



**Cyfoeth
Naturiol
Cymru**
**Natural
Resources
Wales**

Wales LANDMAP Historic Landscape Monitoring Report

C Jones, C Martin, N McGuinness, K Murphy

The Welsh Archaeological Trusts

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1. Crynodeb Gweithredol

Comisiynodd Cyfoeth Naturiol Cymru y pedair Ymddiriedolaeth Archaeolegol yng Nghymru i ymgymryd â cham cyntaf monitro newid ar gyfer agwedd Tirwedd Hanesyddol LANDMAP ar gyfer Cymru gyfan.

Bu pob un o'r pedair Ymddiriedolaeth yn gwneud y gwaith monitro yn eu hardal eu hunain, gan grynhoi data mewn tabl GIS y cytunwyd arno ar y cyd. Defnyddiwyd amrywiaeth o ffynonellau i ganfod newid yn y dirwedd hanesyddol, a'r ffynhonnell fwyaf defnyddiol oedd y map newid Mega (map GIS a gynhyrchwyd ar gyfer yr haen cynefinoedd tirwedd), ffotograffau o'r awyr, MasterMap, Cofnodion Amgylchedd Hanesyddol a gwybodaeth leol/broffesiynol.

Clustnodwyd a gwnaed 817 newid i gyd yn GIS Tirwedd Hanesyddol LANDMAP, a chlustnodwyd 621 newid i gronfa ddata Tirwedd Hanesyddol LANDMAP. Bydd newidiadau i'r gronfa ddata yn ffurfio contract ar wahân.

Roedd y rhan fwyaf o'r newidiadau a nodwyd yn cynnwys tai ar raddfa fechan a datblygiadau diwydiannol/masnachol ysgafn ar gyrion ardaloedd trefol, trefi a phentrefi, gyda chrynnodiad ar hyd ymylon deheuol a gogleddol y wlad. Cyfrannodd ffermydd gwynt/tyrbinau gwynt, aräe paneli solar, ffyrdd newydd a chwareli/gwaith cloddio mwynau at newid mewn ardaloedd gwledig. Ar y cyfan roedd maint y newid yn fychan ac anaml yn cyfiawnhau diwygio Gwerthusiad neu Duedd Cyffredinol ardal o dirwedd, er bod ychydig o eithriadau sylweddol.

2. Executive Summary

Natural Resources Wales commissioned the four Welsh Archaeological Trusts to carry out the first stage of monitoring change for the LANDMAP Historic Landscape aspect for the whole of Wales.

The four Trusts each worked on the monitoring in their own region, compiling data in a commonly agreed GIS table. A variety of sources was used to detect change in the historic landscape, the most useful being the Mega change map (a GIS map produced for the landscape habitats layer), aerial photographs, MasterMap, Historic Environment Records and local/professional knowledge.

In total 817 amendments to the LANDMAP Historic Landscape GIS were identified and undertaken, and 621 amendments to the LANDMAP Historic Landscape database were identified. Amendments to the database will form a separate contract.

The majority of the identified changes consisted of small-scale housing and light industrial/commercial development on the fringes of urban areas, towns and villages, with a concentration along the southern and northern fringes of the country. Wind farms/wind turbines, solar panel arrays, new roads and quarrying/mineral extraction contributed to change in rural areas. Overall the scale of change was small and rarely warranted amending the Overall Evaluation or Trend of an landscape area, although there were a few significant exceptions.

3. Introduction

Natural Resources Wales (NRW) commissioned a consortium of the four Welsh Archaeological Trusts, (Clwyd-Powys Archaeological Trust Ltd, Dyfed Archaeological Trust Ltd, Glamorgan-Gwent Archaeological Trust Ltd, Gwynedd Archaeological Trust Ltd) led by the Dyfed Trust, in September 2016 to carry out the first stage of monitoring change for the LANDMAP Historic Landscape aspect for the whole of Wales.

