Tywyn-Dolgoch Uplands

RCAHMW Uplands Survey Report

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Non-Technical Summary

The Tywyn-Dolgoch Uplands Survey was the first such example undertaken by the joint Archenfield Archaeology and ArchaeoPhysica team in the Welsh uplands. It proved a valuable exercise in terms of both the archaeological monuments found and also for honing field recording techniques in sometimes difficult conditions. As such, the subsequent Nantlle-Beddgelert (South) survey was able to use much of what was learnt and resulted in a smoother transition from field to digital record.

Several general conclusions can be formed from the result of this survey which was successful in detecting several well-preserved monuments from prehistory into the post medieval period. There is a notable lack of settlement remains and field systems in much of the area which is slightly surprising considering the relatively low and sheltered character of this upland. Conversely there are many examples of funerary monuments, usually on south or west facing slopes and with a view of the sea.

The valley of the Nant Braich-y-rhiw seems to have been a focus throughout the past with a concentration of monuments of most types on the south facing slopes above it. There are several well-defined groups of sheep folds, hafods or shepherds' huts and on the higher and more exposed slopes, prehistoric funerary cairns.

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Table of Contents

1 Introduction

Location

1.1 The survey encompassed approximately 2518 hectares of predominantly open ground east of Tywyn in south western Snowdonia, mostly above the 200m contour. It was centred roughly on OS NGR 265 303 near the summit of Pen Trum-gwr.

1.2 Within the area are the peaks of Allt Gwyddgwion, Tarren Cwm-ffernol, Pen Trum-gwr, Mynydd Esgairweddan, Tarrenhendre, Mynydd Tan-y-Coed and Mynydd Rhyd-galed (on a spur to the north east). The popular walking location of Dolgoch on the Talyllyn Railway lies midway down the north western side of the area while the next stop down, at Brynglas, is immediately outside the western corner of the area.

Parties involved

1.3 The survey was commissioned by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) on receipt of grant aid funding from the Welsh Assembly. This funding is to promote an increased understanding of the archaeological content of the Welsh upland regions, defined as anywhere above the 200m contour.

1.4 The initial bid was assembled by ArchaeoPhysica but due to unexpected timetable constraints fieldwork was undertaken by a joint team with Archenfield Archaeology who also contributed to the desktop study.

1.5 Acknowledgements are due to David Leighton at the RCAHMW for his support and patience during this survey, especially as we were new to the Uplands Project at the time. Thanks are also due to our combined staff and management team, especially Huw Sherlock, Sam Meadows, Nico Vaughan, Benji Britton and Alex Rowe from Archenfield and Anne Roseveare and Samantha Lowden from ArchaeoPhysica.

Basic methodology & rationale

Rationale

1.6 The Uplands Project has developed a generic reconnaissance methodology based upon the experiences of the various contractors involved since its inception. This forms the core of all work undertaken within the project remit but it is up to the individual parties as to how it is carries out in the field and what extra capability can be brought to bear.

1.7 In essence, the remit is simply to cover as much ground as possible in a systematic manner based upon the walking of lines at between 30m and 50m intervals depending upon local visibility. Monuments along each line are recorded by a variety of means and then tabulated in a database to suit the Welsh NMR maintained by RCAHMW. Batches of NPRN numbers are allocated for monuments not already within the NMR and existing records are checked and augmented as necessary.

1.8 Various sources of information are available from RCAHMW, e.g., old OS mapping, AP transcriptions, NMR content, etc. This project, along with another south of Nantlle by ArchaeoPhysica in 2005, have also used OS elevation data (Landline Profile) to provide height and aspect information to support fieldwork logistics and data analysis.

Constraints & variations

1.9 External contractual issues of both Archenfield Archaeology and ArchaeoPhysica meant that fieldwork was progressed in short week-long campaigns rather than a single episode as originally envisaged. The primary impact of this was that overall impressions of monument counts and rates of working were not evident until a significant time after the start of fieldwork.

1.10 With one or two exceptions the entire area was walked with a mean line separation of between 30m and 50m as required by the specification. The exceptions to this were for reasons

of safety where there were steep drops into the bottoms of river valleys, principally within Cwm-pandy. In some of these locations assessment was by means of progressing up the edge of the stream below the steeper ground and river cliffs, looking at the slopes above. This proved a worthwhile exercise in spite of difficulties of access as the occasional monument was found.

1.11 Some small areas of tall dense bracken on the south western slopes of Allt Gwyddgwion, east and west of Nant y Bala, were found to be impassable. At least one sheepfold within it was noted and recorded by the more intrepid members of the field teams. With the exception of a level recorded as PRN 20555 in the Gwynedd HER, all known monuments were located. This level is apparently shrouded in long vegetation and in the near vertical sides of the river gorge and could not be seen from either side of the valley.

2 Methodology

Desktop assessment

Cartographic resource

2.1 Several map resources were used for this project and these are listed below:

- Ordnance Survey 1890/91 1st Epoch 1:10560 6": 1 mile
- Ordnance Survey 1901 2nd Epoch 1:10560 6": 1 mile
- Ordnance Survey 1953/54 4th Epoch 1:10560 6": 1 mile
- Tithe map and apportionments 1839 for Tywyn, Pennal and Tal-y-llyn contemporary parishes (the modern parishes are different)
- Ordnance Survey 1813 1:31680 2": 1 mile

2.2 Where possible, e.g., the 1st , 2nd and 4th Epoch OS maps, these were assimilated into the project GIS, as georeferenced images and examined for potential monuments and enclosure patterns.

2.3 In practice, considerable difficulties were experienced in the case of the older maps, e.g., the Tithe, as the modern parish boundaries are quite different and the sparse nature of the mapping of the hilltops limited the potential for useful geo-registration. Attempts to set up something for this project to allow the mapping to be incorporated digitally into the project GIS were thwarted by various curatorial issues.

Documentary resource

2.4 Apart from the cartographic data various other sources were examined and the principal ones are listed below:

- Survey of Ynys y Maengwyn Estate, Peniarth Deposit Collection Volume 2, Surveyor Richard Owen for Henry Arthur Corbet Esq. 1776
- Peniarth Volumes 1-5 and Peniarth Maps 1-20
- RCAHMW Uplands Project AP transcriptions (T. Pert)
- NMRW extract
- Gwynedd HER extract

2.5 Again, although several useful facts emerged from these sources the potential of the historic documentation was limited by the absence of reliable correlation between modern and antique geography. The most useful resources were the existing NMRW and HER extracts, especially in conjunction with the cartographic sources. A major problem proved to be the refusal of the National Library of Wales to permit digital photography ready for direct registration into the GIS. The only alternative would appear to be their own digital photographic reproduction which, sadly, was beyond the available budget.

2.6 Overall, the RCAHMW transcriptions were found to be of variable use although little had been apparent during their survey. In most cases there was more information available from ground survey than aerial but this seems to be normal for this sort of project.

2.7 One disappointing result was that essentially all of the areas of potential ridge and furrow identified through aerial survey were not apparent on the ground and in many cases seemed to relate to modern heath-land management, e.g., bracken mowing.

Field survey

Dates & personnel

2.8 Fieldwork ran from the 12/09/05 through to the 07/11/05 across approximately fifty-one person days, with approximately a further five person days of back-office support immediately after.

2.9 Personnel were drawn from ArchaeoPhysica and Archenfield Archaeology, with variable numbers of field staff across three episodes of fieldwork and additional secretarial and liaison support from ArchaeoPhysica (Samantha Lowden). Sam Meadows for Archenfield Archaeology was responsible for much of the fieldwork.

2.10 Within each team there was a nominated First Aider and a mixture of people with varying experience. Anne Roseveare oversaw project health and safety while Martin Roseveare was responsible for data collection and collation procedures.

Equipment

2.11 Each field team carried cameras and GPS units (Garmin) for collecting point locations for monuments and part-monuments. Each walker had a set of record sheets overlaid onto a pre-printed template for guidance. A field data manual was also carried by each person. In essence, each individual was equipped to be as self-supporting as possible with the minimum of sharing of resources.

2.12 Each walker was responsible for their own safety with respect to the provision for PPE within a team. This included the normal clothing, footwear etc. for mountain walking in adverse conditions and a shortwave radio per person for use within their own team and occasionally between teams. High visibility clothing (usually a flash vest) was required in case of emergency.

2.13 There were no reportable injuries or near miss incidents. Overall conditions were better than expected. The only serious issues were extremely low visibility in some areas on a small number of days due to heavy rain and wind chill on others.

Technique

2.14 The area was in the most part divided into enclosures of variable sizes and the landscape was walked systematically on approximately parallel traverses bounded by field divisions and natural features. Coverage was checked by means of mutual peer-monitoring and GPS positions and no significant omissions were found. In areas of open moorland traverses were up to 50m apart if there was clear visibility between personnel. Monuments within complexes were allocated *ad hoc* between team members with internal specialisms brought to bear where available.

