Ecosystem services: more eco-babble or a business opportunity?

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'Natural Capital', 'Ecosystem Services', 'The Ecosystem Approach', and so on, are fast becoming part of the new vocabulary of policy-makers and the academic research community. But for many in our communities responsible for the day-to-day management of landscapes it is not easy to see the immediate relevance of these concepts and the terms themselves can be somewhat mystifying. This article attempts to de-mystify this area and to show that it presents real business opportunities for land managers which can to be brokered by land advisors.

Ecosystem services are simply the benefits that everyone gains from Nature. Agriculture is both a consumer, such as pollinators and the soil biodiversity needed to recycle nutrients, and producer of these benefits, the most obvious of which are food, fibre (wool), timber and, increasingly, bio-fuels. Less obvious, but of vital importance, are other benefits that underpin agricultural production, such as nutrient cycling and soil formation, whilst agricultural landscapes are also pivotal for services such as carbon sequestration, flood mitigation, pollination and for supporting wildlife and attractive scenery that can be enjoyed by all: the UK countryside is viewed by the public as a green and pleasant land.

Ecosystem Service	What it involves	How it benefits agriculture	How to improve
Natural control of plant pests	Control, suppression or regulation, through natural processes such as predation, of unwanted organisms that reduce yield through crop damage, or cause plant ill health.	Reduces the reliance on insecticides, decreasing costs of production.	Reduce reliance on artificial pesticides to prevent pesticides damaging these non-target species.
Soil fertility	Production of biomass, nutrient cycling, conservation of soil organic matter.	Soil is the foundation of agriculture. Its quality determines crop output.	Reduce reliance on artificial chemicals to promote soil biodiversity and to improve soil structure.
Pollination	Pollinators provide an essential ecosystem service, which is vital for the reproduction and survival of plants, including certain crops and fruits.	More pollinators increases the rate of pollination and thus maximises crop yield, and can also enhance quality of some fruits.	Conserve hedge rows and unfarmed areas, introduce or maintain species-rich grasslands, and enhance floral diversity of field margins.
Soil retention	The physical retention of soil on the land and the maintenance of good soil structure	Ensures soil and benefits it brings such as nutrients remain abundant between crop cycles	The maintenance and conservation of hedgerows and vegetation near waterways reduces nutrient run-off from fields as well as minimising soil loss through wind blow.
Flood control	The regulation of water flow and hence reduction of frequency and severity of flooding both on the land and downstream.	The conservation of woodlands and other vegetation helps to slow down water flow as well as providing a valuable habitat for wildlife, increasing biodiversity.	Maintain and conserve woodland and vegetation surrounding water sources near agricultural land, introduce or maintain ponds to hold the water, and consider establishing 'leaky dams' to reduce peak flows of flood water.

Where are the business opportunities in ecosystem services?

How can the value of services and benefits that the land provides for others in wider society be acknowledged, and how can managers and farmers be properly compensated for that provision? Historically, many of the wider benefits from the land, beyond food production, have been seen as free public goods with no incentives for individuals to pay for their production. Farmers might reasonably challenge the notion behind allocating areas of land as natural habitats for wildlife, thereby diminishing the farm's overall productive capacity, and with the possibility that any neighbouring land could benefit as a 'free rider'. Such benefits need to be properly valued by incentives that pay the producer for ecosystem services (Box 1), so-called Payments for Ecosystem Services (PES) schemes, where agricultural valuers come in as both business advisors to land managers and as brokers for the schemes through:

- Aiding sellers to assess and value a particular service, creating market prices
- Operating as an intermediary between buyers and sellers to organise deals
- Advising on the best land management practices for resource owners to maximise ES
- Structuring PES agreements
- Implementing activities such as monitoring and certification
- Acting as the intermediary for multiple land owners wanting to cooperate for larger schemes

Box 1. The South West Water PES: Upstream thinking

Who pays for the scheme? SW Water

Who sells the services? Farmers in target catchments

Who is the broker? West Country Rivers Trust

Supported by the National Farmers Union, this programme is part of South West Waters long-term plan to reduce their impact on the environment whilst also keeping prices low, and competitive. Grants are targeted at farms with land connected to rivers above water abstraction points aiming to reduce water pollution through land management strategies. Payments are offered to land owners to facilitate implementation strategies to reduce risks to water quality. Sloped areas of land close to a reservoir were required to become low input grassland with wildflower meadows to ensure the farm met the requirements to improve water quality, this also provides additional hay making opportunities for the land owner. These land management strategies also improved farm eligibility for higher level stewardship.

The estimated benefit-cost ratio is 65:1, with costly end-of-pipe treatment avoided by South West Water.

http://www.watergov.org/documents/Westcountry_Rivers_Trust.pdf

How does a PES scheme work?

PES usually involves a long term agreement where a beneficiary pays the owner of the resource in regular instalments in exchange for a constant provision of an element of natural resource that produces the ecosystem service. These can be based on input-based payments given for the adoption of particular land use decisions or management practices or output-based payments given for the production of results (output of ecosystem services). Land advisors are, of course, a crucial intermediary in this process.

Who are the buyers?