The first stage comprised four parts. Part 1 consisted of identifying historic landscape aspect areas where significant change has occurred and complete a summary table. In part 2 a list of LANDMAP Historic Landscape survey unique identifiers to be amended was compiled, based on data drawn from part 1. This short summary report outlining key changes in the historic landscape was compiled as the part 3 element of the work. During part 4 changes to boundaries identified during part 1 were implemented on the LANDMAP historic landscape GIS.

The four Welsh Archaeological Trusts (WATs) carried out the monitoring change work for their region thus: Glamorgan-Gwent Trust (GGAT) did Area 1 (Caerphilly, Bridgend, Rhondda Cynon Taff, Blaenau Gwent, Merthyr Tydfil and Torfaen), Area 2 (Monmouthshire, Cardiff, Vale of Glamorgan, Newport) and part of Area 3 (Swansea, Neath Port Talbot); Dyfed Archaeological Trust (DAT) did part of Area 3 (Carmarthenshire) and Area 4 (Pembrokeshire, Pembrokeshire Coast National Park, Ceredigion); Clwyd-Powys Trust (CPAT) did Area 5 (Powys), Area 6 (Wrexham, Denbighshire, Flintshire) and part of Area 7 (part of Conwy); Gwynedd Archaeological Trust (GAT) did part of Area 7 (part of Conwy, Gwynedd, Snowdonia National Park) and Area 8 (Ynys Mon). Not only are the WATs familiar with the historic landscape of their regions and the development and other issues associated with them, but in many cases the WATs compiled the original LANDMAP historic landscape aspect datasets for NRW. To ensure consistency the WATs met at the beginning of the project and afterwards regularly corresponded by email and phone.

During the monitoring CPAT alerted NRW to the poor quality of the GIS data for Denbighshire. To ensure a consistent quality across Wales NRW provided additional funds to enable CPAT to amend the GIS and associated aspect area survey data for this county.

Updating the LANDMAP historic landscape aspect database with changes identified during Part 1 will form an additional piece of work.

4. Methodology

Following an initial meeting of the WATs a MapInfo GIS monitoring table with columns required by NRW was compiled for use by all the WATs. The LANDMAP historic landscape aspect GIS was disaggregated into the four WAT regions to enable each Trust to work on their own region's data. At the end of

the monitoring the disaggregated, updated GIS tables were combined and a single spreadsheet documenting all change created.

The following list the sources used during the monitoring work with a short commentary on how useful they were:

- Mega change map – GIS map for the landscape habitats layer. This was one of the most useful sources as the locations of landscape change were immediately apparent and then could be verified from other sources. It was particularly useful in identifying change in rural areas, as in these areas detecting change using other sources could be a very time-consuming process.
- Aerial photography – A very useful source, particularly when used in conjunction with other sources such as the Mega Change map, Mastermap and HER data. It was most useful in detecting change on the fringes of settlements, less so in rural areas, unless other sources were available to act as a guide to where change may have occurred. On-line sources such as Bing Maps and Google Earth proved to be useful as in some regions they are the most recent aerial photography available.
- Complexity maps – GIS map for the landscape habitats layer. The information from this source was not particularly useful for detecting change in the historic landscape.
- Local Authority questionnaire – Most of the changes reported in the questionnaire were picked up in other sources, so this source was of limited use.
- Existing LANDMAP monitoring reports – these were of limited use as changes recorded in these reports were detected in other sources such as the mega change map.
- MasterMap – This was a very useful source, although not all WATs were able to obtain the most recent version of the map. As with aerial photography it proved more useful in detecting change on the fringes of settlements and less so in rural areas.
- historic environment assets and on interventions on those assets, ie excavations, surveys etc. Although many hundreds of interventions have taken place in Wales since the initial Landmap studies were compiled, rarely do these new discoveries have an impact at landscape level and thus are not recorded as recommended changes. However, analysis of development control records and similar records held by the HERs proved to be particularly useful in detecting very recent change – ie change not yet shown on mapping or available on aerial photographs, such as solar panel farms. This source was also useful for detecting small but significant changes, for example clusters of single or paired wind turbines.

