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1 Methololeg Cynefinoedd Tirwedd LANDMAP

Mae cynefinoedd lled naturiol a gorchudd llystyfiant yn dylanwadu ar amrywiaeth tirwedd, ffyniant biolegol, gorchudd tir, defnydd a mwynhad o ardaloedd gwledig. Gall rheolaeth o gynefinoedd a llystyfiant effeithio ar y gwerthoedd hyn a dylanwadu ar y dirwedd mewn sawl ffordd wahanol. Mae unrhyw newidiadau neu ddirywiad i'r cynefinoedd hyn, patrymau llystyfiant a nodweddion cysylltiedig drwy ddiffyg rheolaeth, gwaredu neu newid mewn polisi yn effeithio ar amrywiaeth cynefin ac amrywiaeth tirwedd, ac o ganlyniad i hynny ddylanwadu ar werthoedd bioamrywiaeth. Yn sgil hyn mae'n bwysig i fapio cynefinoedd a'u gwerthuso ar raddfa eang er mwyn darparu gwybodaeth bwysig i wneuthurwyr polisi sy'n gweithio ar lefel tirwedd. Mae mapio Cynefinoedd Tirwedd ar raddfeydd sy'n cymharu gydag Agweddau Gwerthuso eraill hefyd yn fodd o wella integreiddio ffurfio polisiâu, gan fod yr Agweddau Gwerthuso yn gydberthnasol a gall rheolaeth un effeithio ar amodau a gwerth un arall.

Mae LANDMAP yn canolbwyntio ar gofnodi gwybodaeth gynefin tirwedd ar raddfeydd sy'n gymharol debyg i Agweddau Gwerthuso eraill, gan adael gwybodaeth sy'n fwy lleol i'w gael ei gyrchu drwy setiau data eraill, megis Cam 1 Arolwg Cynefinoedd cenedlaethol digidol(gweler Llawlyfr ar gyfer Cam 1 Arolwg Cynefinoedd. Techneg ar gyfer Archwiliad Amgylcheddol Cyngor Gwarchod Cymru 1990) rhestr cynefinoedd arbenigol, cofnodion rhywogaethau penodol ag ati. Mae ystyried y nodweddion a chydberthnasau gofodol cynefinoedd a llystyfiant o fewn cyd-destun y matrices dirwedd ehangach, drwy'r dull hwn, yn cynnig cyfleoedd ar gyfer rheoli graddfa facro cynllunio er mwyn gwarchod

bioamrywiaeth. Mae presenoldeb y clytiau cynefin o fewn cyd-destun y dirwedd hefyd yn rhoi disgrifiad o'r pwysau sy'n ymwneud â'r dirwedd a lefel y newid posibl a allai effeithio ar y gwaith o gynllunio a rheoli tirweddau lled-naturiol, a nodwyd o fewn unrhyw ardal.

Ceir llawer i'w ddweud o blaid reoli cadwraeth ar lefel y dirwedd wrth barhau i gynnal cynlluniau rheoli lleol. Cesglir gwybodaeth Cynefinoedd Tirwedd drwy gyfrwng LANDMAP ar wahanol lefelau, o eang iawn i raddfa gymharol fach. Mae'r cynigion posibl ar y raddfa ehangaf yn darparu cyfle i roi sylw sy'n ymarferol i gynllunio tirwedd ecolegol strategol, er enghraifft mewn perthynas â:

- Cynlluniau tirwedd i geisio creu tirweddau mwy naturiol a mwy amrywiol
- Cynllunio ar gyfer rhoi polisiâu amaeth-amgylchedd ar waith
- Cynlluniau sy'n amlinellu patrymau adnoddau naturiol dewisol yn y dyfodol e.e. strategaethau coedwigoedd a choetiroedd.
- Adnabod yr ardaloedd lle byddai creu cynefinoedd newydd neu gynyddu gorchudd presennol a lleihau effeithiau darniad ac arwahanrwydd yn cynyddu natur ecolegol a gwerth bioamrywiaeth y dirwedd.

Hefyd gall fod gan LANDMAP rhaglenni lleol pwysig, er enghraifft:

- Strategaethau i sicrhau fod safleoedd dynodedig yn gysylltiol neu wedi'u diogelu'n bwrpasol.
- Nodi cynlluniau gweithredu sy'n cryfhau natur ecolegol a gweledol ac yn gwella cynllunio cadwraethol yr adnoddau.
- Cyfrannu at Cynlluniau Gweithredu Bioamrywiaeth Leol a'udatblygu ymhellach.

Lle bo angen gwybodaeth fanylach na'r hyn mae LANDMAP yn ei gynnig, awgrymir edrych ar setiau data manylach gan gynnwys arolwg Cam 1, Cam 2 (os ydynt ar gael) a setiau data biolegol/rhywogaethau lleol sy'n berthnasol i'r ardal, Sir neu Barc Cenedlaethol.

2 Summary

Semi natural habitats and vegetation cover influence landscape diversity, biological prosperity, land cover, utilisation and enjoyment of rural areas. Management of habitats and vegetation can affect these values and influence the landscape in many different ways. Any changes or loss of these habitats, vegetation patterns and associated features through lack of management, removal or changing policy affects both habitat diversity and landscape diversity, with resulting consequences for biodiversity values. It follows that it is important to map habitats and evaluate them at a broad scale in order to provide information of value to policy makers working at the landscape level. The mapping of Landscape Habitats at scales comparable with other Evaluated Aspects also provides for improved integration of policy making, since the Evaluated Aspects are inter-related and the management of one may influence the condition and value of another.

LANDMAP focuses on recording landscape habitat information at scales that are broadly comparable to other Evaluated Aspects, leaving more localised information to be accessed through other data sets, such as the digitised national Phase 1 Habitat Survey (see Nature Conservancy Council. 1990. *Handbook for Phase 1 Habitat Survey. A Technique for Environmental Audit*), specialist habitat inventories, species-specific records etc. Considering the characteristics and spatial relationships of habitats and vegetation within the context of the wider landscape matrix through this approach offers opportunities for

macro-scale management planning in order to conserve biodiversity. The presence of habitat patches within the landscape context also gives an indication of the landscape related pressures and possible rate of change that may affect the planning and management of the semi-natural landscapes identified within any area.

There is much merit in approaching conservation management at a landscape scale whilst maintaining the ability to conduct local management planning. The Landscape Habitats information collected via LANDMAP is collected at various levels, from very broad to relatively small scale. Potential applications at the broadest scale provide an opportunity for strategic landscape ecological planning to be addressed at a scale that is workable, for example in relation to:

- Landscape plans aimed at creating more natural or more diverse landscapes
- Planning for the implementation of agri-environment policies
- Indicative plans of preferred future patterns of natural resources, e.g. forest and woodland strategies
- Identifying areas where creating new habitats or increasing existing cover and reducing the effects of fragmentation and isolation would optimise landscape ecological character and biodiversity value

LANDMAP might have important local applications also, for example:

- Strategies to ensure that designated sites are linked or suitably buffered
- Identifying action plans which consolidate visual and ecological character and enhance conservation planning of resources
- To inform and further develop Local Biodiversity Action Plans (LBAPs)

Where finer-scale information than LANDMAP can provide is required, it is recommended that more detailed data sets are consulted including Phase 1 survey, Phase 2 (where available) and local biological/species data sets specific to area, County or National Park.

