

6. NATURAL ENVIRONMENT

We want a high quality natural environment that is protected and enhanced.

1. Trees and woodlands are a vital part of the natural environment. They are important and diverse habitats invaluable in their own right but they also can have impacts on other components of the environment and climate. Trees may have a significant role in mitigating some of the effects of climate change.



A. Climate Change

(See also Landscape and Biodiversity)

2. There is clear and compelling evidence that, because of human activities, the global climate is changing. It is also becoming evident that these changes are likely to be particularly acute in the East of England.
3. By the end of the century, it is likely that there will be:

- hotter, drier summers (between 2° and 5°C warmer and 30% to 60% drier),
- milder, wetter winters (between 1.5° and 3.5°C warmer and 15% to 35% wetter),
- more frequent extreme high summer temperatures and winter rainfall, and
- an extended thermal growing season of up to 50 days.

4. These changes will have a direct impact on the growth of trees and woodlands of the region:

- reduction in summer moisture may prevent tree growth on very thin, free-draining soils,
- increasing soil-moisture deficit may limit species choice, especially where a species is at the limit of its range because of moisture availability,
- growth rates may be enhanced or reduced dependent on species, and
- population densities of mammalian pests are likely to increase due to milder winters and increased forage availability during spring – the critical period. Grey squirrels will benefit more than red.

5. Although some types of woodland in the region may be threatened by climate change, a number of opportunities for the use of trees and woodlands to mitigate its effects are likely to arise.
6. Trees and woodlands play a significant role in moderating the flux of greenhouse gases, particularly carbon dioxide, between the land and the atmosphere. They can serve in three ways, as:

Reservoirs: by storing carbon in biomass, litter and soils;

Sinks: when uptake of atmospheric CO₂ is increased – for example by increasing the area of productivity;

Sources: when the burning or decay of biomass and disturbance of woodland soils results in the emissions of greenhouse gases.

7. Woodland management practices can affect the accumulation of CO₂ in the atmosphere. These practices can be grouped into three categories:

Conservation management: retaining existing carbon reservoirs through woodland conservation and sustainable harvesting;

Storage management: developing sinks by increasing the woodland area, increasing the forest carbon stored per unit area through silvicultural measures (such as longer rotations and increased tree stocking densities), and extending the time over which harvested wood remains in use;

Substitution management: there are two forms of substitution:

- Substituting woodfuel from sustainably managed woodlands for fossil fuels,
- Substituting wood products for more energy-demanding products, such as steel, concrete, aluminium, glass and plastics.

8. Carbon sequestration through afforestation or forest management is not viable as a major mitigating measure for the UK (just one year of UK CO₂ emissions, if stored in woodland, would occupy the entire East of England). Moreover, carbon sequestration as a means to stabilise greenhouse gases in the atmosphere has some serious shortcomings:

- there is no guarantee of **permanence** (woodland may be lost through felling, disease or fire)
- sinks **saturate** (i.e. there is a finite limit to the amount of carbon they can mop up)
- **'leakage'** can occur (a policy of having more trees here might result in having fewer trees elsewhere).

9. Hence, the UK and other EU Member States are firmly of the opinion that policy priority should be given to reducing emissions at source.

10. Nonetheless, increased woodland cover for social, environmental and economic reasons will also bring carbon sequestration benefits in the short and medium term – and an attractive way of helping to meet national targets.

11. The concept of trading in carbon offsets (whereby businesses or individuals offset the CO₂ they produce by engaging in CO₂ saving or sequestering activities) is gaining ground. Although sequestration projects are not included at present in the official UK Emissions Trading Scheme (ETS), a number of voluntary schemes include woodland planting. The expansion of such schemes may provide opportunities to bring more investment into woodlands but their relationship to grant aid needs to be carefully examined. It would also be appropriate to keep a range of sequestration options (like the "Greenfund" project sponsored by the Dutch government) under review for opportunities to link them into the wider ETS.

Initiative for Climate Change

NE1 Adapt to the likely impact of climate change on trees and woodland in East of England.

