

4 **WOODLANDS**

4.1 **WOODLAND HABITATS**

4.1.1 **Summary**

Woodlands as the natural vegetation cover of most of the UK, are our richest wildlife habitats. They often contain the greatest numbers as well as many of our rarest and most threatened species. Woodlands are important for most forms of wildlife, from trees and shrubs to mosses, lichens and fungi, and from mammals and birds to beetles, slugs and moths.

Trees and woodlands are highly valued by people for the many benefits that they have provided in the past and continue to do so today. They provide timber for house building and construction; wood for furniture and tools; fuel for heating and cooking (more so in the past); food from berries and nuts; and paper. Trees help to filter out pollution and act as a carbon sink, perhaps helping to offset some of the effects of global warming. People have long had strong emotional attachments to trees and woodlands, perhaps because of their large size and long lifespan giving them an air of permanence. They often feature prominently in folklore, language and literature. They are an obvious feature helping to define many landscapes as well as forming an essential aesthetic component of human settlements, in gardens, streets and parks. Woodlands are also popular for a wide range of recreational activities.

4.1.2 **Woodland Ecology**

4.1.2.1 **Natural Woodland**

In the absence of human interference, woodland would be the natural habitat type across most of the lowland soils and landforms found in the United Kingdom, developing as a result of the natural process of succession. Since human colonisation of the British Isles began after the last ice age, approximately 5500 - 6000 years ago, clearance of the "wildwood" for agriculture and settlements has progressively occurred. The area of woodland had declined to about 5% by the First World War but has since increased. Today approximately 9% of the UK land surface is wooded, usually in small, fragmented blocks. This is a significantly lower land cover compared with most other European countries, where woodland usually accounts for at least 20% of the land area.

None of the woodland present today is completely natural, it all having been modified by human intervention to a greater or lesser extent. We therefore have no examples of what a natural woodland ecosystem in the UK would have looked like. However, by looking at more natural woodlands elsewhere in continental Europe and by reference to

historical evidence, it is likely that it would have been very different to much of the woodland seen today.

It is thought that the natural woodland ecosystem would have consisted of a variety of successional stages from open glades through scrub to a high forest canopy. A high proportion of very large trees would have been present. These features would have been in a constant state of flux responding to natural processes such as storms, floods, fires and grazing by large herbivores, such as deer, wild cattle, wild boar and beavers. New glades would be created naturally while others grew up into mature forest. Wild herbivores would have been hunted by top predators such as Wolves and Brown Bear. Large areas of woodland would have been dark and damp and contain very large quantities of dead wood with the variety of trees, shrubs and ground flora reflecting the natural geology, soil characteristics, hydrology and other natural processes.

In spite of no truly natural woodland remaining in the UK and although only a fraction of the former woodland cover remains, our woodlands of today often retain many natural characteristics. These are best seen in what is referred to as "ancient semi-natural woodland".

4.1.2.2 Woodland Definitions

Ancient Semi-Natural Woodland: This is woodland which has been continuously present on the same site since at least 1600 AD and which retains a largely natural and locally native species composition, which has developed in response to natural factors such as soil type and hydrology. **They are an irreplaceable natural asset.**

Ancient Replanted Woodland (Ancient Woodland Sites): This is woodland which has been continuously present since 1600 AD, but where the locally native species mix has been replaced by planted trees, usually fast growing conifers and exotics. Valuable semi-natural features are often retained along rides and boundaries.

Secondary Woodland: This is woodland which is self-sown on ground that has been unwooded and usually farmed for a period since 1600 AD. They may contain a large proportion of locally native species, though often have a naturalised and exotic species element to them.

Plantations: These are woodlands which have been entirely planted by humans on ground which has been unwooded for a period since 1600 AD. Many are of recent origin (last 100 years) and most are mixed containing a narrow range of fast growing exotic species, as well as native species such as oak, ash and beech. Historical planting was often carried out for landscape reasons or to encourage sporting interests, particularly on the large estates.

4.1.2.3 Ancient Semi-Natural Woodland

Ancient semi-natural woodlands are usually the richest in wildlife, because of their long continuity of woodland cover, which in some cases may go back to the original wildwood. This continuity of woodland cover has enabled many specialised woodland species with poor powers of dispersal to survive. These woods therefore not only

contain the greatest variety of woodland species, but also often contain many species which can not survive in the generally open landscape now found and are therefore rare.

