%	9%	20%	12%
PR=Prehistoric; PA=Palaeolithic; ME=Mesolithic; NE=Neolithic; BA=Bronze Age; IA=Iron Age; RO=Roman; DA=Dark Age; ME=Medieval; PM=Post-medieval; UK=Unknown.												
Table 6. Numbers of archaeological sites by period, divided into 61m (200 ft) height bands.												



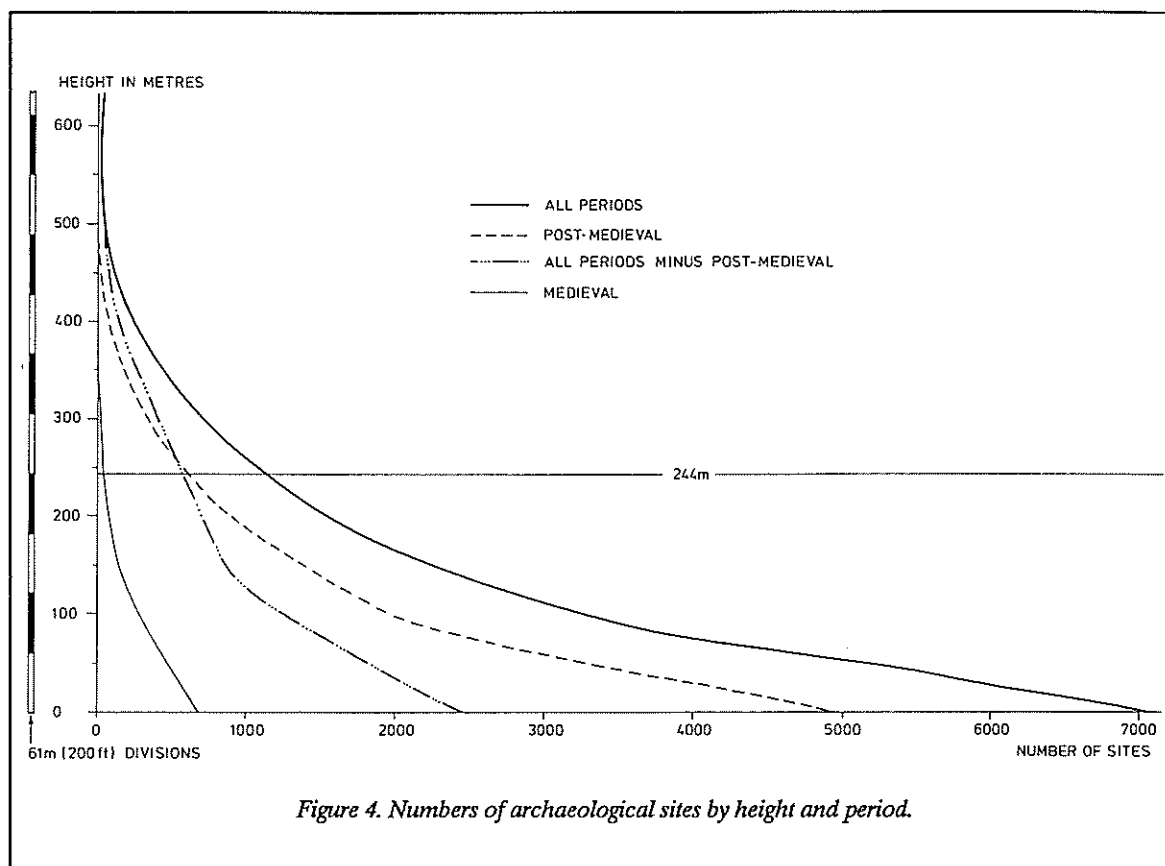
as opposed to 1.5 sites per sq.km. in the uplands. Geographically, these distributions are not even within the uplands and lowlands (Map 10); densities of over 10 sites per sq.km. are frequent on the Pembrokeshire coast; in the mountains it is not uncommon to find densities of less than one site to a kilometre. Indeed, on Map 10 it is possible to recognise the upland areas by the low densities of archaeological site. A closer examination of sites above 244m (Map 11) reveals densities in excess of 2.6 sites per sq.km. on the periphery of the uplands, but very low values indeed in the core of the mountains, with densities falling below 0.5 sites per sq.km. in some OS quarter-sheets. Of the upland core only Mynydd Preseli and the northern part of Pumlumon possess relatively high densities.

4. High levels of archaeological activity account for the high densities on Mynydd Preseli and Pumlumon. As can be seen on Map 15 the latter area has attracted several field projects in the past. But apart from one very large project little *systematic* archaeological work has been undertaken on Mynydd Preseli. However, the ease of access on to this open moorland, coupled with an enduring interest from archaeologists and other fieldworkers, has led to the identification of numerous sites. The infor-

mation from the one large field project (Drewett 1983, 1984, 1985) has not been fully assimilated into the SMR since the definitive report has not yet been completed. When it appears it is expected that the total of known sites will be greatly increased: in the first year's survey the number of sites in a small area was more than doubled.

5. A break-down of all sites by period and divided into 61m (200ft.) height bands is given in Table 6 and is shown graphically in Figs. 3, 4. It will be noted that there is gradual decrease in the total number of sites as altitude increases, from a maximum of 6032 (40% of total) in the lowest 61m division to just 25 (0.2%) on land above 611m. Indeed, there are only 186 sites (1.2% of total) over 428m.