3 Overview of procedure

The process for carrying out the Landscape Habitats aspect is similar to the other evaluated aspects. Initially the study area is classified into different landscape types. These are mapped and survey forms filled out for each. As with all landscape assessments, this is likely to be an iterative process. Desk study derived Aspect Areas will be refined by field assessment which will form the basis for data recording. When the assessment is completed, a technical report is prepared to explain judgements and any deviations from the method. A Quality Assurance procedure is carried out on all assessments to ensure consistency and quality control. In order to maintain the effectiveness and confidence in LANDMAP as the key landscape information resource in Wales, the mapping and survey information is periodically updated. The methodology is described in full in the LANDMAP Guidance for Wales Monitoring Methodology (2016).

The compilation of the LANDMAP Landscape Habitats aspect therefore involves five main processes:

1. Classifying and mapping Landscape Habitats Aspect Areas
2. Aspect Area data capture
3. Compilation of a Technical Report

4. Quality Assurance
5. Monitoring and updating
6. Quality Assurance of updates

Landscape Habitats Aspect Specialists are responsible for 1, 2, 3 and 5 in this process. To maintain nationally consistent standards, LANDMAP datasets are quality assured before they are made available as verified LANDMAP Information. The Quality Assurance assessor is therefore responsible for 4 and 6.

4 Classification and Mapping

The LANDMAP methodology relies on good information sources and so the gathering of relevant data is essential.

4.1 Sources of information

The key objective is to compile biodiversity and landscape information for the study area from existing information sources and begin the process of mapping and data capture. Procedures for mapping and data recording are described in full below. The basic information used is as follows:

- Ordnance survey maps
- Aerial photographs
- Existing habitat data-sets including Phase 1 Habitat Survey and specialist habitat inventories, e.g. upland surveys, common lands surveys, Phase 2/NVC surveys and river, estuary and canal inventories, National Forest Inventory *etc.*
- Designated site information including; SACs, SPAs, Ramsar, SSSI both the maps of their location and their accompanying citations. In addition the locally designated Sites of Importance for Nature Conservation (SINCs)
- Species records
- Soils Survey Map data
- Biodiversity Action Plans, including LBAPS.
- Any pre-existing landscape assessments of the study area
- NRW biodiversity specialists
- Local Authority and National Park ecologists

It is important to be as comprehensive as possible and to compile a record of any consultations and data sources used as part of the Quality Assurance procedure. This is required as a standard component of LANDMAP Technical Reports.

4.2 Landscape Habitat classification

The Landscape Habitats aspect is organised according to a hierarchical classification system. This typology aims to classify the landscape into areas of distinct Landscape Habitat character, and is based on a hierarchy of three levels, with the fourth level being the Phase I Habitat Survey.

Terminology is akin to Phase 1, where potential landscape scale habitat definitions can be found. Groupings have been modified to conform to LANDMAP's objective for landscape-

scale mapping, i.e. habitats with similar character at the landscape scale, or that occur only in small patches, have been amalgamated.

The levels are broadly based on the following criteria:

Level 1	Level 3	Level 2	Level 4
Broad ecosystems	Secondary habitats	Primary habitats	Phase 1 Habitat Survey

The classification will initially be carried out as a desk study exercise. It will be related to mapping of the study area and allocating a classification to each Aspect Area. The classification may be refined by site appraisal. LANDMAP Aspect Areas must be identified to Level 3.

The classification system should be adhered to. Any required deviations, further sub-divisions or problems should be resolved in discussion with NRW to promote consistency and be reported as part of the Technical Report.

Level 1	Level 3	Level 2
Broad ecosystems	Secondary habitats	Primary habitats
Dry (relatively) terrestrial habitats	Mosaic	Mosaic areas with a mixture of agriculturally improved and other habitats with no habitat having a cover of over 75%)
		Upland Mosaic (This is where over 75% of the area is made up of semi-natural habitats but no one habitat is dominant, it will normally be a mixture of heathlands, grasslands and bogs or mires).
	Woodland and scrub	Broadleaved woodland
		Coniferous woodland
		Mixed woodland
		Scrub
		Parkland and scattered trees
		Recently felled woodland
	Grassland and marsh	Acid grassland
		Neutral grassland
		Calcareous grassland
		Improved grassland
	Tall herb and fern	Marsh/marshy grassland
		Bracken
	Heathland	Other
		Dwarf shrub heath
	Rock exposure and waste	Montane/lichen/bryophyte heath
		Natural inland cliff
		Natural scree
		Limestone pavement
		Artificial exposures and waste tips

	Cultivated/disturbed land	Arable
		Amenity grassland
		Horticultural
	Built up areas	Industrial
Residential/green space		
Wet terrestrial habitats	Mosaic (with habitats defined)	Mosaic (with habitats defined)
	Mire/Swamp, marginal and inundation	Bog/bare peat/flush/spring
		Fen/swamp/marginal/inundation
	Open water	Reservoirs and lakes and margins
		Canal corridors
		River corridors
Coastal and marine habitats	Mosaic (with habitats defined)	Mosaic (with habitats defined)
	Coastland	Intertidal, including muds/sands, saltmarsh, shingle/gravel and boulders/rocks
		Sand dune
		Maritime cliff and slope
	Marine	Offshore shallow waters
		Offshore deep waters

In addition to dominant habitat types, LANDMAP data capture allows for the recording of linear features or smaller habitat patches within the form of each Aspect Area. Examples include streams, stonewalls, ditches, hedges and veteran trees, all of which contribute to habitat structure and the overall biological and landscape character of the landscape unit, these will be recorded in the Description part for each Aspect Area.

4.3 Definitions of classification categories

Definitions of these classes to Level 3 of the hierarchical classification system are shown in the table below. This ensures compatibility between adjacent surveys and consistency across Wales. These definitions are used unless there is a particular local circumstance that necessitates an alternative definition, in which case these are defined in full in the Technical Report. In general, Levels 1-3 of the LANDMAP classification seeks to delineate the dominant habitat and vegetation types in the landscape.

Identifying Mosaics

When 75 % or more of an area is one Level 2 or Level 3 habitat type then these habitat types are recorded as the ones that give the Aspect Area its broad character. This decision rule is known as the '**LANDMAP dominance rule**'.

When no single Level 2 or 3 habitat type is dominant, the LANDMAP dominance rule cannot be applied. In this situation an Aspect Area is defined as a mosaic, with recording in the data-capture form of the composition of the mosaic. For example:

- At Level 2, an entry might be: Mosaic (Woodland and scrub + heath), *i.e.* where there is a mix of two Level 2 habitat types.

- At Level 3, an entry might be: Mosaic (Acid grassland + bracken + natural inland cliff), *i.e.* where there is a mix of three Level 3 habitat types.
- Two types of Level 3 Mosaics are identified:

Dry terrestrial / Mosaic/ Mosaic will be recorded where the landcover contains a mixture of agriculturally improved and habitat features, such as improved grassland, woodland and wetland.

Dry terrestrial/ Mosaic/ Upland mosaic will be recorded where the landcover is comprised a mixture of upland semi-natural habitat types such as marshy grassland bog and heath. This separation was introduced in the 2012/13 review due to the need to distinguish those areas of native semi-natural habitats with high biodiversity value, from those areas with a mixture of agricultural improved land and habitats which have a different biodiversity value and characteristic.

The adoption of mosaics for the Landscape Habitat classification formally recognises that complex mixtures of habitat exist such that it is not always possible to define an area of relative uniformity at the broader landscape scale. In fact mosaics of habitat are of key importance for biodiversity, for example often enabling a great diversity of species to exist in a relatively small geographical area.