Many species of plant are slow colonisers of new woodland and therefore depend on a long continuity of woodland cover. These in turn can be used as indicators of ancient woodland. The Ancient Woodland Inventory for Hertfordshire, published by the then NCC, included a list of 100 ancient woodland indicator species applicable to SE England, i.e. those that are most commonly associated with ancient woodland, as well as the inventory of ancient woodland sites.

A good quality ancient semi-natural woodland, will not only contain a diverse mix of trees, shrubs, flowers and lower plants, but will also have a varied structure, with a mature canopy, areas of dense shrub layer and open glades or paths. A diverse structure provides more habitats for a wider range of species, including plants, birds and invertebrates. A quality ancient woodland will also have a large amount of both fallen and standing dead wood. These each provide habitat for their own wide ranging community of saproxylic species (dead wood feeding and decomposing organisms) and allow the natural processes of decay and nutrient recycling to occur. Other important habitat features found in woodlands include streams and ponds, with those in woodlands often having their own unique assemblage of associated species and retaining a relatively natural structure and hydrology.

Ancient semi-natural woodlands retain a variety of trees, shrubs and ground flora which reflect the natural geological, soil and hydrological conditions. Typical tree species locally include; Pedunculate and Sessile Oak *Quercus robur* and *Q. petraea*, Hornbeam *Carpinus betulus*, Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Wild Cherry *Prunus avium*, Silver Birch *Betula pendula*, Alder *Alnus glutinosa* and Willows *Salix spp.* Locally found shrubs include Hazel *Corylus avellana*, Field Maple *Acer campestre*, Hawthorn *Crataegus monogyna*, Dogwood *Cornus sanguinea*, Sallow *Salix capraea* and Holly *Ilex aquifolium*.

This natural mix of trees and shrubs, and the woodland structure, will often have been modified in the past to favour more economically valuable species. In other cases, successional changes brought about by human influences, such as the decline of lime and elm will have influenced woodland composition. However, these cultural influences often provide their own interest, demonstrating how nature responds to human management.

Other important features associated with ancient woodlands which need protection and management are Woodland Archaeological Features such as woodbanks and dell holes.

4.1.2.4 Management Systems

Major management practices which have influenced ancient woodlands include **coppice**, **high forest**, and **wood pasture** systems. Recently, **minimum intervention** has become more widespread, though mainly from neglect except within nature reserves.

Coppicing and associated ride management maintains a varied early successional woodland structure by continuously creating open space, through harvesting of the shrub

understorey on a rotation of 5-25 years, depending on the use to which the wood is put. This management and the associated ride management ensures that open areas, which provide the ideal conditions for many sun loving invertebrates and butterflies in particular, are continually created. Active ride management also helps to link coppice areas to each other and to adjacent habitats such as unimproved grasslands.

The value of coppice woodlands is largely in the early successional species associated with the open space and dense shrubby “young growth” habitats. Mature woodland habitats are generally lacking or very limited. These particularly include wildflowers, butterflies and other invertebrates and scrub loving birds. In Hertfordshire, flowers such as Bluebell *Hyacinthoides non-scripta*, Primrose *Primula veris*, Wood Anemone *Anemone nemorosa* and violets *Viola spp.* are typical. A wide range of invertebrates, including many woodland butterflies, most notably the fritillaries, are associated with the open space provided by this management system. The development of a thick shrub layer about 5-6 years into the coppice cycle, provides ideal conditions for many breeding birds including Nightingale *Luscinia megarhynchos* and for the Dormouse *Muscardinus avellanarius*, which requires a dense interconnecting shrub layer to maintain its preferred arboreal habit. The areas of permanent open space along rides are also often important as refuges for meadow species lost due to changes in the wider countryside.

Coppicing maintains a high species diversity through providing regeneration opportunities for many species, in the large areas of permanent and temporary open space, a wide range of edge habitats and often also some limited mature wooded habitats in the form of standards or boundary pollards.

High forest management and the standards (mature trees) within a coppice-with-standards system produce timber. These standard trees are harvested on much longer timescales. High forest systems produce a more natural mature woodland structure, resembling interior forest habitats and having a much greater potential for deadwood, but with less open space and “young growth” habitats. This benefits woodland birds including Sparrowhawk *Accipiter nisus*, Hawfinch *Coccothraustes coccothraustes*, tits such as Coal Tit *Parus ater* and warblers such as Chiffchaff *Phylloscopus collybita* and Blackcap *Sylvia atricapilla*, as well as shade tolerant invertebrates such as the White Admiral butterfly, some spiders, molluscs and leaf miners.