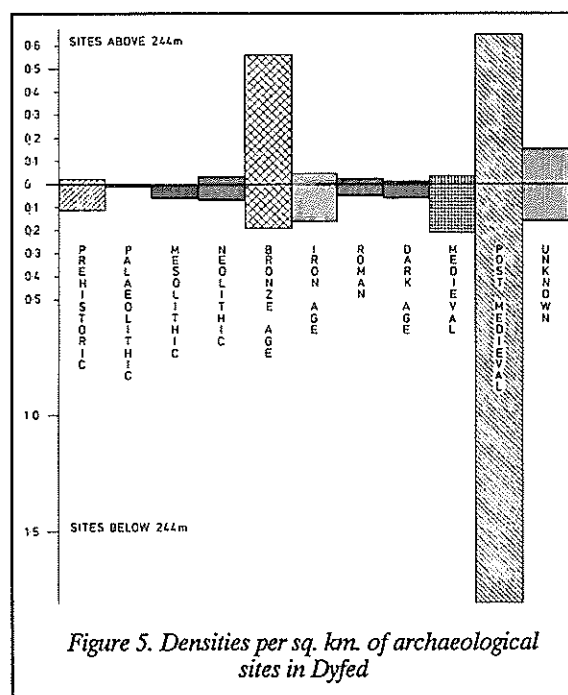
6. A gradual falling away in the total number of sites with height is only to be expected, as only 21% of land in Dyfed is over 244m, and only the tops of the higher mountains are above 611m. Thus, sites of all periods, apart from the Bronze Age, decline in numbers with an increase in height, although the Iron Age peaks between 62-122m rather than in the first height band (Figs. 3, 4). Bronze Age sites decline rapidly in numbers from sea level and then increase to peak either side of the 244m contour before falling away again.



7. As mentioned earlier there is also a lower density of sites above 244m than below. When broken down into periods only sites of the Bronze Age have a greater density above 244m than below (Fig. 5): 0.56 per sq.km. as opposed to 0.19. The highest densities both in the uplands and lowlands are achieved by Post-Medieval sites, with values of 0.64 and 1.80 per sq.km. These two periods account for 78% of all sites above 244m: the Bronze Age with 37% and the Post-Medieval with 41%. Even so, only 9% of all Post-Medieval sites occur in the uplands; other periods are proportionally even more poorly represented.

8. Across the whole of Dyfed there are on average 0.27 Bronze Age sites per sq.km., but only 0.19 below 244m. This figure increases to 0.56 sites per sq.km in the uplands, although numerically there are more sites below 244m than above: 883 to 680. The overall distribution of Bronze Age sites (Map 12) shows very high densities on the south and south-west Pembrokeshire coast and in the uplands, with moderate and low values elsewhere. A strong correlation exists between the density distribution of all Bronze Age sites and the distribution of unenclosed land across Dyfed (Maps 5, 12). This is probably because the small, discrete, character of most Bronze Age monuments renders them susceptible to destruction by farming practice and land improvement. The distribution of sites, therefore, reflects survival of monuments rather than original distribution. However, when viewed in greater detail, considerable spatial variation in densities

is evident on land over 244m (Map 13), with consistently higher values on the periphery of the uplands than on the high moorland, and there are noticeable differences in



altitude	RO	RI	SS	OC	FI	OT	TOTAL
> 611m	14	0	0	0	1	0	15
550-610m	10	0	3	0	0	0	13
489-549m	23	0	3	0	1	0	27
428-488m	46	3	7	0	1	1	58
367-427m	82	8	15	0	0	3	108
306-366m	168	11	30	0	3	7	219
245-305m	167	11	45	0	14	3	240

184-244m	130	10	60	0	30	13	243
123-183m	62	6	66	0	31	6	171
62-122m	89	5	92	4	31	10	231
0-61m	91	3	53	8	72	11	238

total >244m	510	33	103	0	20	14	680
total <244m	372	24	271	12	164	40	883

grand total	882	57	374	12	184	54	1563

% above 244m	58%	58%	28%	0%	11%	26%	43%

RO=round barrow; RI=ring barrow; SS=standing stone; OC= occupation; FI=finds; OT=other.							
Table 7. Numbers of Bronze Age sites by type, divided into 61m (200ft) height bands.							

densities between areas that contain very high percentages of unenclosed land. This probably reflects the quan-

tity and quality of past archaeological work. Some of the more inaccessible areas of the Cambrian Mountains, where no Bronze Age sites are known, have never been visited by archaeological fieldworkers, except perhaps on a casual basis.

9. It is clear from Table 7 (information shown graphically in Fig. 6) that the rise in the total number of Bronze Age sites above 183m is due almost entirely to the increase in the number of round barrows, including cairns; these achieve a maximum at about 305m. Ring barrows, although relatively few in number, have a similar distribution to round barrows. Numbers of other types of site consistently decrease with height, except for standing stones; these peak at between 61-122m, then decrease. In terms of actual numbers there are more standing stone sites below 244m than above: 271 to 103. But when transformed to densities the positions are reversed, with 0.085 sites per sq.km. in the uplands and 0.059 in the lowlands (Fig. 7). The dominance of round barrows over all other types of Bronze Age site in the uplands is clearly demonstrated when densities are calculated.