Overall, it is expected that where two Aspect Areas have been assigned the same classification then these are expected to share the same definitive characteristics. This does not mean that they share all of the same characteristics; there may be descriptive differences between them. However, Aspect Areas of one class should share broad characteristics with others of the same class, no matter where in Wales they might be found.

4.4 Mapping of Aspect Areas

Desk Study

This first phase of mapping work relies heavily on an expert interpretation of existing biodiversity information, and especially the interpretation of maps (for example soil maps and OS maps for contour lines), aerial photographs and habitat data sets supported by Phase 1.

Using these sources, Aspect Specialists should first determine Level 1 Aspect Areas by drawing boundaries on maps to encompass land falling within each definition. This should be relatively straightforward as the distinctions at this level are at the broad ecosystem scale (*i.e.* predominantly dry terrestrial, wet terrestrial or coastal and marine habitats). This process will generate only a few polygons for delineation within the GIS.

Then, for each Level 1 area, sub-divisions need to be determined to equate to Level 2 habitat definitions at a landscape scale, *i.e.* primary habitat types. Use the dominance rule at Level 2 to identify out large blocks of homogenous habitat (greater than 10 hectares) that compromise 75% or more of one Level 2 habitat type. Each geographically distinct area identified is known as an Aspect Area. Repeat this process until all areas that are relatively homogenous at Level 2 have been identified and delineated. Any remaining

areas not determined as relatively uniform in this way are, by definition, mosaics. These mosaics are formally recorded as such at Level 2. Assess the remaining area on the basis of identifying landscape scale mosaic habitats, taking into account physiography (e.g. large topographical features such as hilltop plateau, coastal plains and river valleys), geology, topography, aspect, catchments, slope, land use, distance from maritime influences and Phase I to justify the further division into Aspect Areas. For all Aspect Areas, take into account any landscape scale land management influences that may define upland commons, forestry, agricultural enterprise etc so that Aspect Areas that are identified should be subject to similar landscape scale factors. In some instances a special case may be made for identifying Aspect Areas that are less than 10 hectares. In this way Aspect Specialists should drill down to identify an area rather than building up field by field.

This process is then repeated for Level 3, enabling the sub-division of Level 2 Aspect Areas into a number of Level 3 Aspect Areas that are either relatively uniform (*i.e.* dominated, in landscape terms, by one habitat type, e.g. scrub, acid grassland, horticultural land *etc.*) or are mosaics at this Level.

It must be emphasised that this process of defining a nested suite of Aspect Areas at Levels 1, 2 and 3 of the Landscape Habitat classification is not completely objective and cannot be automated. Instead, it relies on professional judgement and has been devised to allow fairly rapid delineation of the landscape into *relatively large areas* of different Landscape Habitat character.

Site Survey

Since a variety of desk based resources have been used to identify Aspect Area boundaries, further verification can be sought from aerial photographs. Where Aspect Areas deviate from the Phase I baseline, or discrepancies are suggested, then field verification would be justified to finalise the boundaries and should be considered as a valuable technique for supporting the mapping process.

Boundary adjustments must be formally recorded and explained within the Technical Report. See below for guidance on those questions that require a field visit or local knowledge to adequately complete and verify the form entries.

Landscape Habitats Aspect Area map for Ynys Mon (Anglesey)



Produced by NRW on: 17 July 2013

Scale 1:201398

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Cyfoeth Naturiol Cymru
Natural Resources Wales

5 Surveys

The survey form provides a structured summary of the key characteristics of each identified Aspect Area, together with an evaluation of its significance and a summary of its management requirements.

Every effort should be made to fill in the database fields, however some of them may not be possible to make the professional judgements required, without field survey. Therefore collecting Landscape Habitat Information has been formally divided into two distinct and acceptable stages:

Stage 1	Stage 2
Includes a 1-2 day field familiarisation visit plus those questions on the form that can be completed with desk-based resources. Aspect Area boundaries that need field verification can be confirmed at this stage and Aspect Specialists could note any easily recognisable features for the forms e.g. distinguishing field boundaries (hedge/fence/earthbank)	Requires field survey, or detailed existing knowledge, to complete selected questions.
Section of form to be completed	Section of form to be completed
Classification Yes	Already completed
General Questions 1, 2, 3,	Already completed

Description Questions 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 24, 19 (20 and 21 may be assessed if there is evidence on aerial photography)	Questions 15, 17, 18, (20,21)
Evaluation Question 25	Questions 26, 27 (To be completed during monitoring)
Recommendation (28, 29, 30, 31 may be assessable from aerial photography evidence or may require field visit)	Questions 28, 29, 30, 31
Aspect Area Boundary Questions 32, 33, 34, 35, 36	Already completed
Evaluation Matrix Questions 37, 38, 39, 40, 41, 42, 43, 44, 45	Already completed
Bibliography Question 46	Already completed
Assessment Questions 47, 48	Already completed

It is necessary for Aspect Specialists to consider all the questions. However, it is recognised in the LANDMAP methodology that there may be gaps in the available knowledge depending on the resources available. If the requisite information is unknown, then the appropriate response should be entered into the database. In no circumstances should the Aspect Specialist “second guess” a response. It is more credible to enter “unknown” as a response than to enter uncertain or incorrect information.

5.1 Landscape Habitats Survey

Survey Number:	Generate
Aspect Area Name:	Insert
Unitary Authority or NPA:	Select
Aspect:	Select
Date Survey Conducted:	Insert

Classification

Level 1	Broad ecosystems	Select
Level 2	Secondary habitats	Select
Level 3	Primary habitats	Select

Survey

Monitoring

1. Date of monitoring?

1a. Monitoring undertaken by

1b. Has this record been updated following monitoring work?
This record has been updated following monitoring work as more up to date information is available

This record has been updated following monitoring work, there was a real change in the aspect area

This record remains unchanged following monitoring work

1c. Change indicated by

OS Data, Aerial Photographs	Satellite Imagery Interpretation	Phase 1 Habitat Survey & Seasonal Change Maps
Policies, plans & information resources	Fieldwork	

1d. What has changed?

Classification	Description	Evaluation
Condition & Trend	Recommendations	Boundaries

General

1. Has the information been verified in the field? If yes, at what scale has this been verified?

2. Does this area have a special or functional link with an adjacent area? Which area and what is the nature of the link?

3. What is the total land area within the boundary (in hectares)?

Description

4. What are the dominant soil types?

Terrestrial raw soils	Raw gley soils	Lithomorphous (A/C) soils
Pelosols	Brown soils	Podzolic
Surface-water gley soils	Ground-water gley soils	Man-made soils
Peat soils		

5. What Phase 1 habitat types are present?

Specify what percentage of the Aspect Area is made up of these.