Wood pasture was a management system which combined the production of wood and grazing. To successfully achieve this trees are pollarded (cut above browsing height), with cutting carried out on a similar length rotation to many coppice systems. This management results in trees growing to a very old age and developing large amounts of dead wood.

The interest of wood pasture is in the invertebrate and fungal species associated with the dead and dying wood of the pollarded, often veteran, trees, as well as the flora and associated species of the often unimproved grasslands or heaths found underneath the scattered trees. The mixture of mature trees and large amounts of open space is also important for some bird species and bats. Examples found locally of species associated with dead and dying wood include Britain's largest terrestrial beetle, the Stag Beetle *Lucanus cervus*, other beetle species such as the click beetle *Procraterus tibialis*, *Lymexylon navale*, *Platycis minutus*, *Prionychus ater*, *Quedius maurus*, *Rhizophagus oblongicollis* and *Xyloterus domesticus* and the slug *Limax cinereoniger*. Birds such as

Lesser and Great Spotted Woodpeckers *Dendrocopos minor* and *D. major*, and Nuthatch *Sitta europaea* also favour over-mature trees.

Minimum intervention: Many woods have not been managed for 50-100 years. On nature reserves, this management option has often deliberately been chosen, though on many privately and publically owned sites it has come about through the cessation of commercial management. These woods will eventually develop a more natural or “old growth” structure, which resembles high forest, though contains much larger amounts of deadwood. Open space will occur through natural disturbance such as windthrow and these gaps will then pass through the dense shrubby “young growth” stage before becoming mature woodland. Some of these gaps may remain as open space for longer if grazing pressure is high. However, open space and “young growth” stages are generally limited.

All of these management systems have influenced to a greater or lesser extent the natural woodland plant and animal communities. However, with regard to the natural assemblages of plants found within ancient semi-natural woodland, the National Vegetation Classification (NVC) recognises 19 woodland and 6 scrub communities. In Hertfordshire today, 15 of these NVC communities can be found and are described in Appendix 3.

4.1.2.5 Veteran Trees

Dead and decaying wood, particularly rot holes and heart wood, associated with biologically mature **veteran** trees, is a very important habitat, supporting more than 200 species of beetles, of which over 60 are Red Data Book species (that is rare or threatened). In addition, dead and decaying wood supports many flies and moths whose larvae live in the wood or under loose bark, bees and wasps that nest in wood, as well as centipedes, woodlice and springtails amongst others. Vast numbers of fungi species and micro-organisms are also associated with this habitat and smaller but significant numbers of lichens, mosses and liverworts.

Veteran trees, whether they be within woodlands or set in more open parkland or remnant wood pasture habitats, are the richest trees for these saproxylic (dead wood feeding and decomposing) fungi and invertebrate species, due to their rot holes, decaying heart wood and dead and dying branches. For trees to develop a significant quantity and quality of dead wood they need to be at least 150 years old. The most valuable trees are often hundreds of years old and are the oldest trees found in the countryside and towns.

4.1.2.6 Scope of this Action Plan

With reference to habitat types identified in “Biodiversity the UK Steering Group Report”, this action plan relates mainly to Broadleaved and Yew Woodland and Lowland Wood Pastures and Parkland, though does also consider aspects of Planted Coniferous Woodland.

This action plan concentrates on our irreplaceable ancient semi-natural woodland (ASNW) and replanted ancient woodland sites as the types of woodland which harbour most of the local woodland biodiversity resource. Consideration of the future of

Hertfordshire's woodlands will however include recent secondary woodland and plantations. River valley wet woodlands (or carr) are considered in the wetlands habitat action plan (chapter 5).

Economic aspects of woodlands are considered in the Hertfordshire Woodland Strategy, while the Hertfordshire Landscape Strategy considers their role in the landscape. Historical ecology and archaeological features are considered in the Hertfordshire Archaeological Strategy. This action plan is meant to complement these other strategies.