2.15 Each walker kept to their own line, usually a few hundred metres long at most with effort made to stay within at least approximate line of sight and certainly radio contact at all times. This was particularly for safety reasons but also aided recording.

2.16 Within the small pasture fields around the edges of the area monuments were usually clearly visible and to maximise efficiency lines were abandoned in favour of blanket recording, usually moving systematically from one side of an enclosure to another. Farm complexes were recorded by individuals or pairs depending upon their complexity.

2.17 Through previous experience it was known to be necessary to work with the landscape at all times to avoid undue exertion. For this reason fieldwork usually worked along the contours wherever possible, starting at the base of slopes and working uphill until about midday and then returning downhill in the next swathe of country. Where there were crags the landscape was divided above and below the crag, it proving more efficient to work towards these from above or below in separate campaigns.

2.18 For safety reasons the fording of streams was avoided wherever possible, these being used to bound survey areas instead. Where streams ran in gullies or ravines that could not be safely assessed from each side these were examined from their base in a separate campaign. This proved particularly important as a number of sheep dips and related structures were found this way.

Recording

2.19 The overall rationale behind the formation of the record was to ensure the basic information was captured efficiently while in the field, but at the same time minimising the amount of note-taking etc. that was needed at each location. It was felt important to adopt a uniform standardised procedure that worked for the majority of cases to allow errors and ambiguities to be detected. For this reason, a simple pro-forma based system was developed, backed up with rigorous record checking at the end of each day.

2.20 At some points during the survey records were made in notebooks due to difficulties encountered handling record sheets during extremely wet conditions. Records were then transferred onto pro forma sheets.

2.21 Three records were maintained throughout fieldwork. These were a record of GPS locations, a set of record sheets onto which a skeleton record (including OS co-ordinates) was made, and a photographic record. The GPS logs were checked at intervals against the written sheets to detect position errors and to correct them. These sheets also catalogued photographs made of each monument and the general objective was to take at least one photograph of each. In practice poor light and other conditions sometimes prevented this. All personnel were encouraged to make a quick sketch of the monument on the record sheet.

2.22 All record sheets carry the identity of the author and the date of survey to permit auditing. Personnel were encouraged to provided 'Broad Class', 'Form' and 'Condition' data while recording the monument to minimise the chance of ambiguous records.

Archive considerations

2.23 The result of the field campaign is a large set of record sheets, bound into ring binders, which will be deposited with the RCAHMW. Within this resource are the original records, each of which carries a unique 'EN' number. These can be cross-referenced with the NPRNs of the final record by means of the index sheets provided.

2.24 These sheets, as noted above, also have sketches of monuments, including ground plans of some of the buildings and therefore contain more information in some cases than can be conveyed in the written record. However, they also represent the original primary record whereas the digital record contains corrected, augmented and updated data and therefore has precedence.

2.25 In addition, there is a large photographic archive in digital form and the NMR-compatible flat database required by the RCAHMW specification.

Data collation & analysis

Method

2.26 All record sheets were allocated a unique 'EN' number as a temporary analogy to the NPRN to enable auditing. Each sheet was checked for omissions and obvious errors before being passed to Samantha Lowden for initial data entry into the database.

2.27 As data entry proceeded, each camera exposure reference on the record sheets had the project photo number added and the photo record entered into the corresponding part of the database.

2.28 To aid fieldwork planning and logistics in detail the database content was available as a live layer in the project GIS throughout survey. All monuments already recorded within the NMR, the local HER and those available from the desktop study were also available as GIS layers and the whole superimposed upon topographic mapping (OS Landline) and an elevation model (OS

Landform Profile). In addition, the area covered by each team was recorded each day as another layer. Between these it was possible to correlate daily the rate of coverage with the density of monuments and the type of terrain and hence predict fairly accurately how much ground could be surveyed from one day to the next. It also allowed for the planning of escape routes and identification of hazardous areas during the allocation of survey blocks.

GIS formation

2.29 Initial post-survey analysis and data preparation was undertaken in Microsoft Access before being transferred into GIS for more detailed work. This was used to separate the fieldwork data into various classes of record depending on whether there was a related NMR or HER record, a documentary source, whether the site in question was seen or not, etc.

2.30 For all records altitude data was transferred automatically into the record from a surface generated from OS Landform Profile data. Where existing NMR records existed, update of these was limited to filling in blank fields, allocation of altitude, update or addition of the description by appending the new one and general checking for errors.

2.31 There were monuments recorded in the HER and occasionally in the NMR (with form equalling 'documents' so presumably copied from HER) where no monument was noted during survey. On occasion, this was found to be due to erroneous co-ordinates and this has been fixed. Other sites were simply not found and there are a range of reasons why this may be the case, including poor visibility, confusion with other features that were present or errors in the HER or NMR. These represent a small proportion of the whole.

2.32 Records pertaining to find spot locations have been ignored for obvious reasons.

Limiting factors

2.33 The primary limiting factor has been the identification in the field of the function of some structures and subsequent allocation of broad class etc. for the NMR. As a basic example, some settlement remains were fragmentary and hence identification of period has been difficult, especially where re-use might be expected.

2.34 The field recording system has not limited the quality or scope of information gathered in any way we can detect. The adoption of GPS-based location of monuments has allowed a reliable position to be generated in every case to within about 6m horizontally and the use of the OS Landform Profile DEM has meant that height data is particularly accurate.

3 Landscape context

Topography

Landscape form

3.1 The survey area occupies the south western half of an area of high land projecting south west towards the coast. There is an elongated linear rift along the north side with Llyn Mwyngil (Tal-y-llyn Lake) at one extremity and Dolgoch further west and the southern edge is bordered by Dyffryn Dyfi (the Dovey Valley).

3.2 Within the area the land rises to several low peaks, the highest being Tarrenhendre at 634m OD on a pronounced sweeping watershed passing above Gelli Graean at 540m OD through Tarren Cwm-ffernol at 540m to Trum Gelli at 535m OD. To the west, there is the isolated peak of Pen Trum-gwr at 512m OD and the peak of Mynydd Tan-y-coed defining the northern corner of the area at 491m OD.

3.3 Overall, the upland area is approximately wedge-shaped with an extremely steep rise from the Tal-y-llyn valley giving way to more gently sloping land rising towards the eastern watershed. Beyond this it drops away to a denticulate series of steep-sided valleys, mostly outside the survey area.

3.4 Internally most of the area shares a single landscape context, namely broad fairly flat topped hills with moderate slopes giving way to deeply incised stream valleys. The tops of the eastern hills are essentially featureless expanses of bog whereas the western hillsides are more improved, some showing signs of mechanical improvement, e.g. the southern slopes of Mynydd Tan-y-coed.

3.5 There are very few areas of crags and most of those are minor and the expanses of rocky hillside found further north within Snowdonia are absent here.

3.6 For much of the landscape within the survey area there is little reason to suspect significant change with time, especially after the warming of the climate during the Bronze Age. The hilltops are likely to have always been poorly drained as they frequently lack steep slopes and there are numerous topographic saddles. The drainage is apparently essentially natural and the deeply incised stream valleys have their origins in the immediate post-glacial period.