Semi- natural Broadleaved woodland	Planted Broadleaved woodland	Semi- natural Coniferous woodland
Planted Coniferous Woodland	Semi-natural mixes Woodland	Planted Mixed woodland
Dense Scrub	Scattered scrub	Scattered Broadleaved trees
Scattered Coniferous trees	Scattered mixed trees	Felled Broadleaved woodland
Felled Coniferous woodland	Felled Mixed woodland	Unimproved Acid Woodland

Semi-Improved Acid Grassland	Semi- improved Neutral Grassland	Unimproved Calcareous Grassland
Semi-improved Calcareous Grassland	Improved Grassland	Marshy Grassland
Bracken	Scattered Bracken	Tall Ruderal Herb
Non Ruderal Herb & Fern	Dry Acid Heath	Dry Basic Heath
Scattered Dry Heath	Wet Heath	Lichen/ Bryophyte heath
Montane Heath/ Dwarf Herb	Dry heath/ Acid Grassland mosaic	Wet heath/ Acid Grassland mosaic
Basic Dry Heath/ Calcareous Grassland	Blanket Bog	Raised Bog
Wet Modified Bog	Dry Modified Bog	Acid/ Neutral Flush
Basic Flush	Fen	Valley Mire
Modified Valley Mire	Basin Mire	Modified basin mire
Flood- plain mire	Modified flood-plain mire	Bare peat
Swamp	Scattered Swamp	Inundation Vegetation
Standing water	Running water	Intertidal Mud/sand
Intertidal Cobbles/shingle	Intertidal Rocks/boulders	Scattered salt marsh plants
Salt Marsh	Mud/ sand above mhw	Shingle/Gravel above mhw
Rocks/ Boulders above mhw	Dune Grassland	Dune Heath
Dune Scrub	Open Dune	Hard Cliff
Soft Cliff	Coastal Grassland	Coastal Heathland
Acid/Neutral Cliff	Basic Cliff	Acid/ Neutral Scree
Basic Scree	Limestone Pavement	Acid/ Neutral Rock
Basic Rock	Quarry	Spoil
Cave	Mine	Refuse-tip
Arable	Amenity Grassland	Ephemeral / Short Perennial
Introduced Scrub	Gardens	Caravan site
Sea wall	Buildings	Tracks (don't digitise)
Bare Ground	Dune Slack	Not Accessed Land

6. Does the area contain habitats of international importance?

7. If yes, which habitats of international importance? (note: order of entries may differ in)

Subtidal Sandbanks	Estuaries	Intertidal mud flats & sandflats
Lagoons	Shallow inlets & bays	Reefs
Annual Vegetation of drift lines	Coastal Shingle vegetation outside reach of waves	Vegetated sea cliffs
Glasswort & other annuals colonising	Cord- grass swards	Atlantic Salt Meadows
Inland saltmarshes	Mediterranean saltmarsh scrub	Shifting dunes
Shifting dunes with marram	Dune Grassland	Lime-deficient dune heathland, crowberry

Coastal dune heathland	Dunes with sea- buckthorn	Dunes with creeping willow
Dunes with juniper thickets	Humid dune slacks	Machair
Open Grassland, grey-hair & common bent of inland dunes	Nutrient poor shallow waters & aquatic veg on sandy plains	Calcium-rich, nutrient poor lakes and pools
Clear water lakes, aquatic veg. Poor-mod. Nutrient levels	Naturally nutrient rich lakes often dominated by pondweed	Acid Peat-Stained lakes and ponds
Mediterranean temporary ponds	Turloughs	Wet heathland with cross leaved heath
Rivers & floating veg. Often dom. By water crowfoot	Wet heathland, dorset heath, cross leaved heath	Dry heaths
Dry coastal heaths with Cornish heath	Alpine and sub-alpine heaths	Mountain willow scrub
Natural box scrub	Juniper on heaths or Calcareous grasslands	Grasslands on soils rich in heavy metals
Montane acid Grasslands	Alpine and Subalpine calcareous grasslands	Purple moor grass-meadows
Dry grasslands/scrublands on chalk or limestone	Dry grasslands/scrublands on chalk or limestone (including important orchid sites)	Species rich grassland with mat-grass in upland areas
Tall herb communities	Lowland hay meadows	Mountain hay meadows
Active raised bogs	Degraded raised bogs	Blanket bog
Transition mires and quaking bog	Depressions on Peat substrates	Calcium –rich fen dominated by great fen sedge
Hard-water springs depositing lime	Calcium- rich spring water fed- fens	High altitude plant communities associated with areas of water seepage
Acidic scree	Base-rich scree	Plants in crevices in base-rich rocks
Plants in cervices on acidic rocks	Caves (not open to the public)	Sea Caves
Limestone pavements	Beech forests on acid soils	Beech forests on neutral to rich soils
Oak hornbeam forests	Mixed woodland on base-rich soils assoc.with rocky slopes	Dry oak dominated woodland
Western acidic oak woodland	Caledonian forest	Bog woodland
Alder woodland on floodplains	Yew dominated woodland	

8. Does the area contain BAP habitats?

9. If Yes, which BAP habitats?

Upland Oakwood	Lowland beech and yew woodland	Upland mixed Ashwood
Wet woodland	Lowland mixed Deciduous Woodland	Wood-pasture & Parkland (previously Lowland wood pasture and parkland)
Hedgerows (previously Ancient and/or species rich hedgerow)	Cereal field margins	Coastal and floodplain grazing marsh
Lowland meadows	Lowland Calcareous Grassland	Upland Calcareous Grassland
Lowland Dry Acid Grassland	Lowland Heathland	Upland Heathland
Purple moor Grass and Rush pastures	Fens	Reedbeds
Lowland raised bog	Blanket bog	Mesotrophic Lakes
Eutrophic standing waters	Oligotrophic Lochs& Lakes	Aquifer Fed Naturally Fluctuating Water
Ponds of high ecological value	Dynamic Gravel Bed	Montane Heath
Limestone Pavements	Rock Outcrop & mine Spoil Rich & Slope	Maritime Cliff & Slope
Coastal Vegetated Shingle	Coastal Sand Dunes	Sabellaria alveolata reefs
Intertidal chalk (Previously Littoral& sublittoral)	Seagrass beds	Coastal saltmarsh
Intertidal Mudflats (Previously)Mudflats	Sheltered Muddy gravels	Sabellaria spinulosa reefs
Tidal Rapids	Modiolus Beds	Mud habitats in Deep Water
Serpulid Reefs	Maerl Beds	Saline Lagoons
Sublittoral Sand& Gravel	Lophelia pertusa Reefs	
Rivers (new 2008)	Oligotrophic and Dystrophic lakes	Ponds
Traditional Orchards	Upland Flushes, Fens and Swamps	Mountain Heaths and Willow Scrub
Inland Rock Outcrop and Scree Habitats	Calaminarian Grasslands	Intertidal boulder communities
Peat and Clay exposures	Open Mosaic habitats on previously developed land	

Shaded entries are the new priority BAP habitats, or revised names, announced in 2008

10. Does the area contain protected sites?

11. If yes, which ones?

SSSI	SPA	SAC
Ramsar	NNR	AONB
LNR	Local wildlife site	pSNCI

12. Approximately what proportion of the Aspect Area is within the protected site?

0%	1-10%	11-20%
21-30%	31-40%	41-50%
51-60%	61-70%	71-80%
81-90%	91-100%	

13. Does the area support important species?

14. If Yes which species? (For each of the species, also note the source of information)

15. Are there any significant threat species present in abundance? (Field visit required)

16. What other features significantly influence the biodiversity in this area? (What can be confidently identified from aerial photos, OS data and familiarisation field visit?)