10. The almost total absence of Bronze Age settlement sites severely handicaps our knowledge of the period. Some of the 26 prehistoric sites above 244m (Table 6) are settlements. Of particular note are the open settlements on Mynydd Preseli - a number of these may be of Bronze Age date. Also, the 325 burnt mounds, otherwise known as hearths, in Dyfed have frequently been

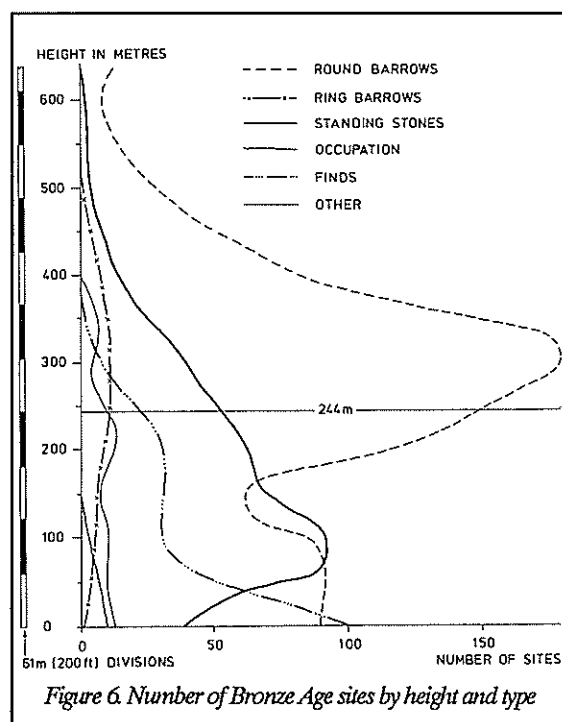


Figure 6. Number of Bronze Age sites by height and type

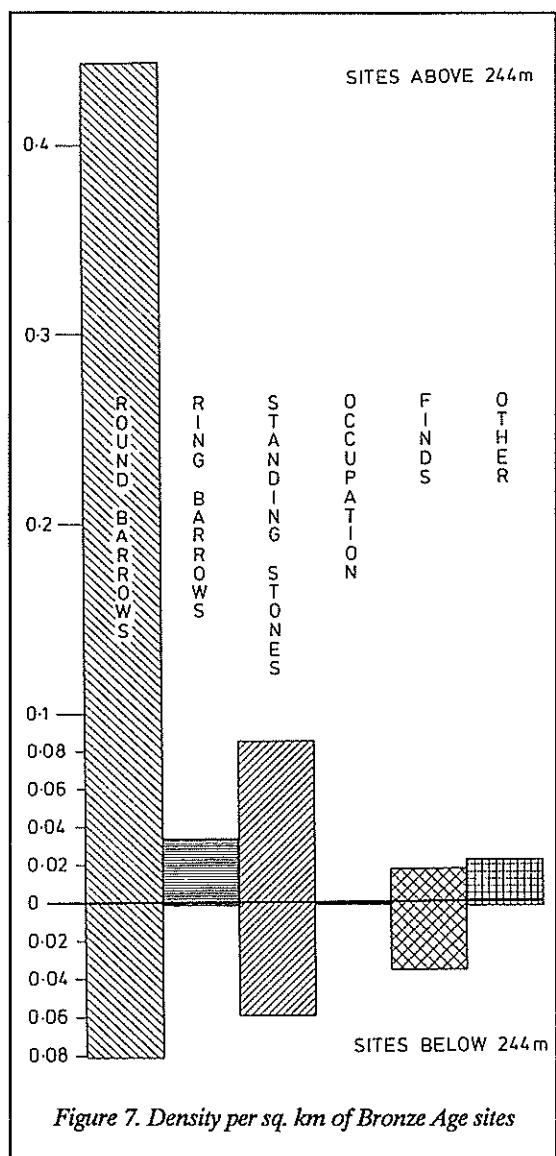


Figure 7. Density per sq. km of Bronze Age sites

shown by excavation to be of Bronze Age date, and they may represent the only visible remains of former settlement sites. At the moment only nine burnt mounds are known in the uplands. Clearly, the large number of surviving funerary and ritual monuments in the uplands indicates a sizeable population, and the lack of known settlements may therefore be due to a failure of archaeological recognition; more fieldwork is required on this problem.

11. In contrast to the Bronze Age the number of Post-Mediaeval sites shows a steady decline with an increase in height (Fig. 4). However, the very high total number of Post-Mediaeval sites ensures there are many over 244m - 784, 9% of the total. This is a density of 0.65 sites per sq.km. in the uplands, opposed to 1.8 in the lowlands. All these figures would be considerably higher if sites known only from place-name and documentary sources were included in the count.

12. Divided into classes, two site types dominate the Post-Mediaeval period - industrial and settlement (Table 8, Fig. 9). Calculated to densities, both these classes have very high values (Fig. 8).

13. When sub-divided still further it is evident that mines and quarries make up a very high proportion of the total industrial sites - 74%, 207 sites. The other categories in the industrial class are as follows: mills, 30 sites; transport, 13 sites; other, 31 sites. Lead extraction is the major quarrying/mining activity recorded on the SMR in the Dyfed uplands. Lead mining was particularly intensive in the Cambrian Mountains/Pumlumon area, and this certainly accounts for the high Post-Mediaeval site densities in these two areas (Map 14). Virtually absent on the SMR are the large numbers of stone quarries scattered across the uplands and the lime quarrying and burning industries on The Black Mountain.

14. The classification of Post-Mediaeval settlements is at the moment very unsatisfactory, with disparate terms such as long-huts, long-houses, platform-houses, farmsteads, *hafodydd* and *tai-unnos* all being employed. This has hampered understanding of the period and such problems of nomenclature need to be resolved.

