LANDMAP Methodology Overview

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(Please note this is an information document and not a training presentation)

LANDMAP

- An **all-Wales landscape resource** where landscape characteristics, qualities and influences on the landscape are recorded and evaluated in a nationally consistent data set

- A **whole landscape approach** that covers all landscapes, designated and non-designated, it covers natural, rural, peri-urban and urban areas, (excluding the Cities of Cardiff and Swansea) and it includes inland waters and coastal areas to the low water mark

- Captures information about landscapes in a digital based resource, providing **easily accessible landscape information**

- LANDMAP

  - Maps and classifies landscapes

  - Describes their characteristics, qualities and components

  - Evaluates their importance from a national to local scale, records their condition & trend

  - Recommends locally appropriate management guidelines

- Collected in a structured, consistent and rigorous way that is defined by the LANDMAP methodology chapters (accessible from http://naturalresources.wales/Landmap)

How is LANDMAP data held?

- **LANDMAP is managed as a spatial dataset**

- Spatial data consists of observations (surveys in LANDMAP) with locations (mapped geographic areas)

- Geographical Information System (GIS) software records and displays this spatial data

What does LANDMAP look like?

LANDMAP divides Wales into discrete geographical areas known as **aspect areas** (polygons in GIS)

- Each aspect area is identified by its own landscape characteristics and qualities, these will be different from adjacent aspect areas

- For each aspect area there is a **survey record** of landscape information

- There are 5 LANDMAP datasets consisting of aspect area maps and surveys unique to each perspective
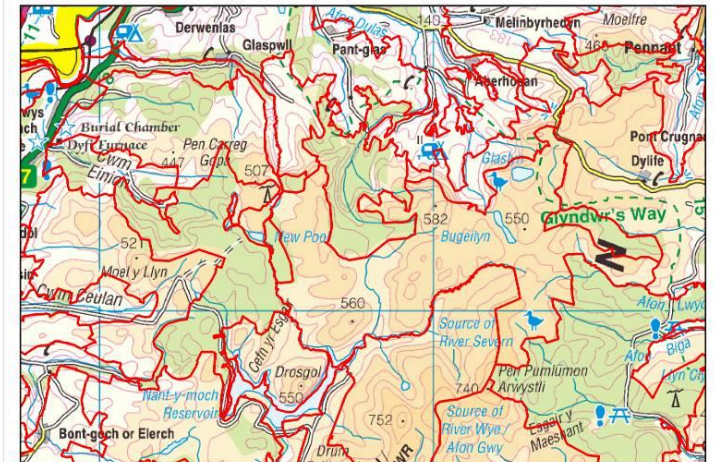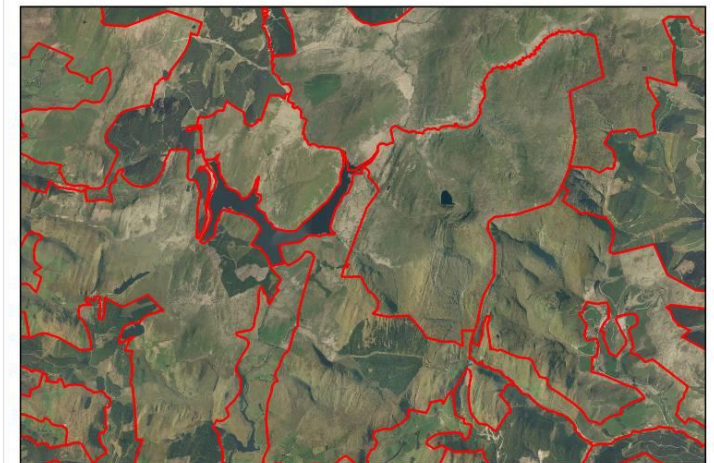

LANDMAP aspect areas are shown here by the red boundaries, with an OS or aerial photo base map.

3

LANDMAP: the landscape baseline for Wales

- The five LANDMAP spatial datasets are called the **Geological Landscape, Landscape Habitats, Visual & Sensory, Historic Landscape** and **Cultural Landscape**

- The thumbnail map images below illustrate the unique perspective captured by the five layers and the diversity between them, including the approximate number of surveys per dataset
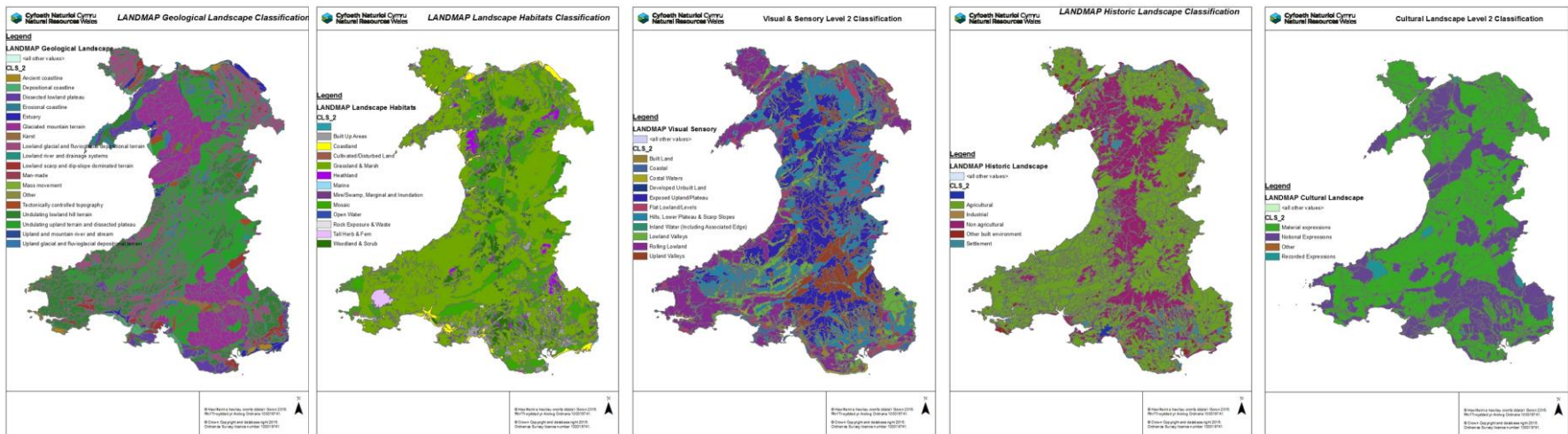
| Geological Landscape 2670 | Landscape Habitats 2738 | Visual & Sensory 1940 | Historic Landscape 2538 | Cultural Landscape 906 surveys |

- Collectively 10,000+ detailed surveys provide landscape information, capturing the interrelationships between people, places and resources – the DNA of landscapes in Wales

LANDMAP

- Champions many of the principles of the European Landscape Convention

- Is recognised as an *important information resource* in Planning Policy Wales 9 (2016, section 5.3.13)

- Evidence is consistent, transparent and Quality Assured

- Provides seamless landscape information at local and National Park planning authority boundaries

- 'Natural beauty' includes flora, fauna, geological and landscape features, as does LANDMAP in the 5 layers

- Provides a comprehensive baseline of environmental, cultural and heritage information to assist with sustainable decision-making at a range of levels from local to national scale whilst ensuring transparency in decision-making

- Is used to monitoring landscape change & trends using remote sensing and professional interpretation

- Builds landscape knowledge and supports capacity of small teams and limited resources

- Training and guidance encourages users to be proportionate, selective and focus effort on what matters

- By being publicly available it gives everyone an opportunity to take landscape into account when making decisions

5

LANDMAP Key uses

The **2016 LANDMAP planning authority survey** showed the following planning authorities (23/25 responses) use / intend to use LANDMAP in:

