# Glastir Modelling and Evaluation Programme: Modelling overview

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and the GMEP team

Llywodraeth Cymru
Welsh Government

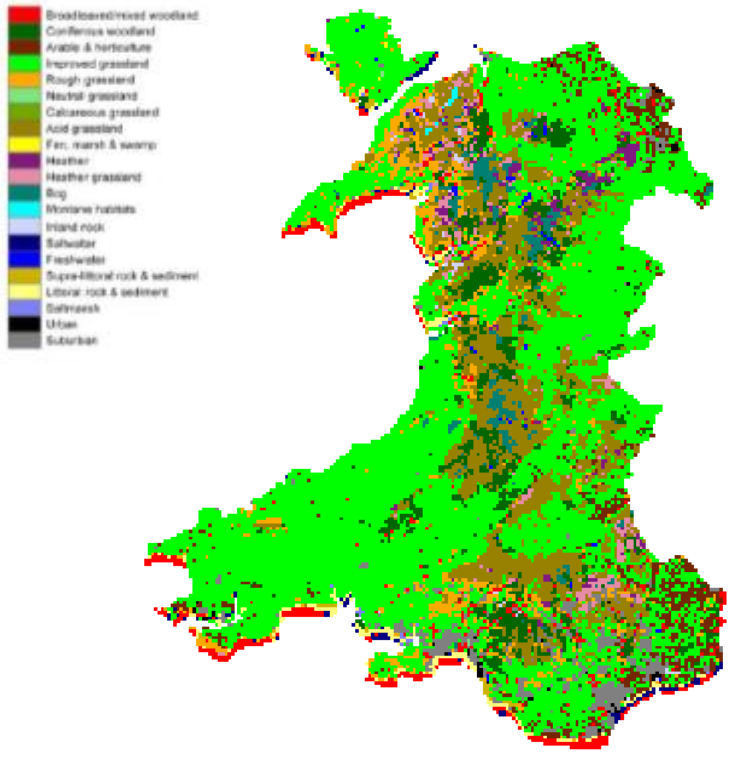
Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

GMEP Glastir Monitoring and Evaluation Programme

- 5 Glastir outcomes are the basis for all GMEP activities:
  - Combating climate change
  - Improving water (and soil) management
  - Maintaining and enhancing biodiversity
  - Enhancing landscape and historic features and access
  - Increasing area and improving management of woodland

# Main tasks required of GMEP

- Report on ongoing national trends (backdrop)
- Quantify impacts of Glastir interventions and provide fast feedback to WG
- Factor in past agri-environment schemes, climate change etc
- Interpret within an ecosystem services framework and identify co-benefits and trade-offs
- Provide data for other reporting requirements

