

Mapping and Assessment of Ecosystems and their Services

IRELAND

Project concept and approach



**An Roinn
Ealaíon, Oidhreachta agus Gaeltachta**
**Department of
Arts, Heritage and the Gaeltacht**

Introduction

National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaeltacht (DAHG) is the EEA/EIONET National Reference Centre (NRC) for Biodiversity Data and Ecosystems Indicators and Assessment. NPWS also represents Ireland on EC MAES Working Group.

As a first step to developing a national ecosystem assessment for Ireland, in June 2015 NPWS commissioned a ½ year project for a National Ecosystem and Ecosystem Services map, for a suite of prioritised and agreed services, based on available data.

The project is utilising existing approaches and tools (MAES conceptual framework, CICES classification for 'final services', & JNCC/ Environment Systems Ltd 'Spatial Framework'.

It incorporates steering and stakeholder participation to identify data sources, prioritise services develop indicators for mapping and assessment and propose future steps.

The project is one of an increasing number of ecosystem services assessment activities in Ireland, further details of which are reported through MAES Working Group.



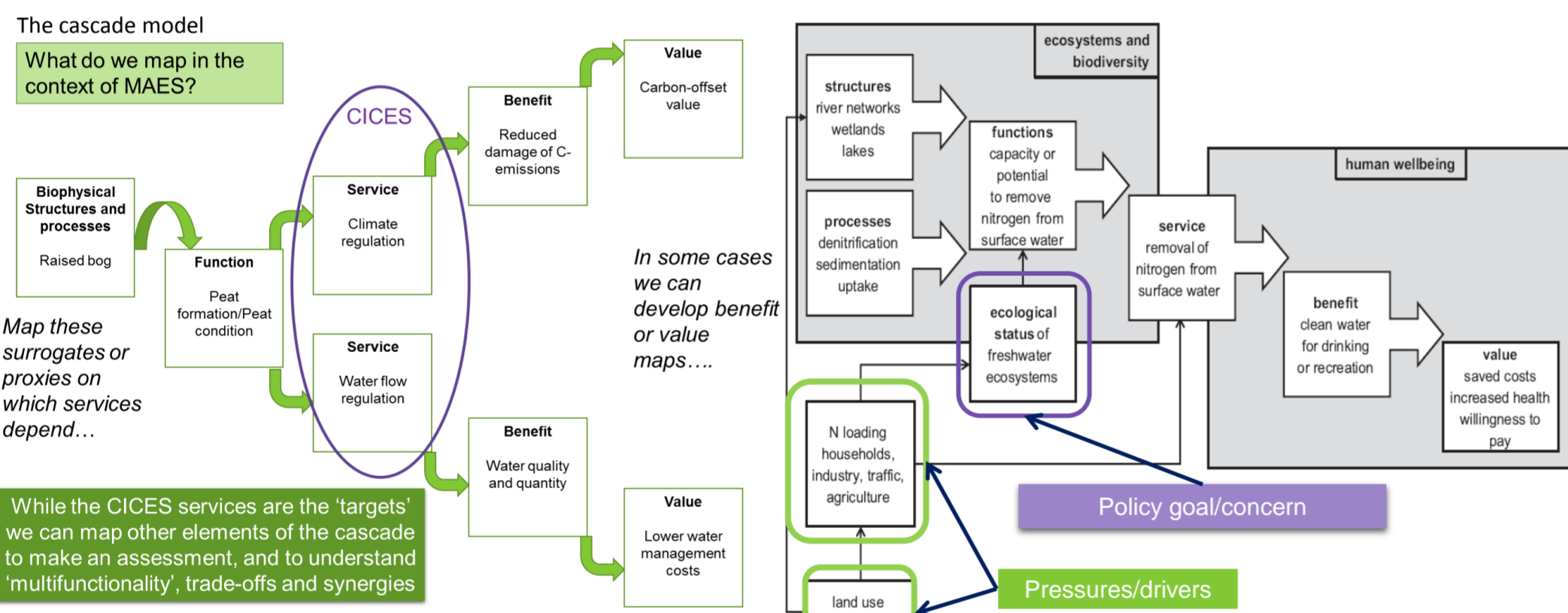
Conceptual approach

We have adopted the cascade model as the starting point for mapping ecosystem services in Ireland.

The model identifies the mechanisms that give rise to the benefits that people derive from natural resources. These mechanisms are the biophysical structures, processes and functions (exchanges of energy, nutrients and wastes). They are influenced by policies, pressures and drivers.

CICES is used to classify the derived services, for which values (monetary and non monetary) may be derived.

By using this approach, we hope to ensure that the links between ecosystem services values, and the complex interdependencies with ecosystems from which they are derived, are considered in natural resource management.