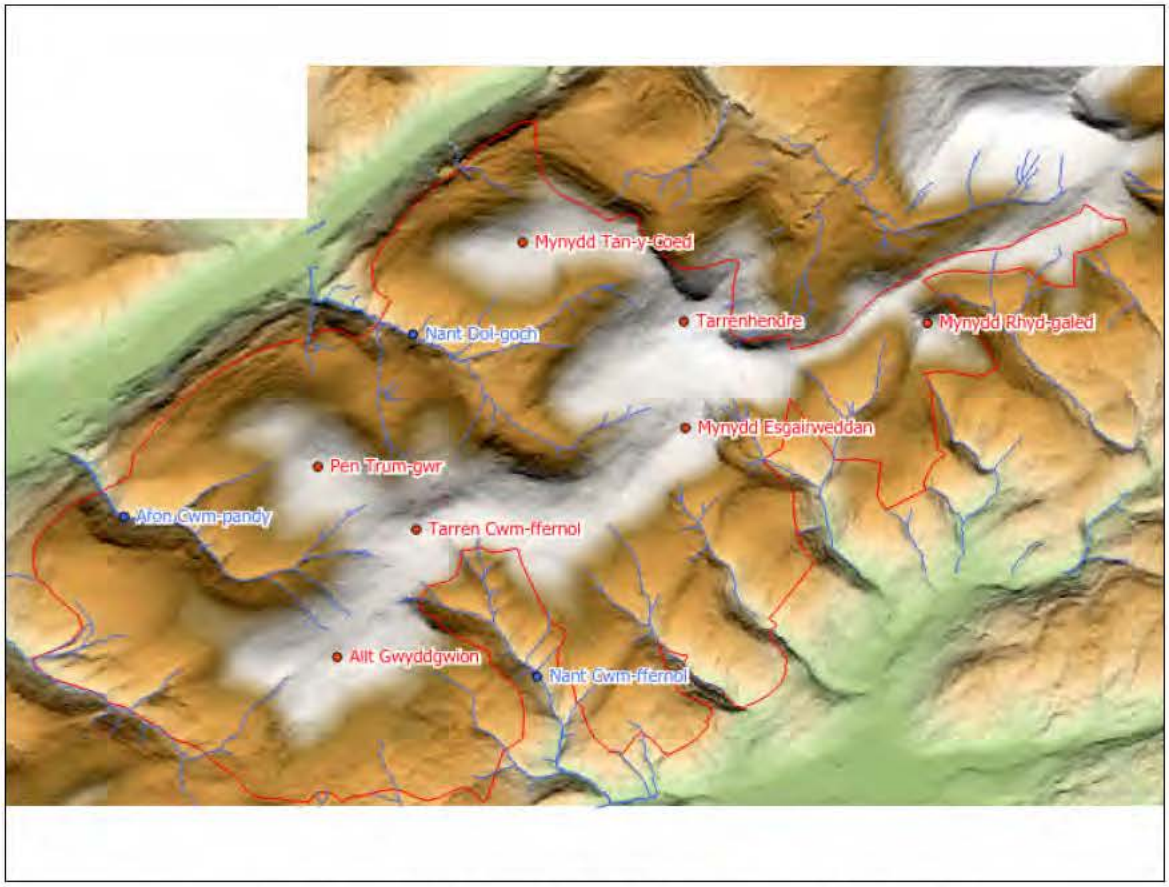


Figure 1: Landscape summary of the Tywyn-Dolgoch uplands

Geology

3.7 The solid geology is classed as Ordovician rock of Bala, Llandeilo & Arenig Beds. The area lacks the igneous basalt and greenstones immediately to the north, on the other side of the Tal-y-llyn rift and underpinning Cadair Idris for example and this lack of hard igneous foundation is evident in the softer profiles of these hills.

3.8 A detailed examination of the soils was not undertaken for this project but most would appear to be stagnogleys. There are localised podzols, especially over the drier rocky slopes above Nant Braich-y-rhiw.

3.9 Neither soil is particularly fertile in an agricultural sense though it is possible that the stagnogleys were once (in prehistory) more suitable for crop production. The podzols would never have been capable of supporting a significant population.

Hydrology

3.10 The survey area is drained to the south east and north west by a series of deep stream valleys. That of the Nant Braich-y-rhiw passes through the range of hills and is known to have been an ancient pass (described as Roman in the Gwynedd HER). The south western part of the area is drained by the Afon Cwm-pandy and the northern by an extensive dendritic system into the Nant Dol-goch. On the eastern side of the area streams Nant Cwm-y-gof, Nant Cwm-ebol and the picturesquely-named Afon Alice drain into the Afon Pennal below.

3.11 The western and southern parts of the area are naturally well drained with no areas of bog or marsh but the north eastern parts tend to be extremely boggy with deeply incised and partly subterranean stream channels in substantial depths of peat.

Vegetation

3.12 The vegetation within the study area is mostly grassland with varying degrees of artificial improvement. South-facing slopes on podzols tend to be bracken covered but elsewhere are dominated by course grasses, partly due to the greater height of the land. In general, plant species are apparently fairly typical of hills of moderate height in this area. To the north and east there are extensive areas of conifer plantation although some of the incised valleys, e.g. Cwm Ebol and Dolgoch contain native woodland. Some of the planting in the latter may, however, be artificial as the valley has long been famous for its spectacular waterfalls.

4 Archaeological context

Known monuments

4.1 The NMR content for the area (five monuments) was essentially limited to major sky-line and summit cairns with one possible path (NPRN 23641) and reflects the lack of systematic survey in this area. The Gwynedd HER contained twenty-four monuments with a similar bias towards cairns but also several industrial monuments, namely four levels or adits and three slate quarries.

4.2 Overall, the character of the historic landscape was best described by the HER but it was noticeable that many of the entries are at low elevations around the edge of the area and again are probably not the result of any systematic study.

4.3 A simple break down by content at the start of the project is tabulated below:

Broad Class	NMR	%	HER	%
Agriculture & Subsistence	0	0	1	4
Domestic	0	0	1	4
Industrial	0	0	7	29
Religious, Ritual and Funerary	5	83	10	42
Water Supply and Drainage	0	0	0	0
Unassigned	0	0	2	8
Transport	1	17	1	4
Other	0	0	2	8

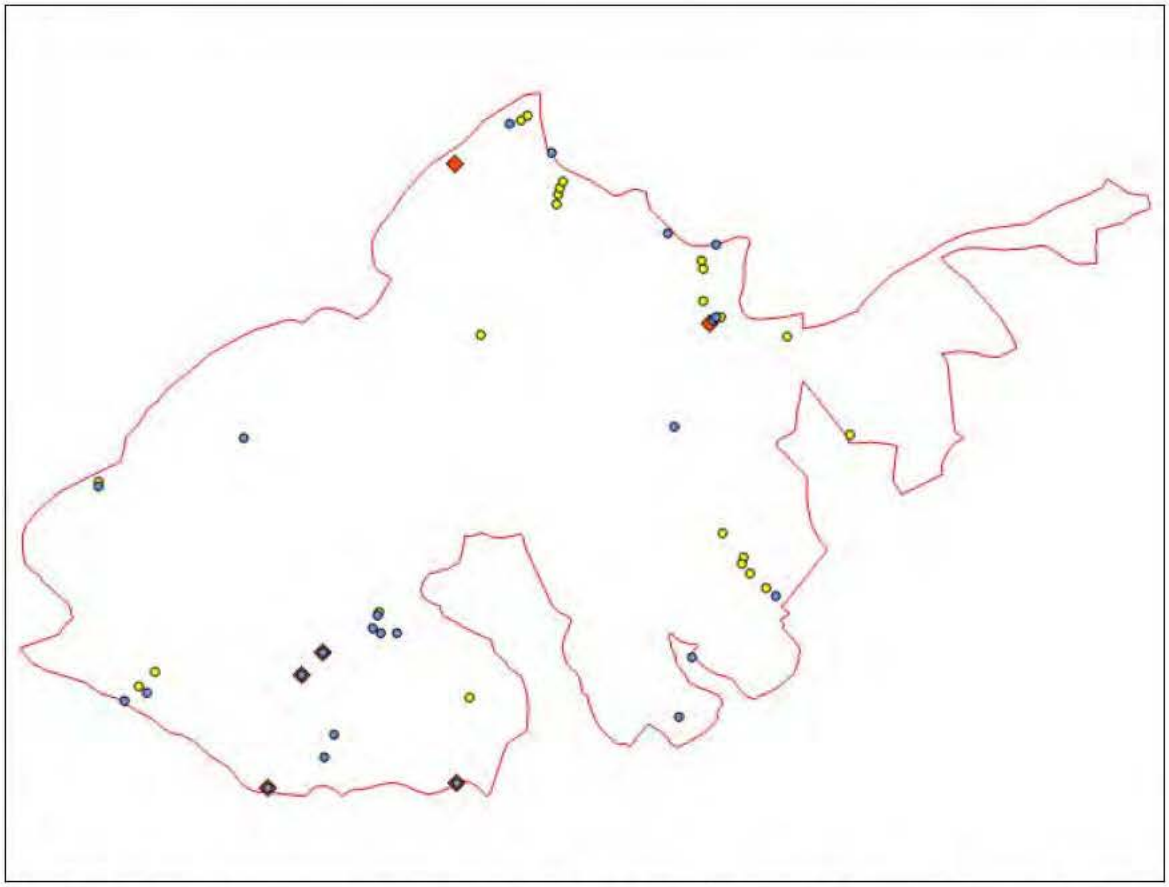


Figure 2: Original monument distribution – blue indicates HER content, red NMR content & yellow monuments depicted by the Ordnance Survey

Settlement

4.4 The only recorded settlement remains are a hafod, Gwynedd HER PRN 15965 north of Dysyrnant. There is no other recorded domestic activity of any date. There is no apparent reason for this except that the improved nature of some of the pasture may have led to the loss of stone-built hut structures from prehistory and later.

4.5 It seems reasonable to assume that most communication routes can be expected to run along the valleys rather than over higher ground. There is the implication therefore that people working or settling at higher levels must have been drawn there for specific purposes, e.g., exploitation of minerals, livestock herding, etc, and presumably various individuals outside of conventional society. The extensive fertile lowland areas that surround the survey area imply that there was perhaps little need to settle higher ground and therefore these uplands may always have been fairly devoid of permanent structures.

Religious, Funerary and Ritual

4.6 Both the NMR and the Gwynedd HER identify cairns. These have been classed in this category but it is unclear in many cases whether this is correct. Field inspection revealed most to be the typical large summit cairn of various dates and with no sign of primary interment, orthostat kerb or other diagnostic prehistoric characteristic. In common with many areas there seems to be an historical presumption in favour of ritual purpose for any hill-top mound of stones.