4.2 HISTORY OF ANCIENT WOODLAND IN HERTFORDSHIRE

Historical evidence suggests that by Roman times the lowland countryside was largely open with few large blocks of woodland remaining. With the loss of large areas of woodland and the hunting to extinction of most large wild herbivores and all top predators, naturally functioning woodland ecosystems were lost from Britain. Without very large areas of woodland, all the natural stages of woodland development and the wide variety of species naturally dependent on these will not occur.

This is the situation in the modern landscape, where woodlands are generally very small and fragmented. Today woodland covers approximately 15000 hectares (ha) in the county (HertfordshireHabitat Survey), which represents only about 9% of the land surface, about the national average. The overall level of woodland cover has not changed significantly over the previous few centuries.

However, this century has seen some significant changes in the nature of the woodland resource, particularly with regard to the ancient semi-natural woodlands, which are generally the richest in wildlife. Historically, the ancient woodland resource of Hertfordshire was managed mainly under either **coppice** or **wood pasture** systems. There appears to be a distinct divide between the south and west of the county, where many commons and larger woodlands have developed from a wood pasture origin, and the north and east of the county, where most woodlands are of coppice origin.

From the last century onwards new management systems have been superimposed on these traditional systems. Many woodlands in west Hertfordshire were converted to beech high forest for the furniture industry. In other parts of the county woods have been converted to oak high forest. Game rearing within woodlands increased across much of the county to provide field sports.

Although many plantations originate from the late 18th and the 19th centuries, it is only this century that large-scale replacement of ancient semi-natural woodlands began. Earlier plantations were usually planted on open ground, sometimes linking up existing ancient blocks of woodland.

However, during the 20th century, forestry practices changed dramatically. This was mainly in response to changes in government policy in the aftermath of World War I, aimed at securing a greater level of self sufficiency in timber production. It also coincided with a decline in the markets for wood products from traditionally managed ancient woodlands.

The establishment of the Forestry Commission in 1919 marked a shift away from using timber and wood from local, usually semi-natural, woodlands, to using introduced, fast-growing conifer species. Though the large scale purchase and planting of land which affected other parts of Britain did not occur in Hertfordshire, the Forestry Commission also encouraged private estates and landowners to adopt the new species mixes and forestry techniques through advice and generous grants and tax incentives.

This change in forestry practices resulted in many ancient semi-natural woodlands being cleared and replanted with conifer species. This century 44% of the ancient woodland

area has been replanted as conifer or broadleaved plantations and 480 ha destroyed completely. There was also significant felling of mature trees during both World Wars, which has affected the structure of many woodlands. Only 3.3% (5410 ha) of Hertfordshire is now occupied by woodland on ancient sites greater than 0.25 ha, with only 2% (3280 ha) of this semi-natural. There is also an unknown area of ancient woodland on sites less than 0.25 ha, though this is likely to represent only a small proportion of the total. The remainder of the woodland resource is secondary woodland (naturally established since 1600) or new plantations on open ground.

The 44% loss of ancient semi-natural woodland this century has resulted in the decline in many species which depend on a long continuity of woodland cover, particularly plants, fungi and invertebrates.

Other species have declined not only as a result of the loss of ancient semi-natural woodlands, but also as a result of changes in management of the remaining woodlands. Examples include the Dormouse, Nightingale and butterflies such as the Silver-washed Fritillary *Argynnis paphia* and Purple Emperor *Apatura iris*. Other butterflies have become extinct in the county as a result of these changes, notably the Pearl-bordered Fritillary *Boloria euphrosyne* (date of extinction 1978), Small Pearl-bordered Fritillary *Boloria selene* (1960), High Brown Fritillary *Argynnis adippe* (1978) and Wood White *Leptidea sinapis* (1976) (Sawford, 1987).

The major change in management responsible for the above declines and extinctions was the decline of the traditional coppice and wood pasture management systems. Coppicing declined from the late nineteenth century onwards, as a result of changes in the rural economy. Other changes which have also contributed to the decline of these species was the loss of unimproved grasslands (detailed in Chapters 5 to 8) associated with woods.

The cessation of coppicing resulted in the unchecked growth of the shrub canopy. This first resulted in the loss of the open space required by the butterflies and eventually also the conversion of the dense shrub layer to high forest and the loss of suitable conditions for scrub species such as Nightingale and Dormouse.