To support this initiative a series of actions will be taken. Each action will require resources and partners to achieve it. Please refer to the Action Plan that accompanies this Strategy (www.woodlandforlife.net/wfl-action).

There is no specific initiative for Carbon Sequestration as tree and woodland establishment and management are not viable as major mitigating measures. The improved woodland management and increase in tree cover that will result from the implementation of the strategy however will have positive, although minor, impacts on carbon storage.

B. Soils

(See also Flood Management and Water Quality and Supply)

12. Sustaining our soil resource is of fundamental importance, as the optimal operation and functioning of other environmental resources, such as water, are dependent on soil health. Soil is a medium for plant growth underpinning habitat and ecosystem functioning and food and fibre production. Soil performs many functions, including :

- modulating the water cycle,
- affecting biogeochemical cycles (including the carbon cycle),
- buffering and reducing pollutants.

13. Woodland soils tend to have a structure that greatly enhances their ability to perform these functions compared to arable land. The lack of cultivation results in a more open texture, increased organic matter content and greater activity of soil fauna. The presence of tree roots tends to make the soils more stable and less prone to erosion. The tree canopy and litter layer reduces the impact of heavy rain thereby limiting the likelihood of erosion due to flash flooding.

14. The East of England has extensive areas of soils that are very vulnerable to wind and water erosion (sands and peat) and compaction (heavy clays). The establishment of shelter-belts or hedgerows can reduce wind erosion by moderating wind speeds and acting as physical barriers against which blown soil accumulates. Riparian woodland prevents water-eroded soil entering rivers and streams.

15. In areas with heavy clays, woodland soils tend to suffer less compaction in comparison to agricultural uses due to lower levels of 'traffic' and other negative effects. The exception to this norm may be caused by tree harvesting and extraction using unsuitable machinery in wet conditions.

16. There is a need to further investigate the impact of harvesting systems on the soils of ancient woodland sites (notably on clays) to develop appropriate guidelines. Existing guidance is based primarily on upland peat and gley soils and therefore not particularly appropriate to the East of England context.

17. Consideration of soil suitability for woodland expansion, and protection of soil function and diversity in management, is central to the delivery of all other benefits. Good soil management is the foundation for the healthy functioning of the region's woodland.

18. The water resource cannot be divorced from the soil resource – indeed it is imperative that the soil is managed in an effective way in order to ensure delivery of sustainable water resource benefits (in terms of water quality, water supply and flood management).

Initiative for Soils

NE2 Promote woodland planting and management to help protect other natural resources as part of integrated sustainable land management.

To support this initiative a series of actions will be taken. Each action will require resources and partners to achieve it. Please refer to the Action Plan that accompanies this Strategy (www.woodlandforlife.net/wfl-action).

C. Water Quality and Supply

(See also Flood Management and Soils)

19. The East of England is one of the fastest growing regions of the country in terms of population, with a resultant increasing demand on natural resources such as water. The impact of trees and woodlands on the future management of water in the region is likely to become ever more significant; particularly when viewed against climate change predictions.
20. The East of England is the driest area of the country and climate change predictions indicate that this is likely to get worse with resultant demand on water that will impact on all uses including domestic and agricultural production.
21. The Environment Agency, the body responsible for maintaining and improving the quality and quantity of water supply, is developing a number approaches to water management, including Catchment Abstraction Management Strategies and River Basin Management Plans.
22. Trees and woodlands can impact on:

Water quality:

- water entering streams and rivers from agricultural land may be contaminated by fertiliser and pesticide residues, and the effects of soil erosion. Trees planted as permanent buffer strips along watercourses can help remove these pollutants.
- water abstracted from beneath forest areas tends to have much lower levels of contamination than that beneath agricultural land due primarily to the much lower levels of fertiliser and pesticide application to the crops and improved soil quality.