Streams	Ponds	Wet Ditches
Walls	Hedgerows	Veteran Trees
Fence Lines	Earth Banks	Rock Outcrops
Caves	Mine Shafts	Other (Please specify)

17. Are any of these features in very good condition? (Field visit required)

18. Are any of these features in a poor condition? (Field visit required)

19. What are the main land management activities taking place in the area? (Field visit required)

Cultivation	Burning	Cutting
Draining	Fencing	Flailing
Flooding	Game Management	Stock Grazing
Irrigating	Mowing	Pest Control
Restoration	Scrub control	Tree felling
Other		

20. Do any of the above appear to have an appreciable positive impact on the condition of habitat? (Field visit required, use to advise management recommendations)

21. Do any of the above appear to have an appreciable negative impact on the condition of habitat? (Field visit required)

22. Is the biodiversity in the area in any way threatened?

23. Are there clear opportunities to improve the biodiversity of this area?

24. Summarise the key features that define this Area's biodiversity character

25. Value		
Outstanding	High	Moderate
Low	Unassessed	Details...

26. Condition		
Good	Fair	Poor
Unassessed		Details...

27. Trend		
Improving	Constant	Declining
Unassessed	Details...	

Recommendations

28. Existing management.	Generally appropriate	Generally inappropriate	Unassessed
29. Existing management remarks - Explain the management that is appropriate or inappropriate			
30. Principal management recommendations (Field visit required)			
31. Guidelines (up to 10) and indicate timescale (Field visit required)	Immediate	Medium Term	Long Term

Aspect Area Boundary

32. To what level was this information site-surveyed?		
Level 1	Level 2	Level 3
Level 4	Individual Site	None

33. At 1:10,000, how much of the Aspect Area boundary is precise?		
All	Some	Most
None	Explain	

34. What baseline information source was used for Aspect Area boundary mapping?		
OS Raster	Aerial photographs	OS Landline
Other, specify		

35. If OS Data was used, what was the scale?

1:10,000	1:25,000	1:10,000 and 1:25,000
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36. What is the justification for the Aspect Area Boundaries?

Evaluation Matrix

		Outstanding	High	Moderate	Low	Unassessed	Details (must be completed)
37.	Evaluation criteria: priority habitats						
38.	Evaluation criteria: significance						
39.	Evaluation criteria: opportunity						
40.	Evaluation criteria: expansion rates						
41.	Evaluation criteria: sensitivity						
42.	Evaluation criteria: connectivity / cohesion						
43.	Evaluation criteria: habitat evaluation						
44.	Evaluation criteria: importance for key species						
45.	Evaluation criteria: Overall Evaluation Give details						
46.	Justification of Overall Evaluation.						

Bibliography

47. List the key sources used for this assessment.

Assessment

48. Additional Assessments.

49. Additional Comments

5.2 Definition of terms

Here, guidance is provided for completion of the Landscape Habitat survey form, except where the information to be entered is obvious or automated through the use of drop down

menus. Aspect Area Specialists should note that some sections can only be reliably completed after field visits have been undertaken. This is indicated in the table below.

Aspect Area Classification

Level 2 mosaics	Enter as text in the format: Mosaic (Level 2 habitat A + Level 2 habitat B + Level 2 habitat C) listing the habitats in approximate order of dominance.
Level 3 mosaics	Enter as text in the format: Mosaic (Level 3 habitat A + Level 3 habitat B + Level 3 habitat C) listing the habitats in approximate order of dominance.

No	Field name	Guidance notes
1	Date of monitoring	The monitoring process may have been carried out over a period of time. Note the date of the initial change detection study (Stages 1 & 2) and date of updating the survey record (Stage 3) if significantly different. The Log section automatically notes any activity and revisions to questions/fields and therefore can be used to note changes made during monitoring.
1a	Monitoring undertaken by	This field should be filled in to record all involved in the updating work, e.g. those involved at both Stage 1 and Stage 2 of the monitoring work, who led on the final amendments and who was consulted. The Quality Assurance Panel assessor will also be recorded here.
1b	Has this record been updated following monitoring work?	The three available options are self-explanatory
1c	Change indicated by	The monitoring table, completed at Stage 2 of the monitoring process, will supply this information.
1d	What has changed?	This will allow users to refer to the relevant fields to find out what changes have been detected (classification, description, evaluation, condition & trend, recommendations, boundaries). Therefore cross-check to ensure that monitoring changes are clearly stated in the relevant fields.
1e	Has the information been verified in the field?	Has a site survey been carried out or not? This may be updated following monitoring work.

2	Does this area have a special relationship with adjacent areas?	All Aspect Areas have at least some relationship with their adjacent areas. This field aims to identify where that relationship is of special interest. Consider, for instance, whether the area is important in terms of landscape connectivity, allowing dispersal of species between areas, or whether any management influences in one area might have knock-on effects for another.
3	Total land area within the boundary (hectares)	The total area of land within the Aspect Area should be calculated from the GIS and expressed in hectares. In part it is needed so that the areas of particular habitats within the Aspect Area can be expressed as percentages of the total.
4	Soil types	This requires an understanding of the Soil Survey data, which may require specialist knowledge. However, this is important information in terms of future land use and should not be ignored. Recognising that a mix may be present, limit the selection to the three most widespread soil types within the area.
5	Areas of Phase 1 habitat types	The availability of Phase 1 habitat survey data for Wales in digital format enables a detailed description of habitat composition of each Aspect Area. Use of GIS tools will enable the amounts of habitats to be calculated for the Aspect Area, at the finest level of detail available from Phase I. Enter these amounts and let the <i>LANDMAP</i> software to express these as a percentage of the total Aspect Area. The most five abundant types (proportionately) will be displayed by the <i>LANDMAP</i> Information System. In certain Aspect Areas there may be significant change in the proportion of Phase I Habitats noticed on Air Photography being used and the 1990 Phase I Habitat Map, this is particularly the case around urban areas. Any changes in areas should be noted in this section of the form as an additional comment and can also be usefully highlighted under question 48 'Additional Comments'.
6-12	Approximately what proportion of the Aspect Area is within protected sites?	Paper-based and electronic information sources will have been accessed for protected sites within each Aspect Area. From these, the Aspect Specialist should provide a very approximate estimate of what percentage of the Aspect Area is covered by protected sites.
13	What are the key species for the area?	Requires an assessment of whether the area contains <i>significant populations</i> of any Red Data Book (RDB), Biodiversity Action Plan (BAP) or other important species, such as those legally protected by Schedules 1, 5 or 8 of the Wildlife & Countryside Act 1981 and amendments, or Annexes of the Habitat Directive 1994. Or identify key species for the area (e.g. abundance of rhos pasture, marsh fritillary, woodland known for lesser horseshoe bats, copse for dormice etc. This assessment can be made from existing data sources.
14	For each species selected, note	For quality assurance purposes, it is important to provide an audit trail for the species records. The drop down menu allows you to flag your own observations and also provides

	source of information.	insight into the data sources used. Full details should appear in the Technical Report.
15	Are there any significant threat species present in abundance?	<i>Threat</i> is defined as those species that represent an invasive threat to dominant, significant or endangered species or habitats. Most areas will contain at least one specimen of at least one threat species. However, the entries here should highlight areas where there are appreciable populations of threat species, i.e. where there is real cause for concern. Usually requires field visit.
16	What other features influence significantly the biodiversity character of this area?	Use this field to highlight additional habitat features, which by virtue of their abundance or effect on the landscape, contribute significantly to the biodiversity character of the area. These features are often an important part of the fabric of the landscape, whilst providing valuable additional habitats for species and serving to link Aspect Areas. Usually requires field visit.
19	What are the main land management activities taking place in this area?	These fields are completed to indicate where there is significantly widespread evidence of certain key management techniques. Not all management activities can be recorded and so the emphasis is on the main ones of relevance to the presence and welfare of biodiversity habitats and species. Usually requires field visit.
20	Which appear to have an appreciable positive impact on condition of habitat?	Positive management impacts are to be encouraged, for example controlled burning where this is done in appropriate locations and seasons. It is important, therefore, to highlight such examples so that land managers may seek to further or enhance such management. Usually requires field visit.
21	Which appear to have an appreciable negative impact on condition of habitat?	Where it is obvious that land management practices within any Aspect Area are having a widespread negative impact on biodiversity resources, <i>LANDMAP</i> has a role of play in identifying such problems. Usually requires field visit.
22	Is biodiversity in the area in any way threatened?	In addition to threats arising from invasive species (considered elsewhere), a wide variety of anthropogenic impacts and disturbances may be encountered within individual Aspect Areas. Examples include: unsympathetic management, neglect, urban development, recreation, grazing pressure, afforestation, pollution, drainage, quarrying etc... (note that this is not an exhaustive list)... Threats such as these should be recorded with reference to their likely impacts upon biodiversity characteristics of the Aspect Area... (This question usually requires a field visit)
24	Are there clear opportunities to improve the biodiversity of the area	If there are clear activities which would improve the biodiversity of the whole Aspect Area these should be explained in this section.