The changes to the ancient wood pastures which have resulted in a decline and loss in their associated wildlife, are linked as with coppicing, to the changing rural economy. From the late eighteenth century onwards, much former common land in the south and west of the county, including large areas of wood pasture, was enclosed. Much of this has developed into high forest whether through neglect or management, and may now superficially more resemble secondary woodland. These changes have resulted in a loss of the associated habitats, often open unimproved grassland or heath and the species associated with these. At the same time, neglect of the pollarded veteran trees has resulted in many now being top heavy and collapsing.

Other historic woodland features which locally have survived to the present day, but which may no longer be found in ancient woodlands, include a large number of **veteran trees**, particularly pollards, found in parkland. This parkland may have been developed from original wood pasture or may have been developed from open agricultural land in the eighteenth and early nineteenth centuries. The future of veteran trees and associated

species is very much in the balance in the modern landscape, due to neglect and management practices.

Other locally important historic features include ancient green lanes and trackways. These often retain veteran trees as well as a remnant ancient woodland flora. These too are under threat in the modern landscape, due to removal or intensive use. Many hedgerows represent linear remains of ancient woodlands. Hedgerows are considered in Chapter 9.

4.3 **ANCIENT WOODLAND - CURRENT STATUS, TRENDS AND THREATS**

4.3.1 **Current Status**

Of the 15000 ha of woodland in Hertfordshire, 3280 ha is ancient semi-natural woodland over 0.25 ha and a further 2130 ha is plantation on ancient woodland sites (Report of the State of Hertfordshire's Environment, Hertfordshire Environmental Forum, 1992). The remainder is a mixture of recent and older secondary semi-natural woodland and coniferous and broadleaved plantations on formerly open ground. The exact area of wood pasture in the county is unknown, though there is 600 ha of parkland.

There are three major types of woodland found in the county which correspond closely with the landscape and Natural Areas (NA) identified in the English Nature / Countryside Commission joint character map. These major woodland types each include one or more of the NVC communities described in Appendix 3 and are described further below:

Oak-hornbeam: The woodland type most typical of Hertfordshire are the oak-hornbeam woodlands of the south and east of the county, typically found on the London clay and other geological deposits of the London Basin NA. They are also found further north in the county, particularly on the decalcified boulder clay around Stevenage. **NVC community W10.**

key sites: Broxbourne Woods complex (includes SSSI, NNR and proposed SAC), Knebworth Woods SSSI, Northaw Great Wood SSSI, Sherrardspark Wood SSSI, Wain Wood SSSI.

Ash-maple: In the north and east of Hertfordshire, the woodlands are dominated by ash-maple types on the tills (chalky boulder clay) of the East Anglian Plain NA, though few of any size remain. **NVC community W8.**

key sites: Great Hornead Park SSSI, Northey Wood, Reed Wood, Cokenach woodlands, Clothall Wood, Bush Wood.

Beech: In the west of the county in the Chilterns NA, on the clay-with-flints of the dip slope and the chalk of the scarp, beech woods of various descriptions are dominant, largely as a result of planting from the later eighteenth century onwards. **NVC communities W12, W14, W15.**

key sites: Ashridge SSSI (part), Tring Woodlands SSSI, High Scrubbs, Whippendell Woods SSSI.

Throughout all the character zones identified in the county, where conditions are suitable, the various wet woodland types occur. In the southern half of the county, particularly in the Thames basin, **oak-birch** woodlands (**NVC community W16**) can also be found on the most acid, often gravelly soils.

Hertfordshire has a particular responsibility for oak-hornbeam woodlands, with a large proportion of the national total. These are listed on Annex 1 of the EU Habitats

Directive and part of the Broxbourne Woods complex is a proposed Special Area of Conservation (SAC), under the directive.

The Beech woods of west Hertfordshire, whether on the chalk or clay-with-flints of the Chilterns, are also listed on Annex 1 of the Habitats Directive, giving a wider responsibility to maintaining the ecological value of these woodlands. Lowland beech woods have been identified as a key habitat in the UK Steering Group Report.

The major former **Wood Pasture** sites and important **Parklands** occur mainly in the southern half of the county. These are largely of value for their veteran trees and associated species. For example it is known that some trees at Panshanger are approaching 1000 years old and there are over 500 Hornbeam pollards at least 250 years old at Knebworth Park.

key wood pasture sites: Ashridge SSSI (part), Broxbourne Woods (part), Northaw Great Wood SSSI (part, including Cuffley Camp), Hatfield Home Park and Millwards Park, Knebworth Woods (part), Symondshyde Great Wood.

key parkland sites: Panshanger Estate, Sacombe Park, Brocket Park, Stagenhoe Park, Knebworth Park, Broxbournebury Park, Youngsbury Park.