Water quantity can be modified in two ways:

- **Modification of flow.** Due to greater soil permeability and enhanced infiltration rates, rainwater tends to enter watercourses much more gradually than from arable land or hard surfacing, thereby reducing the impact of flash floods. Woodlands can therefore help to balance out water flows.
- **Substitution of crops.** There is some debate about the quantity of water used by woodland in comparison to agricultural land. There is general agreement that deciduous woodland is largely inactive in water use until mid to late May, which allows for an extended period of ground water recharge. When in full leaf, however, there is no argument that woodland uses more water than grassland and most arable crops. It may be that replacing grassland or arable crops with trees could increase the overall water availability. Some tree species, including willow and poplar, have particularly high water demands, which may have a bearing on their future planting in areas where water may become an increasingly scarce resource. There is a need for further research into the relationship between tree species and water use.

Initiative for Water Quality and Supply

The initiative for water quality and supply is incorporated within:

NE2 Promote woodland planting and management to help protect other natural resources as part of integrated sustainable land management.

D. Biodiversity

(See also Recreation and Access, Health, Landscape, Community Engagement, Urban Fringe and Built Environment, Flood Management and Woodland Produce, Timber Production and Marketing)

23. Trees and woodlands contribute greatly to the biodiversity of the East of England. Of greatest importance are those woodlands that are Special Areas for Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI) or Ancient Semi-Natural Woodland (ASNW). ASNW has been continuously wooded since at least 1600 and in many cases since the last ice-age, and consist of site native species of trees and shrubs. They are the closest to truly natural woodlands that exist in Great Britain having been managed by traditional and sustainable means and as such are irreplaceable ecological and cultural assets. The region has a higher percentage of ASNW than the national average, and the designated woodlands underestimate the true resource as wood-pasture was generally omitted from the original list, as were all woodlands under two hectares in area. Ancient woodlands that have been converted from site native to other species, generally conifers, are termed Plantation on Ancient Woodland Sites (PAWS). These woodlands frequently retain remnants of the original ancient woodland communities, including under-storey, ground flora and dead-wood fauna. By careful and judicious restoration of these woods to site-native tree species, it may be possible to recreate the characteristics of ASNW (see **Figure 9**).
24. The biodiversity interest is not limited however to these two woodland categories. The extensive conifer plantations of the Sandlings have been designated and Thetford a candidate as SPAs due to their international importance for woodlark and nightjar.
25. Hedgerow and other non-woodland trees are also of great importance for biodiversity and landscape. In many cases they are under threat from agricultural intensification and climate change.
26. All woodlands can provide habitats for a range of flora and fauna. Even small, recently established, woodlands within otherwise intensively cultivated land can be useful although their scope is limited by their isolation and, in certain circumstances, can harbour pest species. It is vital to consider the interaction and interdependency of woodland and other habitats (e.g. unimproved grassland, fenland and hedgerows). Trees and small woodlands can bring aspects of the countryside, particularly birds and mammals, into the heart of urban areas, where they can contribute to quality of life by bringing people into daily contact with nature.
27. The importance of biodiversity is increasingly being recognised and international, national and local initiatives have been instigated in response. The international process originated at the Rio "Earth Summit" in 1992 to which the UK government responded in 1994 with the publication of the UK Biodiversity Action Plan (UKBAP).
28. A series of UK Habitat and Species Action Plans (HAPs and SAPs) have been agreed for nationally important habitats and species. A large number of these are relevant to woodland (40% of habitats and 30% of species). Targets in these plans are increasingly being dispersed to a local level to give Local Biodiversity Action Plans (LBAPs) guidance to allow them to play their part in delivering UKBAP. Some LBAPs were developed ahead of the national HAPs and SAPs however so there may be some discrepancies between them.
29. The Government has produced a biodiversity strategy for England "Working with the Grain of Nature". Amongst other measures set out in the Strategy is the commitment to develop and support biodiversity partnerships in the English regions and at more local levels.

30. Three Habitat Action Plans for woodland relevant to the East of England have been or are in the process of being prepared:

- Wet Woodland,
- Lowland Beech and Yew Woodland,
- Lowland Mixed Deciduous Woodland.