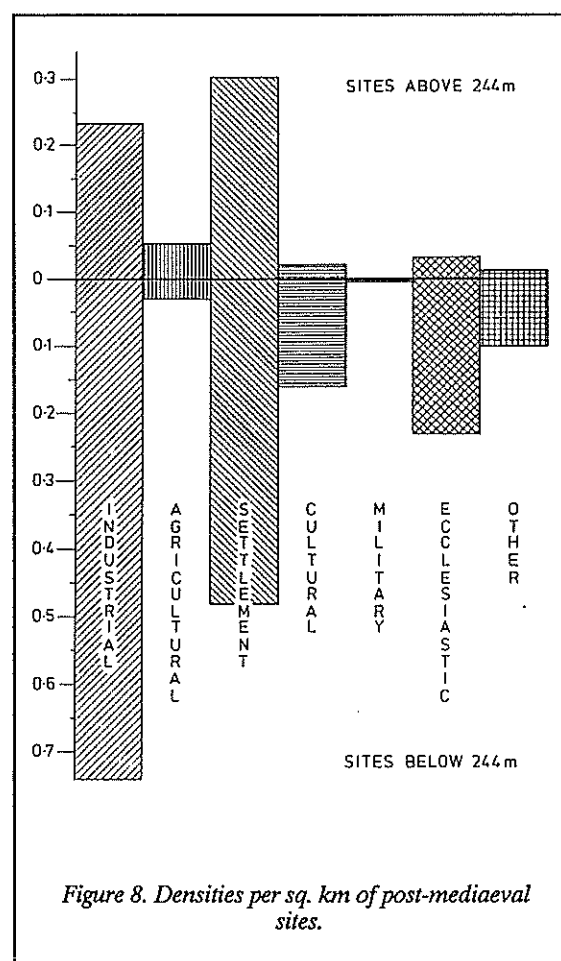


Figure 8. Densities per sq. km of post-mediaeval sites.

15. The exclusion of place-name and documentary sources also accounts for the extremely low number (38) of known Mediaeval sites. This figure compares startlingly with that quoted by Darvill (1986, 18, Table 2) of 805.

It is clear from the SMR that there are many Mediaeval settlements which continued in use into the Post-Mediaeval period but whose origin is known only through the study of documents and/or etymology.

altitude	ID	AG	SE	CU	MI	EC	OT	TOTAL
>611m	6	0	0	0	0	2	0	8
550-610m	3	2	0	0	0	0	2	7
489-549m	3	2	0	0	0	0	0	5
428-488m	15	5	7	0	0	0	1	28
367-427m	27	15	38	5	0	2	1	88
306-366m	59	19	116	4	0	9	4	211
245-305m	168	22	198	13	0	27	9	437
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184-244m	354	15	200	50	0	113	24	756
123-183m	655	15	333	92	1	240	58	1394
62-122m	867	21	567	156	2	360	106	2079
0-61m	1489	87	1075	440	18	578	307	3994
total >244m	281	65	359	22	0	40	17	784
total <244m	3365	138	2175	738	21	1291	495	8223
grand total	3646	203	2534	760	21	1331	512	9007
% above 244m	8%	32%	23%	3%	0%	3%	3%	9%

Table 8. Number of post-mediaeval sites by class, divided into 61m (200 ft) height bands. ID=industrial; AG=agricultural; SE=settlement; CU=cultural, administrative and commercial; MI=military; EC=ecclesiastical; OT=other.

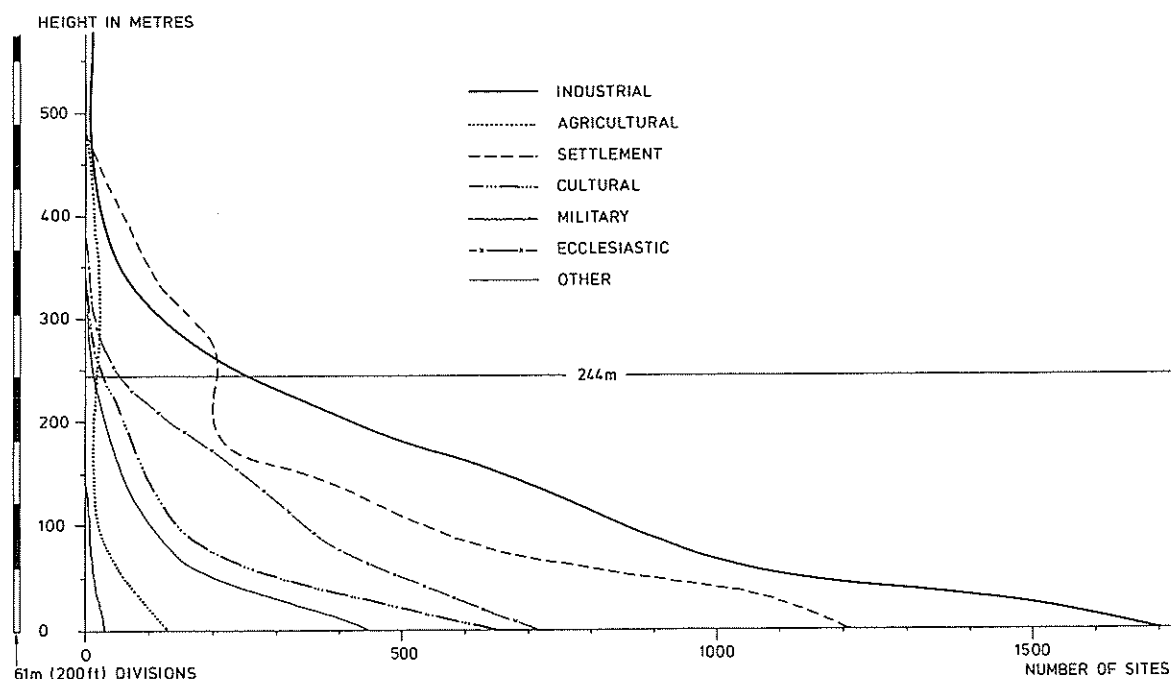


Figure 9. Number of post-mediaeval sites by type and height.