Examples of key woodland species found in Hertfordshire, are listed below, with the reasons why they are important species.

Bluebell - The species which forms the major component of the ground flora of many of the oak-hornbeam and ash-maple woods in Hertfordshire. Although seen as common locally and throughout the UK, it is important because it is estimated that the UK holds 20% of the world population of this species (Biodiversity Challenge, RSPB, 1995).

Coralroot Bittercress - A species which has one of its major national strongholds in the Chilterns dip-slope beechwoods and Hertfordshire holds a high proportion of the national population.

Common Dormouse - A secretive inhabitant of mixed broadleaved woodland with a dense understorey and hedgerows, this species requires a wide variety of trees and shrubs to provide a regular food supply throughout the summer period. It is thought that populations have generally declined throughout its range and the species has become extinct from 7 counties this century. Hertfordshire is within this species UK range. The Dormouse is listed on Annex IVa of the EC Habitats Directive (EC/92/43), Schedule 5 of the Wildlife and Countryside Act 1981 and Appendix 3 of the Bonn Convention. A national and local species action plan (see chapter 12) has been prepared for this species.

Bats - All 14 species of bat found in the UK are protected under both Annex IVa of the EC Habitats Directive and Schedule 5 of the Wildlife and Countryside Act (1981). Nine species are found in Hertfordshire, they are; Pipistrelle, Noctule, Natterers, Brown Long-eared, Daubenton's, Serotine, Leisler's, Brandt's and Whiskered. A local species action plan has been prepared for the Natterers Bat (see chapter 13).

Hawfinch - A shy and elusive inhabitant of mature woodlands, favouring Hornbeam, Beech and Wild Cherry. Hertfordshire is one of the national strongholds of the

Hawfinch. However, nationally the species has declined by 25-49% (Biodiversity Challenge, RSPB, 1995) and this decline has also occurred locally. The Hawfinch is listed in the Amber list (of moderate concern) in the RSPB's Birds of Conservation Concern.

Stag Beetle - A large conspicuous beetle of woodland, parks and gardens, though in Hertfordshire it is predominantly found in parks and gardens. The larvae live in decaying wood, often in roots and stumps and take 3½ years to mature. It used to occur throughout England and south Wales, but now appears to be restricted to southern England. In Hertfordshire it is known mainly from the south-east of the county, particularly the Broxbourne Woods complex. Following widespread concern at this decline, the Stag Beetle is listed in Annex II of the EC Habitats Directive (EC/92/43) and Appendix III of the Bern Convention. A national and a local species action plan (see chapter 22) has been prepared.

Silver-washed Fritillary - The largest UK species of fritillary butterfly. Its preferred habitat is open semi-natural woodland. The species has declined throughout its range in southern and western Britain and in Hertfordshire declined by 75% when comparing pre-1970 and post-1970 records (Sawford, 1987). It is thought that it has declined further since 1987 (T. James, Pers. Comm.). The decline is however less than for the other fritillary species, probably because it is more tolerant of shade.

Woodlands also play an important role in other aspects of our natural and cultural heritage, particularly in their influence on the landscape and also for their archaeological records.

The county's ancient woodlands, wood pastures and long standing secondary woodlands often contain many important archaeological remains. The issues surrounding woodlands and their history in Hertfordshire and their relation to archaeology are explored more fully in the Hertfordshire Archaeology Strategy.

The pattern of woodlands in the county and the differences in species composition make a significant contribution to the landscape variations now seen. The beechwoods which now characterise the Chilterns being one example with the largely treeless landscape of the East Anglian heights being another. The Hertfordshire Landscape Strategy explores these relationships further.

4.3.2 Trends

The isolation of woodlands within the surrounding countryside has been a major trend, with the links to other semi-natural habitats largely lost. Woodlands and unimproved grasslands used to be linked with hedgerows providing the wooded link through the open countryside and woodland rides and glades providing an unimproved grassland habitat within woodlands. The loss of these links, affecting both wooded and grassland habitats is one of the most serious ecological losses which has occurred through the intensification of land management and is responsible for the decline of many species which require both wooded and open habitats.