	Summarise the key features that define this area's Landscape Habitat character	<i>The purpose here is to summarise the above detailed information in Part III of the form and provide a succinct description of key biodiversity features, including habitat quality, notable features, species interests, opportunities, threats, management issues etc.. The description should focus on the characteristics and features that distinguish this particular Aspect Area.</i>
25	What is the overall Value of the Aspect Area?	The overall value of the Aspect Area is recorded here, for a full explanation of how the evaluation was reached you should refer to questions 37 to 45 where the Landscape Habitat 'Evaluation Matrix' is presented and guidance for its completion is given. The matrix is included in the form so that the judgements made are transparent to all. Usually requires field visit.
26	What is the overall condition of this Aspect Area? Usually requires field visit.	Condition refers to the <i>current physical state</i> of an Aspect Area at the time of the assessment. It refers to the overall Aspect Area, rather than individual elements within it. The concept is to establish that even though a particular Aspect Area may be, for instance, of high or outstanding value, it may also be that the Landscape Habitat content of the Area is degraded so may be assessed as being in poor condition. A baseline for assessing condition should be that "fair" condition is the <i>lowest acceptable</i> condition for an Aspect Area of this class in Wales. Those that are significantly above that lowest acceptable condition should be assessed as in good condition, and those below as in poor condition. The values available for condition are: <ul style="list-style-type: none"> • Good: Aspect Area is predominantly in good health as assessed against the lowest acceptable condition • Fair: Aspect Area is predominantly in the lowest acceptable condition • Poor: Aspect Area is in predominantly poor health as assessed against the lowest acceptable condition • Unassessed: Insufficient information exists to evaluate the condition of this Aspect Area
27	Trend	Give an indication within this section if the Aspect Area is increasing or decreasing in biodiversity value, explaining your justification for your analysis. This section will usually require a field visit and good data of the Aspect Areas current and past condition and value, it is therefore unlikely to be filled in on the initial study, unless the whole Aspect Area is documented in a past piece of work. An example of this is where large commons in Wales were visited in the early 1990's by the 'Common Land Survey of Wales' which would include notes on the condition and value. This information could be used to make a decision on the trend of the Aspect Area.

28-31	Recommendations and Guidelines	<p>The purpose of this information is to provide the decision-maker with an informed judgement on how the particular qualities identified in an Aspect Area might best be managed. Although some obvious management recommendations may be justified on the basis of desk research only, the most useful management recommendations are only likely to be formulated after field surveys. For this reason, the inclusion of detailed management recommendations is considered optional, to be provided only if sufficient knowledge and experience of an Aspect Area has been attained.</p> <p>Up to three priority recommendations can be entered. The management recommendations should detail proposals that strengthen and consolidate the Landscape Habitat character of the Aspect Area. LANDMAP surveyors may identify important opportunities to improve or enhance the biodiversity resources within an Aspect Area, e.g. habitat creation or restoration, landscape zonation, grazing introduction, rotational management, sustainable use, education etc Urgent means that the prescribed action should ideally be taken immediately or certainly within two years. Remember that the recommendations should pertain to the overall Aspect Area, though implementation would most likely take in specific land parcels within it. Links to LBAP or UKBAP recommendations could be used.</p>
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32	To what level was this Aspect Area surveyed?	Resources may not allow all administrative areas to be surveyed or to be surveyed to Level 3 detail. This question is designed to record the level of detail to which the Aspect Specialists surveyed the study area.
33	Aspect Area Boundary and how much of the boundary is considered to be precise?	<p>This question aims to provide some information about the accuracy of the line that defines the perimeter of a particular Aspect Area. Within a GIS, the line drawn around an Aspect Area has no width. This means that as the viewer zooms in on the line it doesn't appear to get thicker as it might on a conventional paper map. This has meant that some viewers perceive greater line accuracy than the Aspect Specialist intended. In order to counter this, the Aspect Specialist should record whether the lines are considered precise or not.</p> <p><i>“Precise” is defined here as following specific landscape elements, e.g. distinct habitat units, hedgerows, tracks, buildings, which are recognisable at a scale of 1:10,000.</i> It may be that some of the boundary is exact and other parts are not, in which case the Aspect Specialists may feel that the basis of this judgement requires refinement in due course.</p>
34-35	What baseline data was used to	It is important that as far as possible boundaries follow recognisable features on the ground, whether these are gleaned from the OS maps, the air photography or the

	distinguish the boundary?	existing Phase I maps will help the user understand why the boundary fall in a particular place.
36	Justification for the Aspect Area boundary	It is very important that the user understands why the Aspect Area boundary has been drawn as it has, and a full explanation should be given here justifying the inclusion and exclusion of features on the ground.
37-45	Evaluation Matrix	See evaluation section
46-48	Supplementary information	<p>Assessors and assessment dates: Noted every time the form is substantially updated</p> <p>Information sources and bibliography: Any literature that pertinent to this Aspect Area should be noted. References that relate to the whole study area should be noted only once in the Technical Report to avoid repetition. Enter as text in formats like: Bloggs 1990; Bloggs et al. 1990, Bloggs 1990a; Bloggs 1990b. These should cross-referable to a bibliography in the Technical Report.</p> <p>More detailed studies: If more detailed studies within the Aspect Area have been carried out then this should be noted for further reference.</p> <p>Comments by Assessor: This is for the Aspect Specialist to make notes about the process of description undertaken in this section of the form. They may wish to explain as succinctly as possible the basis for a difficult decision, or perhaps where they felt that the answer they might have given was not available to them.</p>
	Date of desk work & Date of field work	Enter as text in formats akin to: April-June 2000; December-February 2000/01

6 Evaluating Aspect Areas

The Aspect Specialist aims to establish an evaluation of intrinsic value based on a professional understanding of the Landscape Habitats character of the landscape. Pre-defined assessment criteria are provided in a matrix. The matrix is completed within the survey form for each Aspect Area after collecting all information on which the evaluation is to be based. The evaluation is then summarised with an overall evaluation and justification. The summary needs to be carefully worded as it may be used for secondary products such as designation or in development management and decisions.