LDP	23
SPG/Development Management	20
Public Inquiries	19
Special Landscape Areas	17
Renewable Energy Studies	16
Forward Planning	16
Local Landscape Character Assessments	15
Strategic Environmental Assessment	15
EIA	13
Design Guidance	11
Countryside strategies, Green Infrastructure or natural resource plans	6

- Most LPAs are yet to use LANDMAP in relation to the creation of their Wellbeing plans (5 LPAs do/intend to)

- All National Parks and those respondents with AONBs use LANDMAP to inform their Designated Landscape Management Plans

- LANDMAP in 2016 is very well established in LPAs as an evidence base of landscape information

LANDMAP is also used in the **State of Natural Resources Reporting (SoNaRR)**, for example

Over 50% of Wales is nationally valued for its scenic quality and character, many Welsh landscapes are iconic with a clear sense of place and recognisable identity

46% has a negligible level of night time light pollution in 2015. Substantial night time light pollution (501 km2) contributes to a low landscape evaluation (SoNaRR, 2016)

6

LANDMAP Geological Landscape Classification

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Natural Resources Wales

Legend

LANDMAP Geological Landscape

<all other values>

CLS_2

- Ancient coastline
- Depositional coastline
- Dissected lowland plateau
- Erosional coastline
- Estuary
- Glaciated mountain terrain
- Karst
- Lowland glacial and fluvioglacial depositional terrain
- Lowland river and drainage systems
- Lowland scarp and dip-slope dominated terrain
- Man-made
- Mass movement
- Other
- Tectonically controlled topography
- Undulating lowland hill terrain
- Undulating upland terrain and dissected plateau
- Upland and mountain river and stream
- Upland glacial and fluvioglacial depositional terrain

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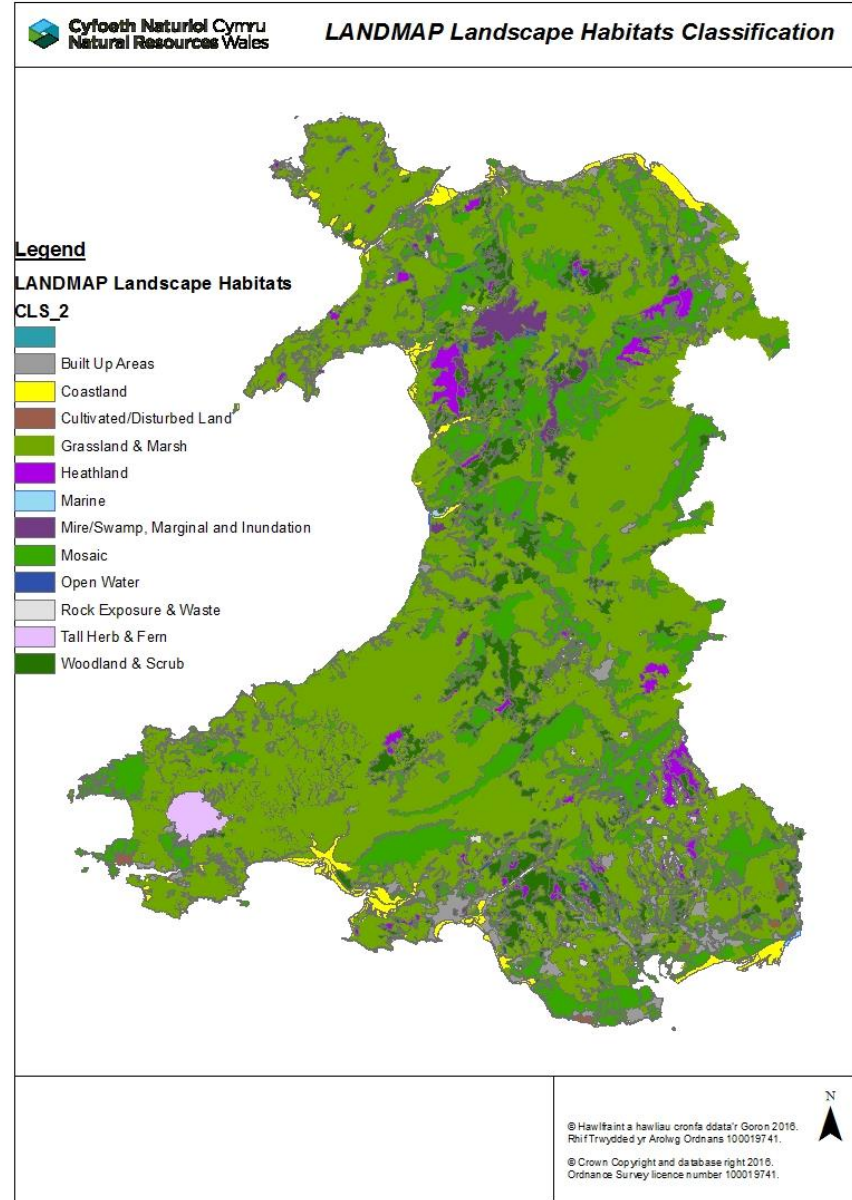Ordnance Survey licence number 100019741.

LANDMAP: Geological Landscape

- Considers the physical, primarily geological, influences that have shaped the contemporary landscape.

- Identifies those intrinsic landscape qualities which are linked to the control or influence exerted by bedrock, surface processes, landforms and hydrology.

- Emphasis is on the strongest influence in landscape generation through erosion (e.g. glacial cirques) or deposition (e.g. river floodplains), or a combination