- Local/professional knowledge – as with HER data this source was useful in recording recent landscape change.
- Websites – As noted above Bing Maps and Google Earth were useful sources. www.renewables-map.co.uk a website that records windfarms and solar farms and other renewables projects was useful for obtaining data not readily available elsewhere.
- Other sources – even large-scale initiatives such as HLF-funded landscape partnership projects and Glastir were found to have an impact at local level, but little impact on change at a landscape level, and so were of limited use. Data from the consistency workshop held in 2011 were also used, but this limited to areas in north-east Wales. Other sources such as digital data on registered historic parks and gardens and and conservation areas were found to be useful in some instances.

5. Results

5.1. Aspect areas to be amended

The following table lists the numbers of aspect areas to be updated by Area and by those that require GIS amendments and those that require database amendments. Note: an amendment to a GIS aspect area requires not just an amendment to that aspect area but also to the neighbouring area(s).

Table 1. Number of aspect areas to be updated by Area.

Area	Total number of aspect areas	Number of areas requiring GIS amendments	Number of areas requiring Database amendments
Area 1 Caerphilly, Bridgend, Rhondda Cynon Taff, Blaenau Gwent, Merthyr Tydfil, Torfaen	210	28	26
Area 2 Monmouthshire Cardiff, VoG, Newport	156	11	22
Area 3 Carmarthenshire, Swansea, NPT	443	72	41
Area 4 Pembrokeshire & Pembrokeshire Coast National Park, Ceredigion	544	54	27
Area 5 Powys (including Brecon Beacons National Park within Brecknockshire)	338	331	81
Area 6 Wrexham, Denbighshire, Flintshire (figures exclude Denbighshire)	309	156	57
Area 7 Conwy, Gwynedd, Snowdonia National Park	416	138	340

Area 8 Ynys Mon	75	27	27
Total	2491	817	621

5.2. Key changes

In most cases identified change was relatively minor and, as noted below, usually related to small-scale housing, light industrial and other development on the fringes of settlements. This rarely required a change to the overall evaluation or to trend. However, in some cases a relatively large development, or several small developments resulted in a recommendation of trend:declining, and in a few instances the overall evaluation was downgraded. Recommended amendments to evaluation, trend etc in the Landmap monitoring table are only shown only where change has been identified.

Area 1 Caerphilly, Bridgend, Rhondda Cynon Taff, Blaenau Gwent, Merthyr Tydfil, Torfaen. The key changes in this area are mainly concentrated in the areas of Rhondda Cynon Taff and Blaenau Gwent, with a few changes in Merthyr Tydfil and Torfaen. Amendments to the GIS mostly relate to expansion to the built environment (including aspects relating to settlement and the creation or expansion of industrial estates) and the result of opencast mining and quarrying activities. These changes are often able to be easily moved into adjacent areas of similar character, however, a number of new aspect areas have been suggested where large scale change is seen. Nevertheless the overall impact is the resultant loss of areas classified as lower valley agricultural settlement and fieldscape as well as early industrial extractive landscapes. More substantial changes to the current aspect areas include those relating to the impacts of forestry and the installation of green energy infrastructure, particularly wind turbines in this area but some solar farms. In these cases amendments are required to the description and on occasion to the classification and evaluation depending on scale.

Area 2 Monmouthshire Cardiff, VoG, Newport. Key changes to the GIS are related to small expansions to settlement and quarrying activities on the whole – however, the area around Magor and Undy has undergone some substantial remodelling to the aspect areas due to the impact of settlement expansion and the loss of Fen Edge character. Changes to descriptive text commonly need to be made in terms of declining trend and degradation of aspect areas falling outside of the main areas of built environment and settlement, particularly in the area of the Gwent Levels. Other descriptive changes relate to the

incorporation of additional information in light of new discoveries, designations and archaeological work in the area.