4.7 There is some difficulty with the summit cairns in particular as they are often described as funerary although any such original purpose is effectively hidden by their later use as markers of parish and related boundaries. From the Victorian era it was common for day parties to augment and create new cairns as part of the day's activities; how many of the supposed funerary cairns really are is therefore difficult to tell.

4.8 The Tithe Map suggests that several of the summit cairns were in use as boundary markers at that date and we can therefore expect many to have been rebuilt or enlarged.

Communications

4.9 Most of the extant paths and tracks pass up onto the high ground from the stream valleys to the north west and south east, usually where settlements (farms) exist lower down. In most cases therefore these tracks are likely to be intimately associated with the working of these settlements and of similar date.

4.10 There are two exceptions, one being the suggested Roman route through Nant Braich-y-rhiw Gwynedd HER PRN 17771 which survives as a well worn but serviceable bridleway from Rhyd-yr-onen to Pant-yr-on and presumably continued by the line of the minor road eastwards to Cwrt.

4.11 It is difficult to be sure of the identification of the route as Roman; that it was once a major thoroughfare cannot be disputed but in the absence of any characteristic form or material identification as Roman is problematic. From separate work on the A458 through central Wales ArchaeoPhysica has seen how roads from the medieval period have become lost. In one case a road depicted on a nineteenth century map has now vanished beneath almost a metre of marsh.

4.12 The second track is a footpath that follows the watershed through Trum Gelli, Tarren Cwm-ffernal, etc. which is today a recreational path. This may have its origins in walking the bounds of the adjacent parishes as their border follows essentially the same route. That it has been used for such is clear as it continues southwards out of the survey area across lower land but again along the parish boundary. While not a major monument in it's own right it suggests that the custom of walking the parish bounds each year was maintained here perhaps into living memory.

Industry

Agriculture

4.13 Modern OS mapping shows the hillsides to be peppered with sheepfolds, mostly concentrated near the tracks and within the stream valleys. These do not feature in any either the NMR or Gwynedd's HER and the relative increase in their count after this survey can be expected to be large.

4.14 Most of the field boundaries would appear to be relatively modern and with the exception of a cluster east of Allt Nantygwenlli show no foci that could indicate abandoned settlement. The cluster is documented as Cynfal medieval township, Gwynedd HER PRN 9876.

4.15 The available copies of the Tithe Map were not of sufficient quality to reveal the detail of contemporary enclosure, except to suggest that the division into fields almost entirely post-dates 1839. The boundaries that did exist were demarcated in strategic locations by large cairns.

4.16 The earlier maps in the Peniarth estate collection do detail ownership and boundaries.

Mineral and stone extraction

4.17 Three slate quarries are noted in the Gwynedd HER and also some levels or trial workings. There is insufficient detail in the HER to determine whether the distinction can be made from surface evidence but one at least is noted as being for lead and copper. Further workings, supposedly for lead, exist within Nant Dol-goch, near the waterfalls.

4.18 There are no known shafts, open works, significant tips or surface workings, nothing to suggest mining ever expanded beyond a small naturally-drained working. The lack of characteristic nineteenth century structures and the fact that workings were simply following hopeful-looking ground puts them into the category of not being easily dated.

5 Desktop result summary

Introduction

5.1 Only a small amount of information of use to the survey (i.e. associated with reliable location data) was recovered during the desktop study. This was in part due to the lack of available correlation between the oldest maps (e.g. the Tithe and Peniarth Estate maps) and modern mapping and hence the identification of documented properties with actual locations.

Summary

5.2 A significant part of the survey area once lay within the Ynys y Maengwyn estate and passed through a succession of related persons until being disposed of in 1873 by Athelstan John Soden Corbett. It is tempting to see this disposal as the origin of many of the field boundaries present today.

5.3 There are a good many maps and documents pertaining to this estate and provided suitable digital copies could be made it would be possible (in theory) to correlate these with the modern mapping. This would locate the sites of several buildings and mineral workings documented from the second half of the eighteenth century.

Conclusion

5.4 It was felt that if Tithe map and apportionment's could be made available in digital form documentary research of sparse upland areas such as this would be made substantially easier. It would then be possible to identify changes in parish boundaries and through map registration locate the sites of settlements and other features on modern mapping. References in non-cartographic sources could then be compared with the Tithe data and their approximate locations determined.

6 Field survey - introduction

Coverage

6.1 All the area within the project outline supplied by RCAHMW and indicated by the red enclosing line on figure 1 in this report was surveyed.

Queries

6.2 Transhumance in the western part of Britain has been identified as a medieval practice but in Snowdonia structures already labelled as hafods (in the Gwynedd HER for example) had been classed as post medieval and some could equally well be shepherd's huts. Some found during this survey had clearly been used in the modern period judging from artefacts within them. There seems little to differentiate these structures, let alone assign meaningful dates, especially as the general practice seems to have been to continually rebuild structures on the same spot. This is particularly the case with sheep folds where examples depicted on nineteenth century mapping have clearly been maintained up to the present day. Can the seasonal use of a hut by a shepherd during lambing for example be identified with the wider practice of transhumance? The results of this survey suggest not as the complexes of light-weight structures capable of supporting the women and children of a settlement, in suitable locations, could not be readily identified.

6.3 For this reason, we have tended to describe these structures in terms of their most recent use and hence many have been assigned post medieval dates. One immediate avenue for future research would be a detailed systematic survey of all the hafod, shepherd and generic hut structures in southern Snowdonia to seek to understand how these various structures relate. The question of transhumance may then be better understood.

6.4 In addition to the above comments, there are issues of identification of the reuse of structures. Within the Nantlle Beddgelert South survey area for example, there were several monuments identified in the Gwynedd HER as long huts that were found during survey to be sheepfolds as they possessed sheep creeps. At the same time there were no surviving features either within the structure or immediately adjacent to it that could be reliably identified as a hut.

6.5 A similar problem exists in the Tywyn uplands where the southern part of the area is thickly studded with stone rectangular structures that in some cases are clearly huts and in other cases sheepfolds. However, there are a good number that may well have been both.

6.6 In basic terms, what characteristics must a hut have to be identified as a hafod rather than a simple hut?

Criteria

6.7 Cairns have been classified by their location and visible characteristics, thus if a kerb or cist is visible then it is obviously a funerary cairn. Unstructured heaps on low ground have tended to be considered clearance cairns in the absence of other distinguishing features. On summits and ridges the classification has had to flex as in some cases cairns have been augmented by walkers but in others they seem solely to be way markers or recreational structures.

6.8 In some cases sheepfolds could not be distinguished from huts so criteria were formed to provide a systematic identification. To be identified as a hut a structure had to exhibit obvious signs of habitation like a fireplace or to have a recognised dwelling plan. Examples of the latter included having a single doorway central to a long wall of the structure and a levelled floor.

7 Field survey - analysis

Introduction

Use of GIS

7.1 At the analysis stage of the project GIS has been used to automate several labour-intensive tasks and to provide a powerful platform for spatial analysis. Among the data preparation tasks for which GIS was used are:

- Matching of surveyed monuments with existing NMR & HER records by location, including morphing of HER tables into NMR format
- Identification of monuments not found during survey by location
- Automated insertion of community and other regional details into the record
- Capture of height data from the OS DEM
- Automated extraction of OS features and map generation
- Generation of an environmental model to assist with the provision of landscape context
- Fusion of NMR, HER, survey, aerial photographic and OS-derived data for analysis.
- Database management, NPRN enumeration and table linking, etc.

7.2 In addition, all of the analyses described below were conducted within the GIS for simplicity and to exploit the spatial character of the data.

Geographical summary

Monuments by altitude

Altitude Band /m	Area / Ha	As % Area	Site Count	As % Total	Count per km^2
100 – 150	30.8	1.2	5	2.5	16.1
150 – 200	86.5	3.4	13	6.4	15.1
200 – 250	207.5	8.2	26	12.8	12.5
250 – 300	435.1	17.3	53	26.2	12.2
300 – 350	482.2	19.1	45	22.3	9.3
350 – 400	372.8	14.8	16	7.9	4.3
400 – 450	367.3	14.6	10	5.0	2.7
450 – 500	295.3	11.7	9	4.5	3.1
500 – 550	179.0	7.1	17	8.4	9.5
550 – 600	36.5	1.4	1	0.5	2.7
600 +	21.7	0.9	7	3.5	31.8

7.3 The above table shows the number of sites found by area at different altitudes within the survey area. The figure below shows the spatial distribution. For regions above 600m the count per unit area is partly inflated by the very small proportion of the survey at that height. However, a significant proportion of the monuments at this height will be cairns which are normally rather numerous.

7.4 As would be expected, a significant proportion of sites exist below the 300m contour where conditions tend to be more favourable for settlement. There is a minimum proportion between 350m and 500m where slopes become too exposed to the weather for many activities but above

this the proportion of sites rises again. At this height summits are reached and the density of funerary monuments (cairns and barrows) rapidly increases.