Potschin and Haines-Young (2011): Progress in Physical Geography 35(3)

Application of the ecosystem services cascade framework to water purification (after Maes et al. 2012)

Figure 1 Cascade Model and its application for water regulation (Courtesy of Haines-Young & Potschin (Fabis Ltd))

Key Influencing Factors

What the land cover is

Where it is

What is underlying?

Soil

Geology

Management

Environment SYSTEMS
evidence and insight

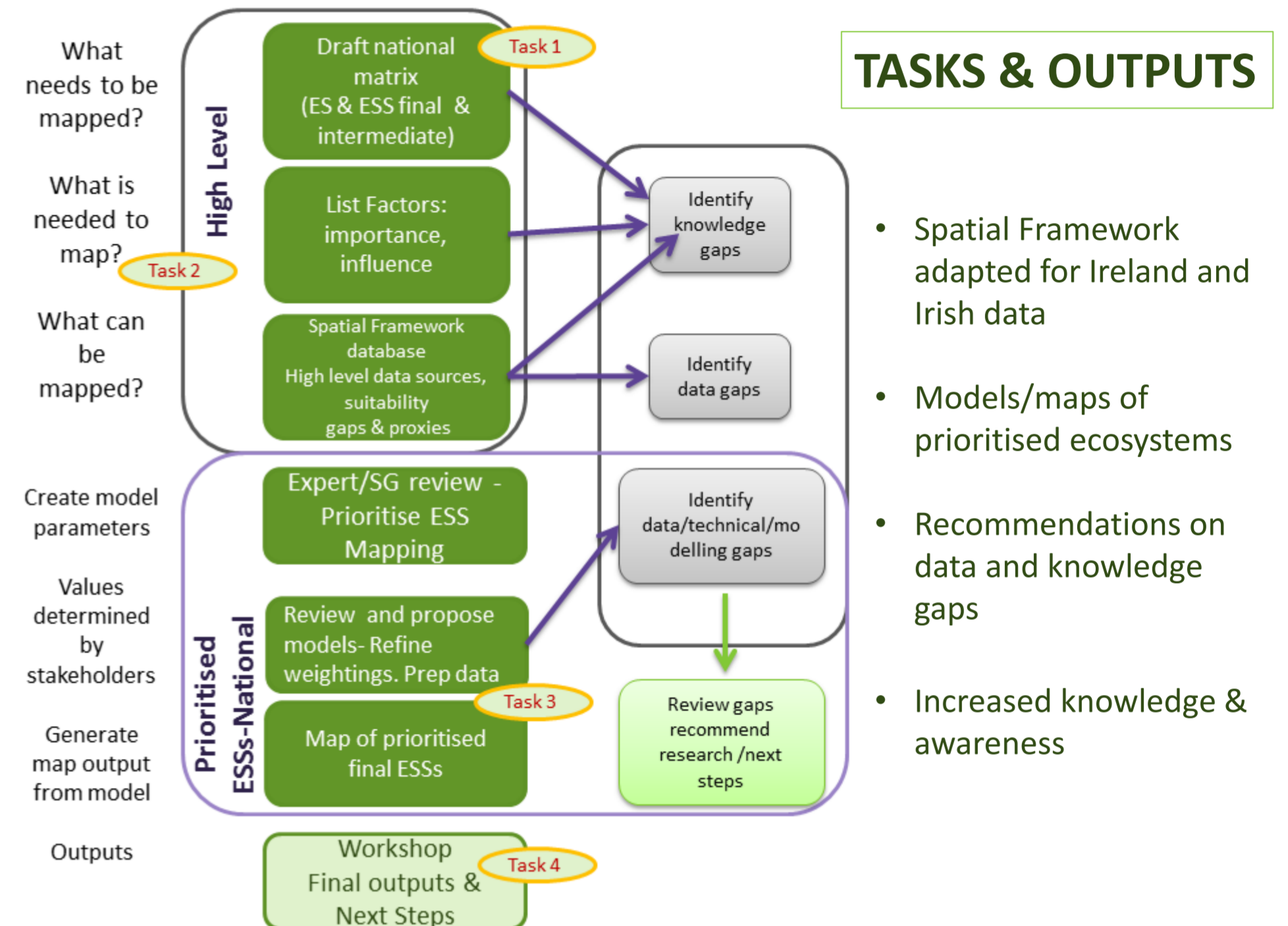
- Targeted Welsh regions in the SCANN project
- Method based on that created for JNCC (Medcalf, et al 2012, 2014)
- Developed into a toolkit: SENCE

Spatial Evidence for Natural Capital Evaluation

Figure 2. Key Influencing factors, as developed into Environment Systems Ltd 'SENCE Toolkit'

NPWS Project Aims

- To progress ecosystem assessment in Ireland, in particular mapping and assessment of ecosystems and their services
- To identify the interdependencies, influencing factors, data availability and data suitability
- Identify knowledge and data gaps for future research
- Expert & stakeholder engagement
- Extensible - to be further expanded and developed as new national data are developed