- Examples of information recorded includes: characteristic components (features), geological and topographical character, current processes, educational value, rarity (rock types/fossils), mineral extraction and designations.
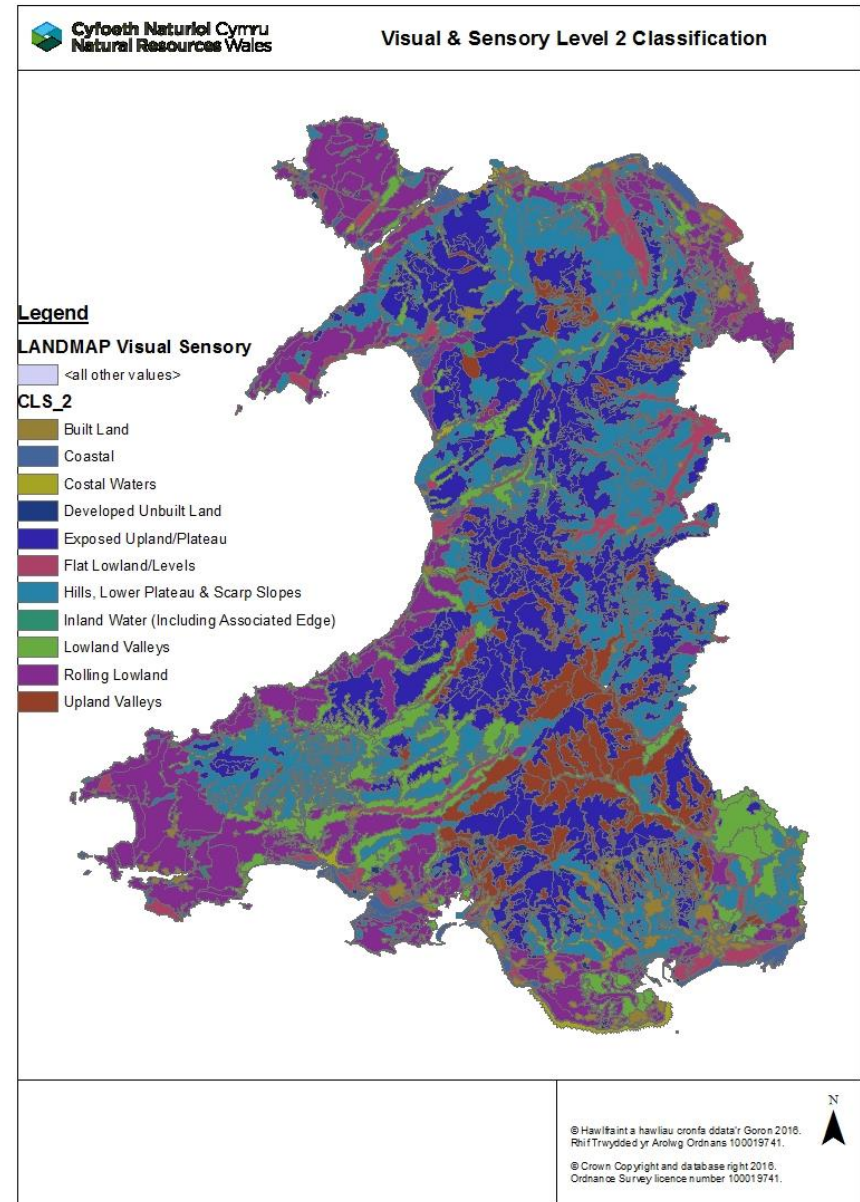
7
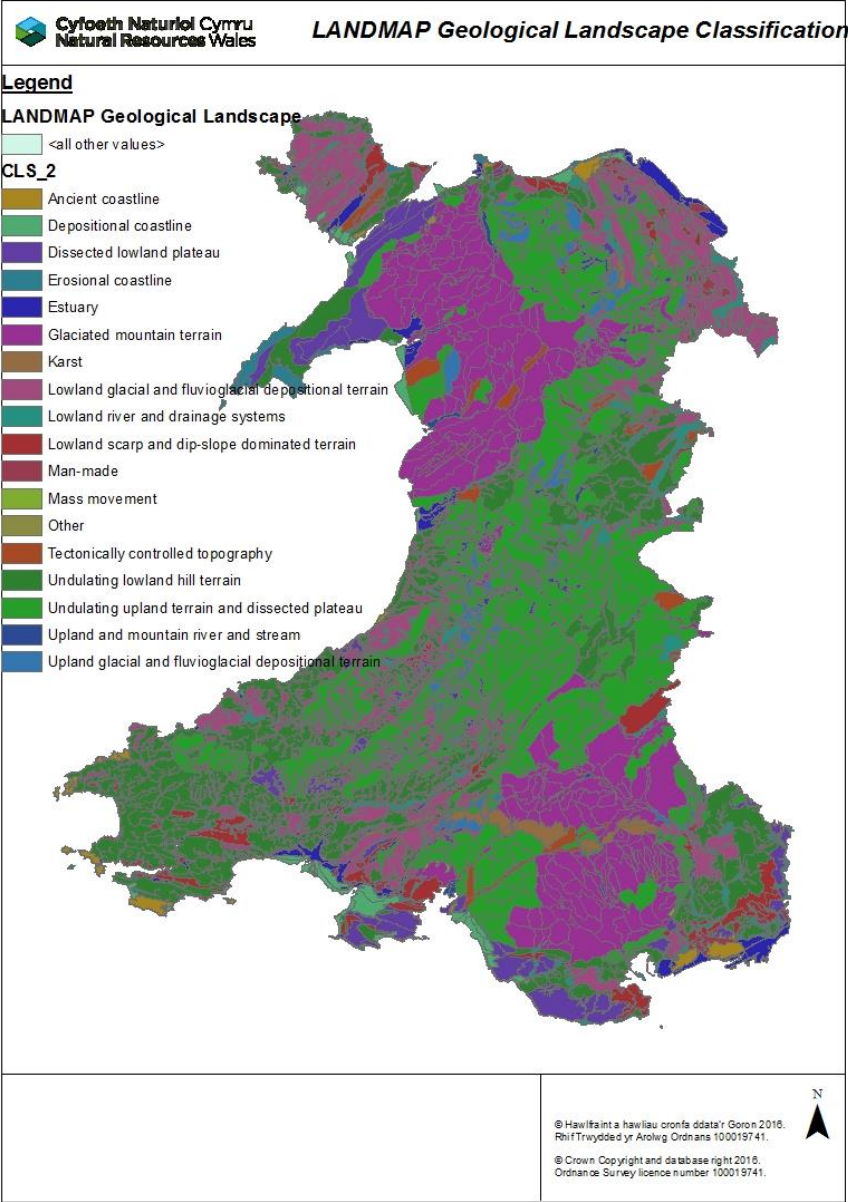
LANDMAP: Landscape Habitats

- Focuses on recording habitat features, characteristics and their spatial relationships within the context of the wider landscape

- Aspect Areas defined may encompass whole valleys, dominant habitats or a mosaic of habitats within an agricultural environment.

- Examples of information recorded includes: identifying key Phase 1 habitats present, habitat features (veteran trees, caves, ponds), protected areas, special sites or locally important sites, species, threat species, significance, fragmentation

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LANDMAP Landscape Habitats Classification

Legend
LANDMAP Landscape Habitats
CLS_2

- Built Up Areas
- Coastland
- Cultivated/Disturbed Land
- Grassland & Marsh
- Heathland
- Marine
- Mire/Swamp, Marginal and Inundation
- Mosaic
- Open Water
- Rock Exposure & Waste
- Tall Herb & Fern
- Woodland & Scrub

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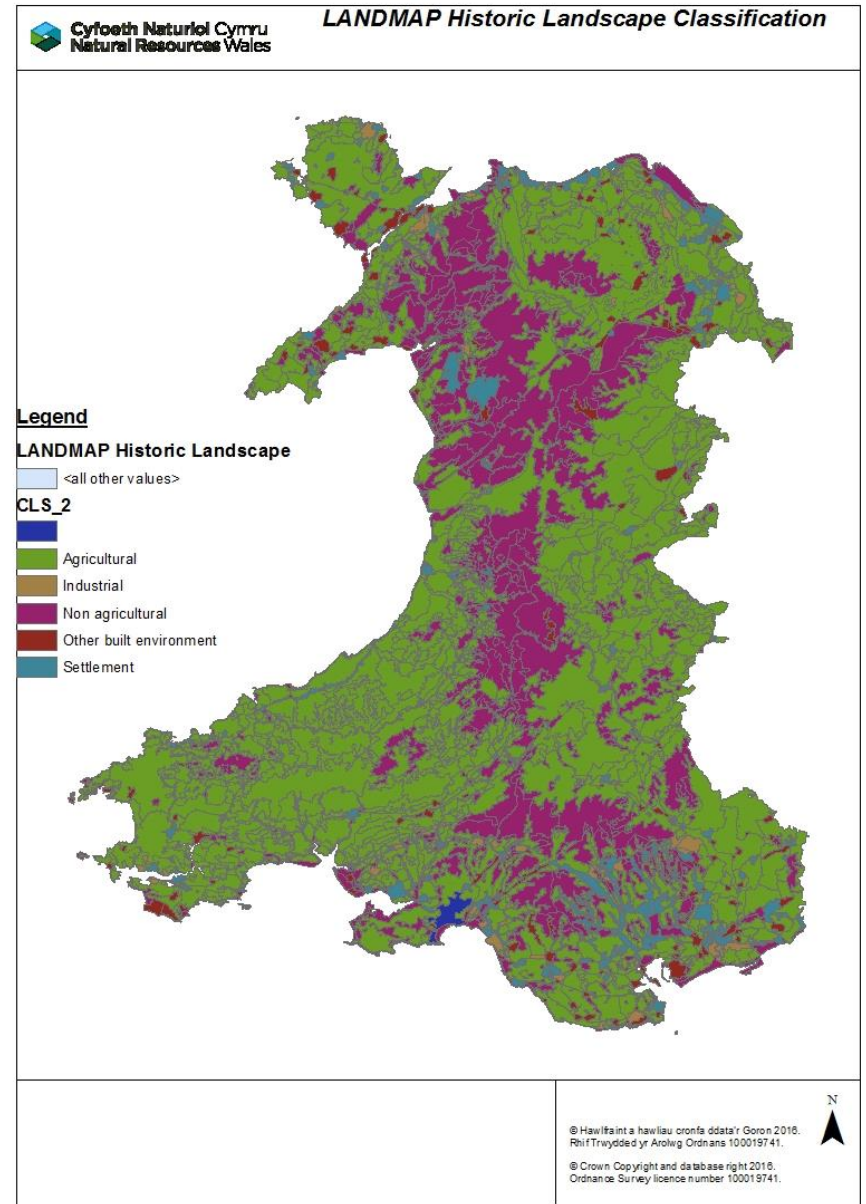
N

LANDMAP: Visual & Sensory

- Maps landscape characteristics and qualities as perceived through our senses, primarily visually.