Area 3 Carmarthenshire, Swansea, NPT. In Carmarthenshire the majority of amendments are to the GIS and these are almost exclusively in the south to of the county and relate to small-scale housing, light industrial and other development on the edge of existing settlements. Rarely are these changes of sufficient scale to warrant amendments to overall evaluation or trend. An exception is a large wind farm on Mynydd y Betws, CRMRTL39603, which has reduced the overall evaluation of the area from outstanding to moderate. Other windfarms, solar panel farms and individual wind turbines have been recorded, particularly on the higher ground in the north of the county. Changes in Neath Port Talbot mostly pertain to the decline of traditional industry in the area and require a change in evaluation to be made to the aspect areas as well as to reflect addition of green infrastructure. Key changes in Swansea often reflect small scale expansion to the built environment with some renewable energy installations. The main change to the Swansea aspect areas would be to incorporate the results of the Gower Historic Landscape Characterisations that have taken place over the last 10 years.

Area 4 Pembrokeshire & Pembrokeshire Coast National Park, Ceredigion. The key changes in this area are concentrated in the southern part of Pembrokeshire, with few in the north of that county and in Ceredigion (Cardiganshire). Amendments to the GIS are the most common type of amendment required, and of these the most common are additions to urban areas and villages due to small-scale housing development. These developments are relatively minor and rarely warrant amendments to overall evaluation or trend. Expansion of industry mostly around Milford Haven waterway has also been recorded. In Ceredigion substantial windfarms require amendment of both the GIS and the database. Other database amendments are mostly related to renewable energy developments, such as solar panel arrays, wind farms and clusters of individual/pairs of wind turbines. Three new road schemes have also been recorded.

Area PMBRKHL42273 was found to have no GIS polygon.

One new area needs to be created due to the splitting of CRDGNHL078.

Area 5 Powys (including Brecon Beacons National Park within Brecknockshire). Most of the GIS changes required across Powys arise from small scale expansion to settlements, with relatively few large scale adjustments being required.

Two larger edits are needed in Brecknock which has seen opencast coal mine expansion and contraction around Ystradgynlais (BRCKNHL132, BRCKNHL826), since 2003, together with some adjustments to forestry boundaries (eg. BRCKNHL953). It is perhaps also true to say that Brecknock, being the first LANDMAP area for which Historic Landscape Aspect Areas were drawn, requires some updating in the light of descisions made later in

other authority areas (see BRCKNHL133, BRCKNHL270, BRCKNHL172 or BRCKNHL485 for example).

A similar pattern, albeit to a lesser degree, exists in Radnorshire where only one larger area requires attention (RDNRHL914), although adjustments to two other areas (RDNRHL763 & RDNRHL993) have also been suggested to reunite parts of Registered Parks and Gardens which had, for some reason, been split by the original exercise. The largest edit proposed is the disaggregation of area RDNRHL210 which is in fact two separate areas.

Montgomeryshire exhibits a very similar pattern to Radnorshire, with small scale expansion of existing settlements and very few large scale edits required. For some reason Llanfyllin (MNTGMHL178) is not well drawn but also appears to have been moved to the west at some point, so that virtually none of its boundaries co-incide with anything on the ground – this will need adjustment.

There are numerous database adjustments also required across Powys, most of which are the result of new schedulings, conservation areas, etc. There are however areas (RDNRHL643, MNTGMHL661, MNTGMHL704, MNTGMHL859, MNTGMHL117) affected by new or expanded windfarms which may require adjustments to descriptions and/or evaluations. As may the handful of areas noted by the Consistency Workshop in 2011.

Area 6 Wrexham, Denbighshire, Flintshire, eastern Conwy. It should be noted that during the project it became apparent that the accuracy of many the areas drawn for Denbighshire was simply not good enough and following discussions with NRW it was agreed that CPAT would redraw those areas in Denbighshire that were not fit for purpose. This would be done as a separate, and additional, exercise within the overall project with the monitoring being done as part of that rather than part of this work. The figure given above of 93 edits required does not therefore include any from Denbighshire.