TASKS & OUTPUTS

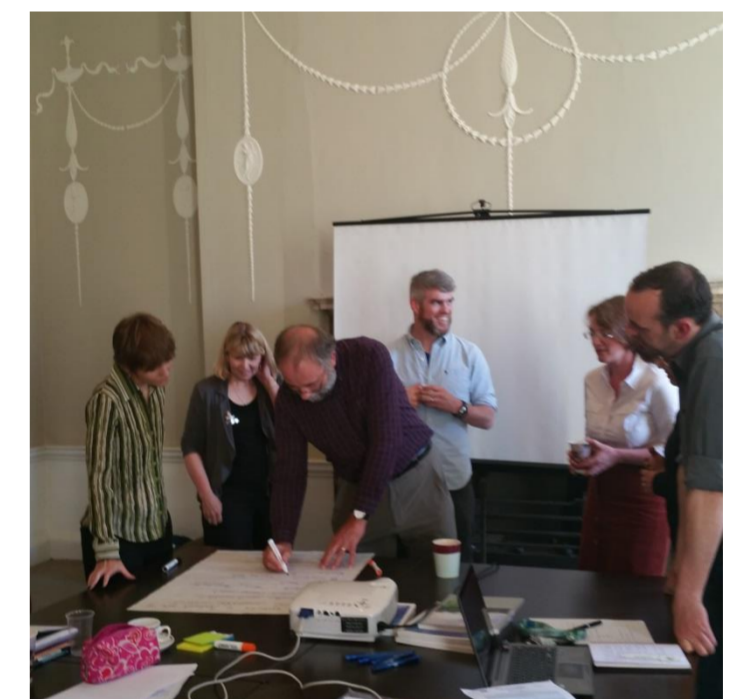
- Spatial Framework adapted for Ireland and Irish data
- Models/maps of prioritised ecosystems
- Recommendations on data and knowledge gaps
- Increased knowledge & awareness