- The physical attributes of landform and land cover, their visible patterns and their interrelationship.

- Examples of information recorded includes: Landscape elements and features, aesthetic presence of water and seasonality, important qualities, boundary type, scale, enclosure, diversity, colour, sense of place, night time light, building materials, views, scenic quality, rarity, integrity and character.

Cyfoeth Naturiol Cymru Natural Resources Wales

Visual & Sensory Level 2 Classification

Legend
LANDMAP Visual Sensory
<all other values>
CLS_2
- Built Land
- Coastal
- Costal Waters
- Developed Unbuilt Land
- Exposed Upland/Plateau
- Flat Lowland/Levels
- Hills, Lower Plateau & Scarp Slopes
- Inland Water (Including Associated Edge)
- Lowland Valleys
- Rolling Lowland
- Upland Valleys

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CPAT

LANDMAP: Historic Landscape

- Landscape characteristics that depend on key historic land uses, patterns and features.

- Identifies only those classes of historic land uses, patterns and features that are prominent and contribute to the overall historic character of the present landscape.

- Examples of information recorded includes: historic pattern and elements, designations, traditional boundary types, vernacular building style, features of archaeological interest in a landscape context, e.g. standing stones in a prehistoric environment

LANDMAP Historic Landscape Classification

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Legend
LANDMAP Historic Landscape
<all other values>
CLS_2
- Agricultural
- Industrial
- Non agricultural
- Other built environment
- Settlement

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Cultural Landscape Level 2 Classification

Legend
LANDMAP Cultural Landscape
<all other values>
CLS_2
- Material expressions
- Notional Expressions
- Other
- Recorded Expressions

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LANDMAP: Cultural Landscape

- Describes the links between landscape and people, from the way in which cultural, or human activity shapes the landscape, to the way in which culture shapes the way we respond to landscape.

- Focus is on mapping the landscape where it has been, or is being, shaped by a particular cultural activity or process, or where it has been directly represented, depicted or described in art, literature or folklore – the contemporary 'cultural essence'.

- Examples of information recorded and linked to the landscape includes: cultural context, character, influences, associations, artistic work, famous people/institutions, folklore, events, traditions, scientific discoveries, significant place names.

11
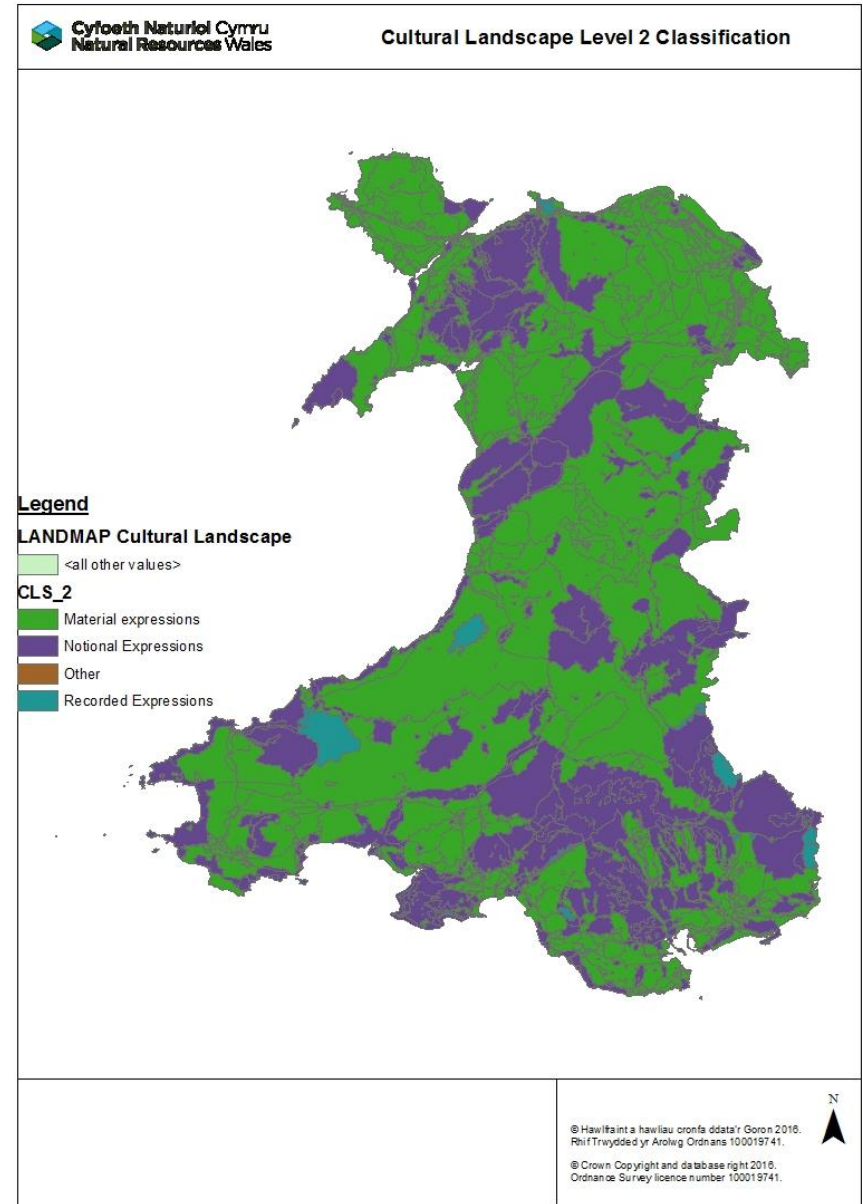
LANDMAP classification

- **All of Wales is mapped and classified** into geographically discrete areas.

