The role of woods in adaptation to climate change

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My wife gave me a book for Christmas. Here it is. 'The man who planted trees' by Jean Giono. It was written in the 1950s and bore a message ahead of its time. The narrator, journeying on foot across the barren plains of the lower Alps, has his thirst assuaged by the shepherd Elzeard Bouffier. The shepherd, who lives alone, has set about transforming the desolate hills and lifeless villages, all with the help of a few acorns. Over 40 years, a great treescape is established, ancient springs flow again, the breeze is sweet with the scent of flowers, people return to the village.

There are several messages in this book. Firstly, it is a vivid picture of hope. Whilst we shouldn't shy away from alerting people to the threat of climate change, we should spend more time sharing our solutions. Secondly, how difficult is it to plant an acorn? Yet we wrap ourselves up in all these action plans and strategies and pretend that we are making progress. Thirdly, trees outlive us, they are spiritual places, places to relax and you cannot put a price on that. Fourthly, as the story demonstrates, there are things that woods provide that help us to survive.

And that brings me to the first part of my talk.

Goods & services

1.1 The old battle between growing food and growing trees is going to be renewed soon as some of the major food exporting countries of the world are impacted by climate change. Some of the goods & services from woods, such as water purification, presently hidden from society, need to be revealed. It will be critical for us to create markets for these goods & services. So what are they?

1.2 Recreation

My family enjoy FE's new bike tracks, art & 'Go Ape' at Haldon Forest but we would like to get there by public transport.

1.3 Zero carbon building materials

1.4 Fuel

1.4.1 What happens to the timber from railway track management, local council site management etc?

1.4.2 Can partial wood burning yield charcoal to improve soil structure and carbon sequestration?

1.5 Biodiversity

- Excellent Woodland Trust paper by Calder et .al. 2008

1.5.1 Yes, we can expect changes and let's not forget that many will be driven by change in other countries e.g. migrant birds wintering in the Sahel.

1.5.2 Consider that a 300 year-old oak started growth in the Little ice Age of 1450-1890, survived the hottest August ever in 1908, severe winters of 1962, drought of 1976 and the mid 1990s heat waves.

1.5.3 Remember also that woodlands have many niches; a butterfly currently adapted to hot open space may move into dappled shade, as they do in southern Europe.

1.6 Shelter

1.6.1 Animals – we're used to wind breaks but shade will be increasingly important.

1.6.2 Humans likewise will need protection from direct sunlight and high temperatures in cities. Trees can ameliorate temperatures by 1-2 degrees.

1.7 Climate regulation

1.7.1 Carbon cycle

Old growth forest

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Old-growth forests as global carbon sinks

Sebastiaan Luyssaert et. Al.

Carbon dioxide is stored in live woody tissues and slowly decomposing organic matter in litter and soil[4]. Old-growth forests therefore serve as a global carbon dioxide sink, but they are not protected by international treaties, because it is generally thought that ageing forests cease to accumulate carbon[5, 6]. We find that in forests between 15 and 800 years of age, the net carbon balance of the forest including soils is usually positive. Old-growth forests can continue to accumulate carbon, contrary to the long-standing view that they are carbon neutral. Old-growth forests accumulate carbon for centuries and contain large quantities of it. We expect, however, that much of this carbon, even soil carbon[9], will move back to the atmosphere if these forests are disturbed.

1.7.2 Water cycle

Flood amelioration

Water balance

Annual water yield under broadleaved trees will usually be lower than under grass or crops but depends on climate, geology and woodland design.

Woods could reduce low flows. Risk greatest for conifers on deeper lowland aquifers, lowest for broadleaves on shallower upland aquifers.

Research on floodplain woods needed – and demonstration planting sites throughout UK.

1.7.3 Nutrient cycle

Preventing soil erosion

Scavenging pollutants born through air, soil & water. For example, low-level ozone will increase in urban areas and trees can remove it.

2 What should happen 2009-2012?

2.1 Where should new woodland be created?

2.1.1 Close to markets & low carbon modes of transport e.g. canals and rivers!

2.1.2 In towns and cities (not just woods but orchards of fruit (cherry, peach) and nuts (walnut) which will thrive in our future climate).

2.1.3 'Climate change in the SW: A practical guide for woodland owners and agents' was sent to each of the SW upper-tier Local Authorities as part of our guidance on delivering National Indicator 188: Preparing to Adapt to Climate Change.

2.1.4 Next to existing woods to increase patch size

2.1.5 In the upland fringe by a cessation of burning

2.1.6 Floodplains (forthcoming 'water and woodland' workshop 31st March 09)

2.1.7 Where they can provide stepping stones for mobile species e.g. woodland butterflies.

2.1.8 Areas prone now or in the future to soil erosion and nutrient loss e.g. on steep slopes, shallow soils, dry soils? On the South Downs, hedgerow removal led to measurable increase in soil loss on the slopes. I understand that *FC & EA* ran a *pilot* in 2*008 to encourage new planting on erodible soils* by adjusting the EWGS *scoring system.* How did that go?

2.1.9 South bank of chalk streams to ameliorate water temperatures for fish

2.1.10 Not in areas prone to wind throw!

Have we set out exactly where on a map? Yes. Nature Map, Ancient Woodland Priority Areas, Roger Catchpole England Habitat Network, Environmental Stewardship targeting map

AWP - how indentified?

The first stage was a mapping exercise to identify robust habitat networks centred on clusters of ancient and native woodlands.

These networks were then considered in the light of the potential for partnership working, and four Ancient Woodland Priority Areas (AWPAs) were selected for 2006/07. Dartmoor, Exmoor, Cotswolds &?

Has prioritising worked on the ground?

2.2 What should we plant?

2.2.1 Here I am not the expert but I recommend www.forestresearch.gov.uk

2.2.2 Oak, ash, sweet chestnut, small-leaved lime (which needs temperatures of 20 degrees for seed to set) and don't give up on beech!

2.2.3 Variety - to limit the chance of total death from pests and diseases.

2.2.4 Perhaps it would be a good idea to source seed from ancient woodlands that already experience drought e.g. on thin soils. There is probably already enough genetic variation in existing populations.

2.3 How should woodlands be managed in future?

2.3.1 A few points to consider. Bring forward management to autumn as the whole tree year advances and winters get wetter?

2.3.2 Fire risk management

2.3.3 'Traditional' management; pollarding to reduce chance of wind throw, coppicing & layering for wood fuel, high forest for building materials, continuous cover techniques, all increasing structural diversity which will be good for wildlife.

2.3.4 But not forgetting the vital role of non-intervention on our ancient woods or at least small coupe management to maintain micro-climates. Nature given free reign will throw up surprises and we have much to learn.

2.3.5 Deer and the importance of eating them to enable establishment! Lynx!

So, I hope that is enough to stimulate a lively debate. Thanks.