Steering and Stakeholder participation

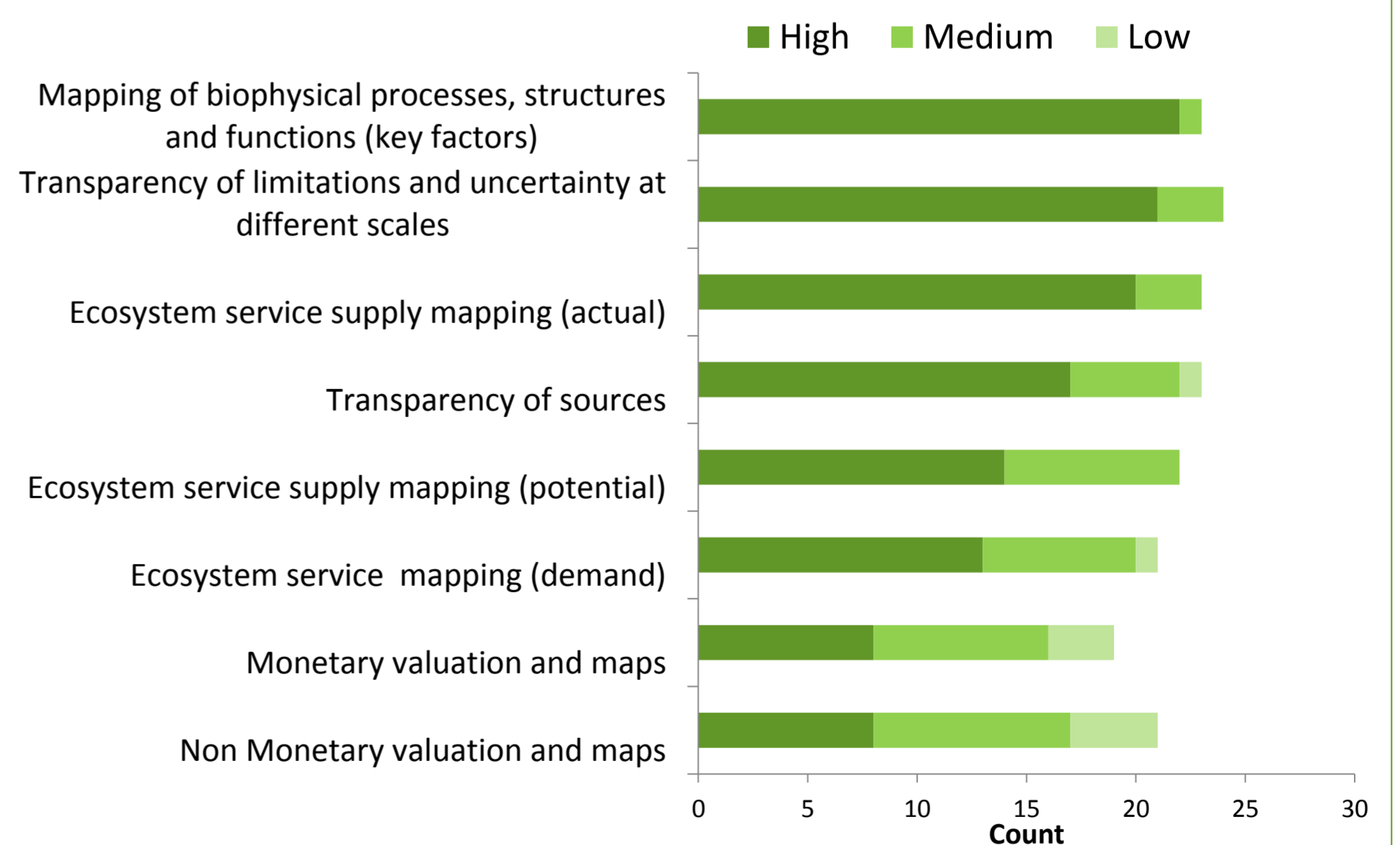


Photo 1: Steering Group, (participants from EPA, UCD, Teagasc and NPWS), developing policy pressure matrix, and prioritisation of ecosystem services for further development

Photo 2: Stakeholder Workshop; identifying key pressures and important ecosystems in Ireland



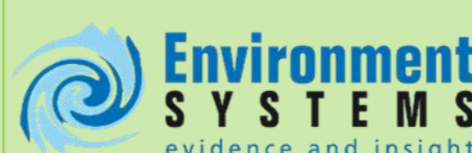
Stakeholder prioritisation of ES mapping and assessment elements



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Associate Experts
Conor Kretsch
Dr Benjamin Burkhard



References

- Medcalf, K. A., Small, N., Finch, C., & Parker, J. 2012. Spatial framework for assessing evidence needs for operational ecosystem approaches. JNCC Report No. 469 JNCC, Peterborough.
- 7 Medcalf, K., Small, N., Finch, C., Williams, J., Blair, T., Haines-Young, R., Potschin, M. & Parker, J. 2014. Further development of a spatial framework for mapping ecosystem services. JNCC Report, No. 514, JNCC, Peterborough.
- Potschin, M. and Haines-Young, R. (2011) Ecosystem services: exploring a geographical perspective, Progress in Physical Geography 35: 575-594. DOI: 10.1177/0309133311423172

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NPWS Project Interim & Draft Outputs



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Workflow for mapping ecosystem services