APPENDIX II: EXCAVATED SITES OVER 244m IN DYFED

1. Carreg y Bwci (SN 64574790). Partly excavated in 1879, recently resurveyed and re-interpreted as a possible Roman watch tower. Davies, J. L. 1986; Thomas, D. R. 1879.
2. Moel Trigarn (SN 157336). Excavation of numerous hut platforms within this hillfort took place in 1899. No structural remains recorded, finds indicate late Iron Age/Romano British occupation. Baring Gould, Burnard and Anderson 1900.
3. Crug Du (SN 381504). 1904 salvage excavation on a Bronze Age burial cairn. Davies, J. 1905.
4. Blaenau Gwenog (SN 482498). Description of the discovery in 1910 of several Bronze Age cremations in a mound, plus description of similar finds in the vicinity. Thomas, E. L. 1910, 1912.
5. Waun Clawdd (SN 675555). Partial excavation in 1927 of three rectangular stone structures, no dating evidence found. Lewis, T. 1927.
6. Bryn Cysegrfan (SN 642517). Pillow mounds (rabbit warrens) of late Mediaeval/early Post-Mediaeval date. First investigated in the 1920s, re-examined in the 1970s. Austin, D. 1988; Lewis, T. 1927.
7. Pen-y-glogau (SN 55455931). Late 1920s salvage excavation on a Bronze Age cairn that contained many cremations. Jones, S. I. and Davies, D. E. 1930.
8. Disgwylyfa Fawr (SN 737847). Two Bronze Age wooden coffins found in a barrow during small scale excavations in 1937. Radiocarbon dates have been obtained and the importance of the site has been recently reassessed. Forde 1938a, 1938b, 1939; Green 1987.
9. Cwmystwyth mines (SN 816756). First investigated in 1946; recently re-excavated, with evidence for Bronze Age mining supported by radiocarbon dates. Davies, O. 1946; Timberlake, 1987.
10. Croesmhangel (SN 164332). Excavation in the late 1950s of a Bronze Age barrow which contained several cremations. Nye, Harrison and Savory 1983.
11. Aber Camddwr I (SN 75408670). Ring cairn with central burnt inhumation; excavated 1962. Hogg 1977.
12. Aber Camddwr II (SN 75108690). Small kerb cairn with central inhumation, small standing stones around cairn. Excavated 1962, re-investigated 1986. Hogg 1977; Murphy and Marshall forthcoming.
13. Bwlch yr Hendre (SN 744877). Full investigation in 1962 of a long hut; no dating evidence, but possibly associated with lead mining. Butler 1963.
14. Mynydd Llangyndeyrn I (SN 48021305). Small scale excavation in 1976 around a large standing stone. Radiocarbon date of 1140±100 bc from near stone. Site just below 244m. Ward 1983.
15. Mynydd Llangyndeyrn II (SN 48031308). Very small scale investigation around a small standing stone. Ward 1983.
16. Caer Cadwgan (SN 622479). Large scale investigation of defences and interior of a hillfort. Archaeology Unit, SDUC 1984, 1985, 1986.

APPENDIX III: SURVEYS OVER 244m IN DYFED

Site specific

1. Carn Ingli (SN 063373). Survey, description and discussion of a major defended site. Hogg 1973.
2. Cefn Gwernffrwd (SN 73744995). Survey and description of a stone circle and associated monuments. Briggs 1975.
3. Dolau Cothi aqueducts (SN 719466). Survey of the courses of the aqueducts leading to the Roman gold mine. Jones, Blakey and Macpherson 1962.
4. Dolau Cothi gold mine (SN 667404). Survey of features associated with the gold mine. Lewis and Jones 1970.
5. Hafod Ithel (SN 610678). Survey of a cairn cemetery. Briggs 1974.
6. Bryn y Gorlan (SN 74155390). Drawing and description of Bronze Age monuments. Leighton 1980.

7. Cwmystwyth (SN 8074). Survey of lead mining complex supported by much historical data. Hughes, S. 1981.
8. Frongoch (SN 723744). Survey of lead and zinc mine complemented by historical data. Bick 1986.
9. Esgair Hir (SN 7391). Detailed survey of lead and copper mines with historical analyses. Palmer 1983.
10. Esgair Gerwyn (SN 8027 5737). Survey of a cairn cemetery. Leighton and Metcalfe 1978.

Thematic surveys

1. Carmarthen Fan (SN 8222). Drawings and descriptions of possible hafodydd sites. Crampton 1968.
2. Hirnant (SN 75388399). Description of a small group of ?Bronze Age cairns. Evans in Hogg 1977.

3. The Black Mountain (SN 7419). Drawings and descriptions of long houses. Ward 1988.
4. Mynydd Llangyndeyrn (SN 4813). Work concentrated on the Bronze Age monuments. Ward 1976.
5. Carmel (SN 5815). Drawings and descriptions of a group of Bronze Age Monuments. Ward 1987.

Non-intensive area surveys

1. Cynwil Gaeo. Description with drawings of several sites in north Carmarthenshire/south Ceredigion. Thomas, D. R. 1879.
2. Bwlch y Styllen (SN 7186). DAT n.d.
3. Llysarthur (SN 7882). DAT n.d.
4. Llywernog (SN 7280). DAT n.d.
5. Llyn Fyrddon-Fawr (SN 8070). DAT n.d.
6. Caron-uwch-clawdd (SN 7560). DAT n.d.
7. Nant-Llwyd (SN 7852). DAT n.d.
8. Cellan (SN 623480). Survey in association with the Caer Cadwgan excavation project. Archaeology Unit, SDUC 1984, 1985, 1986.
9. Nant Garw (SN 721721). Extensive survey on The Black Mountain, locating and recording new sites. Leighton, Percival and Malaws 1987.
10. Capel Bangor - Trefeurig (SN 68). Recording of known sites, plus location of new sites. Ceredigion Archaeological Survey (SDUC) 1988a.
11. Ystbyty Ystwyth (SN 77). Recording of known sites, plus location of new sites. Ceredigion Archaeological Survey (SDUC) 1988b.