No.	Evaluation Criteria	Definition
37	Priority habitats	In particular, those most characteristic of the area, rarity in national context. Priority Habitats are explained in terms of those habitats most characteristic of the area,

		although where there are significant areas of high quality habitats for example SSSI's these should be described:
38	Significance	This addresses the issue of whether the Aspect Area contains a high % of national resource e.g. Is a habitat confined to the area or does the area have a high proportion of the national resource?
39	Opportunity	Opportunity is scored according to how easy it would be to enhance any existing moderate, high or outstanding habitats
40	Expansion rates (Formally Decline rates)	Increases in the semi-natural and valuable habitats and species assessed over the last 25 years
41	Sensitivity (Formally threats)	How sensitive the area is to changes in land management and other practices that could adversely affect the biodiversity.
42	Connectivity / cohesion (Formally fragmanetation)	Describe how well the Aspect Area functions in terms of interconnection networks and corridors for native habitats, which will allow for species movements and protect and enhance biodiversity.
43	Habitat evaluation	
44	Importance for key species	Is the area known to be of special significance for one or more important species?
45	Overall Evaluation Habitat and Species	This should be an overall assessment of how important the area is for both Habitats and species.

For each criteria the importance of the qualities within the Aspect Area are scored on the following scale with the suggested interpretation of each category in the second table.

Outstanding	Of international or national importance to the Aspect for example large areas of the Aspect Area have an internationally important designation e.g. Special Area of Conservation (SAC) or contain a cohesive and extensive network of internationally important habitat types or support large populations of internationally significant species.	
	High	Of regional or county importance to the Aspect e.g. the area contains a large proportion of sites of Special Scientific Interest (SSSI) or similar quality habitat.
	Moderate	Of local importance to the Aspect e.g. areas contain a network of habitats of local importance such as Local Nature Reserve or Sites of Nature Conservation Interest, or there are good proportions of common habitats that link to form important corridors of resources.
	Low	Of little or no importance to the Aspect
	Unknown	Insufficient information exists to evaluate this Area

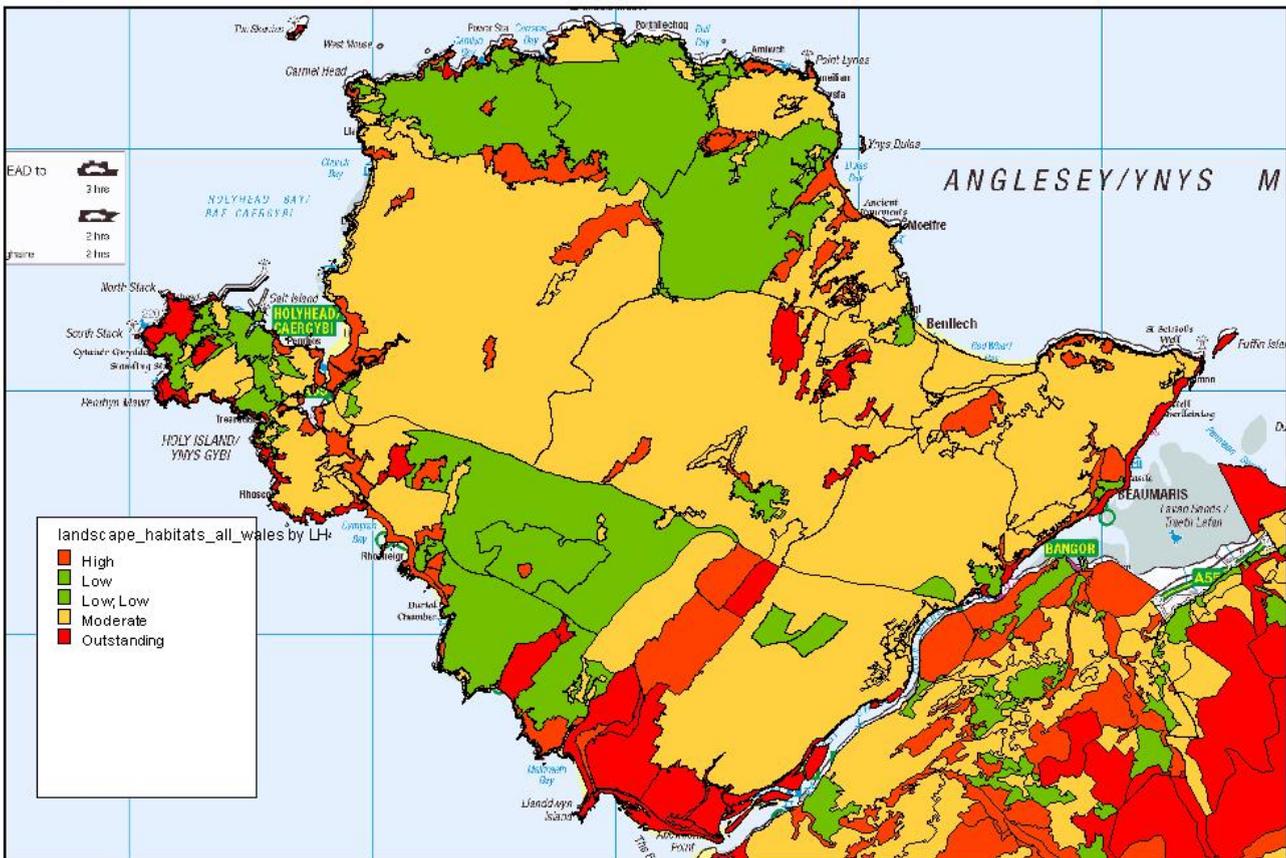
Evaluation Criteria	Outstanding	High	Moderate	Low
<p>Priority Habitats</p> <p>Priority Habitats are considered in terms of those habitats most characteristic of the area, although where there were significant areas of high quality habitats for example SSSI's these were described.</p>	<p>Outstanding value areas are either internationally important or nationally significant with the majority of the Aspect Area comprising National or Local BAP habitats or substantial percentage of SSSI habitats. Areas may also have high concentrations of protected species.</p>	<p>High importance is given where there are areas of national importance e.g. SSSIs which are enhanced by local features such as dense hedgerows, standard trees, species-rich areas or scrub and blocks of woodlands which form wildlife corridors. It will also include areas where many diverse habitats are linked together by hedges and or streams or there are important areas for protected species.</p>	<p>Moderate habitats are those with a local importance. This includes areas of more intensively farmed land where there are still well managed stock-proof hedges and occasional areas of native vegetation for example; fragmented woodland blocks.</p>	<p>Low value habitats are where the landscape is mainly low diversity sown grass swards or arable land where fields are very large and have post and wire fences. Large urban areas with little green space and lacking in biodiversity networks are also classed as low value.</p>
<p>Significance</p> <p>Addresses the issue of whether the Aspect Area contains a high % of national resource.</p>	<p>Outstanding Aspect Areas contain a significant proportion of very valuable BAP habitats and habitats of international importance.</p>	<p>High significance can be awarded to Aspect Areas which contain important representation of BAP habitats or where there are smaller but extremely important examples of a particular habitat which can be enhanced by</p>	<p>Moderate importance can be awarded where the Aspect Area contains local BAP or other native or semi-natural habitats which may be draft Local Wildlife Sites; which although being fragmented still form a</p>	<p>Low significance occurs where the Aspect Area contains little or no significant national or local, native or semi-natural communities.</p>