31. There are also HAPs for Lowland Wood Pasture and Parkland, and Hedges, both of which have implications for woodland management.

32. Collectively the region's Local Biodiversity Action Plans contain many actions that are likely to affect woodland management. These relate to:

- increasing the extent of semi-natural woodland cover,
- bringing more ancient woodland into active management,
- creating woodland where it will link or buffer existing habitat,
- better recording of heritage woodland resources,
- better protection for veteran trees,
- restoration of coniferised ASNW,
- more universal application of the UK Forestry Standard, and
- encouraging traditional industries that will give economic purpose to coppice and wood-pasture systems.

33. One of the Government's headline indicators of sustainable development, included within the biodiversity strategy, is the population of wild birds. The objective being the reversal of the long-term decline in populations of farmland and woodland birds. An East of England regional version of the index exists.

34. The East of England has a number of key areas in which conservation bodies are keen to see the restoration or re-creation of lowland heath, another habitat for which a national HAP has been prepared. Most of these areas are currently covered by woodland, with the Forestry Commission having the major landholding interest. There is continued and increased pressure on landowners to convert woodland or forested land into heathland.

35. Despite the challenging HAP target for the restoration and creation of wet woodland in the Region, over 180 hectares of such woodland has been felled to recreate fen or reed bed habitats since 1997.

36. The very high deer population of the region presents a severe threat to the ecological importance of many woodlands, particularly ASNW. Without effective management, it is expected that deer numbers may double within the next few years, with resultant greater impact on woodlands.

37. There is anecdotal evidence that the high grey squirrel population has an adverse impact on the populations of breeding woodland birds and on the regenerative capacity for a number of tree and shrub species.



Figure 1 Map of Ancient woodland

What is being done for biodiversity?

There is no lack of woodland management activity in the region for biodiversity and it would be fruitless to try to summarise it, but a number of key regional developments are however in progress.

Targets for the maintenance, restoration and creation of semi-natural woodland have been agreed by the East of England Biodiversity Forum.

Habitat	Maintain	Restore	Create
Lowland mixed deciduous woodland	100% of existing	1250ha by 2010	1250ha by 2010
Wet woodland	100% of existing	200ha by 2010	150ha by 2010
Wood pasture and parkland	100% of existing	250ha by 2010	Expand 18 key sites by 2010

No targets for lowland beech/yew HAP have been included. Climate change evidence for the East of England indicates that beech will be 'unsuitable' across much of the region.

English Nature, EEDA, the Forestry Commission, the RSPB and other partners have begun to discuss a means to identify the 'best' sites for heathland re-creation at the regional scale.

A partnership of the regional Wildlife Trusts have been contracted by the Forestry Commission to identify three clusters of ASNW and PAWS in each of the six counties that could be targeted for restoration and expansion.

Research into management of deer and squirrel populations is ongoing at the regional and national levels.

Opportunities for biodiversity.

As with existing activity, there are many opportunities for biodiversity enhancement. Most of these are included in existing Local Biodiversity Action Plans and do not need repeating here. Other issues, particularly research and policy development into the impact of high deer and squirrel populations on woodland habitats need to be undertaken at a national level. Some activities however could be instigated at the regional level:

- Develop opportunity maps for habitat restoration and re-creation that include both woodland and non-woodland habitats.
- Heighten awareness of the importance of trees and woodlands in biodiversity, particularly within urban areas.
- Ensure woodland SPAs, SACs and SSSIs are brought into favourable condition.

Initiatives for Biodiversity

NE3	Promote the establishment and management of woodland within an integrated functional landscape to protect the historic environment and enhance biodiversity.
NE4	Help deliver Habitat Action Plans and Species Action Plans particularly through the management of native or ancient woodland, wood pasture and veteran trees.

To support this initiative a series of actions will be taken. Each action will require resources and partners to achieve it. Please refer to the Action Plan that accompanies this Strategy (www.woodlandforlife.net/wfl-action).