APPENDIX IV:

SITES ABOVE 244m SAMPLED FOR ENVIRONMENTAL ANALYSIS

The information for this appendix was kindly provided by A. E. Caseldine, St. David's University College, Lampeter.

Pollen sites

1. Maesgoleu (SN 595634). Slater 1966.
2. Teifi Lakes (SN 793620). Taylor 1973.
3. Hafod Ithel (SN 614680). Campion 1972.
4. Cors Pwyll-yr-ych (SN 614680). Theobald 1973.
5. Figyn Blaen Brefi (SN 6755). Davies, E. G. 1944.
6. Bryn Gawr (SN 7373). Crampton 1963.
7. Banc Nant Rhys (SN 7678). Crampton 1963.
8. Pumlumon 2 (SN 796865). Smith 1970; Smith and Taylor 1969; Taylor 1973.
9. Ffair Rhos (SN 764687). Smith 1970; Smith and Taylor 1969.
10. Llyn Gynon (SN 801648). Moore 1966; Moore and Chater 1969a, 1969b.

Small-area 'blanket' surveys

1. Nant-y-môch (SN 750869). Drawing and descriptions of sites during low water-level of reservoir. Briggs and Murphy 1984.
2. Caron-is-clawdd (SN 730600). Survey in progress by P. Muckle, 1988-9.

Large-area 'blanket' surveys

1. Mynydd Preseli. Identification of new sites, plus detailed drawings and descriptions. Drewett 1983, 1984, 1985.

11. Plynlimmon (SN 798858). Moore 1966, 1968; Moore and Chater 1969b.
12. Towy Valley UTV-4 (SN 782573). Moore 1965, 1966, 1972.
13. Mynyddmelyn (SN 027357). Seymour 1985.
14. Carn Ingli (SN 055368). Seymour 1985.
15. Bluestones (SN 148323). Seymour 1985.
16. Croesmihangel (SN 164332). Seymour 1985.
17. Pen Rhiw-wen, 5 sites (SN 7318). Cloutman 1983.
18. Pen Rhiw-wen, 1 site (SN 741179). Cloutman 1983.

Environmental evidence from upland archaeological sites

1. Aber Camddwr I (SN 75408670). Charcoal identification. Hogg 1977.
2. Aber Camddwr II (SN 75108690). Pollen analysis and charcoal identification. Caseldine in Murphy and Marshall forthcoming.

**APPENDIX V:
POLICIES RELATING TO ARCHAEOLOGICAL FEATURES IN THE BRECON BEACONS
NATIONAL PARK FIRST REVIEW, AND IN THE DYFED STRUCTURE PLAN: ALTERATION NO. 1**

BBNP First Review

- HF1 The NPA will seek to protect and conserve all features of historical interest and importance, and their settings if appropriate.
- HF2 Where a feature is to be altered or destroyed by development, the NPA will seek to ensure that it is fully investigated and recorded first.
- HF3 The NPA will maintain a register of all features and sites of historical interest and importance within the Park.
- HF4 The NPA will normally oppose developments harmful to scheduled ancient monuments and those of importance within the Park, or their settings.
- HF5 The NPA will press the Secretary of State to include on the schedule any monuments it considers to be worthy or in need of such protection.
- HF9 The NPA will pay special attention to increasing its knowledge and protection of industrial archaeological sites, and urge statutory bodies to give them more consideration.

- HF13 The NPA will in surveying the Park's historical features seek to identify historic landscapes or groups of sites, and will seek to protect them.

Dyfed Structure Plan: Alteration No. 1.

- EN1 'It is the policy of the County Council that there shall be a presumption against development which would reduce the amenity or historic value of listed buildings of grades I, II* and II or scheduled ancient monuments.'
- EN1A 'It is the policy of the County Council to protect and conserve wherever possible unscheduled archaeological, historical and architectural features or areas of importance. Where permission is granted for development, conditions will be included, if necessary, to provide adequate opportunities for the recording and where desirable, the excavation of such sites. The protection of areas in close proximity to these sites will always be an important planning consideration.'

**APPENDIX VI
DOCUMENTS FOR THE DYFED UPLANDS**

Nature of the evidence

National records, usually housed in the Public Records Office, contain information on Royal administration and management of Crown estates. Such records may contain data of a topographical nature useful for the study of the uplands. Also, much material of a local or regional nature, of a type customarily stored in local offices and pertinent to the study of the uplands may be housed in national repositories. Records relating to corporate bodies, such as the great religious houses of Strata Florida and Talley, are often extensive and well-preserved, and contain a wealth of detail concerning the administration of the mother-house and its granges. These documents may be our best information on upland land use in the Mediaeval period, and as such have received attention from historians, most notably by D. H. Williams in his study of the Welsh Cistercians (1984).