- Thematic maps can be created showcasing how the landscape is classified in each dataset

- **Maps can illustrate patterns, diversity, distribution, rarity and commonplace**

- The higher the level in the **hierarchical**, **classification** (described in the methodology), the more detailed the classes

- The example (right) shows the Historic Landscape classification zoomed in at Level 3

- Slide 13 compares the same dataset but mapped at Level 2 and then at Level 3

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Natural Resources Wales

Historic Landscape Level 3 Classification

Legend
LANDMAP Historic Landscape
<all other values>
CLS_3
- Communications
- Designed
- Extractive
- Horticulture
- Irregular Fieldscapes
- Marginal Land
- Military
- Non-nucleated Settlement
- Nucleated Settlement
- Other Settlement
- Other fieldscapes
- Processing/Manufacturing
- Reclaimed land
- Recreational
- Regular Fieldscapes
- Water & Wetland
- Woodland

[Double click on "Legend" above to edit map legend]

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LANDMAP Classification at Level 2 (left) & Level 3 (right)
Example shown for Historic Landscape

13
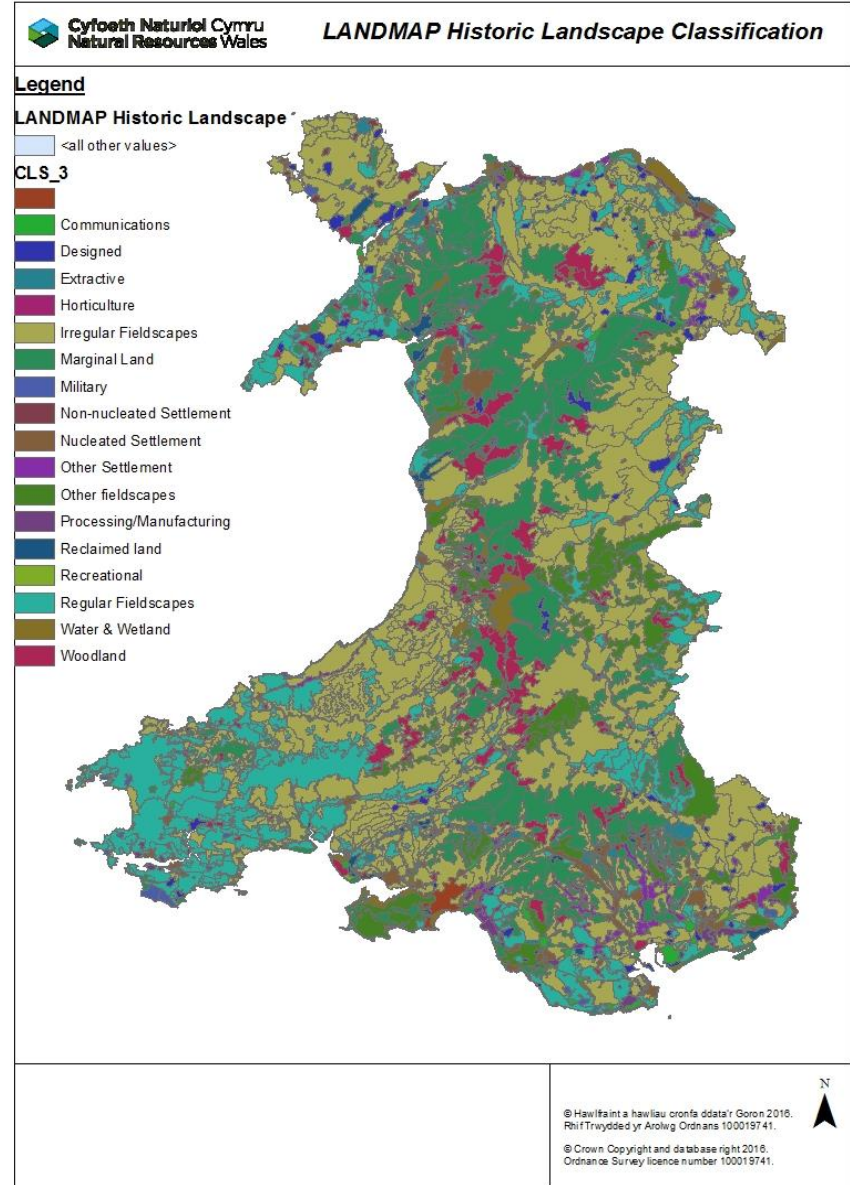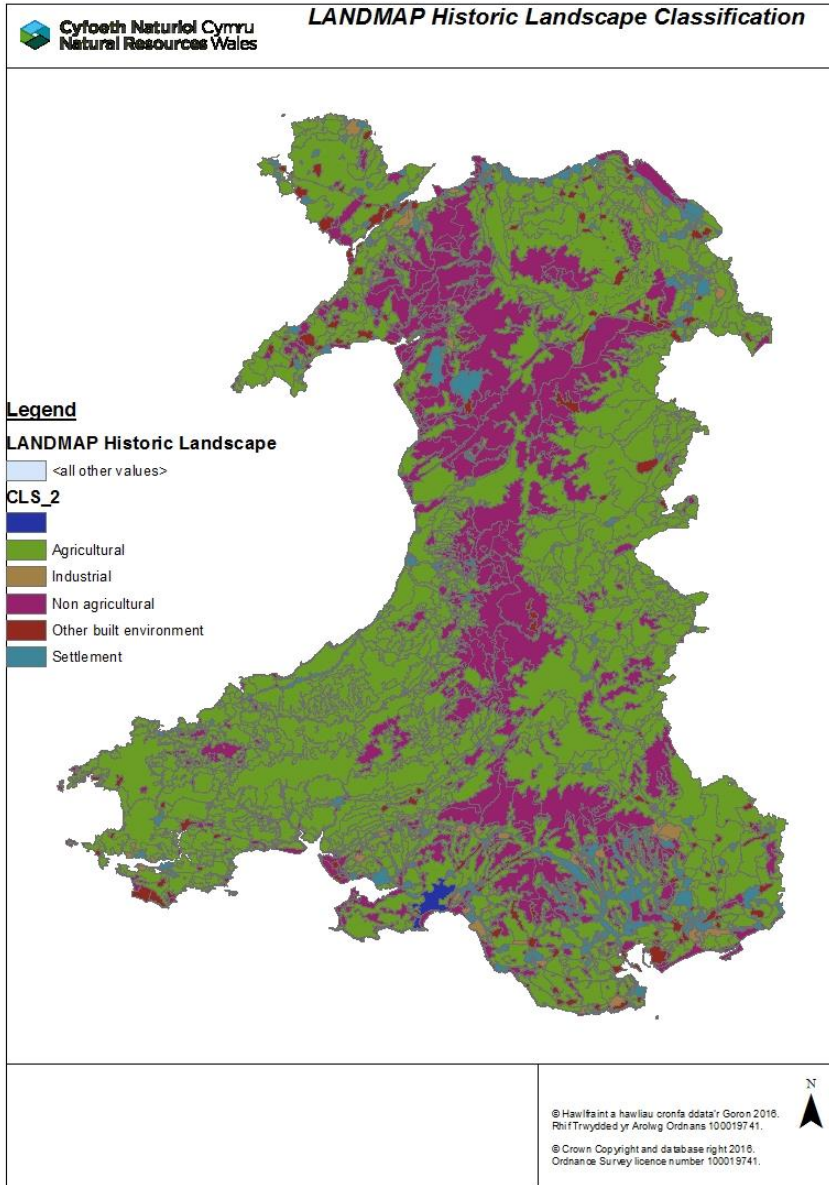
LANDMAP evaluation

- All of Wales is evaluated from a local to a national scale of landscape importance. The terms used include:
  - Outstanding: nationally important
  - High: regional or county importance
  - Moderate: local importance
  - Low: little or no importance

- **Evaluation criteria** specific to each LANDMAP dataset underpin the evaluation process

- The evaluation criteria in each dataset inform the **overall evaluation** for each aspect area. The process is explained in the methodology chapters on our website http://naturalresources.wales/Landmap

- Thematic maps can be created to give an all-Wales or local perspective. The example shows the Visual & Sensory overall evaluation at an all Wales level

