



Forestry in England
A response from the British Ecological Society to the Environment, Food and Rural Affairs
Committee
25 October 2016

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Founded in 1913, we are the world's oldest ecological society, with over 5,000 members worldwide. As the voice of the UK's ecological community, we communicate the value of ecological knowledge to policymakers and promote evidence-informed solutions.

The UK is a world leader in ecological research. It is vital that in making changes to environmental policies, especially following the decision to leave the EU, Government draws on this expertise and evidence base, and that the research community engages with decision-making.

This response has been developed in collaboration with our Forest Ecology Special Interest Group. The group aims to stimulate discussion on all aspects of forest ecology, in biomes from boreal to tropical, including both natural and managed systems; share new, best practice and findings among researchers, forestry professionals and policy-makers; and hold and facilitate meetings, workshops and symposia. <https://besfeg.wordpress.com/>

Introduction

1. England's trees, woodlands and forests are an exceptionally important component of our natural capital – the elements of nature that provide value to people. They provide a range of ecosystem services – the benefits that people receive from the natural environment. These include, but are not limited to: timber and fuel production, capture and storage of carbon in both wood and soil, water regulation and supply through the interception of rainfall, soil protection, biodiversity, and recreation¹. The value of the social and environmental benefits derived from the UK's forests has been estimated at over £1.2 billion per annum².
2. England's forests do not represent a homogeneous habitat type. The UK National Ecosystem Assessment³ highlights two habitat types, coniferous woodland, and broadleaved mixed and yew woodland, and six further priority habitats in England: lowland beech and yew woodland, wet woodland, wood-pasture and parkland, upland mixed ash woodland, and upland oak woodland. Woodland types are affected by a range of factors including climate, soils, geology and past management.

The Committee is seeking recommendations on how effectively current government policies achieve the objectives below and how they should be developed in future to:

¹ Sing, L., Ray, D., Watts, K. (2015) *Ecosystem services and forest management*, Research Note, Forest Research. Available online at: [http://www.forestry.gov.uk/pdf/FCRN020.pdf/\\$FILE/FCRN020.pdf](http://www.forestry.gov.uk/pdf/FCRN020.pdf/$FILE/FCRN020.pdf)

² UK National Ecosystem Assessment (2011) *The UK National Ecosystem Assessment: Technical Report*. UNEP-WCMC, Cambridge.

³ Quine, C., Cahalan, C., Hester, A., Humphrey, J., Kirby, K., Moffat, A. and Valatin, G. (2011) Woodlands. In *The UK National Ecosystem Assessment Technical Report*. UK National Ecosystem Assessment, UNEP-WCMC, Cambridge.

a. Increase the level of tree cover and improve management of private and public forests in England

3. In England, approximately 215,000 hectares are classified as woodland or forest, representing 10% of land area. Despite Government commitments to increasing the level of tree cover, annual planting rates in England have remained relatively static in recent years, and decreased substantially in 2015-2016⁴.
4. The previous Natural Capital Committee (NCC) identified increased forest planting, as a key opportunity for natural capital investment⁵. Their analysis suggested that up to 250,000 hectares of planting over the next 50 years could generate net societal benefits of over £500 million per year, particularly in terms of carbon sequestration and storage, and recreation.
5. The NCC also underlined the importance of taking a strategic approach to increasing tree cover, by locating new planting appropriately. Targeting woodland creation around the periphery of urban areas can maximise recreational benefits, and planting adjacent to existing woodlands can improve enhance resilience and ecosystem service delivery⁵. Woodland planting should use an appropriate native species mix, and this should be made explicit in relevant guidance.
6. Woodland creation should also avoid peatlands and other biodiversity rich habitats that rely on active management to inhibit tree growth, such as chalk grassland. Previous forestry policies, pursued in the 1970s, that incentivised plantation forestry in peatland areas had a number of negative ecological impacts including direct loss of internationally important ecosystems, modification of adjacent habitat due to changes in water flow and storage, and net greenhouse gas emissions from the disturbance of deep peat^{6, 7}.
7. The management and creation of woodlands should be considered within the context of a strategic approach to land use planning and ecosystem service delivery at the catchment, or other scale appropriate for delivering ecosystem service outcomes⁸. Forestry policy should be integrated with other relevant policies currently under development, including Defra's 25-year plan for the natural environment and the replacement for the Common Agricultural Policy.
8. Forests, woodlands and trees in the wider landscape are important elements of delivering a coherent ecological network, resilient to climate change, as identified in the Making Space for Nature report⁹, and carried forward in the Natural Environment White Paper¹⁰.