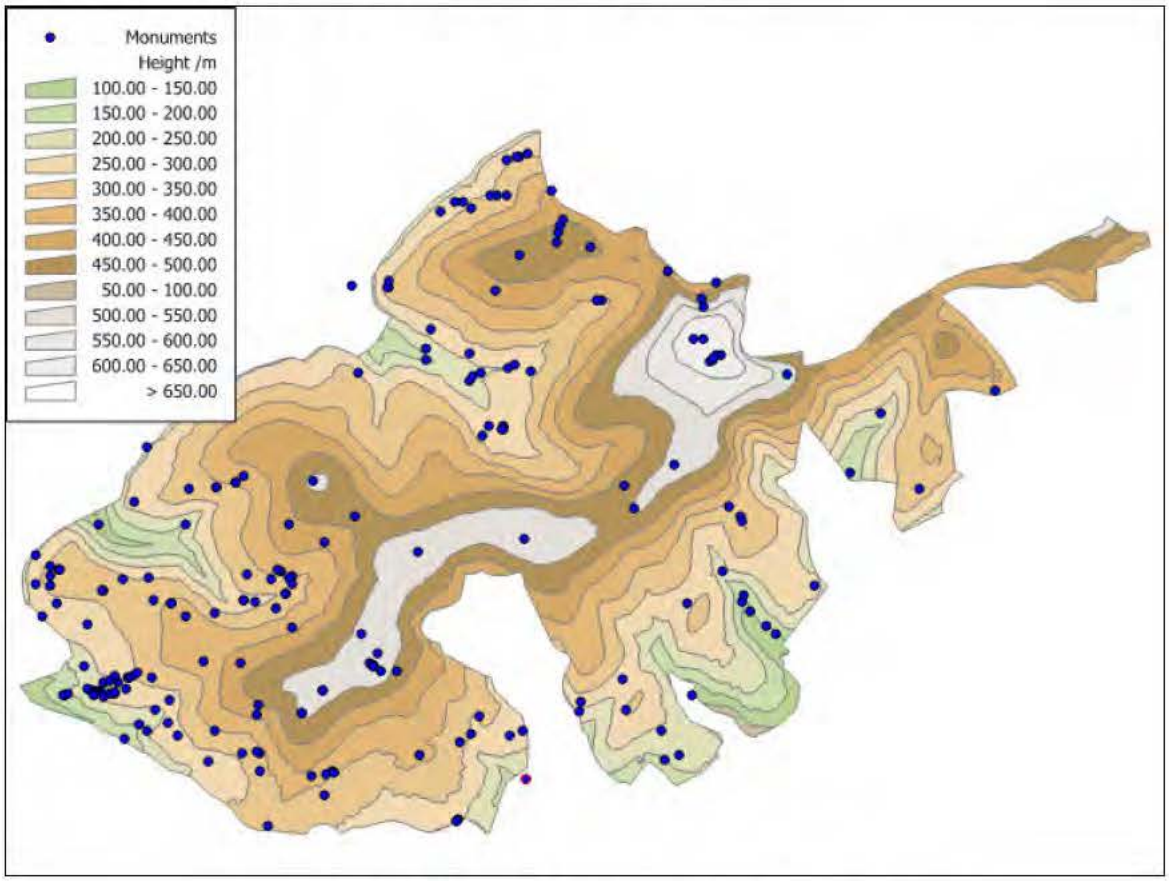


Figure 3: Distribution of monuments by 50m contour

Record character

Content

Category	Count	As % total
Total number of records in catalogue	202	-
Including new survey records	152	75.2
Including original NMR records	2	1.0
Including edited NMR records	4	2.0
Including HER records that were not conclusively identified during survey	20	9.9
Including cartographic sites not seen during survey	22	10.9

7.5 Of the original NMR records, four from the six have been updated. These are; 55787, 302859, 302860 and 302885.

7.6 The proportion of records that were not conclusively identified seems high but it is evident that the HER was predominantly formed from cartographic analysis. The proportion of not conclusively identified HER sites should therefore be similar to that of the project's own cartographic analysis and the figures above demonstrate this to be the case.

7.7 Of these sites, two were cropmarks while another was the site of cairns. Another four were levels or adits which can be hard to detect when bracken is tall (one could not be found even after an exhaustive search). A further record was a spot reference to the alleged Roman road which was seen but not flagged in the project database in the same way.

7.8 All the rest were small discrete sites that may have been concealed beneath bracken, assigned incorrect co-ordinates or destroyed since the original cartographic source had been produced.

7.9 The high proportion of new sites demonstrates the huge value of this sort of basic reconnaissance survey in the uplands.

Performance

Performance Indicators	Value
Average monuments per person day in the field	3.96
Average monuments per square kilometre	8.02

7.10 These figures seem quite reasonable though the monuments per person day is lower than expected and lower than encountered in the more extreme conditions encountered in ArchaeoPhysica's parallel survey between the Nantlle Ridge and Beddgelert further north.

Archaeological character

Breakdown by NMR Broad Class

Broad Class	Count	As % total	Min. % Increase
Agriculture & Subsistence	80	40.4	4000
Civil	2	1.0	0
Domestic	8	4.0	Infinity
Industrial	27	13.6	386
Religious, Ritual and Funerary	72	36.4	720
Unassigned	3	1.5	50
Transport	6	3.0	600

7.11 The percentage increase figures need some justification because as observed above the HER in particular seems to have been based on cartographic sources and not field observation. We cannot therefore be sure that the identification of a site in the HER is correct or that the site ever existed on the ground. At the same time the NMR was not based on any form of systematic survey and included just a small number of sites that are locally prominent.

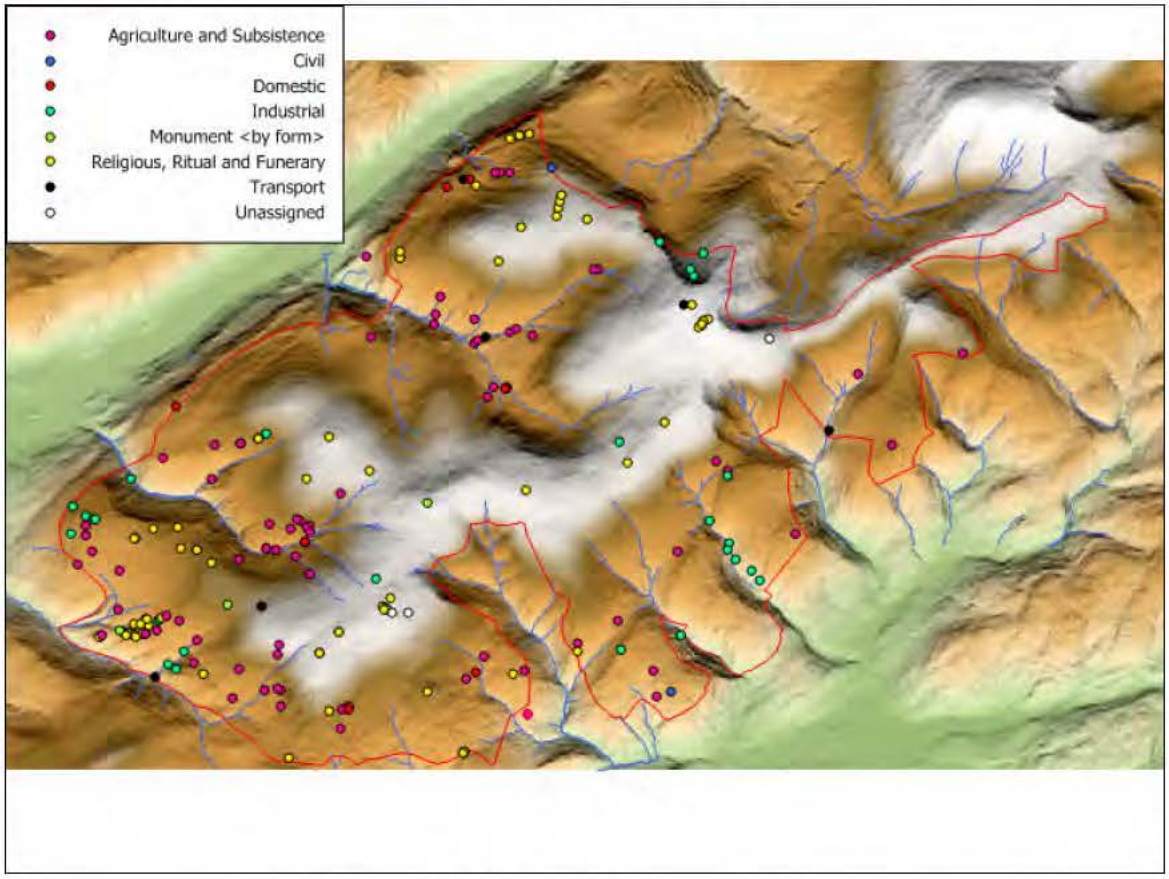


Figure 4: Distribution by NMR Broad Class

Breakdown by most numerous types

NMR Type	Count	As % total
Cairn	61	30.2
Sheepfold	43	21.3
Clearance Cairn	12	5.9
Quarry	10	5.0
Hafod	9	4.5
Level	8	4.0
Round Barrow	7	3.5
Hut	5	2.5
Ditch	4	2.0

7.12 That the most numerous type was the cairn is no surprise as this has been observed in other Uplands Project surveys in Snowdonia. The relatively high proportion of sheepfolds also seems fairly typical of the landscape associated historically with sheep grazing, although this class of monument has never been systematically studied.