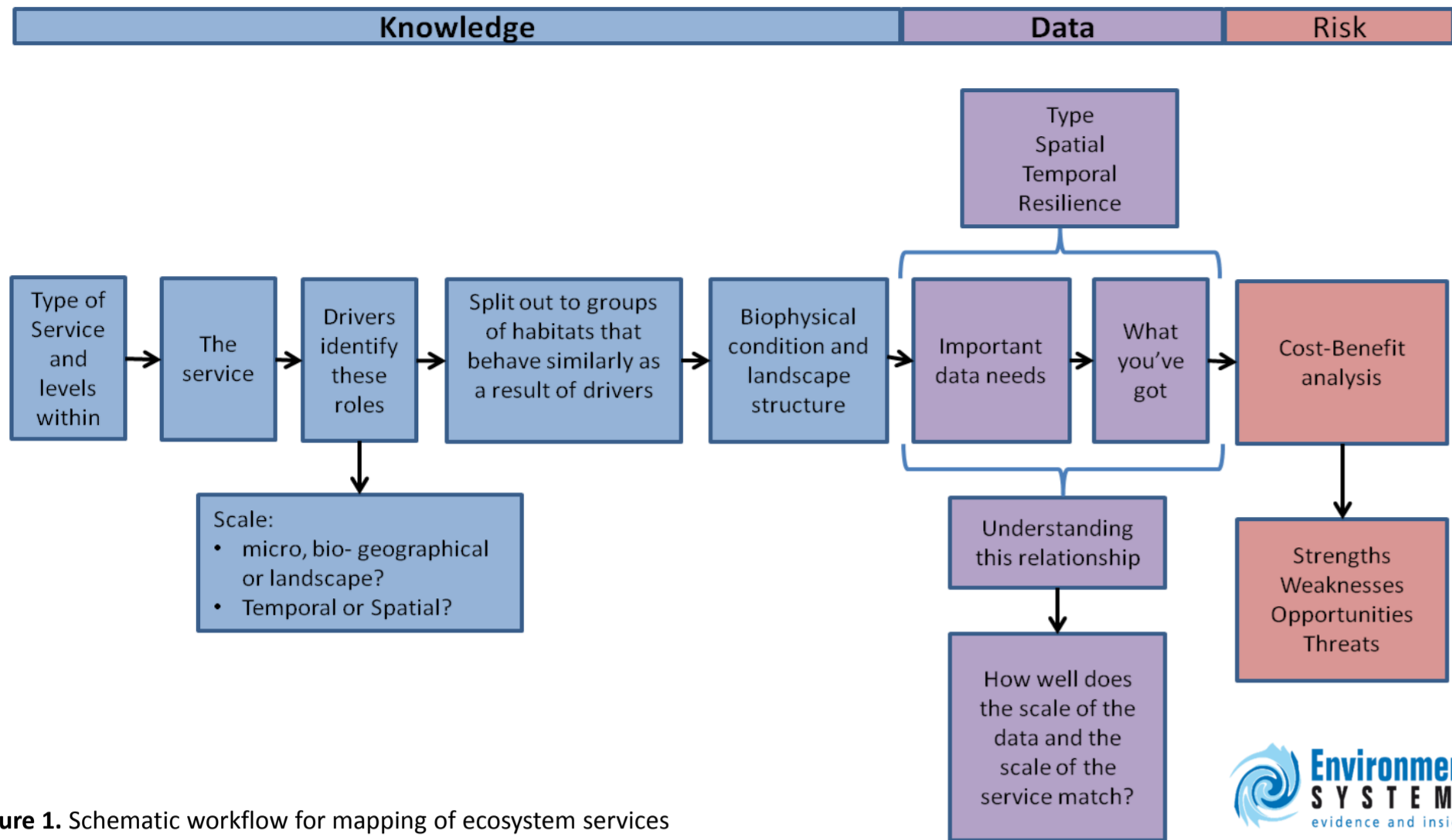


Figure 1. Schematic workflow for mapping of ecosystem services

The suite of available data for prioritised ecosystem services are reviewed (Fig 1) and collated to create key factor maps (Fig 2). The different classes within in each key factor layer are assigned weightings (Fig 3) based on their potential contribution to multiple ecosystem services. The weightings are drafted based on scientific literature and reviewed by domain experts and stakeholders. All weightings are documented in a spatial framework database and developed into a rules base for ecosystem services map generation (Fig 4). Information on sources, resolution and certainty are also documented. In some cases key factors are generated from multiple sources. Ireland is lacking in a national landcover and habitat mapping. Figure 5 below shows the process of combining circa 40 separate layers to create a national habitat asset layer for this purpose.