<p>Opportunity (to enhance resource)</p> <p>Opportunity should be scored according to how easy it would be to enhance any existing moderate, high or outstanding habitats</p>		features in the surrounding area, for examples linking hedges, copses of woodland or small ponds and streams.	small proportion of the Aspect Area.	
	Outstanding is applied to areas adjacent to large, outstanding BAP habitats which with suitable management or minimal restoration would revert easily to these native habitats.	High should be awarded where some input and change to management practice of more important habitats of national and/or local significance could be formed which could enhance the overall biodiversity of the area and make larger areas of high quality resource.	Moderate opportunity is awarded where either much effort would be needed to restore medium sized blocks of native habitats or where smaller changes to management practices would restore only small blocks of more fragmented communities.	Low importance should be given to areas where very significant effort or very large areas would need to be restored in order for the Aspect Area to form a significant part of the biodiversity network.
<p>Expansion rates</p> <p>Increases in the semi-natural and valuable habitats and species assessed over the last 25 years</p>	Outstanding expansion rates are where there has been a significant increase in the amount of important semi-natural habitats over the last 25 years.	High expansion rates are where there has been a small increase in habitats or habitat networks within the Aspect Area over the last 25 years	Moderate expansion rates are where the aspect area has a stable amount of semi-natural and important habitats over the last 25 years	Low expansion rates are where there has been a loss in semi-natural habitats over the Aspect Area within the last 25 years
<p>Sensitivity</p> <p>How sensitive the area is to changes in land management and other</p>	Robust semi-natural ecosystems well protected against adverse changes by active	Robust habitats where the management practices are not degrading	Sensitive habitats which could be prone to damage by smaller changes in	Sensitive ecosystems being actively damaged by management of the area or

practices that could adversely affect the biodiversity.	management regimes.	the habitats to any extent.	management practices etc of the area	surrounding areas.
Connectivity / cohesion Describe how well the Aspect Area functions in terms of interconnection of networks and corridors for native habitats which will allow for species movements and protect and enhance biodiversity	Large cohesive areas of sufficient habitats strongly related to other native areas	Larger blocks of habitat giving viable sites for many species, or moderate sized blocks linked together without significant breaks.	Where blocks of habitat are small they are connected through a network of hedges, streams or rivers to allow species to travel along biodiversity corridors.	Very little native habitats scattered throughout the landscape
Habitat evaluation	All of the outstanding conditions met	Mostly high conditions met but if lower in some aspects outstanding in others	Overall of moderate value although with some high and some low features.	Mostly low value features described
Importance for key species	Records of BAP species, protected species and species of international importance or where such species is represented by a particularly significant population.	Many records of local or national BAP species and of importance nationally	Local BAP species recorded as present or old records for important species but not recorded for over 15 years.	No records of important species either local BAP or national BAP or protected species'
Habitat and species evaluation	Both species and habitats are of international importance and form a very substantial part of the Aspect Area.	Either the species or the habitats are of national importance.	This will be awarded if either the species or the habitats have moderate importance.	Habitats and species have no particular importance

<p>Justification of overall evaluation</p>			<p>Where there is a nationally scarce species such as the otter but the habitats are only locally important then the overall evaluation will be taken as moderate</p>	
	<p>This section summarises all the information in the table so that it can be viewed with the polygons as a stand-alone field.</p>			

Landscape Habitats Aspect Area and Evaluation thematic map for Ynys Môn (Anglesey)



Produced by NRW on: 17 July 2013
 Scale 1:205627

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Cyfoeth Naturiol Cymru
 Natural Resources Wales

7 Technical Report

To support the Landscape Habitats survey the Aspect Specialist submits a Technical Report for the Landscape Habitats aspect so that the justification and explanation of key decisions is made transparent.

Format and content of Technical Reports

- Executive Summary (500 words) in Welsh and English
- Contents page
- Methodology: If the prescribed LANDMAP guidance was followed then the Aspect Specialist does not need to reproduce the methodological description.
- Overview: A summary description of the Landscape Habitats aspect for the whole study area bringing out the most important characteristics and key issues.
- Information sources and data sets used including full details of consultations, date, personnel involved and outcomes
- References
- Justifications and judgements of any decision that may cause confusion. Areas where such texts are likely to be needed include:
 - Justification of approved additions to, or departures from, the prescribed hierarchical classification system, although such deviations are generally not permitted.
 - Explanation of potentially contentious decisions about individual Aspect Areas.
 - Elaboration on the justifications of evaluations for any potentially contentious decisions about individual Aspect Areas.

8 Monitoring

A robust, repeatable and standardised monitoring methodology has been developed to facilitate the process of identifying Aspect Areas where significant change has occurred. This methodology is described in full in the LANDMAP Monitoring Methodology (2016) and uses a range of mapped data, including processed information derived from remote sensing, to identify areas of potentially significant landscape change.

The following may provide useful insights in interpreting the materials available during monitoring.

Change in Segment Density (complexity)

Changes in Segment Density (i.e. complexity) can be useful for indicating changes to main habitat types either with more segments as areas become more heterogeneous with scrub and bracken, or a decrease as they become less diverse with a change to improved grassland. An increase in complexity can also result from the conversion of agricultural land to housing, or the development of scrub across upland heathland. A decrease may represent the conversion of the latter to grassland or the removal of woodland. As such changes are mapped by Aspect Area, however, it is necessary to further investigate any identified Aspect Areas where change has apparently been significant to help pinpoint the exact location of such changes and thereby assess their significance.

Normalised Difference Vegetation Index (NDVI)

NDVI indicates changes in biological productivity, for instance increases due to the 'improvement' of grassland or a decrease due to development or the restoration of a more natural vegetation cover. In the context of LANDMAP monitoring, changes identified using NDVI can help explain changes in the complexity identified through the Change in Segment Density analysis and indicate where this has taken place (as the data is mapped

on a point rather than Aspect Area basis). Used in conjunction with Phase 1 habitat mapping and aerial photographs these maps can, for instance, help resolve if the identified changes relate to afforestation, which can be a normal management process or result in a significant landscape change if the type of forestry replanted changes or is replaced by another habitat type.

Ordnance Survey MasterMap

Most changes highlighted are likely to be minor and associated with urban or industrial areas. Unless on a large scale these changes are not likely to be significant in the context of a much broader Aspect Area. Note: Although most accurate in urban areas, Ordnance Survey digital mapping does not always record significant changes in rural areas, and as a consequence may not be reliable as an indicator of change in such areas. In addition, mineral workings, mineral and waste disposal areas and some natural features such as sand dunes are also commonly not fully mapped, for instance lacking contours or water bodies. As a result Ordnance Survey mapping is not suitable for assessing such areas and referral must be made to aerial photographs.

Phase 1 Habitat Classification

Used in conjunction with Seasonal Change maps, Phase 1 habitat maps are an essential tool for assessing changes to Landscape Habitats as they provide information about vegetation type and productivity which can help determine whether changes highlighted through other methods, for instance NDVI, are potentially relevant. The updated map has a finer spatial resolution and it must be remembered that this may be a better recording of the extent of existing features rather than the development of new vegetation features, the 2000 aerial photography should be consulted as a guide to aid interpretation.

Seasonal Change

Used in conjunction with Habitat classification maps, Seasonal Change maps are useful for assessing changes to Landscape Habitats Landscape as they provide information about vegetation type and productivity which can help determine whether changes highlighted through other methods, for instance NDVI, are potentially relevant.

Aerial photographs

Aerial photographs can be extremely useful for investigating the significance of changes identified through other mapped data resources although in some cases assessment of any identified changes may remain inconclusive. In such cases, a site visit to assess the significance of any change may be necessary.

9 Quality Assurance

To ensure national consistency and high standards, LANDMAP information is Quality Assured before any datasets are approved and made available. The methodology is described in full in the LANDMAP Quality Assurance Methodology.

Aspect Specialists submissions for quality assurance should be comprehensive and include:

- A single GIS layer defining Aspect Areas
- Aspect Area surveys
- A comprehensive Technical Report/Monitoring Table
- Supplementary information as required. Documentation, including correspondence, survey maps and field data sheets should be retained, in the event that they are required.