7.13 The low proportion of domestic sites is interesting as although the area has been used for grazing and in prehistory for the placing of funerary monuments it would seem that people did not live upon the upland area. It is, however, easily accessible from the Tal-y-llyn valley to the north west where there is substantial medieval and perhaps earlier settlement. This upland area may therefore always have been regarded as marginal land as better (i.e. more fertile and sheltered) land existed very nearby.

Breakdown by Period

Period	Count	Grouped	As % total
Bronze Age	51	52	25.7
Bronze Age?	1		
Iron Age	0	3	1.5
Iron Age?	3		
Roman	1	1	0.5
Roman?	0		
Early Medieval	0	0	0
Early Medieval?	0		
Medieval	2	3	1.5
Medieval?	1		
Post Medieval	80	90	44.6
Post Medieval?	10		
Modern	2	2	1.0
Other			
Prehistoric	16	16	7.9
Prehistoric?	0		
Unknown	35	35	17.3

7.14 The distribution by period shows a heavy weighting towards the Bronze Age and also the post medieval. The latter is due to the high incidence of sheepfolds and related structures. The early medieval period is not represented on this upland in any form that could be detected through walkover survey, a similar observation can be made about earlier settlement remains as well.

7.15 There were no examples of the hut circles assigned a Roman date elsewhere in Snowdonia and the only monument that has been assigned a Roman date is NPRN 286687, a track identified in the HER and surviving as a lane. Why this has been suggested to be Roman is unclear; the presence of prehistoric cairns overlooking it imply that it could have formed earlier, especially as it follows the only logical course through these mountains.

7.16 As noted earlier, hafod structures have been assigned a range of dates through the medieval into the post medieval period.

7.17 There is a fairly high proportion of undated monuments across a wide range of types. These include isolated standing stones, clearance cairns without associated dateable field systems and various miscellaneous boundary banks and ditches.

7.18 A hafod identified as HER 15955 NPRN 286635 has been recorded in the HER as date unknown and left that way in this record as there is no suitable evidence for it being a hafod or medieval transhumance.

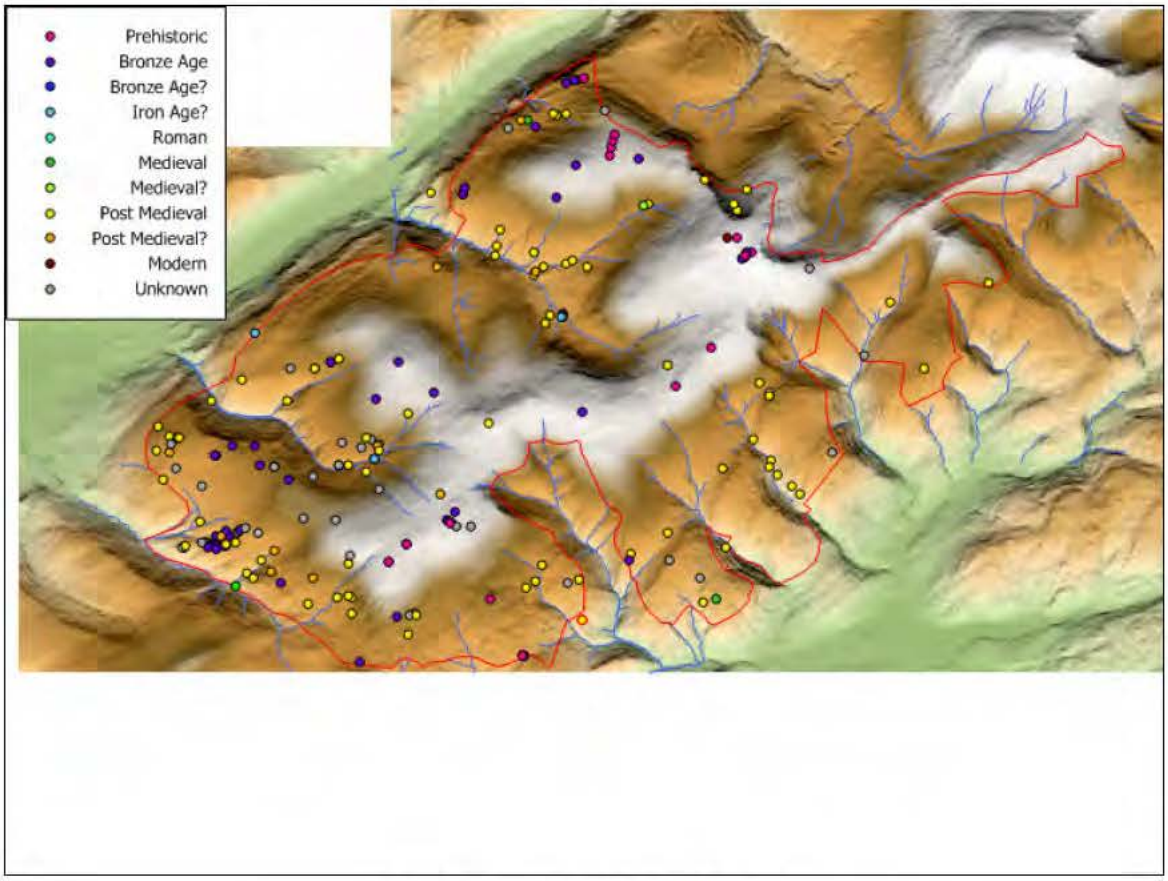


Figure 5: Distribution by NMR Period

Suggested spatial analyses

7.19 Is it possible to estimate the local visual and resource context of individual settlements by calculating their field of view and searching that for water supplies and for the easiest route of access based on topography?

7.20 What can be seen from cairns of funerary origin? Are there settlements of potentially similar date within this view? Could spatial associations be formed between places of the living and those of the dead?

7.21 What correlation exists between terrain aspect or altitude and settlement by period?

7.22 What correlation exists between terrain aspect or altitude and cairn locations?

8 Conclusion

Introduction

8.1 Most of the monuments in the project record can be considered new in the sense that many were totally unknown and only a small proportion recorded on maps. Of these latter only a small proportion were present in the NMR and HER.

8.2 Large parts of the western half of the area had been subject to various degrees of land improvement in modern times and there will therefore have been loss of certain classes of monuments, especially low stone features like cairns and hut circles. None of the latter class were conclusively identified within the area but may well have existed on south and west-facing slopes where improvements have taken place.

8.3 Along the south facing slopes north of Nant Braich-y-rhiw and the line of the postulated Roman road NPRN 286687 over the hills from Rhyd-yr-onen there is a marked increase in the density of monuments. The presence of prehistoric funerary activity, possible medieval settlement and post-medieval sheepfolds and hafods suggest the valley to have once been settled and integral to wider population as a whole.

Environmental potential

8.4 Environmental analysis could be used in two ways; firstly to establish a model of environmental development of this upland area and secondly to then examine secure contexts within monuments of ambiguous date to assess their potential antiquity. For this to be successful sampling needs to be carried out over a wide area and may therefore be beyond the bounds of the Uplands Initiative.

8.5 Overall, there are few sites that would be specifically recommended for environmental analysis simply because of the terrain and modern ground cover. Most of the area lacks suitable sinks within which environmental data could be expected to survive and the acidity of the soil is not going to support widespread preservation of materials with the probable exception of pollen.

8.6 However, it is possible that the peat uplands in the eastern parts of the area may retain suitable material for C14 dating. If so, then samples taken down a series of freshly-cut profiles may yield wind-blown pollen that can be dated. This might inform upon episodes of clearance e.g., reduction of scrub land species.

8.7 One recommendation that could be made is that any excavation that occurs of monuments in this upland area be required to identify and sample possible environmental sinks, e.g. soils sealed beneath stonework, cairns, etc. This may provide secure and dateable environmental data in a landscape currently lacking significant visible sinks.

The project

8.8 The use of GIS has substantially aided the later stages of data cleansing and interrogation and cannot be recommended too highly. It's use in image formation has also been of considerable benefit, allowing different data sets to be prepared, combined and manipulated with ease.