Using key factors

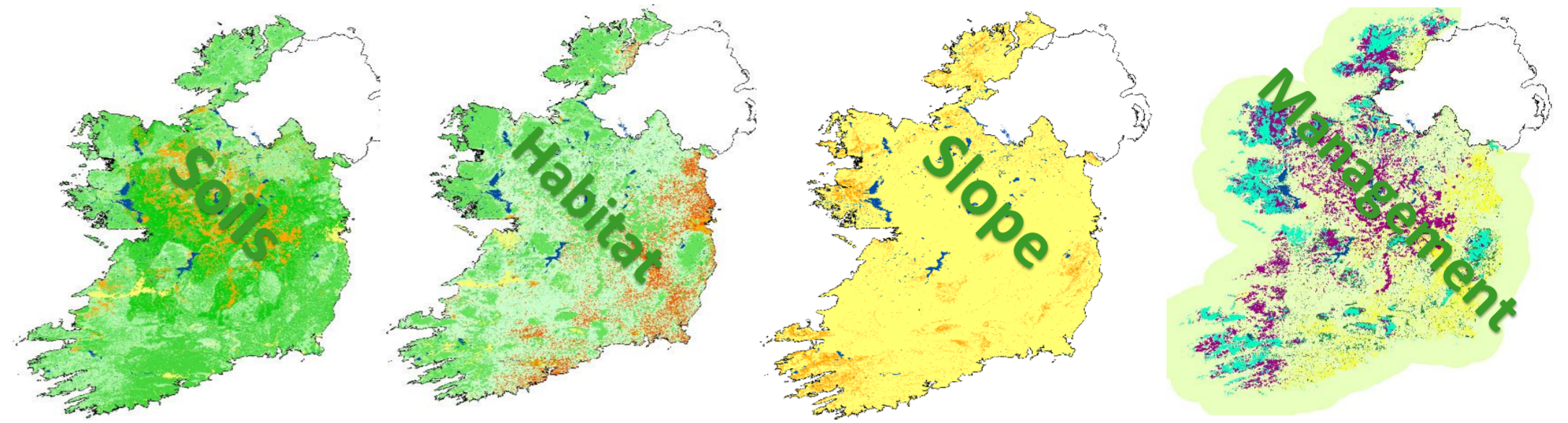


Figure 2. Typical key factor maps

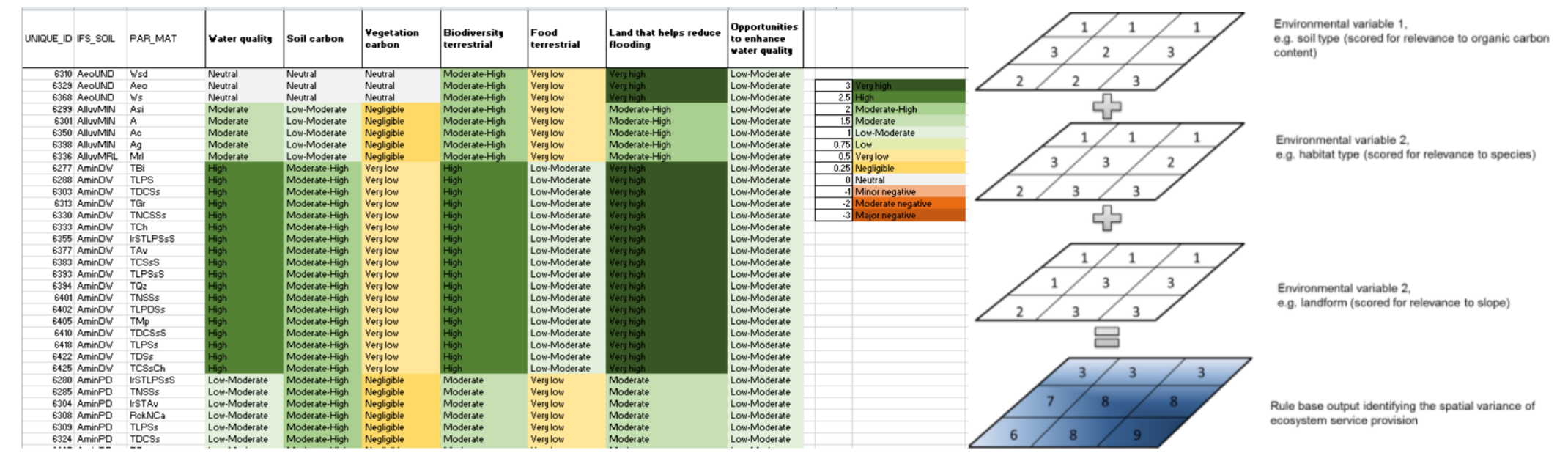


Figure 3. Example of draft weightings of influence of different types of soils in multiple ecosystem services.

Figure 4. Key factors are combined spatially using map algebra, utilising weighted values for each factor for each service