The modern trend of replanting after felling, often with non-native stock, rather than relying on natural regeneration is a major threat to the genetic diversity of local woodlands. The expansion of introduced species has also become an increased threat.

The increase in access to the countryside has affected all major woodland blocks and is now being encouraged more than ever. This increases pressure on woodlands particularly through disturbance. In some areas intensification of game-rearing is modifying the woodland habitats. There is also an increasing demand for insensitive recreational pursuits such as war games. The incorporation of woodland into other uses such as golf courses has become common, resulting in the loss of management continuity.

Finally, external changes in climate such as global warming and droughts, the effects of pollution and the effects of lowered water tables are already having a major influence on woodlands and are likely to have greater influence in the future.

Ancient semi-natural woodland is now largely protected through statutory controls on felling and forestry operations, and through local planning policies. Although the area of ancient woodland can not increase, the overall area of woodland has recently started to increase slightly. This is due to the encouragement given to woodland planting through various initiatives and grant schemes including the Woodland Grant Scheme, Farm Woodland Premium Scheme and recently the establishment in south Hertfordshire of the Watling Chase Community Forest, where a locational supplement for woodland planting is also available.

Since the 1980s, the Woodland Grant Scheme in particular has encouraged the planting of broadleaves, even as part of coniferous plantations. It also encourages the management of existing woods for a variety of uses including timber production, recreation, landscape and nature conservation. Replanting of ancient semi-natural woodlands with conifers is however no longer permitted.

The Forestry Authority has recently produced an excellent draft Forestry Standard, which once adopted will help to improve the environmental standards in all forestry operations.

4.3.3 Threats

Loss of ancient semi-natural woodlands is no longer such a major issue affecting the woodland resource of Hertfordshire, though the continued attrition of woodlands resulting from the loss of their economic role is a concern. However, the remaining ancient woodlands and the species they contain, particularly those dependent on a long continuity of woodland cover, are still under threat. The major threats can be summarised as:

- * the small size and isolation of woodlands
- * lack of woodland structure
- * changing management practices
- * potentially damaging species
- * environmental changes e.g. climate change, pollution
- * recreation

4.3.3.1 Small Size & Isolation

This is perhaps the major threat to the remaining ancient woodlands and their wildlife. In Hertfordshire, 75% of the wooded area occurs in fragments under 10 ha, while 40% of all woodlands are less than 1 ha. The generally small woodland size and the isolation resulting from the loss of connections between semi-natural woodlands and grasslands in the wider countryside, has resulted in populations of characteristic woodland flora and fauna becoming confined to particular sites. Such isolation increases the chances of small populations becoming locally extinct, in response to local factors such as woodland management and population fluctuations or wider issues such as climate change as a result of global warming. Once extinct, they are then unlikely to colonise from other sites.

Species which are particularly vulnerable to adverse external influences are those associated with the generally darker and damper conditions of the woodland interior. Many such species are already likely to have become extinct due to the original forest clearances, but those that survived will be adversely affected by the increase in light, drying out and other changes associated with small woodlands. These "**edge effects**" are increased in small woodlands, as the surrounding area has a proportionally greater influence on the woodland habitat. This is demonstrated by recent studies on breeding woodland birds and the effects of noise, particularly from adjacent roads. These studies showed that breeding success and density of territories was far higher in the centre of woodlands, away from the disturbance. It is therefore important to retain large woodlands and encourage the expansion of small copses.

4.3.3.2 Lack of Structure

A second threat is the lack of structure in many woodlands. This effect is often exacerbated in small woodlands, where all successional stages may not be represented continuously. The wide range of natural growth phases from open glades to over-mature woodland and dead wood typically found within natural forests often does not occur in small woodlands. This can result in the loss of suitable habitat conditions for plants and animals with specialised requirements, which may then become locally extinct. **The species which are most vulnerable to this threat are those associated with open glades or old veteran trees and dead wood.**

4.3.3.3 Management Practices

A third threat to ancient woodlands and woodland wildlife, is the change in forestry management practices which has occurred this century. Many of these issues have begun to be addressed through the publication of Good Practice Guidelines by the Forestry Authority and English Nature and new UK Forestry Standard, which is currently in draft. There are two very different issues relating to management. The first is the past cessation and the possible future re-introduction of traditional management practices, such as coppicing, in ancient woodlands. The second is the intensification of management associated with modern forestry practice.