2015 - VS50

Outstanding | High | Moderate | Low | Unassessed
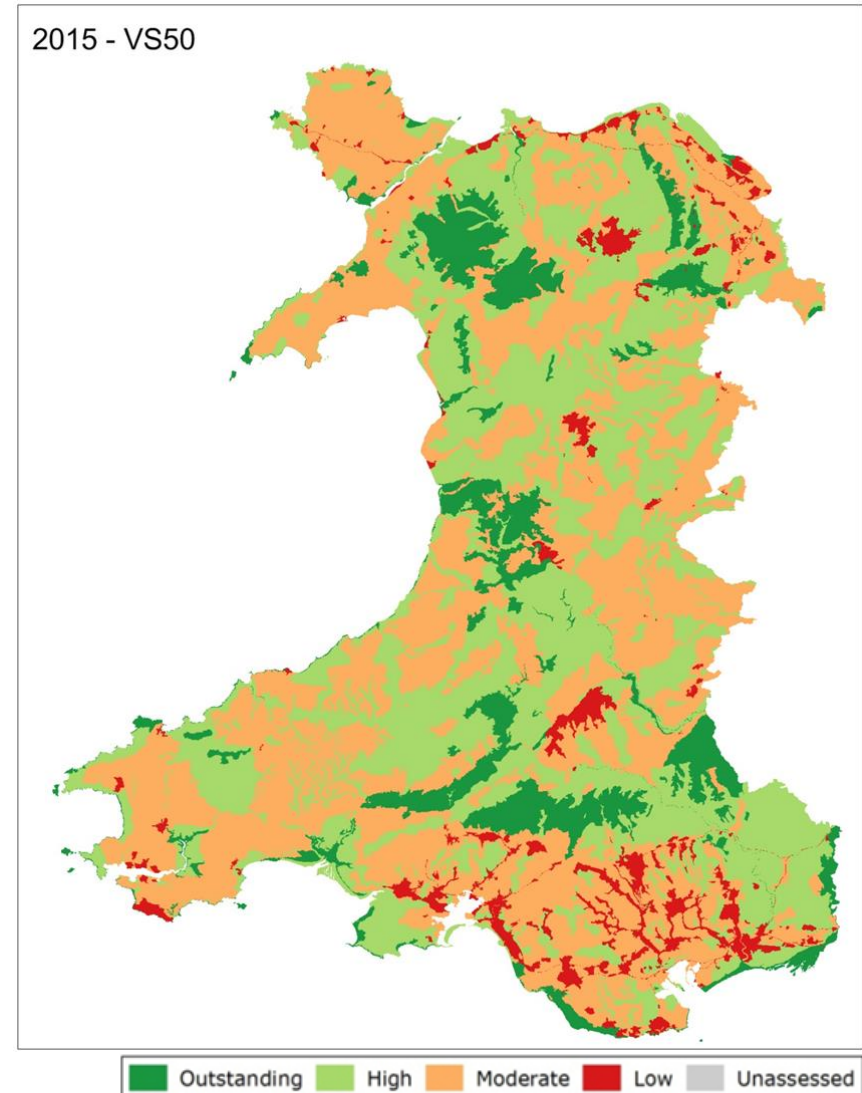
Interpreting LANDMAP Visual & Sensory data

- Analysing LANDMAP Information offers all-Wales, and local, perspectives and insights. Examples from the statistical analysis of the Visual & Sensory data are included in slides 15-17

The LANDMAP Visual & Sensory Wales - predominantly a rural landscape

- 58% of Wales is categorised as an Upland landscape, 37% Lowland landscape

- Almost 5% is Development (excluding the urban areas of Cardiff and Swansea)

- 60% of the landcover is defined as Field Pattern/Mosaic, 20% is categorised as Open Land

- 44% is identified as Scattered Rural/Farm, 27% is categorised as having No Settlements at all

Level 1 and 2 classification (Whole of Wales)
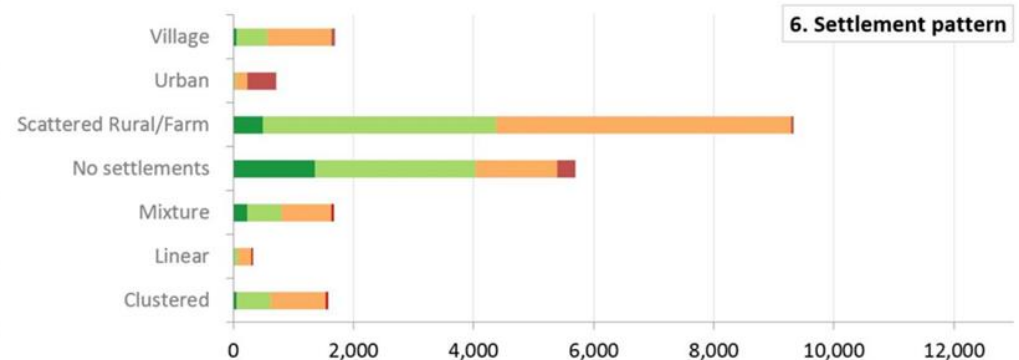
Settlement pattern (Whole of Wales)

15

Interpreting LANDMAP Visual & Sensory data

Highly valued landscapes

- 11% is evaluated as Outstanding, 40% is evaluated High (together this is more than half of Wales)

- Most of the areas evaluated as Outstanding are Upland
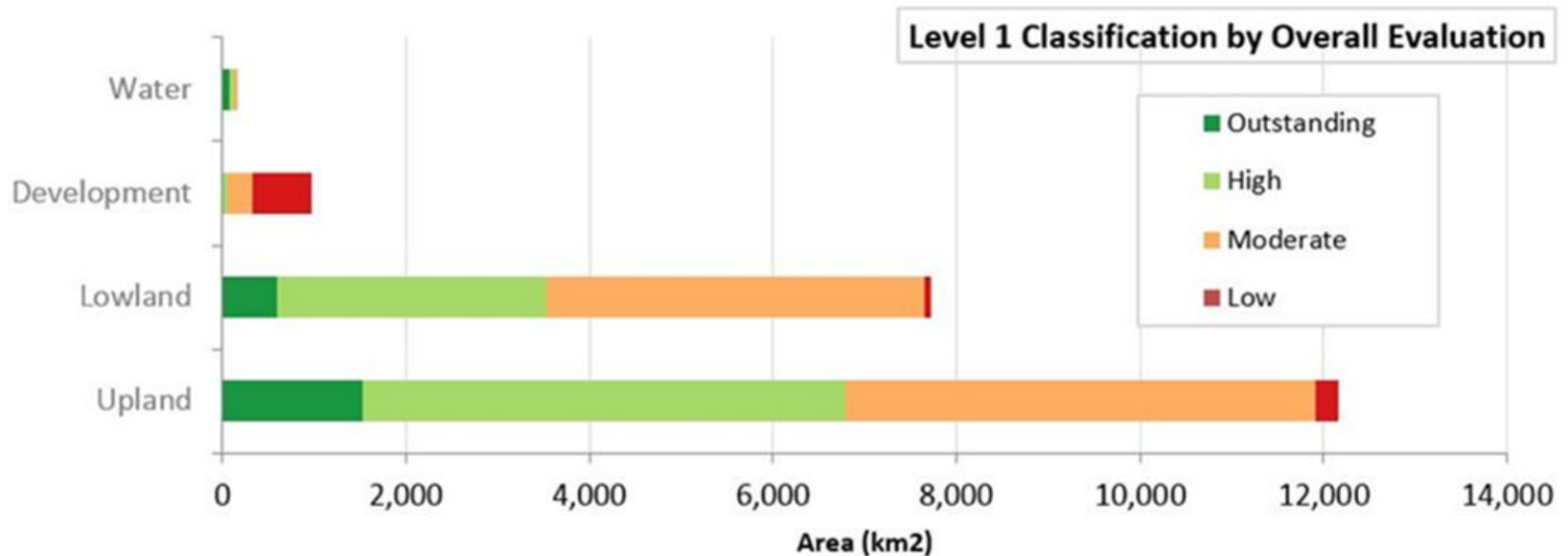
Level 1 classification by overall evaluation (Whole of Wales)