The remaining three authority areas display a similar pattern to most of Powys, with small scale edits required as a result of settlement expansion accounting for almost all of the total numbers. The availability of digital conservation area data has also suggested alterations to settlement boundaries such as WRXHMHL026, WRXHMHL032 or WRXHMHL050. The emergence of new or expanded windfarms has again caused concern with an adjustment to the boundary of CNWHL025 being recommended. Further edits to both GIS and database as a result of windfarm activity are anticipated for Denbighshire.

There are a number of database edits required across Area 6. Most of these have been noted as a result of new schedulings or conservation areas or other newly available digital data. A small number of areas were also noted by the Consistency Workshop of 2011 and these will require editing.

Area 7 west Conwy, Gwynedd and the Snowdonia National Park. 138 Aspect Areas require GIS polygon edits. These are mainly due to small scale settlement expansion from residential areas into adjacent rural areas. Some

changes are required due to limited small scale expansion of business parks and trading estates into neighbouring Aspect Areas, as in Porthmadog GWNDDHL547, Pendre GWNDDHL101, Penygroes GWNDDHL919, Mochdre GWNDDHL058 and Caernarfon GWNDDHL549. New solar farms at Morfa Camp, straddling GWNDDHL430 and GWNDDHL101, and Parciau straddling GWNDDHL021 and GWNDDHL850 both necessitate changes to the GIS. Large scale alterations to the GIS are limited to Bangor GWNDDHL547 and adjacent Aspect Areas due to the construction of larger scale housing projects and the Parc Bryn Cegin Business Park.

One new Aspect Area polygon needs to be created in Area 7. This results from the subdivision of Enclosed Uplands SNPHL574 as recommended in the 2011 Consistency workshop. This new aspect area, Enclosed Uplands Irregular Fieldscape, has been assigned the UID SNPHL001

A number of errors have been identified within the Area 7 GIS. The polygon for Arudwy coastal strip SNPHL193 is extensive and fragmented appears to be incorrectly defined. Similarly, the polygons for Intermediary slopes of the Moelwyns GWNDDHL472 and Penrhyndeudraeth GWNDDHL556 contain multiple amalgamated areas with a wide geographical spread and require complete re-assessment. The polygons for Harlech SNPHL990 and Bangor GWNDDHL747 had both been amalgamated into Roads SNPHL990 and required disaggregating. The Aspect Area polygons for Improved fields above Pentir GWNDDHL407 and Nantlle slate quarries GWNDDHL005 had also been amalgamated and required splitting.

340 Aspect Area in Area 7 require database edits. The majority of these, 238 Aspect Areas in Conwy and Gwynedd, are required to complete blank entries for Evaluation Trend in the current database. Where entries for Evaluation Trend and Value do already exist, few areas have been subjected to change on a landscape scale that require these to be changed. The other database updates are largely due to updated descriptions, management recommendations, new HER sites and completed Historic Landscape Characterisation reports.

The record for Blaenau Ffestiniog GWNDDHL003 appears to be describe another aspect area and needs to be corrected. The database records of four aspect areas could not be retrieved: SNPHL574 Enclosed Uplands, Harlech SNPHL990, Bangor GWNDDHL747 and Improved fields above Pentir GWNDDHL407. 238 Aspect Area database records have been flagged as they have blank Management Recommendation entries, the assessment of which is outside of the scope of the current project.

Area 8 Ynys Mon. 27 HL Aspect Areas require GIS edits. The majority of changes to aspect area boundaries are as a result of minor expansion of settlement from existing residential areas into neighbouring rural areas. The construction of Business Park infrastructure on the north of the island at Parc Cybi, Holyhead in YNMNHL029 did require a larger GIS polygon alteration, and the area of the Park has been incorporated into the industrialised northern part of neighbouring YNMNHL073. A number of new solar panel arrays have

also been identified in YNMNHL079 and YNMNHL023, however their relatively small scale means that none are sufficiently intrusive to justify large scale landscape area edits. One new wind farm has been identified; the two turbine site at Ysgello, YNMNHL052, and like the solar arrays, its scale did not justify changes to the GIS.