⁴ Forestry Commission (2016) *Woodland Area, Planting and Restocking*, IFOS Statistics, Forest Research. Available online at [http://www.forestry.gov.uk/pdf/wapr2016.pdf/\\$FILE/wapr2016.pdf](http://www.forestry.gov.uk/pdf/wapr2016.pdf/$FILE/wapr2016.pdf)

⁵ Natural Capital Committee (2015) *The State of Natural Capital: Protecting and Improving Natural Capital for Wellbeing and Prosperity*. Available online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/516725/ncc-state-natural-capital-third-report.pdf

⁶ Lindsay, R., Birnie, R. and Clough, J. (2014) *Ecological Impacts of Forestry on Peatlands*. IUCN UK Committee Peatland Programme Briefing Note 4. Available online at: <http://bit.ly/2e9VA8r>

⁷ Laine, J., Vasander, H., Sallantausta, T. (1995) Ecological effects of peatland drainage for forestry, *Environmental Reviews*, 3 (3-4), pp286-303.

⁸ British Ecological Society (2016) *The Future of the Natural Environment after the EU Referendum inquiry: A response from the British Ecological Society to the Environmental Audit Committee*. Available at: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/the-future-of-the-natural-environment-after-the-eu-referendum/written/37671.pdf>

⁹ Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leaf, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) *Making Space for Nature: a review of England's wildlife sites and ecological network*. Report to Defra.

¹⁰ HM Government (2011) *The Natural Choice: securing the value of nature*. HM Government, London.

9. There has been a long-term trend towards lower levels of active management (for example coppicing, partial harvesting)¹¹ of broadleaved woodlands, particularly those in private ownership, leading to a loss of open habitats and consequent declines in populations of species dependent on those habitats, such as some woodland birds and butterflies^{12,13}.
 10. Currently around 58% of woodland is in active management (an increase from 52% in 2011)¹⁴. Further increasing the proportion of woodland in active management, in line with the aims of the Government's Forestry and Woodlands Policy Statement¹⁵ and actively managing new woodlands, can have a positive impact on biodiversity, as well as improving recreation potential.
- b. Balance woodland protection, including of ancient forests, with economic exploitation, including developing woods as an energy source**
11. The economic value of forests to society is not limited to their exploitation for timber and fuel. For example the UK's forests hold a carbon stock of 800 Mt¹⁶, providing a social value of net carbon sequestration at least double the market value of wood production per hectare.
 12. An overemphasis on the economic exploitation of forests may lead to a decline in the provision of other environmental or cultural services, with a consequent reduction in societal benefits. Management of England's forests should take into account the full range of ecosystem services they provide, including carbon storage and sequestration, flood mitigation, biodiversity, recreation and cultural values, as well as timber and fuel production.
 13. The ability of forests to provide different ecosystem services is dependent on the appropriate active management of individual woodlands, and their location within the wider landscape. Forest management may require trade-offs between different ecosystem services, and does not constitute a binary decision between protection and exploitation.

Ancient Forests

14. An ancient forest or woodland is defined as one which has been wooded continuously since at least 1600 AD¹⁷, and is regarded as irreplaceable. Ancient forests are widely recognised for their exceptionally high biodiversity value, providing habitat for large numbers of associated species, and supporting complex communities of organisms that have developed over long periods of time^{18,19}.

¹¹ Bernes, C., Jonsson, B.G., Junninen, K., Löhmus, A., Macdonald, E., Müller, J and Sandström, J. (2015) What is the impact of active management on biodiversity in boreal and temperate forests set aside for conservation or restoration? A systematic map, *Environmental Evidence*, DOI: 10.1186/s13750-015-0050-7

¹² Kirby, K.J., Smart, S.M., Black, H.J., Bunce, R.G.H., Corney, P.M., and Smithers, R.J. Long term ecological change in British woodland (1971-2001), *English Nature Research Reports*, 653.

