

# The use of a natural capital approach to assess the impact of rewilding on the provision of ecosystem services: An illustration through the Broughton Hall Estate

## Aim

Develop an understanding of the way in which rewilding will impact upon the provision of ecosystem services at the Broughton Hall Estate.

## Objectives

- To better understand the current natural capital assets and the ecosystem services provided by the Broughton Hall Estate.
- To establish the baseline value of the ecosystem services provided by the estate
- To better understand the way in which rewilding activities will impact upon the ecosystem services provided by the estate.
- To help determine which of the ecosystem services provided by the estate would be most useful to monitor going forward.

## Research process: methods and techniques

- The project used current natural capital accounting techniques to calculate the baseline value of the ecosystem services provided by the estate.
- A habitat-based approach whereby different habitat types are linked to the provision of different ecosystem services was used to identify relevant ecosystem services.
- GIS was used to aid in this process with different habitat types mapped and their extent quantified using geoprocessing tools.
- The ecosystem services identified were then valued using a benefit transfer approach through which ecosystem service values taken from other studies were applied to this study site.
- DEFRA's Enabling a Natural Capital Approach (ENCA) guidance was used in both the scoping of ecosystem services and in identifying suitable studies from which transfer values could be obtained.
- The research also involved conducting a review of available literature considering the impact of rewilding on ecosystem services. Literature relating to each individual ecosystem service included in the assessment was reviewed and then related back to the Broughton Estate study site.

## Key results

- The study found food provisioning to be the current most valuable ecosystem service with an annual value of £146,507. This is unsurprising given the majority of the estates land has been used for sheep farming.
- In terms of regulatory services this study found they currently represent just under a third of the estate's value with carbon sequestration valued at £42,225, air purification valued at £29,546 and flood reduction valued at £7,605.
- A review of the current literature regarding the impact of rewilding on ecosystem services highlighted that trade-offs are typically observed between provisioning and regulatory services.
- Thus it is expected that Broughton will see a reduction in the value of its food provisioning service while regulatory services such as carbon sequestration, air pollutant removal and flood reduction are expected to increase.
- This predicted reduction in the food provisioning services is largely a consequence of reduced numbers of livestock on the estate to alleviate grazing pressure in nature recovery areas.
- Regulatory services increase with woodland which is shown to sequester larger volumes of carbon, remove more air pollutants and reduce flood peaks compared to the improved grassland habitat.

Ecosystem Service	Monetary Valuation (£)
Food Production	146,507
Carbon Sequestration	42,225
Air Pollutant Removal	29,546
Welfare	18,879
Amenity	14,673
Flood Regulation	7,605
Physical Health	2,953

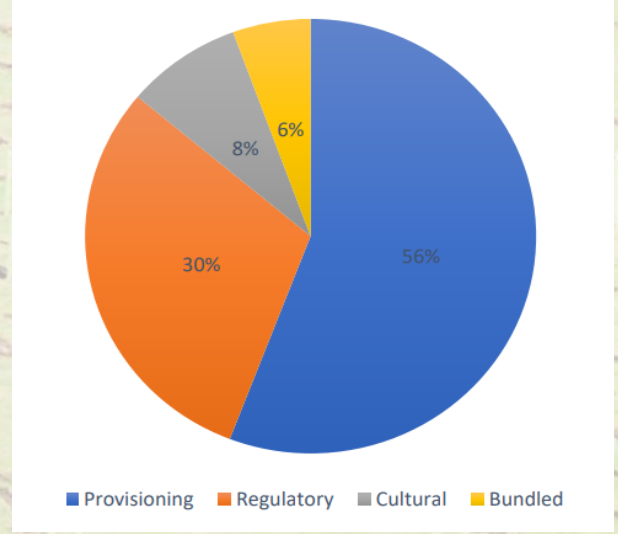


Figure 1. Table showing the monetary value of the ecosystem services provided by the Broughton Hall Estate. Chart showing the proportion of the estates value represented by ecosystem service category.

## Recommendations

The impact of rewilding on the diversity and quality of food production is little discussed in the academic literature. It would be interesting to monitor and attempt to integrate quantitatively into future natural capital assessments.

Given the health and wellbeing focused services offered on the estate, Broughton provides an interesting opportunity for future research into the way in which rewilding can deliver health and wellbeing benefits.

The implementation of Natural Flood Management (NFM) techniques alongside rewilding could help demonstrate synergies between the two techniques perhaps helping NFM gain some of the public interest rewilding has received.



- Approximately one-third of our land to a much wilder state
- Existing long-term farming community continue on remaining two-thirds
- Grade 3 - 5 land is more suited to nature recovery
- The one-third will support small numbers of grazing animals
- Tree planting
- Natural regeneration of trees, scrub & grasslands
- The creation and restoration of wetland habitats
- Sensitive woodland management

The graphics above and the background image have been taken from the Broughton Hall website, more information is available at <https://www.broughtonhall.co.uk/nature-recovery>

The research described here is based on a study completed by Luke Hussey for his MSc in Sustainability and Consultancy at the University of Leeds. Luke's work was supported by Jenny Broomby, the JBA Trust and JBA Consulting.