Oxford to Cambridge Arc Ecosystem Services Baseline – Summary of baseline creation report

Introduction

The Ecosystem Services (ES) Baseline is a spatial dataset based on a habitat and land-use map. The habitat map is joined to a matrix (list) of Ecosystem Service scores which separately rate the ability of different habitat types to deliver 18 ecosystem services, on a scale of 0 to 10. The scoring matrix we have used is the same on that was created for Natural England's EcoMetric.

Provisioning	Regulating	Cultural
Water supply	Air quality regulation	Noise reduction	Pest control	Aesthetic value	Education and knowledge
Wood production	Erosion protection	Pollination	Cooling and shading	Carbon storage	Recreation and leisure
Fish production	Flood regulation	Water quality regulation	Interaction with nature
Food production			

Ecosystem Services mapped within our Baseline

Two versions of this Baseline have been created.

1. The Best Available Data

The starting point for these ecosystem services (ES) maps is the Local Natural Capital Plan's (LNCP) Natural Capital Baseline habitat map. This Natural Capital Baseline integrates Ordinance Survey Mastermap (OSMM) with other datasets including; Phase 1 or similar habitat data issued under licence from Local Environmental Record Centres (LERCs) across the Oxford to Cambridge (OxCam) Arc, information from local Wildlife Trusts, the Centre for Ecology and Hydrology (CEH) Landcover Map 2015; Natural England's Priority Habitats Inventory (PHI), OS MasterMap Greenspace data, OS Open Greenspace data, Built-up Area Boundaries data, and the National Forest Inventory data.

2. The Most Accessible Data

These ES maps utilise a Natural Capital Baseline that i created from an alternative habitat and land use map based on a mix of Ordinance Survey (OS) data and freely available datasets comprising; OSMM, the Rural Payments Agency's CROME Crop map, Natural England's Priority Habitats Inventory, OS MasterMap Greenspace and OS Open Greenspace data.

The two Natural Capital Baseline's were generated using different methods. You can read the full report on how this difference affects the ES baselines created, in this report "OxCam LNCP Natural Capital Baseline Assessment: Comparing habitat basemaps for Oxfordshire". We created two versions because there is a trade-off between the best available data (Often under strict licence, chargeable and is difficult to share with others) and more accessible data (Often open licences so freely shareable, but with reduced confidence in the results).

How the maps were created

- Start with the OS Mastermap polygons and the Natural Capital Basemaps described above.
- Using an ES scoring matrix that was derived from Natural England's Eco-Metric, scores were assigned against each polygon for each service based on its habitat classification.
- Multipliers were applied for certain services to provide a more refined score. For example, a multiplier was applied to set the score for the recreation service to zero if there is no public access.

The ES were then mapped into 25 metre grid squares across the OxCam Arc. We used 25 metre squares instead of more detailed mapping as it:

- Encourages the maps to be used strategically as intended
- Allows the maps to be displayed quickly on mapping software and in JPEG/PDF formats.
- Removes the license restrictions of OS MasterMap
- Aids people's understanding that these maps show indications of the potential services and are not comprehensive.

Example of 25 metre grid square Aesthetic Ecosystem Service Map

Limitations of Mapping

This mapping is designed to be used strategically. It is not designed to be used at a site or master planning scale. If you want mapping that can be used at a more tactical level it would be better for you to use a more in-depth modelling approach. Our mapping mostly does not account for the condition of habitats which would impact on their provision of an Ecosystem Service (6 out of 18 do use a simple form of quality weighting) and it does not assess the location of the habitat, so for example the noise regulation scores are the same whether a habitat is next to a noise source or not. Thus these maps show indications of the potential services and are not comprehensive.
However we do take into account some quality indicators. If a habitat is located in a designated landscape we uplift their scores for certain services. As part of this we also consider agricultural land class as a quality indicator for food production, and for recreation values we consider if the site is accessible to the public.

How different are the two baselines

Understanding differences between the two Natural Capital baselines that the Ecosystem Service Maps are based on, opens the door for us to understand how different the two sets of Ecosystem Services maps are.

Across 74% of the Arc area the two baseline versions are identical.

There are 52,000 ha where the habitat classification differs because the most accessible method breaks down OS Mastermap polygons to smaller units where needed and uses more up to date crop data

Within the best available data Natural Capital Baseline there is LERC Phase 1 habitat data that identifies an additional 20,000 ha of semi-natural grassland and 411 ha of scrub, heath and wetland

As outlined above the two Natural Capital Baselines that the Ecosystem Services Maps are based on have differences in the habitat data that they contain. The difference these habitat inconsistencies have on the Ecosystem Services scores varies depending on the habitat. For example not correctly identifying semi-natural grassland, heath and wetlands can greatly affect the Ecosystem Scores, as these are often mis-assigned as improved grassland, arable or unknown natural surface in the most accessible dataset and the Ecosystem Services scores for these different habitats are vastly different.

The largest total source of inconsistency arises from differences in the classification of farmland (arable vs improved grassland), with 100,000 ha classified differently between the two Natural Capital Baselines. However because the difference in scores are small per hectare, it is unlikely that this would affect how the maps are viewed.

LERC data also identifies significant additional semi-natural habitats (E.g. 20,000 ha of semi-natural grassland), which in turn has a large impact on a wide range of Ecosystem Service scores, as these semi natural habitats score more for all the cultural and regulating services than their miss classifications.

Take Away Messages

The 'Most Accessible' maps are useful to give a broad overview of the pattern of the distribution of Ecosystem Service provision across the Arc area, including at a county or district scale. They are cheaper to produce and can be shared widely, as no paid for data licences are required (Excluding OS MasterMap). However the Most Accessible data omits many semi-natural habitats that are included in the Best Available datasets, which leads to significant differences in the maps and means they are less accurate when zoomed in to a local level.

As the maps we have produced were designed to be used at a strategic scale either of the datasets could be used for this purpose.

If you want to map Natural Capital / Ecosystem Services at a local (Sub District) scale, then it is essential to use the best available data, including Local Environmental Record Centre data, to give a true reflection of the Natural Capital present. If you are looking to map Natural Capital and use it for decision making at this scale then you should also consider using more comprehensive data on habitat condition and location, as these will have a significant effect on ecosystem provision.