¹³ Amar, A., Smith, K.W., Butler, S., Lindsell, J.A., Hewson, C.M., Fuller, R.J., and Charman, E.C. (2010) Recent patterns of change in vegetation structure and tree composition of British broadleaved woodland: evidence from large-scale surveys, *Forestry*, doi: 10.1093/forestry/cpq017

¹⁴ Department for Environment Food and Rural Affairs (2016) *England Natural Environment Indicators*. Defra, London.

¹⁵ Department for Environment, Food and Rural Affairs (2013) *Government Forestry and Woodlands Policy Statement*. Defra, London

¹⁶ UK National Ecosystem Assessment (2011) *The UK National Ecosystem Assessment: Technical Report*. UNEP-WCMC, Cambridge.

¹⁷ <https://www.gov.uk/guidance/ancient-woodland-and-veteran-trees-protection-surveys-licences>

¹⁸ Wentworth, J. and de Palma, A. (2014) Ancient Woodland, *POSTnote*, 465.

¹⁹ Forestry Commission (2016) *Ancient Woodland*. Available online at: <http://www.forestry.gov.uk/fr/infid-5w2g8q>

15. To ensure that this biodiversity value is maintained, ancient forests require specific and appropriate protection, and differentiation within policy and management guidance, as currently provided by the Forestry Commission²⁰. A lack of monitoring and recording of woodland loss and damage can currently hinder implementation of this guidance.

Adaptation to climate change

16. Climate change poses a threat to forests, their biodiversity and the ecosystem services they provide. There are a variety of different strategies to increase their resilience, including increasing the size of woodland patches, restoring the hydrology of wetlands and diversifying the species mix when planting new stands. Different approaches will be appropriate in different circumstances and adaptation needs to be integrated with other objectives in management plans²¹.
17. It is important that guidance aimed at strengthening the resilience of native and ancient woodlands to climate change does not conflict with biodiversity conservation. There is debate over the extent to which management practices currently recommended within Forestry Commission guidance for native and ancient woodland²², such as diversifying the species mix by planting native species outside their natural range, or introducing non-native seed origins or species, could risk exacerbating biodiversity loss²³. Such interventions should only be undertaken when it can be clearly demonstrated that they will not contribute to biodiversity loss, and guidance should reflect this.

Trees in the wider landscape

18. The focus of current policy is trees within woodland, with little attention given to trees in the wider landscape, including ancient or 'veteran' trees of high cultural or environmental value, for example the Tolpuddle Martyrs' Tree²⁴. England is particularly well endowed with such trees which provide habitat for a large number of species²⁵. However their population is at risk through land use change, pollution, and pests and diseases.
19. The important function of trees in the wider landscape, including providing habitat for other organisms and enhancing ecological connectivity between individual woodlands, should be better recognised by policymakers, planning authorities and land managers. They can play an important role in delivering England's ecological network, as identified in the Making Space for Nature report²⁶.

²⁰ Forestry Commission and Department of Environment, Food and Rural Affairs (2005) *Keepers of time: a statement of policy for England's ancient and native woodlands*. Available online at: [http://www.forestry.gov.uk/pdf/anw-policy.pdf/\\$FILE/anw-policy.pdf](http://www.forestry.gov.uk/pdf/anw-policy.pdf/$FILE/anw-policy.pdf)

²¹ Natural England and RSPB (2014) *Climate Change Adaptation Manual*. Available <http://publications.naturalengland.org.uk/publication/5629923804839936>

²² Forestry Commission England (2016) *Adapting England's woodlands to be more resilient*. Available online at: <http://www.forestry.gov.uk/england-resilience>

²³ Newton, A.C. (2016) Biodiversity Risks of Adopting Resilience as a Policy Goal, *Conservation Letters*, doi:10.1111/conl.12227

²⁴ <http://www.ancient-tree-hunt.org.uk/discoveries/newdiscoveries/2009/The+Tolpuddle+Martyrs+Tree>

²⁵ Forestry Commission (2016) *Veteran Trees*. Available online at: <http://www.forestry.gov.uk/fr/inf-d-5w2g5b>

²⁶ Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) *Making Space for Nature: a review of England's wildlife sites and ecological network*. Report to Defra.