8.9 A further benefit has been the use of OS Landline Profile DEM data as this has allowed the construction of a virtual landscape with the GIS environment, useful at several different levels. It was initially of most use in fieldwork planning as all team members could easily visualise the terrain to be covered and assess means of access to more difficult areas etc. To some degree this could be done with conventional OS maps but greater flexibility of the digital format was of benefit as custom maps could be prepared as relevant scales, etc.

8.10 A second major benefit was the automated extraction of altitude data for each monument location which saved many hours of time working this out by plotting against OS maps. Not only was it faster, it was also far more accurate.

8.11 At the analysis stage, the ability to combine a 3D landscape with a 3D-monument data set allowed the siting of settlements, cairns and other monuments that could be influenced by topography, to be assessed. At the most basic level, the preparation of overview maps with the DEM as a background reinforced the visual correlation between landscape and human activity.

8.12 The aerial mapping data from the RCAHMW was useful to an extent but not as much as expected. It did highlight areas where eroded tracks (for example) were present and these in particular were sometimes hard to see during ground survey. The predicted areas of ridge and furrow which would have informed substantially on the medieval landscape either could not be found on the ground or proved to be marks left from the mowing of bracken.

8.13 It would perhaps be more useful (though this will vary from area to area) if rectified digital copies of the photographs were available, especially within a GIS environment. If so, correlation could be sought between ridge and furrow, tracks, possible settlement, etc, and an underlying topographic model.

Significant discoveries

Ritual landscape

8.14 There are several good groups of related monuments, e.g. barrows NPRN 286534 and 286522 on adjacent peaks of Pen Trum-Gwr. A broad cluster some 750m long of cairns NPRN 286527, NPRN 286502, NPRN 286536, NPRN 286538, NPRN 286635 and NPRN 286519 exist along the prominent ridge above Cwm Pandy on a west-facing slope. There is a further group of cairns low down on the southwest slopes of Allt Gwyddgwion of which NPRN 286627 is a member. These represent a tightly-defined cluster of at least twelve cairns in a group about 300m by 120m in unimproved ground. None are specifically identifiable as funerary monuments but all share the same flat, often slightly oval form identified with these. None are sufficiently large or comprise sufficiently mixed sizes of stone to suggest an origin as clearance cairns. Other groups of cairns (though less numerous and subject to relatively modern disturbance) are present on the summits of Trum Gelli, Tarrenhendre and Mynydd Tan-y-Coed.

8.15 NPRN 286534 is a round barrow of 11m diameter with two small depressions, one central, that appear to be the remains of cists.

8.16 NPRN 286527 is a flat cairn with a possible displaced central capstone. There were no visible indications of disturbance of the funerary deposit itself. Another example, this time formed of quartz, is cairn NPRN 286538 with a central sandstone slab, again perhaps a displaced capstone.

8.17 Cairn NPRN 286572 is an excellent example of 3m diameter with a kerb surviving up to 0.4m high supporting a compact fill of small stones. Visible centrally under later clearance stone piled on top are three flat slabs that probably cover a central cist. There are no visible signs of disturbance of the interior of the monument.

8.18 A somewhat more enigmatic example is NPRN 286587 – a pair of slabs, described as a cairn but in appearance similar to a miniature dolmen. The upper stone has a set of deeply-incised grooves, clearly artificial and similar to knife-sharpening marks. Why these should be present in such an isolated location is open to conjecture – perhaps it was the meeting place of hunters, or more romantically, perhaps bandits?

8.19 Overall, most cairns seem to be on west or south-facing slopes and some individual examples occupy positions from which panoramic views exist. Examples include NPRN 286546 which has a fine situation overlooking a particularly steep hillside to north and also NPRN 286636 nearby.

8.20 An important cairn is NPRN 286593. It has been categorised as post medieval but falls into the ritual category due to attached memorial plaques to members of the Mountain Rangers Association who were killed in WW2. It is possible that the cairn itself incorporates a prehistoric predecessor.

Settlement

8.21 There is little direct evidence for settlement within these uplands which is slightly unexpected considering the density of cairns that exist above slopes capable of supporting habitation. Prehistoric settlement is essentially absent and there are no definite examples of the Romano-British hut circles seen in the more northern parts of Snowdonia. Medieval settlement is also elusive; some long huts have been identified in the past but this is debatable through a lack of clearly recognisable form but also association with sheep folds that are presumably of a different period.

8.22 NPRN 286652 is a derelict post medieval cottage of two floors with a fireplace.

8.23 Smaller examples of habitation include the following monuments where identifiable elements exist.

8.24 NPRN 286638 is a hafod or hut, identified on the basis of an internal fireplace but it has a doorway only 0.7m high (although more may be buried in rubble) more typical of a sheep creep. Could the structure been used to warm lambs and pregnant ewes (for example) rather than being a human shelter?

8.25 NPRN 286560 is a more definite hut. It is ruinous but has a fireplace, the remains of a chimney and a doorway in the centre of the western (long) wall.

8.26 NPRN 286537 is again a definite example with a gable fireplace and a doorway central to a long wall. The structure is dug deeply (almost buried) into an extremely steep slope, the only access being along an informal track along the contour. There are no sheep folds or field systems nearby and so perhaps it is not a hafod or shepherd's hut? If so, who lived there and why the precarious and almost inaccessible situation?

8.27 All these huts are rectangular, often set into and parallel to a slight slope with walls no more than 1.5m high and a doorway usually central to the downhill long wall. The fireplace is usually situated to take advantage of the slope behind and there is never any sign of roofing material. This implies it must have been perishable so probably a thatch of bracken or heather. The accommodation offered is usually a single room of no more than about four square meters. One, NPRN 286592, has signs of a small porch but identification as a shepherd's hut is tentative due to the lack of a visible fireplace.

8.28 The tendency to build into a slope was perhaps to provide insulation, something perhaps carried to an extreme for NPRN 286524 which is built into the centre of a round barrow!

Possible burials

8.29 NPRN 286563 is a wide stone-filled depression, partly within a crack in a rock with a prominent flat vertical stone firmly embedded at one end. It's general appearance is remarkably like a grave which was not expected during survey but has since been noted within another area of uplands survey, Nantlle Beddgelert (South) where several similar features were seen.

8.30 Although solitary burials within the uplands away from settlements are likely to be unusual they are perhaps the result of individual incidents rather than any systematic practice. It is easy to imagine coming upon the remains of an individual who has perished from cold for example and to understand the need for rapid burial, perhaps during Winter when conveyance to the nearest cemetery may not have been possible.

Sheepfolds

8.31 These are the largest contributor to the present record and are found nearly everywhere.

8.32 NPRN 286570 is sheep dip, derelict but still with obvious function and layout. A deepened section of stream survives outside the funnel-shaped exit from the fold.

8.33 NPRN 286577 is a multi-celled sheepfold in excellent condition with coping stones and intact creeps. Another good example is NPRN 286559 which has a particularly high standard of finish.

8.34 The importance of recording sheepfolds is perhaps illustrated by NPRN 286606 where the fold itself is not of particular interest but a stone bench was found outside it.

8.35 Another sheep dip is NPRN 286574 which has a stone-lined dipping pond with the water level controlled by a sluice in a small stone dam across the stream.

Thematic analysis

8.36 The data has considerable potential for 3D thematic analysis. The accurate altitude data that is now applied to every monument opens up a new level of analysis if the data is combined with a DEM (like the Landline Profile data used for this study). It is possible to simulate views from monuments, calculate intervisibility of monuments, study 3D proximity to resources etc.

Recommendations

Documentary resource

8.37 A programme of digital image capture of the Tithe Maps with geo-registration to the modern map base (preferably OSTN02 to facilitate location with GPS) would considerably increase the usefulness of the resource. For surveys of fairly remote areas like this it is difficult to correlate features on the map with current boundaries by eye; digital registration would be more accurate and allow isolated features to be correctly positioned.

8.38 This could be achieved fairly easily once digital photographs had been taken and the resulting rectified mosaic would itself make a valuable addition to the documentary resource. For uplands survey in particular it is difficult to see how the information contained in this resource could be used to maximum potential until digital capture has been completed.

8.39 If the AP resource for these upland areas could be shared as geo-referenced images then their inclusion in a GIS would be straightforward. The information contained (vegetation and other surface details, not just archaeology) would benefit field survey.

Monuments

8.40 Several of the small rectangular huts are in perilous state but retain diagnostic features like fireplaces. Their long-term survival cannot be guaranteed and unlike the numerous sheepfolds with which some are associated, their use belongs to a past episode of uplands life. Whether a programme of small-scale excavation to recover detail before their eventual collapse would be appropriate is open to debate but at least a programme of detailed recording is perhaps advisable.

8.41 Most monuments are in a stable form, e.g., cairns, although it is noticeable how many have disappeared within the past hundred years of OS mapping. Some have clearly been destroyed by walkers collecting stone to augment recreational cairns and way marks, others may simply have had their stone dispersed. Whatever the cause, it would be useful to make a determined appraisal, perhaps included some targeted excavation, to ensure that any type series are identified and individual examples protected where necessary.

