Integrated catchment planning using a natural capital approach: a case study of the Bristol Avon

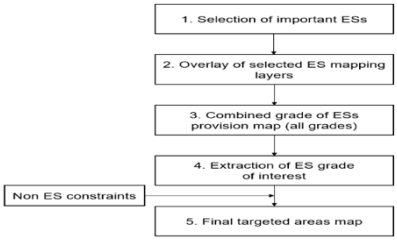
Introduction

This project focuses on catchment management of the Avon Bristol and Somerset North Streams area, and aims to inform Environment Agency planning and decision-making processes based on the goals of the government's 25-year environment plan, by adopting a natural capital approach. By mapping the ecosystem services which deliver the benefits to society provided by our natural capital, an analysis methodology has been developed that could be adopted locally and nationally using only opensource data.
A case-study of the Bristol Frome sub catchment presents a way forward in the use of monetary accounting of natural capital.

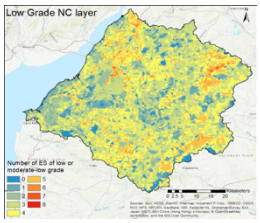
Objectives

- Collate available whole-of-England open source data and associated metadata
- Produce mapping layers of low-grade natural capital and individual ecosystem services
- Generate a methodology to overlay the ecosystem service map layers in useful ways
- Provide an illustrative case study of the above methodology examining areas targeted for potential woodland planting
- Provide a case study for natural capital accounting of the Bristol Frome sub-catchment

Methodology



Bristol Avon study

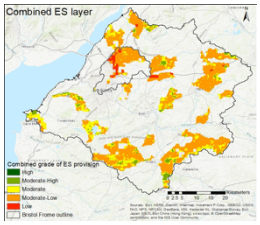


Ecosystem Service layers:

- Air quality
- Carbon storage
- Erosion
- Flood prevention and reduction
- Groundwater supply
- Water quality
- Recreation
- Provisioning
- Biodiversity

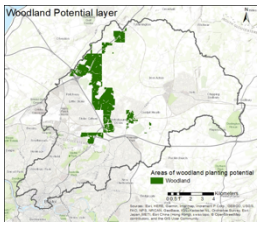
Low-grade natural capital map showing the number of ecosystem services of low grade using all the ecosystem services listed above. It allows the identification of poor areas, where integrated planning could be carried out in order to improve them.

Potential for woodland planting in Bristol Avon:



Overlay of ecosystem service layers which would benefit most from woodland planting: air and water quality, recreational opportunity, biodiversity and carbon storage.

- Choice of ecosystem services benefiting most
- Selection of moderate-low and low status areas
- Identification of area of maximum benefit (Bristol Frome Sub-catchment)
- Withdrawal of woodland constrained areas

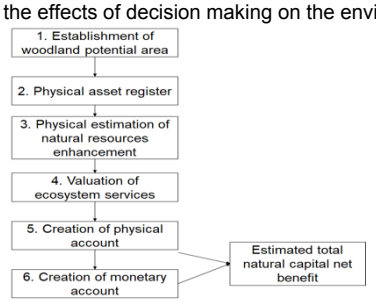


Final potential converted area:

- 1,142 hectares
- 6.5 % of Bristol Frome area
- Potential improvement of air and water quality, carbon storage, recreation and biodiversity

Natural capital accounting: Bristol Frome Case study

Natural capital accounting: Giving monetary value to ecosystem services in order to establish equal footing of tradable goods and the positive externalities derived from the environment. It is a tool to study the effects of decision making on the environment.



- Increasing values for ecosystem services
- Decreasing values for livestock and crop production
- Estimated Total Natural Capital Net Benefit: **37,114,000 £/year**

Conclusion

Ecosystem service mapping is a useful tool for natural capital management in catchment planning.
This study demonstrates how opensource data can be used for ecosystem service mapping, and how those results could be further utilised in natural capital accounting.

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