- c. Provide a strategic framework, including fiscal and regulatory regimes, to support forestry businesses**
 - d. Provide grants and advice through the CAP and the Rural Development Programme, and any successor programme, for England that incentivise the sector to deliver multiple economic and environmental benefits**
20. While the decision to leave the European Union presents a number of risks to the environment, the need to develop an alternative to the Common Agricultural Policy presents an opportunity to develop an agricultural funding mechanism that better integrates agriculture and the environment, and shifts the balance away from income support towards payment for ecosystem services – including those delivered by forests – based on a principle of “public money for public goods”
21. A revised approach to agri-environment support based on ecosystem service delivery should provide more flexibility to incentivise woodland creation, multifunctional land-use such as agro-forestry, and forest management within a strategic framework.
22. We would recommend an approach to funding and advice aligned with our recent recommendations to the Environmental Audit Committee inquiry on the ‘Future of the Natural Environment after the EU Referendum, namely²⁷:
- i. A strong focus on delivering ecosystem services and paying by results, thereby securing public goods for public money
 - ii. Incentives to encourage land-owner cooperation to deliver landscape scale changes
 - iii. Greater flexibility including variable length grants and a focus on outcomes giving land managers more freedom to determine how they are achieved
 - iv. More scheme after-care to provide ongoing support and advice for land managers
 - v. Better monitoring and evaluation to ensure effective delivery and value for money
23. In order to effectively deliver such schemes, it is important that adequate technical and professional forestry expertise is available to land managers, and that Government agencies such as Natural England and the Forestry Commission possess the capacity to offer appropriate advice.
- e. Ensure there is the right research, including into management of pests and diseases, which is well integrated into policy development**

UK co-ordination

24. UK forestry policy is increasingly devolved, with Natural Resources Wales and the Northern Ireland Forest Service assuming forestry responsibilities, and the Scottish Government currently developing plans to take on full responsibility for forestry. However it is important that research co-ordination retains a UK-wide dimension in line with the recommendations of the

²⁷ British Ecological Society (2016) *The Future of the Natural Environment after the EU Referendum inquiry: A response from the British Ecological Society to the Environmental Audit Committee*. Available at: <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/the-future-of-the-natural-environment-after-the-eu-referendum/written/37671.pdf>

Independent Panel on Forestry²⁸, to prevent duplication of effort and effective knowledge sharing, for example in the face of novel pests and diseases.

Monitoring

25. Long-term monitoring of the condition of English forests could be improved. The National Forest Inventory (NFI) provides our current monitoring framework, designed to provide information on the “size, distribution, composition and condition” of our forests and changes over time²⁹. Current monitoring effort is primarily focused on producing information relevant to the forestry sector, and could be enhanced through greater incorporation of ecological data.
26. The NFI relies mainly on ground data, with a sample of woodlands surveyed over a five-year period. There are opportunities to better integrate new remote sensing technologies to improve temporal and spatial resolution, alongside the use of enhanced ground data, for example through long-term permanent plot studies³⁰. For example, remote sensing techniques can collect data on primary productivity – the rate at which energy is converted to organic matter - at two-week intervals. This data could be used as an early detector of pests and diseases, combined with ground data to map changes in carbon stocks, or map the distribution of tree species.
27. In some cases monitoring effort has been reduced in recent years. The UK is a member of the UN Economic Commission for Europe (UNECE) International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests)³¹. However, it is no longer contributing to the International Co-operative Programme (ICP) Forests Level I systematic monitoring programme, which provides an annual overview of forest condition based on soil, tree crown and foliar (leaf) assessments, maintaining a record of biotic and abiotic damage important for monitoring pest and disease spread. The last large scale UK survey under the Level I programme took place in 2006/2007.
28. The UK continues to contribute to the ICP Forests Level II programme³², which aims to gain a better understanding of stress factors, including air pollution and climate change, affecting UK forest ecosystems.

