Calculating the ecosystem services associated with coppice woodland management in Kent, South East England.

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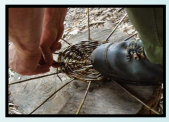
COPPICE

Coppice is a **traditional method of woodland management** in which stools are cut on a regular cycle. This provides a variety of habitats for wildlife and a valuable supply of small-wood with many uses:

- Fencing
- Charcoal
- Fuel
- Building
- Tan-bark
- Turnery
- Crafts



The active management of woodland have been declining for more than a century and many of those remain neglected.

To highlight the importance of this management, coppice is increasingly being valued for its ecosystem services.

ECOSYSTEM SERVICES (ES)

ES are defined as **"*the benefits people obtain from ecosystems*"**

Powerful tool to translate the importance of ecosystem services to decision-makers

Anthropocentric justification for conserving species and ecosystems based on human dependence on the goods and services they provide.

THE ES ARE NORMALLY CLASSIFIED IN FOUR CATEGORIES

- **Provisioning services: "***The products obtained from ecosystems".*
- **Cultural services:** "*The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, andaesthetic experiences".*
- **Regulating services:** *"Benefits obtained from the regulation of ecosystem processes".*
- **Supporting services:** "*Those that are necessary for the production of all other ecosystem services".*

To carrying out ecosystem services valuation:

- Study all the ES associated with traditional coppice rotation.
- Determining the extent of active coppice management.

Woodland butterflies have declined as traditional management has been abandoned.

Specific communities of birds are found in coppiced woods with a mosaic of stages of growth.

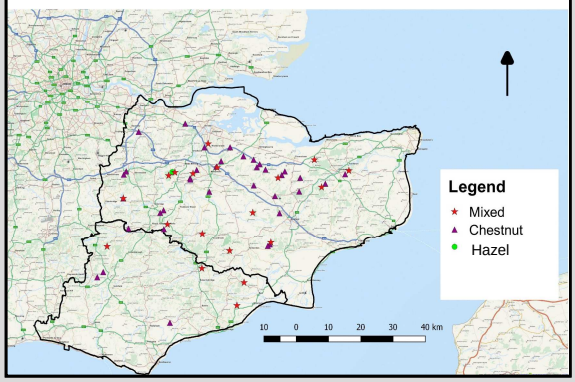
Coppice of between 1 to 7 years old supports the greatest diversity of small mammals.

Sustainable forest management favours bluebells carpets.

Table showing the ecosystem services in woodland based on literature. The higher the number of asterisks, the more each management type is related to each ecosystem service. The interrogation marks account for ecosystem services for which no information was found.

SUPPORTING	COPPICE	OVER STOOD COPPICE	HIGH FOREST
Light requiring ground flora	***	**	*
Invertebrates	***	**	*
Reptiles	***	**	*
Small mammals	***	**	*
Scrub nesting birds	***	**	*
Connectivity	**	*	***
Bats	*	**	***
PROVISIONING			
Small diameter round wood	***	**	*
Fencing products	***	*	*
Fuel wood	***	*	***
Charcoal	***	**	*
Fodder	***		
Nuts and berries	***	**	*
Game	**	*	***
Deadwood	*	**	***
Hole nesting birds		*	***
Bat roosts		*	***
CULTURAL			
Traditional rural jobs	***	*	**
Ancient woodland	***	*	**
Landscape aesthetics	*	**	***
Industrial archaeology	***		
REGULATING			
Carbon sequestration	***	**	**
Soil erosion prevention	**	?	***
Reduction of diffuse pollution	**	?	***
Air quality	?	?	***

Active coppice sites 1st September – 31st August 2015



QUESTIONS

This initial research has revealed how little evaluation of the ecosystem services associated with coppice has been carried out to date. A systematic approach is required to inform future management strategies and a pre-requisite to this is collecting more data.

Key questions include:

- What is the area of coppice forests?
- What species are these composed of?
- What is the proportion in active management as compared to abandoned?
- How long is the rotation cycle?
- What are the timber and wood products?
- How many jobs are related to coppice forest management?

Work has been carried out to track the area of active coppice and record the principal species in South East England but much more needs to be done to move from qualitative to quantitative evaluation of coppice compared to high forest systems and this is likely to be country/ecoregion specific.

Bealey, C. E., & Robertson, P. A. (1992). Coppice management for pheasants. In *Ecology and Management of Coppice Woodlands* (pp. 193-210). Springer Netherlands.
Buckley, G. P. (Ed.). (1992). *Ecology and management of coppice woodlands*. Springer Science & Business Media.
Carbon sequestration: Deckmyn, G., Muys, B., Garcia Quijano, J., & Ceulemans, R. (2004).
Cinnirella, S., Iovino, F., Porto, P., & Ferro, V. (1998). Anti-erosive effectiveness of Eucalyptus coppices through the cover management factor estimate. *Hydrological processes*, *12*(4), 635-649.
Coppice products (2016). Retriebed from http://coppice-products.co.uk/product-type/coppice-restoration-management/
Fox, R., Warren, M. S., Asher, J., Brereton, T. M., & Roy, D. B. (2007). The state of Britain's butterflies 2007.
Fuller, R. J., & Warren, M. S. (1993). *Coppiced woodlands: their management for wildlife*. Peterborough, UK: Joint Nature Conservation Committee.
Gherardi, F., Corti, C., & Gualtieri, M. (Eds.). (2009). *Biodiversity Conservation and Habitat Management-Volume I*. Encyclopedia of Life Support Systems (EOLSS).
Glemnitz, M., Platen, R., Krechel, R., Konrad, J., Wagener, F., Boatman, N., ... & Peel, S. (2013). Can short-rotation coppice strips compensate structural deficits in agrarian landscapes?. *Aspects of Applied Biology*, *118*, 153-162.
Mirck, J., Isebrands, J. G., Verwijst, T., & Ledin, S. (2005). Development of short-rotation willow coppice systems for environmental purposes in Sweden.*Biomass and Bioenergy*, *28*(2), 219-228.
Russo, D., Cistrone, L., Jones, G., & Mazzoleni, S. (2004). Roost selection by barbastelle bats (Barbastella barbastellus, Chiroptera: Vespertilionidae) in beech woodlands of central Italy: consequences for conservation. *Biological Conservation*, *117*(1), 73-81.