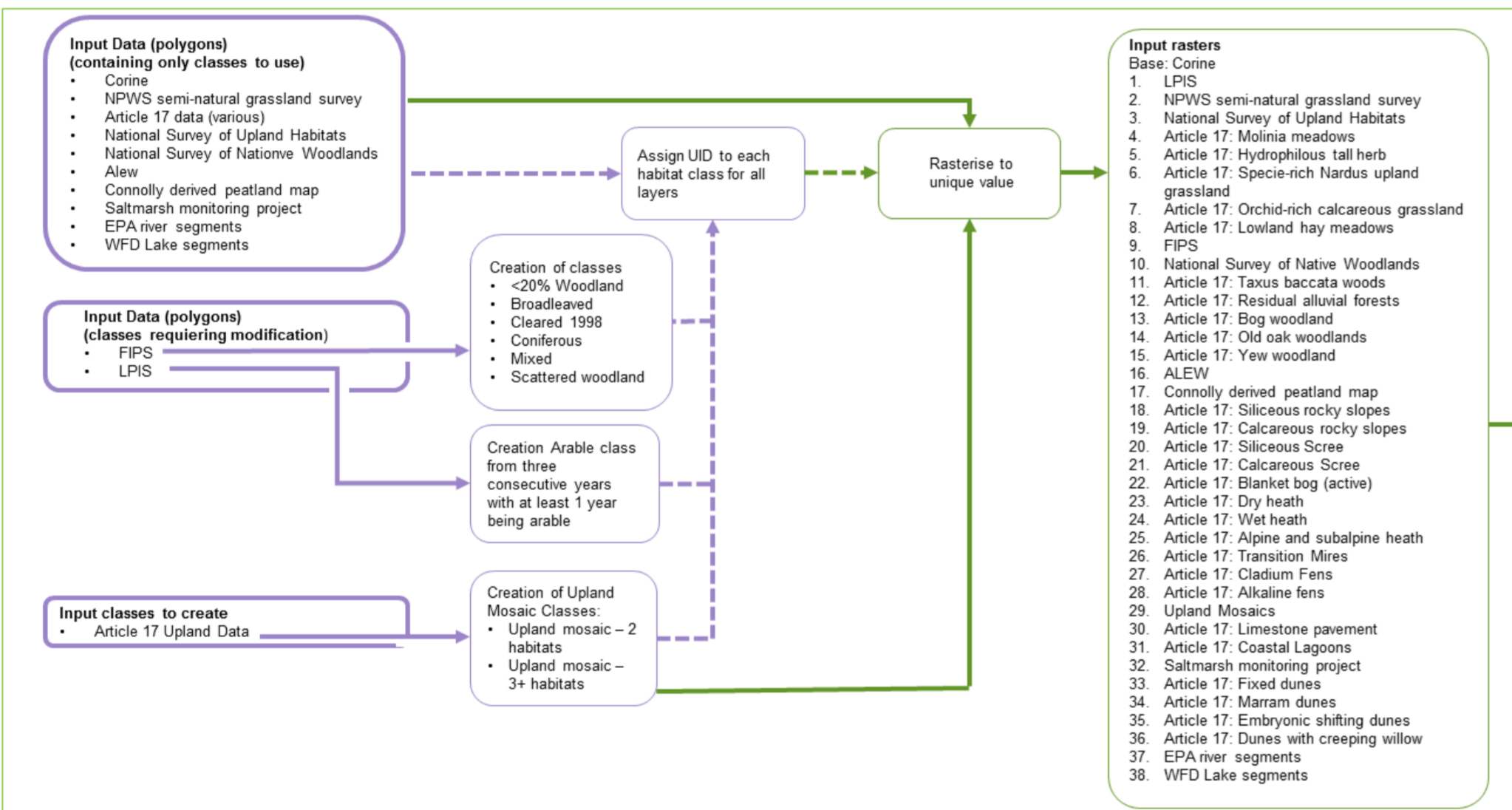
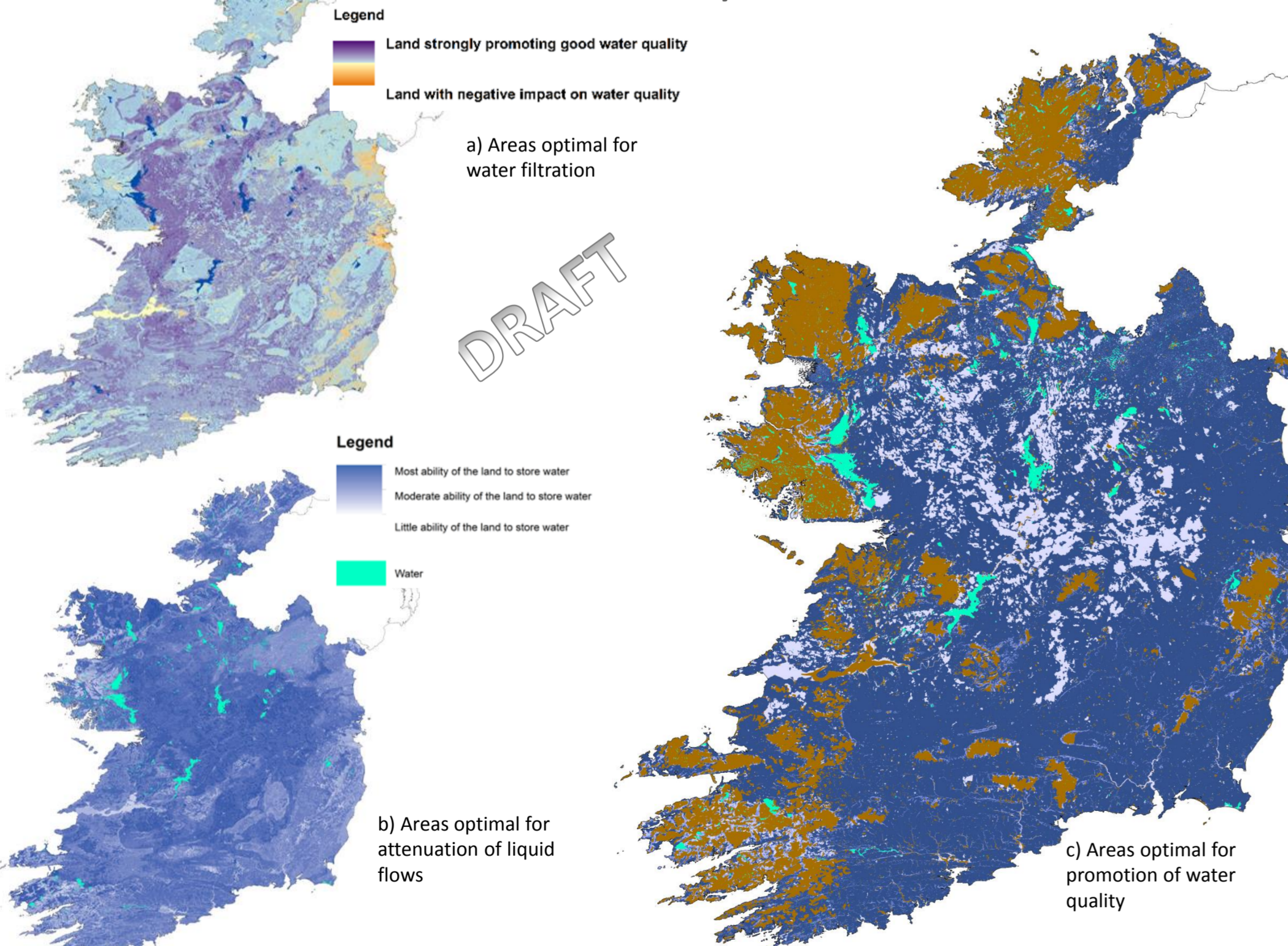