Interpreting LANDMAP Visual & Sensory data

- 46% (< half the total land area) is classified as having a Negligible level of night-time light pollution

- Construction materials used in 69% of the land area are Generally Appropriate, this is important in maintaining a sense of place and character. 18% is associated with Generally Inappropriate or Inappropriate materials

19. Night time light pollution
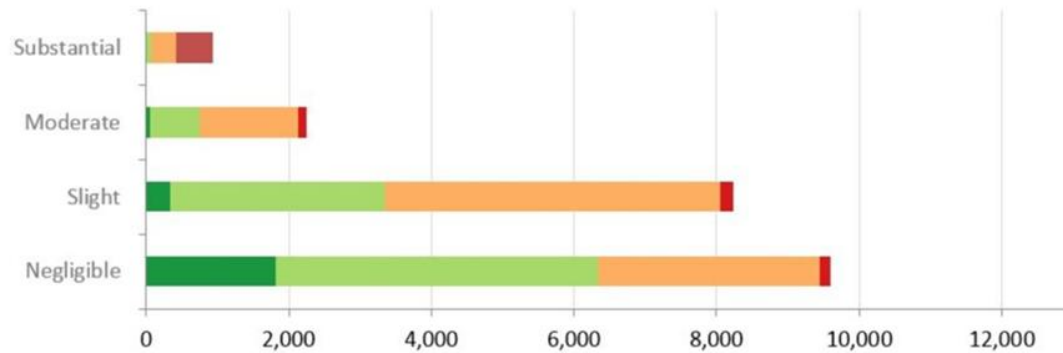
20. Use of construction materials

Area (km2)

17
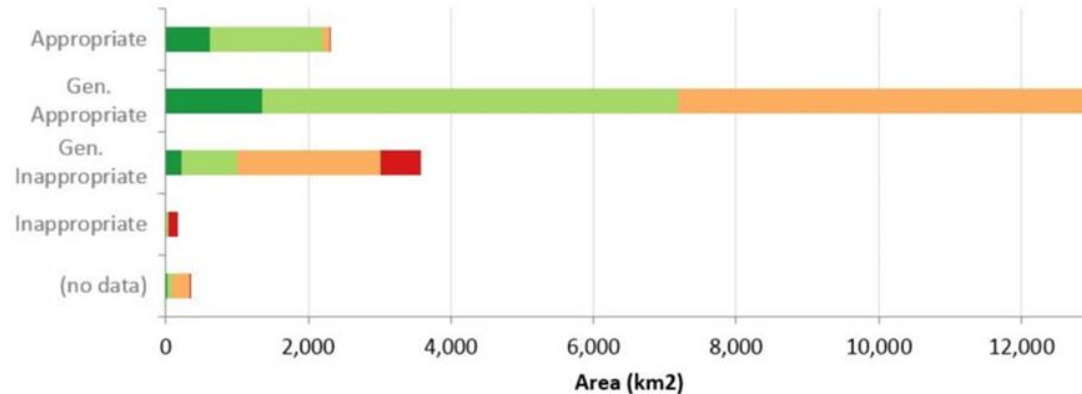
Monitoring the landscape evidence base

Why?

- LANDMAP must be updated to maintain effectiveness and users confidence in the landscape baseline

- To deliver on indicators that include landscape

- To contribute to reports and plans such as 'State of Designated Landscapes' , SoNaRR and natural resource plans

How?

- A robust and repeatable landscape monitoring methodology has been developed

- Consistency in LANDMAP data through the benchmark methodology (introduced in 2003, now dated 2016) enables comparisons to be made across Wales and historically

- Monitoring identifies areas where significant landscape change has been identified, for example between 2003 and 2016

- Multiple resources are used to identify, analyse and interpret change

- Changes are interpreted from the perspective of each LANDMAP dataset

- Change detection work identifies exactly which aspect areas should be amended and in what way, for example the survey content, boundaries or both

- All LANDMAP information, including monitoring updates, is quality assured

What has been monitored so far?	What is yet to be monitored?
Visual & Sensory	Cultural Landscape (initiate 2017)
Landscape Habitats	Geological landscape (plan for 2018)
Historic Landscape (in process 2017)	

Evidence to inform landscape monitoring

Baseline and reporting units

- LANDMAP relevant spatial dataset

For information and context

- Ordnance Survey 1:50,000 and 1:25,000

- True colour aerial photography - assessment of land cover change

- Wales Tranquil Areas Map

- Phase 1 Habitat of Wales & Seasonal Change map of landscapes influenced by habitat change

- Consented and Operational Wind farms

- Additional information sourced relevant to each dataset

- Professional and local knowledge from local authority input and specialists

For comparison over two time periods

- OS MasterMap Roads and Buildings - changes in artificial structures and surfaces

- Satellite imagery (e.g. Landsat 5, 7, Spot 2003)

    – Normalised Difference Vegetation Index (NDVI) - changes in living and non-living surfaces

    – Complexity Maps (Segment Density) - more/less/same landscape complexity

- Mega Change Map - highlights the most significant changes

Landscape monitoring example map 1

Mega change map

Highlights the most significant changes in Roads/Buildings and NDVI/surface productivity

20

Landscape monitoring example map 2

Complexity map

Highlights more/less/same landscape complexity from textural change
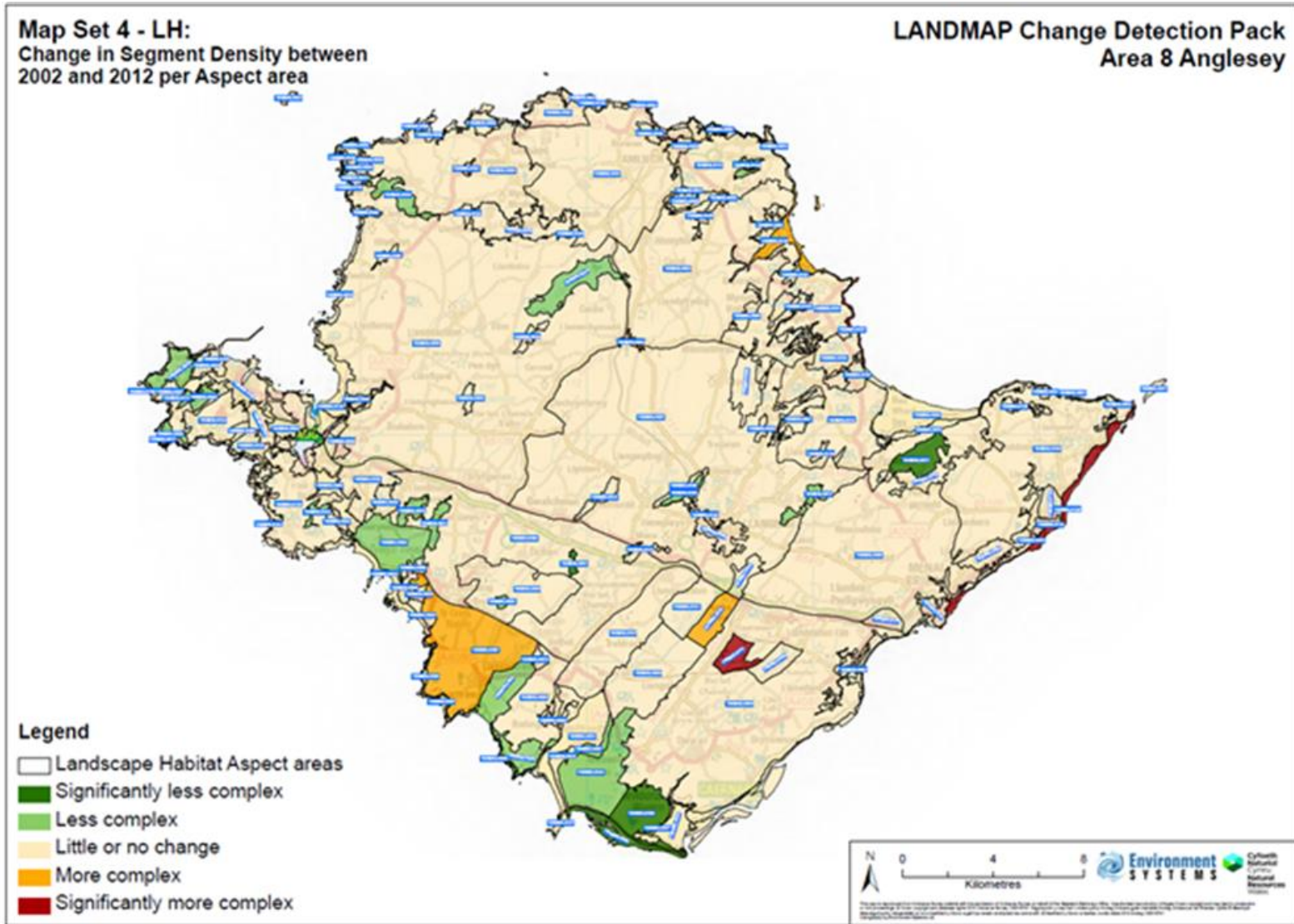
Interpreting monitoring