27 HL Aspect Areas require database edits. Evaluation Trend and Value is generally the same as before, few areas have been subjected to change on a landscape scale that require Evaluation Trend or Value to be re-evaluated. The construction of Business Park infrastructure at Parc Cybi, Holyhead in YNMNHL029 for example, and the wholesale transfer of that part of the aspect area into neighbouring YNMNHL073 does not require a reassessment of Evaluation Trend for either area, and they will remain as “Declining” for YNMNHL029 and “Constant” for YNMNHL073. The majority of data changes relate to minor changes to descriptions to take into account small scale landscape changes and important new archaeological discoveries and the addition of a number of references to completed Historic Landscape Characterisation reports for areas on the east of the Island.

The Aspect Area YNMNHL073 Fieldscape around Quirt has no accessible online survey record and it was therefore not possible to assess.

5.3. New Aspect Areas to be created

The following 13 new aspect areas will need to be created as a result of the monitoring:

Table 2. List of new aspect areas to be created

Note: Note including Gower – these to be decided at the next stage.

UID	Name	LA	Class 1	Class 2	Class 3	Class 4
CRDGNHL255	Capel Dewi	Ceredigion	Rural Environment	Agriculture	Irregular Fieldscapes	
BLNGWHL046	Cefn Bach	Blaenau Gwent	Rural Environment	Non agricultural	Reclaimed land	Other reclaimed land (former opencast mine)
CynonHL002	Hirwaun common South	Rhondda Cynon Taff	Rural Environment	Non agricultural	Marginal land	Other marginal land (relict fieldscape reverting back to moorland)
CynonHL003	Penderyn relict fieldscape	Rhondda Cynon Taff	Rural Environment	Non agricultural	Marginal land	Other marginal land (relict fieldscape reverting back to moorland)
CynonHL004	Pen-y-fan	Rhondda	Built	Industrial	Processing/	

	Industrial Estate	Cynon Taff	environment		Manufacturing	
CynonHL005	Cefn y Brithdir	Caerphilly	Rural Environment	Non agricultural	Marginal land	
CynonHL006	Penmoelallt	Rhondda Cynon Taff	Rural Environment	Non agricultural	Woodland	
SWNSHL001	Swansea Airport	Swansea	Built Environment	Other built environment	Communications	Airfield (including infrastructure)
CynonHL007	Cwncarn Forestry	Caerphilly	Rural Environment	Non agricultural	Woodland	
NPTH004	Blaengwrach Opencast	NPT	Built Environment	Industrial	Extractive	Coal mining
CRDFFHL031	Cardiff Airport	VoG	Built Environment	Other built environment	Communications	Airfield (including infrastructure)
SNPHL001	Enclosed Uplands Irregular Fieldscape	SNP	Rural Environment	Agriculture	Irregular Fieldscape	
RDNRHL001	Norton	Powys (Radnor)	Rural Environment	Agriculture	Regular fieldscapes	

7. Data Archive Appendix

Data outputs associated with this project are archived in the NRW Document Management System within the library and folders Advice>Landscape>Landscape Monitoring>Historic Landscape>Evidence and within the X:\ of the internal NRW GIS environment on server-based storage at Natural Resources Wales.

The data archive contains:

- [A] The final report in Microsoft Word and Adobe PDF formats.
- [B] A set of raster files in ESRI and ASCII grid formats.
- [C] A Microsoft Excel sheet of aspect areas to be amended

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue <https://libcat.naturalresources.wales> (English Version) and <https://catllyfr.cyfoethnaturiol.cymru> (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no [NRW to insert this number]



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