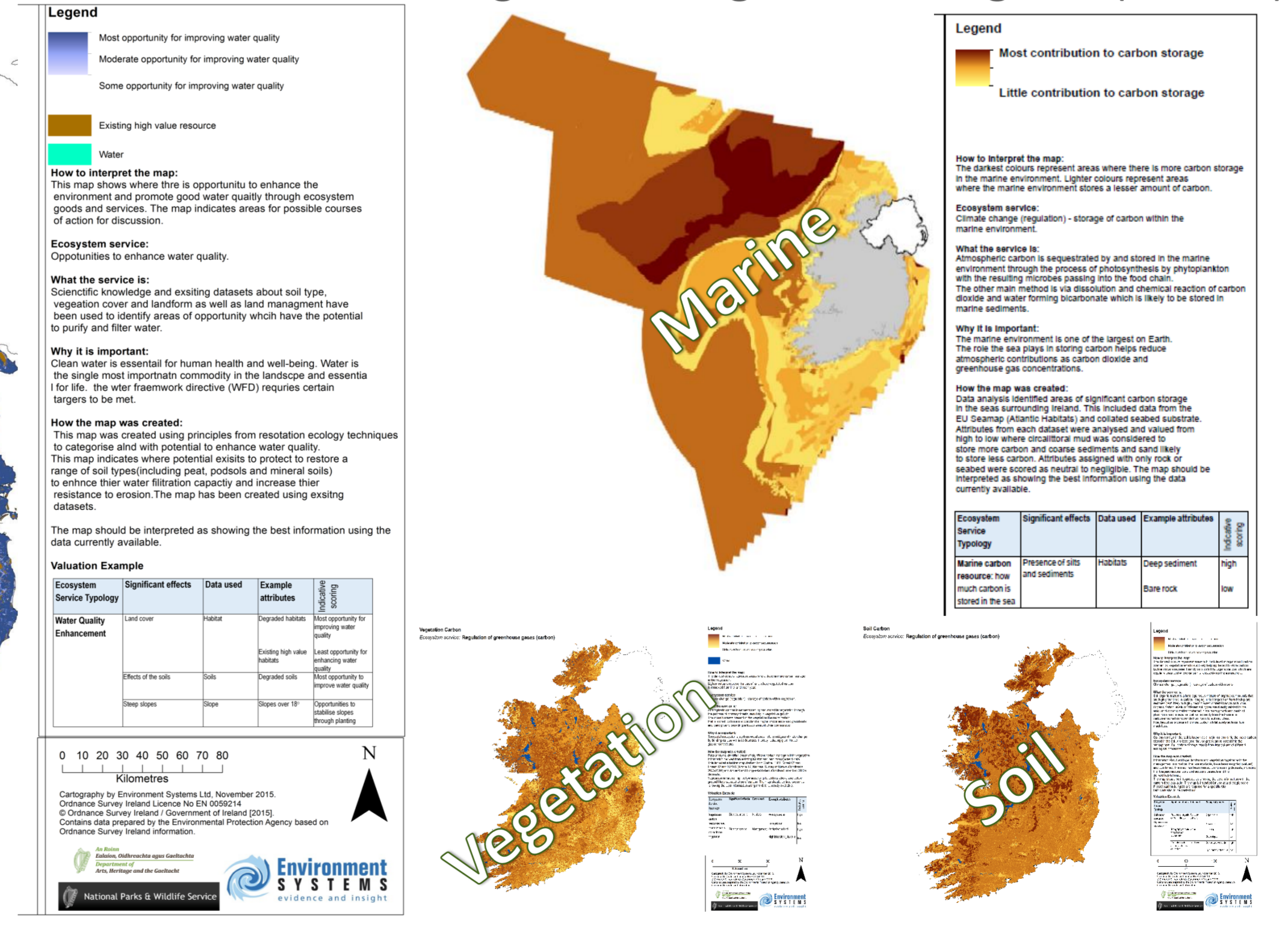
Figure 5. (Left) and below Schematic showing collation of national terrestrial habitat key factor layer and output map (below).

Draft ecosystem services outputs

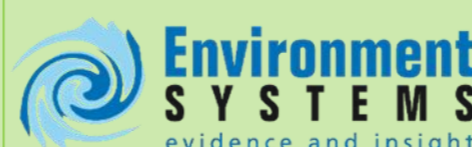
Water Quality Enhancement



Regulation of greenhouse gases (carbon)



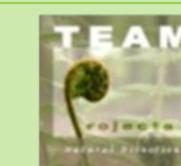
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