Key influences on landscape change 2003-2015 include:

Built environment

- Expansion of settlements, commercial and industrial development, expansion of quarries, road improvements, onshore wind-farms and turbines, recreational related developments

Natural environment

- Replacement of conifers with broad-leaved trees, woodland expansion, changes in bracken cover, reduced habitat diversity in places, reduced bog, some improvements in upland vegetation

- Mapping landscape change is important and informative. However care is required during interpretation. The example here shows change in the Visual & Sensory dataset, note the following:
  - Changes may be to aspect area boundaries or survey information
  - The scale of change may be substantial or limited in area
  - Some changes detected were not sufficient to justify a change in the LANDMAP

KEY

Aspect area mapped as undergoing real change in previous Monitoring project

22
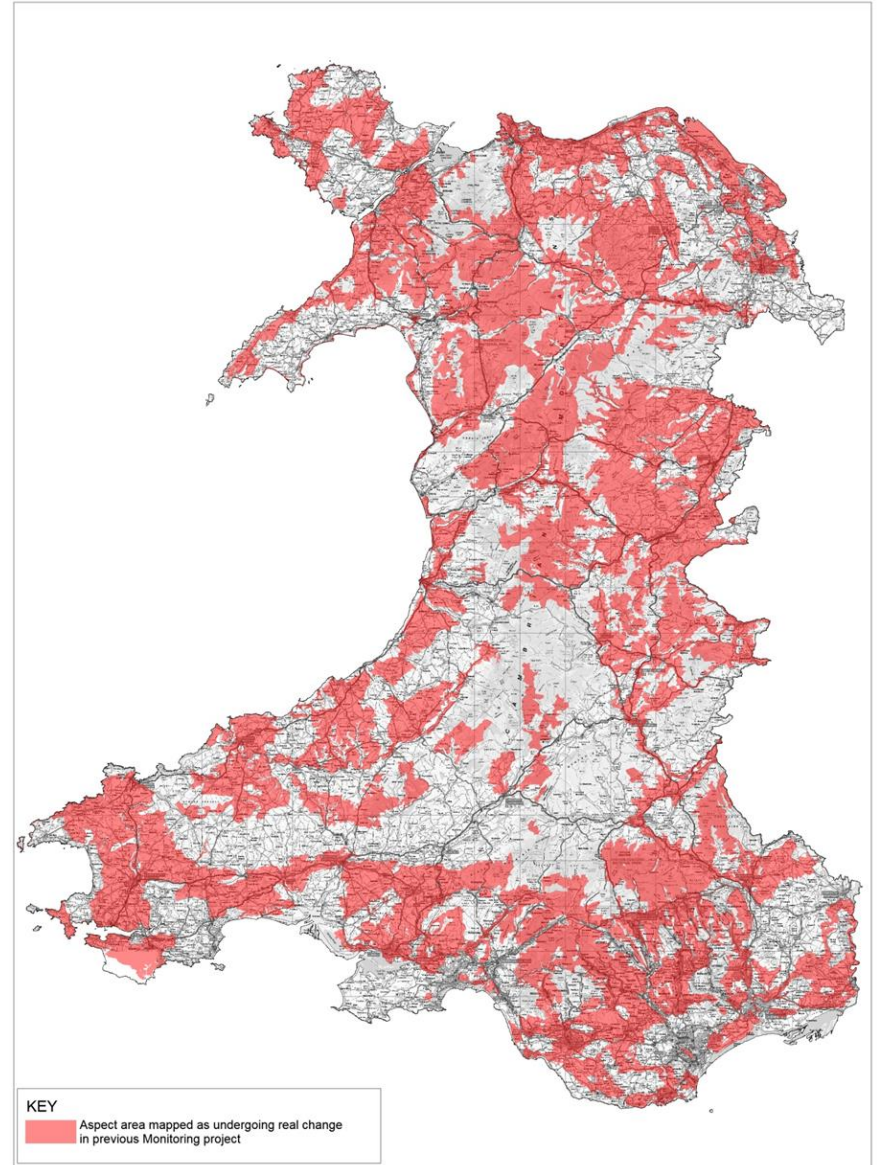
A Landscape Indicator based on LANDMAP

The quality and diversity of the natural and historic character of our landscape and seascape is maintained and enhanced

- Using LANDMAP monitoring work we can we calculate the extent to which landscape character, diversity and quality has been significantly changed from the baseline established

- This could translate as 'the percentage of Wales' landscape evaluated as outstanding or high should be maintained or increased' , or even a target of a 10% increase in the highest evaluations over 10 years

- In time, an assessment could be made of the extent to which a landscape has moved away from or towards agreed visions for an area, for example as part of Area Statements or wellbeing assessments

We can do this by calculating

- character and diversity, using the % and area (ha) of each classification

- quality, using the % and area (ha) of each evaluation (outstanding/high/moderate/low)

We could report this by

- National Park, Area of Outstanding Natural Beauty, Local Planning Authority, National Landscape Character Area, Registered Historic Landscape, Public Service Boards, by Area Statement or at an all Wales level

Accessing LANDMAP spatial datasets

- To access the LANDMAP interactive map to view aspect area maps and surveys
  http://landmap-maps.naturalresources.wales/

- To download LANDMAP maps and surveys to use in a GIS environment
  http://lle.wales.gov.uk/Catalogue?lang=en&text=landmap

Further Information

- Information, guidance notes and methodology chapters are available from http://landmap-maps.naturalresources.wales/

LANDMAP Methodology Chapters

- LANDMAP Methodology Overview (2017)

- LANDMAP Methodology Geological Landscape (2016)

- LANDMAP Methodology Landscape Habitats (2016)

- LANDMAP Methodology Visual and Sensory (2016)

- LANDMAP Methodology Historic Landscape (2016)

- LANDMAP Methodology Cultural Landscape (2016)

- LANDMAP Methodology Monitoring (2017)

Guidance Notes (GN)

- GN1 LANDMAP & Special Landscape Areas (2017) *(correction of evaluation criteria text)*

- GN2 Accessing LANDMAP Information (2017)

- GN3 LANDMAP & LVIA for onshore windfarms (2017)

- GN4 LANDMAP & the Cultural Landscape (2016)

- GN5 LANDMAP & the Geological Landscape (2016)