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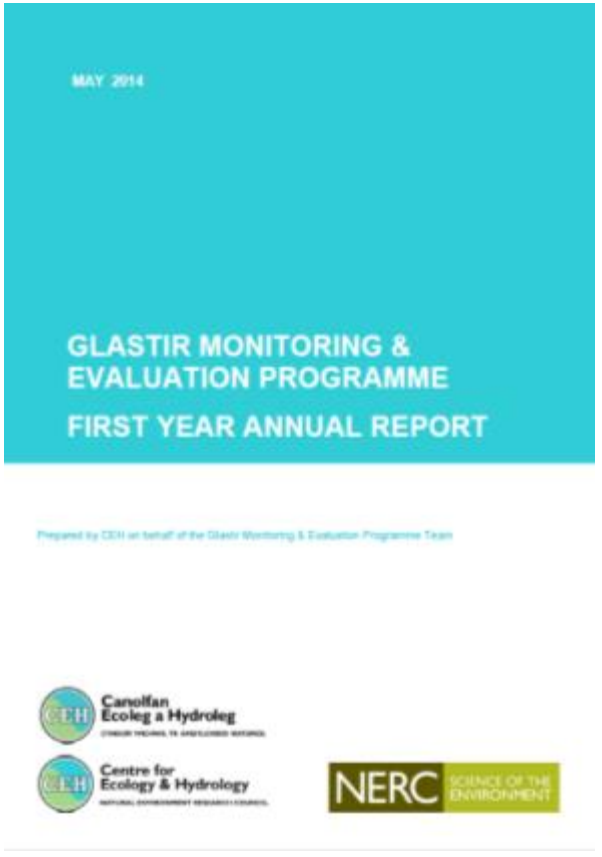
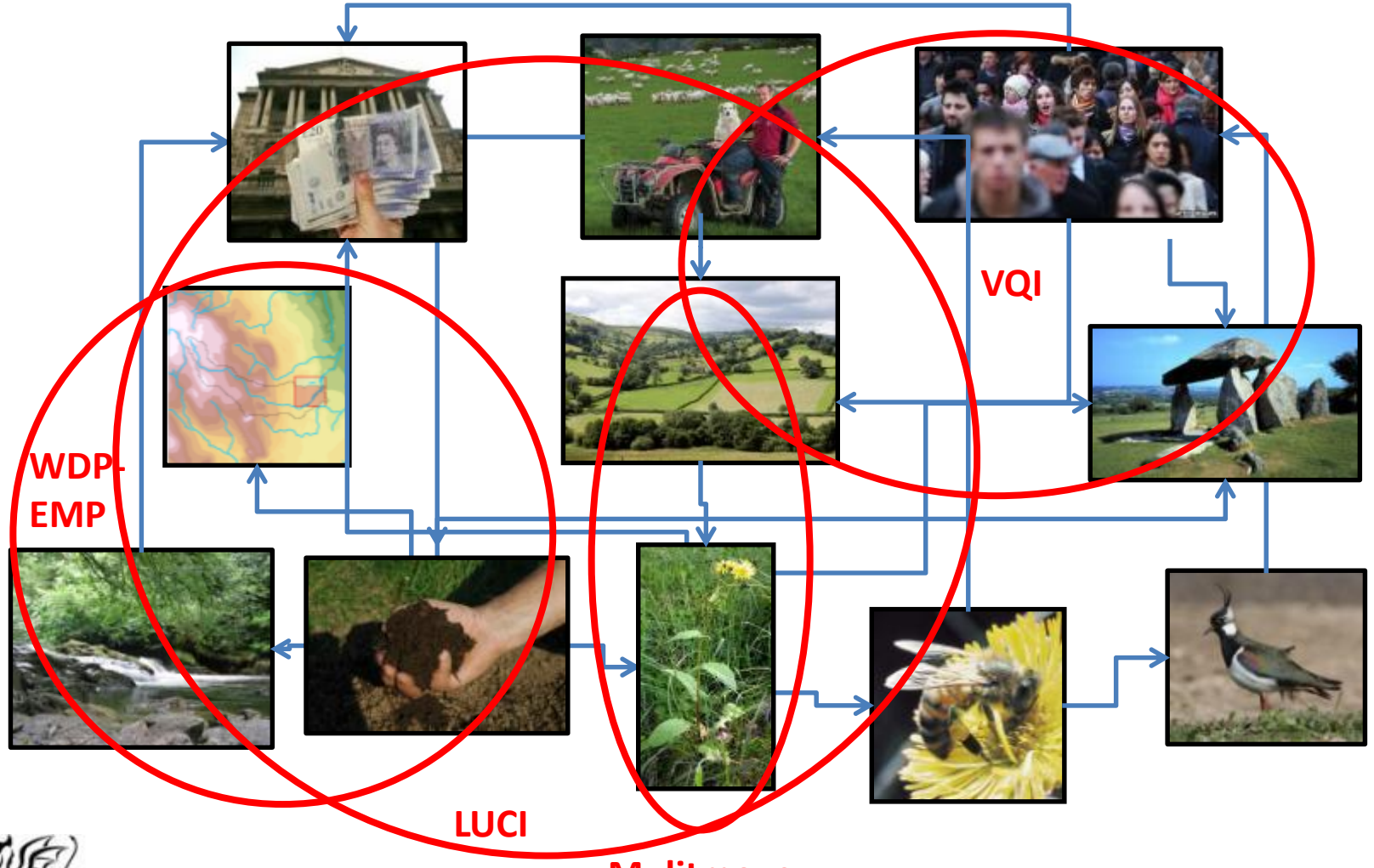
# GMEP Approach