Manorial records of the Mediaeval and Post-Mediaeval periods often contain incidental information on topography, land use and management in the form of charters, land transfers, leases, extents, surveys and fines. These types of records are often found in solicitors' collections in the National Library of Wales (NLW), Carmarthen Record Office (CRO) and other local record offices, or in collections not tied to an estate, such as Cwrt Mawr (NLW). Morris' study (1985) of the boundaries of the commote of Perfedd, Carmarthenshire, demonstrates one way in which these records can be applied to the study of the uplands. The explosion in private ownership in the 16th century saw the propaga-

tion of vast numbers of documents relating to land transfer and land management. Often these documents contain a wealth of topographical detail. Long runs of estate records often survive, usually in an easily accessible form in a record office. A good example is Cwrt Mawr No 4 (NLW), dating to 1650: 'Tythin Kennant and a cottage or summer house called Llystyn ym mlaen Kennant in the parish of Llanviehangl y Croythin, Co Carmarthen'. This type of document is used by many authors to construct patterns of transhumance (Davies, E. 1980; Vaughan 1966).

Local Post-Mediaeval documents, such as vestry books, account books and poor law books may also contain useful details relating to how the uplands were utilised in the 18th and 19th centuries. The vestry book of Caron-is-clawdd was employed by W. J. Lewis (1955) to plot the squatter settlements on Mynydd Llanddewibrefi - houses which are now abandoned on open moorland. It is important to obtain the name of a former upland settlement if the written historical evidence is to be associated with a specific site. Large-scale maps of the 18th and 19th centuries can help here: they often name upland settlements now abandoned, and in some cases preserve names of houses and dwellings that were deserted when the map was compiled.

A wealth of other useful detail is depicted on estate maps and tithe maps, and these are a rich source of information on land use, field names and ownership. An afternoon's work in a record office examining relevant

maps may provide more information than several days of fieldwork. J. G. Thomas (1957) used 18th and 19th century manuscript maps in his study of enclosure patterns in an area of mid-Wales upland. The use of first edition 6" Ordnance Survey maps should not be neglected when studying the uplands. They were used to great effect in West Yorkshire in establishing territories and boundaries redundant but still known of in the 19th century (Faull and Moorhouse 1981).

Areas of Good Documentary coverage.

Clearly the size of a territory, be it an estate, manor or grange, was not static through time, and the documentary evidence, when tied to a specific estate collection, reflects these changes in area. Thus, the following can only be taken as a rough guide to the available collections and the areas which they cover.

The Black Mountain: manorial records in Cawdor Vaughan (CRO). Estate documents with map book in

Gwynne of Dyffryn (W.Glam. RO) and Ashburnham (NLW).

Mynydd Mallaen: Grange of Strata Florida. Collection of manorial and estate documents, with maps, in Cawdor Vaughan (CRO); possible continuity of documents from the Mediaeval period.

Mynydd Pencarreg: a grange of Talley at the southern end of the mountain. Much of the area in the Edwinstford estate (NLW), with good documentation from the 16th century, though no map book.

Mynydd Preseli: a collection of manorial records in Bronwydd (NLW). Estate records in Llwyngwair, Colby and Trewern (NLW).

Northern Cambrian Mountains, Pumlumon and Mynydd Bach: several granges of Strata Florida in this area. Dominated by the four very large estates of Crosswood, Gogerddan, Hafod and Nanteos (all in NLW). Excellent coverage for Crosswood and Gogerddan, though Gogerddan documents not catalogued. Coverage of Nanteos and Hafod less satisfactory.

APPENDIX VII SUGGESTED STUDY AREAS

The following factors were taken into account in suggesting priority areas for rapid search:

- (1) apparent low site densities (generally less than one site per sq.km. - see Map 11).
- (2) open land with little afforestation
- (3) a variety of topographical situations
- (4) different levels of statutory protection or conservation restraints
- (5) potential threats

Area 1 (SN 53 NW). Mynydd Pencarreg. 13.88 sq.km. of unenclosed land. No statutory protection. Relatively low rounded moorland.

Area 2 (SN 71 NW, NE). The Black Mountain. 39.93 sq.km. of unenclosed land. In BBNP and mostly in a SSSI. A variety of topography and geology.

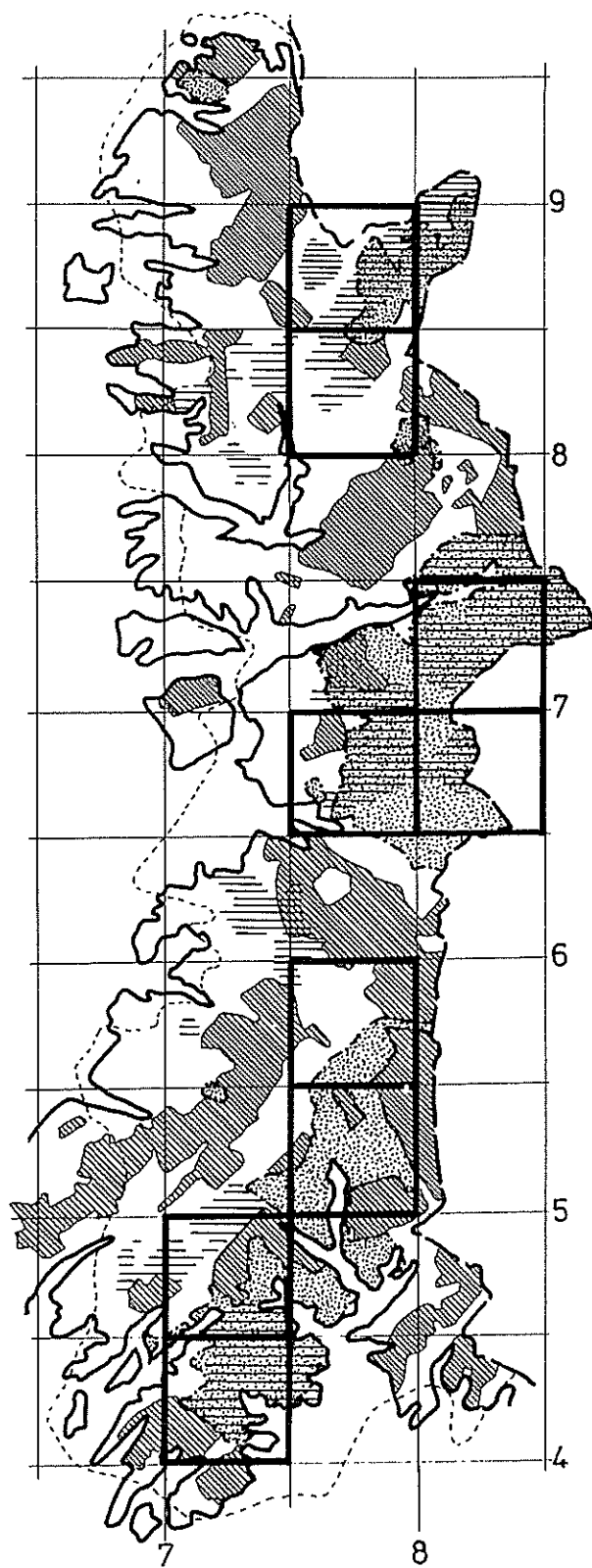
Area 3 (SN 74 SW, NW). The Cambrian Mountains - Mynydd Mallaen. 32.62 sq.km. of unenclosed land. In the ESA and with a large SSSI. Mid-range moorland and steep-sided valleys.