8.42 Although the sheepfolds are relatively new features within the landscape, it is not known whether there are particular local styles of construction or whether any from the medieval period survive among them. This is particularly relevant for those that are now within open ground as they may be earlier than those formed in angles of the post-medieval field walls. Many of these isolated examples are ruinous but may reward further study.

Field survey

8.43 A study of rectangular huts, shepherd's huts and hafod sites would considerably benefit the understanding these monuments with reference to subsequent field survey. Whether typologies

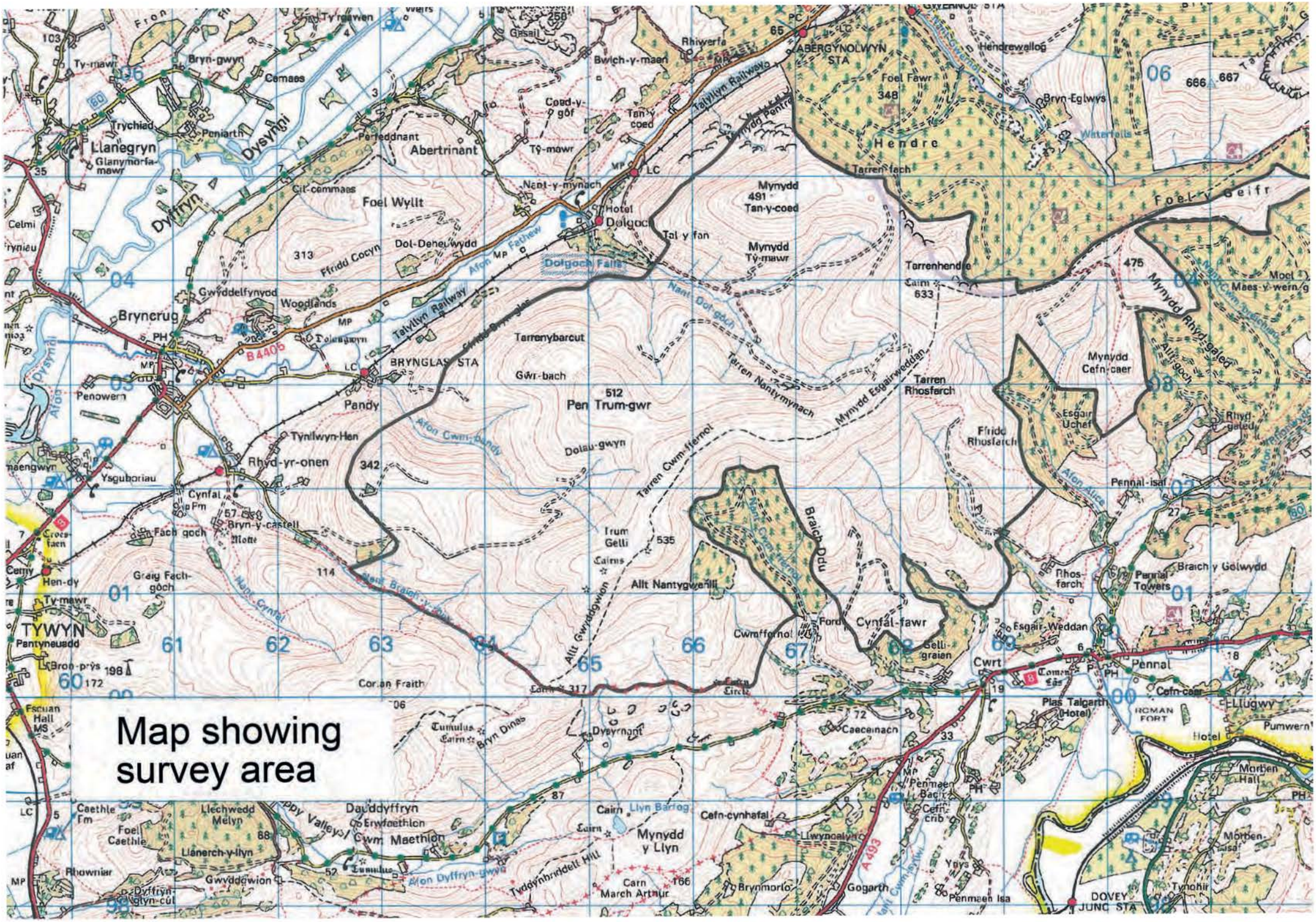
could be generated that would allow these to be accurately distinguished in the field is perhaps debatable but worth an attempt.

8.44 A shepherd's hut looks very much like a long hut once recognisable features like fireplaces have been lost. It is possible that these two types of monument have long been confused. Detailed thematic survey may support better identification of these in the future.

NMR

8.45 Class in the NMR is period specific but many monuments don't necessary reflect a single period. An example is medieval or post-medieval graves – the classification system only allows for Dark Age isolated burials which is too specific to describe a later example.

8.46 Overall, the options for monument class seem ill-suited for uplands survey; perhaps the results of the previous years of work could be pooled and monument types re-assessed? If so, a thematic classification better suited to the upland archaeology may result and allow the results of existing surveys to be tightened.


Map showing survey area
Llanegryn
Abertrinant
Foel Wyllt
Dolgoch
Dolgoch Falls
Brynerug
Woodlands
BRYNGLAS STA
Pandy
Penowern
Tarrenybarcut
Pen Trum-gwr
Rhyd-yr-onen
Cynfal Fm
Bryn-y-castell
Graig Fach-goch
TYWYN
Pantyneuadd
Corlan Fraith
Foel Fawr
ABERGYNOLWYN STA
Hendre
Tarren-fach
Mynydd Tan-y-coed
Mynydd Tŷ-mawr
Tarrenhendre
Mynydd Cefn-caer
Tarren Rhosfarch
Esgair Uchef
Ffridd Rhosfarch
Pennal-isaf
Braich-ddu
Allt Nantygwenlli
Cwmffernol
Cynfal-fawr
Esgair-Weddan
Braich-y-Gelwydd
Pennal Towers
Rhos-farch
Pennal
Cwrt
Plas Talgarth (Hotel)
Cefn-caer
Llugwy
Pumwern
Caeceinach
Dysynnant
Bryn Dinas
Tumulus
Cairn
Dauddyffryn
Erwfaethlon
Cwm Maethlon
Llechwedd Melyn
Llanerch-y-llyn
Gwyddgwion
Dyffryn-glyn-cul
Rhowniar
Foel Caethle
Caethle Fm
Mynydd y Llyn
Cefn-cynhafal
Llwyncelyn
Brynmorlo
Gogarth
Penmaen Isa
Penmaen Bach
Cefn-crib
Morben Hall
Morben-isaf
Tynohir
DOVEY JUNC STA
Carn March Arthur
Tyddynhridelt Hill
Carn Llyn Barlog
Allt Gwyddgwion
Nant Cwm-Hernol
Afon Cwm-pandy
Afon Dysynni
Afon Fathew
Nant-y-mynach
Nant Dol-goch
Tarren Nantymynach
Mynydd Esgairweddan
Tarren Cwm-ffernol
Dolau-gwyn
Ffridd Cocyn
Ffridd Bryn-glas
Dol-Deheuwydd
Cil-cemmaes
Coed-y-gôf
Tan-y-coed
Tŷ-mawr
Foel-y-geifr
Mynydd Rhyd-galed
Maes-y-wern
Rhiwerfa
Bwich-y-maen
Hendrewallog
Bryn-Eglwys
Waterfalls
Tal-y-fan
Trum Gelli
Gelli-graian
Ford
Penmaen-bach
Tarren Nantymynach
Tarren Cwm-ffernol
Mynydd Esgairweddan
Tal-y-llyn Railway
A493
B4405
Dysynni
Afon Alice
Afon Cwm-pandy
Nant Cwm-Hernol
Allt Gwyddgwion
Nant Cynfal
Afon Dyffryn-gwyn
Tal-y-llyn Railway
Ty-mawr
Trychiad
Peniarth
Glanymorfa-mawr
Cemaes
Bryn-gwyn
Ty-nawen
Celmi
Hen-dy
Graig Fach-goch
Bron-prys
Fachan Hall MS
Roman Fort
Hotel
Watercolour
Afon Gwernol
Afon Dysynni
Afon Fathew
Afon Alice
Afon Cwm-pandy
Afon Dyffryn-gwyn
Nant Cynfal
Nant Cwm-Hernol
Allt Gwyddgwion
Nant Dol-goch
Nant-y-mynach
Tal-y-llyn Railway
Tal-y-llyn Railway
Ffridd Bryn-glas
Ffridd Cocyn
Dysynni
Afon Fathew
Afon Alice
Afon Cwm-pandy
Afon Dyffryn-gwyn
Nant Cynfal
Nant Cwm-Hernol
Allt Gwyddgwion
Nant Dol-goch
Nant-y-mynach
Tal-y-llyn Railway
Tal-y-llyn Railway
Ffridd Bryn-glas
Ffridd Cocyn