- Field survey
  - 300 1km$^2$ on a rolling 4-year cycle.
  - 50% of squares within scheme
  - Ecosystem approach
- Modelling
  - Integration and upscaling
  - Future scenarios
  - Trade-offs and co-benefits
  - Scientific hypothesis framework
- Public data portal



# Ecosystem approach for field survey and modelling

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# 1st Year Survey

Co-located measurements in 60 1km$^2$ (300 after 4 years) of:

1726 **botanical** plots

1500 **soil** samples for physical, microbial, chemical, carbon and invertebrate analysis.

4 surveys of **birds**

2 **pollinator** surveys walking 120km of transect plus timed searches within 9000m$^2$.

790 vegetation surveys of **hedgerows and stream banks**

freshwater invertebrates, diatoms, macrophytes, physical habitat, water chemistry, in **ponds and streams**

47 **historic** features assessed for their condition

2043 **landscape** features

960 **landscape** photos

**To be repeated in Yrs 2-4 + socio-economic assessments**

# GMEP Modelling Strategy

- Models had to tell us about one of the 5 Glastir outcomes
- Appropriate for farm, catchment and national scale applications
- Data requirements practical and available
- Model was available to us (no IPR problems)

***4 models/modelling framework were selected + 1 commissioned.***

# Mapping models to outcomes

| Glastir Outcome | Target | WDP-EMF | Multi-move | LUCI | VQI-Viewshed | Carbine / C flow |
|---|---|---|---|---|---|---|
| Biodiversity | Plants | | | | | |
| | Connectivity | | | | | |
| | Habitat diversity | | | | | |
| Climate change | Ruminants and manures | | | | | |
| | Energy | | | | | |
| | Plants and soil | | | | | |
| Water quality | N,P | | | | | |
| | Sediment | | | | | |
| | Flow/flood | | | | | |
| Landscape | Visual quality | | | | | |
| | Visual accessibility | | | | | |
| Woodlands | Carbon | | | | | |
| | Biodiversity | | | | | |
| Trade-offs | | | | | | |

# Modelling scenario Work In Yr 1

- 6 Glastir interventions covering ‘narrow and deep’ and ‘broad and shallow’ interventions:
  - *Allow Woodland Edge to Develop Out into Adjoining Field*
  - *Grazing Management of Open Country*
  - *Grazed Permanent Pasture with No Inputs*
  - *Create Streamside Corridor with Tree Planting*
  - *Mechanical Bracken Control*
  - *Retain Winter Stubbles*
- Low, medium and high uptake scenarios by farmers
- No intention of assessing actual uptake or impact of scheme to date

# Results from GMEP Modelling in Yr 1

- Steven (WDP-EMF)

  Site level reductions as high as 80% for diffuse pollution and GHG . National level generally delivered 1-10 % (Steven)

- Simon (Multimove)

  Positive changes in habitat suitability projected for 75% of the 21 plant species modelled. Significant progress within 10-23 years of uptake of options

- Beth (LUCI)

  Woodland edge expansion and streamside corridor planting:

  - increased accessible land for broadleaf focal species by 3 to 12%,
  - reduced the potential reduction in flood generating land by 1 to 9%,
  - increased national carbon storage by ca. 0.4%,
  - reduced eroded soil and phosphorus delivery by up to 15%

- Ruth (VQI)

  Development of landscape framework completed for application in Year 2

# GMEP Team

ADAS

APEM

BTO
Looking out for birds

BGS 1835
British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Butterfly Conservation Wales
Gwarchod Glöynnod Byw Cymru

BioSS

Edwards Ecological Services Ltd

BOWBURN CONSULTANCY
Specialist Ecological Advice to the Water Industry

ECORYS

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Freshwater Habitats Trust

1 4 9 5
UNIVERSITY OF ABERDEEN

University of St Andrews
600 YEARS

1884
PRIFYSGOL BANGOR UNIVERSITY

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA UNIVERSITY OF WELLINGTON

STAFFORDSHIRE UNIVERSITY

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# Questions?

Email: GMEP@ceh.ac.uk

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