Area 4 (SN 75 SE, NE). The Cambrian Mountains - Llyn Brianne. 32.88 sq.km. of unenclosed land. In the ESA and with a large SSSI. Mid-range moorland. Much recent forestry in this area.

Area 5 (SN 76 NE; 86 NW; 87 SW). The Cambrian Mountains - Llyn Teifi. 47.75 sq.km. of unenclosed land. In the ESA and mostly in a large SSSI. Variety of topography, from the Teifi and Ystwyth valleys to high level moorland.

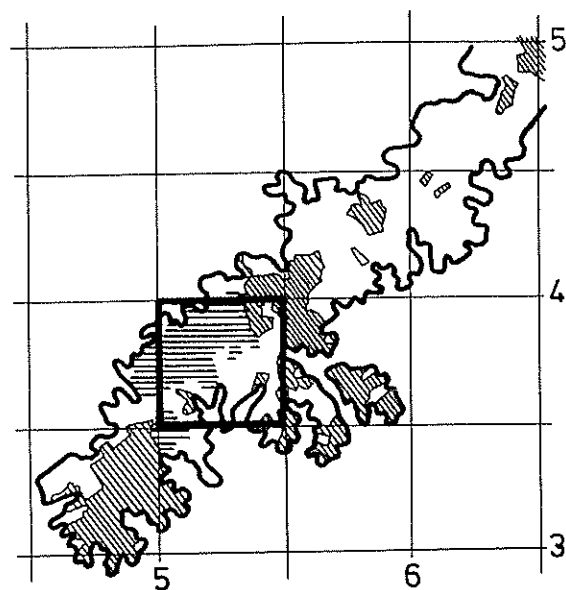
Area 6 (SN 78 SE, NE). Pumlumon. 38 sq.km. of unenclosed land. In ESA and partly in a SSSI. Variety of topography, from the upper Rheidol valley to the summit of Pumlumon. Higher site density than the other areas because small scale surveys have dramatically increased the number of known sites within small pockets. These surveys have demonstrated the high archaeological potential of this area.

Attention is also drawn to a number of other areas and locations mentioned in the main report where the need for search and survey has been mentioned: Mynydd Bach (2.2(2)), quarrying concessions in the western part of the Black Mountain (2.4,2.5), common land areas (3.6), and Nant-y-môch reservoir (2.7).

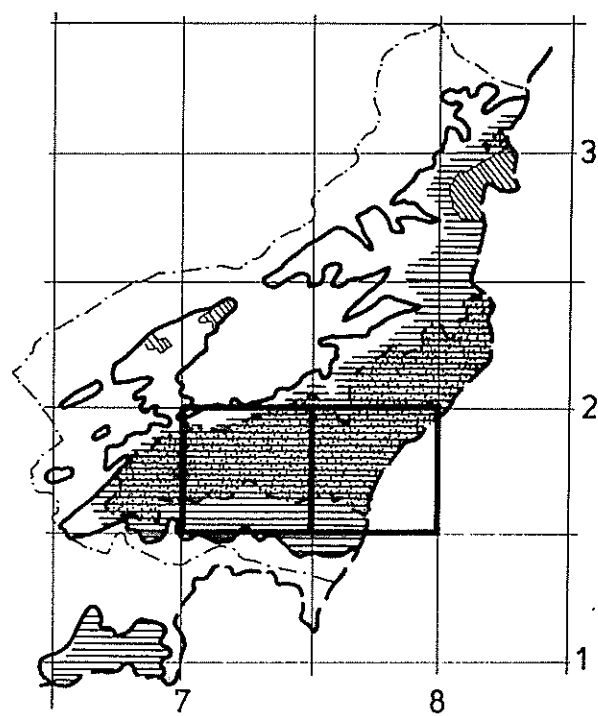


Cambrian Mountains-Pumlumon

25 sq. km-



Mynydd Pencarreg



The Black Mountain

- 244m contour
- forestry
- NP boundary
- SSSIs
- ESA boundary
- common land

Figure 10. Areas suggested for rapid search.

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