A variety of buyers are interested in engaging in PES deals. Businesses seeking to offset their carbon production, flood insurance groups, water companies and tourism groups are showing an increasing interest in PES. – It is currently challenging for land agents to gain business from the open market for PES. This is because buyers have been by-passing intermediary brokers, going directly to well established organisations such as the Woodland Trust. Therefore it is important for agents and agencies to make their availability known. Engaging with the rising demand for PES provides a great opportunity to gain an emerging share of the market. This includes both individual buyers and sellers of PES, as well as opportunities to bring together multiple providers for larger-scale projects.

Private payments for ecosystem services is just one approach and there are also government-funded PES schemes, such as the agri-environment schemes like Countryside Stewardship. Whilst these are not explicitly for ecosystem services, the schemes funded often safeguard both biodiversity and the services it provides. For instance, the Countryside Stewardship Hedgerows and Boundaries grant is a standalone capital grant available under the countryside stewardship scheme and runs for a maximum of two years. The payments can be significant: hedgerow laying @ £9.4/m, earth bank restoration @ £7/ per tree, planting standard hedgerow trees @ £8.8/ per tree and hedgerow coppicing @ £4/m. Hedgerows and their associated biodiversity are very important for a range of services: providing flower-rich habitat on 2% of farmed land and 1km flowering hedgerow per 100 ha can supply six dominant wild pollinator species with enough pollen to feed their larvae (www.nerc-bess.net/). See also Dicks et al 2015 in reference list. How Brexit will affect the uptake and long-term availability of such schemes is uncertain.

How important is biodiversity on the farm?

Biodiversity is vitally important for a diversity of services, including pollination, natural pest control and drought resistance (www.nerc-bess.net/), as well as providing a “cultural service” (Box 2). To help producers assess the biodiversity present, BESS has contributed to the development of the free ‘Cool Farm Tool’ app. (www.coolfarmtool.org). This tool can be used at both ends of the supply chain. Companies can use it to collate and manage supply chain emissions and farmers can use it for decision-making support. Some supermarkets are placing increasing pressure on growers to ensure the products on their shelves are from an environmentally friendly source by carefully choosing their suppliers to meet their own environmental obligations and thus it is more important than ever for farmers to ensure their working practices match retailer demands.

Box 2. The value of biodiversity at Three Hagges Wood Meadow:

Escrick Park Estate, York

Between 2012 and 2013, 10,000 trees were planted in the 10 hectare area of Escrick Park estate, run by Charles Forbes Adams. The aspiration was to replicate natural woodland comprising of a variety of trees which will host a vast array of species, a haven for biodiversity. The creation of the wood meadow boasts significant opportunities for biodiversity and carbon capture. The annual benefits were 15-20k per annum, providing a good return on investment.

Within Three Hagges wood meadow many other projects are being undertaken to enhance the area's land capital. This 'bee hotel' provides a habitat for solitary bees, a lesser known but important pollinator.

The estate commissioned the consultancy EFTEC to assess the natural capital of Three Hagges wood meadow and they identified the most significant natural benefits as:

- Provisioning services- timber, hay
- Cultural services- education, recreation
- Regulating services- carbon sequestration – for the coppice woodland alone, this was valued at £51k -181k

Potentially significant ecosystem services also included crop pollination and soil quality regulation.

Farm diversification through increased ecosystem service production

Land advisors may wonder about the viability of PES for their clients whose business may already be diverse with holiday lets and sporting interests alongside crop production. PES schemes do not diminish these business ventures but complement them through adding a *bio*diverse element. Land areas can be dedicated as 'wild' sites for ecosystem service production with wide ranging possibilities, such as providing a habitat for natural pest control thus reducing reliance on and the costs of artificial pesticides, although this still needs rigorous testing from a cost-benefits perspective. Engaging with up-and-coming environmental markets is an intrinsic part of contemporary estate management. Enhancing natural ecosystem processes will create a sustainable agricultural industry for future generations.

Under the complex and rapidly-evolving regulatory environment it is clearly challenging for those responsible for advising farmers to meet the individual client's needs whilst complying with environmental objectives - often the two may seem like polar opposites. Payments for ecosystem service schemes provide scope to meet both environmental obligations while maximising profit on agricultural land. Taking a more proactive approach to generating ecosystem service benefits from productive agricultural land also presents a timely opportunity to link into the emerging natural capital agenda at the heart of the new Defra 25-year plan for the environment.

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For more information please see:

How can land advisers incorporate ecosystem services thinking into their everyday practice?

www.nerc.ac.uk/research/partnerships/lwec/products/ppn/ppn04/

More case studies

www.gov.uk/government/uploads/system/uploads/attachment_data/file/200901/pb13932a-pes-bestpractice-annexa-20130522.pdf

Hedgerow conservation

www.rspb.org.uk/ourwork/conservation/advice/farmhedges

Dicks, L. V., Baude, M., Roberts, S. P. M., Phillips, J., Green, M., Carvell, C. (2015) How much flower-rich habitat is enough for wild pollinators? Answering a key policy question with incomplete knowledge. Ecological Entomology 40, 22-35.

Cool Farm Tool

www.coolfarmtool.org/CoolFarmTool

Water friendly farming

https://www.gwct.org.uk/media/434327/Water-Friendly-Farming-Report-2014a.pdf

Agri-environment schemes

https://www.gov.uk/government/collections/countryside-stewardship-get-paid-for-environmental-land-management