Skills Gaps

29. Forestry research in general, and plant pathology specifically, have been identified as vulnerable skills and capabilities within UK science by the Biotechnology and Biological Sciences Research Council (BBSRC)³³. Major skills shortages within plant pathology and entomology, including

²⁸ Independent Panel on Forestry (2012) *Independent Panel on Forestry: Final Report*

²⁹ Forest Research (2016) *About the NFI*. Available online at <http://www.forestry.gov.uk/fr/bee-h-a3gf9u>

³⁰ Kirby, K.J., Bazely, D.R., Goldberg, E.A., Hall, J.E., Isted, R., Perry, S.C., and Thomas, R.C. (2014) Changes in tree and shrub layer of Wytham Woods (Southern England) 1974-2012: local and national trends compared, *Forestry*, 87 (5), pp663-673.

³¹ <http://icp-forests.net/>

³² Forest Research (2016) *Intensive long-term monitoring of forest ecosystems*. Available at: <http://www.forestry.gov.uk/environmentalresearch/level2>

³³ BBSRC and MRC (2014) *BBSRC and MRC Review of Vulnerable Skill and Capabilities*. Available online at: <http://www.bbsrc.ac.uk/documents/1501-vulnerable-capabilities-report-pdf/>

molecular ecology techniques such as DNA barcoding³⁴ well as taxonomy have also been identified by the UK Plant Sciences Federation³⁵.

30. In its 2014 report, the BBSRC found that there is relatively little research in UK higher education institutions dedicated to forestry, especially UK forestry; difficulty recruiting undergraduates; a lack of specialist training opportunities and a shortage of postdoctoral level research skills.
31. For plant pathology, it identified a significant shortage of appropriately trained scientists and a lack of training opportunities, an increased demand for expertise, and difficulty in generating the high impact publications demanded by the Research Excellence Framework for applied research.
32. Our members working in this research area have reported that the skills shortage in forests pests and diseases is particularly acute within the UK higher education sector. There are a limited number of specialist undergraduate or postgraduate courses in this field³⁶, and a lack of funded studentships or bursaries to encourage more applicants.

Funding programmes and research priorities

33. Recent funding for research on UK forest pests and diseases has been channelled through the Tree Health and Plant Biosecurity Initiative (THAPBI)³⁷, co-ordinated by the Living with Environmental Change partnership (now superseded by the Research & Innovation for our Dynamic Environment Forum³⁸) and co-funded by BBSRC, the Natural Environment Research Council, Economic and Social Research Council, Defra, Forestry Commission and Scottish Government. THAPBI is now in its third phase, but it is not clear whether it will be extended. There has also been concern expressed that funding calls have excluded more ecological approaches to forest disease problems.
34. In the context of a drive to increase forest planting, assessing the impact of forest expansion on biodiversity, ecosystem services and human wellbeing, and the resilience of such forests to climate change (both increased temperature and carbon dioxide levels), is an important research priority.
35. New advances in molecular and mathematical approaches to ecology have the potential to inform new approaches to forest management and help address these questions. Enhanced knowledge of how species interact within forest ecosystems, and how these systems function, can improve our understanding of how forests will respond to environmental change, including climate change and pathogens, therefore informing management responses that enhance resilience³⁹.
36. While research examining the impacts of various forest management techniques is well established, there is a need to better understand how and why these impacts occur. Ecological

³⁴ DNA barcoding is a method of identifying species using an organism's genetic code.

³⁵ UK Plant Sciences Federation (2014) UK Plant Science: Current status and future challenges. Available online at: https://www.rsb.org.uk/images/pdf/UK_Plant_Science-Current_status_and_future_challenges.pdf

³⁶ Exceptions include Harper Adams University MSc Conservation & Forest Protection; MSc Forestry Management

³⁷ <https://wiki.ceh.ac.uk/display/THAPBI/THAPBI+-+Tree+Health+and+Plant+Biosecurity+Initiative>

³⁸ <http://www.nerc.ac.uk/research/partnerships/ride/>

³⁹ Evans, D.M., Kitson, J.J.N., Lunt, D.H., Straw, N.A. and Pocock, M.J.O. (2016) Merging DNA metabarcoding and ecological network analysis to understand and build resilient terrestrial ecosystems, *Functional Ecology*, doi: 10.1111/1365-2435.12659.



processes acting in forest ecosystems happen over long time scales, therefore long term research funding and appropriate monitoring is vital, including better use of the Forestry Commission's network of experimental sites⁴⁰.

⁴⁰ Forest Research (2016) *Management of long-term experiments*. Available online at: <http://www.forestry.gov.uk/fr/infd-7pcdhb>