Traditional Management - Coppicing: A large proportion of the woodlands in Hertfordshire which were formerly managed as coppice or coppice-with-standards, are no longer managed either commercially or for conservation.

The loss and decline of many open glade species associated with coppicing has already been detailed (see Section 4.2). The decline in many of these high profile species, has resulted in the re-introduction of coppicing being promoted as a generally desirable form of conservation management.

The Forestry Authority's Woodland Grant Scheme can support the management of ancient coppice woodland for timber, amenity and conservation. Organisations such as the National Small Woods Association and Herts County Council are also actively promoting management. Many woodland management initiatives promote coppicing as a method of producing "environment friendly" charcoal, to replace imported charcoal from tropical forests. In addition, many conservation organisations, including the Herts and Middlesex Wildlife Trust have re-introduced coppice regimes to formerly coppiced woodlands for the benefits to wildlife.

However, while the re-introduction of coppicing, as one part of a programme of woodland conservation management, can be beneficial in some woodlands, it will not always be an appropriate form of management. Coppicing provides a harsh environment for many woodland plants and animals, which may increase with less intensive woodland management. The key features provided by coppicing are a continuous supply of the early successional open glade and dense shrub habitats. However, active coppicing prevents the establishment of mature canopy woodland conditions and limits the amount of old dead and dying wood, both key features of a varied woodland ecosystem. An increasing problem is that of deer damage to regrowth, potentially affecting the profitability and even success of this management. The wildlife benefits of any large scale re-introduction of coppicing to the woodlands of Hertfordshire, as part of a concerted effort to produce charcoal or other woodland products, will therefore need to be carefully considered.

Traditional Management - Wood Pasture / Parkland: Although many large woodlands and commons in south and west Hertfordshire were formerly managed as wood pasture, today only remnants remain and these are not actively managed. Many former wood pastures are now part of a high forest woodland, while others are part of formal parklands. Although the species associated with the open wood pasture habitat will have been lost or become much reduced, the veteran trees have often survived. If managed as high forest the veteran trees may have been removed. Even where they have survived, perhaps in unmanaged woodland, they are likely to be top heavy and in danger of collapsing. In parklands the veteran trees have often survived but have usually been tidied up for safety reasons, often to excess, thereby removing the valuable dead and dying wood. In other cases the veteran trees may be neglected and in danger of collapsing. In both former wood pasture and parkland situations, there is often a lack of replacement old trees to provide the continuity of habitat required by the specialised species of old wood.

Modern Forestry: The replanting of ancient semi-natural woodland with conifers or non-native broadleaves is no longer permitted. However, commercial management of ancient woodlands for hardwood timber can pose a threat to the biodiversity of these

woodlands. While continuation of management has probably contributed to the survival of these woodlands, aspects of modern intensive management can result in a decline in their conservation interest.

Management for a timber crop will **prevent trees from reaching biological maturity** and so prevent the accumulation of the vital dead and dying wood resource and the particularly important large diameter dead wood. This will often be further compounded by the tidying up which occurs to remove dead wood as potential sources of disease, though lop and top does provide a small resource for some species.

A second, if more subtle threat arising out of modern practices is **the replanting of woods after felling**. Though native tree species may be specified, the source of these will often be from other regions of the country or from abroad. For beech and oak this is a greater threat, because an EU Directive on Forest Reproductive Material restricts the use of seed sources other than from approved stands. The use of non-locally derived stock results in the dilution of the genetic make up of woodlands. For the conservation of the genetic components of biodiversity in local woodlands, greater emphasis should be placed on natural regeneration or the use of trees derived from local seed sources.

Commercially managed woodlands, if not of a varied age structure, will often have a lack of open space and early successional stages, resulting in the potential loss of specialist species of these habitats.

Another threat associated with modern practices is the **over-tidying of old trees throughout the countryside and urban areas, resulting in a loss of valuable dead wood habitat**. The work is done in the name of safety, but is often carried out to excess. Areas owned by public authorities, whether woodlands or parks, are often the most over-managed, but the problem also occurs on private land (see chapter 9 for further discussion).

4.3.3.4 Potentially Damaging Species

The fourth major potential threat to woodlands in the county concerns the impact of individual key species on the functioning of a woodland ecosystem. In particular, the increasing numbers of deer, grey squirrels and rabbits as potential inhibitors of natural regeneration, and the increasing abundance of some trees such as Sycamore and Sweet Chestnut resulting in changes in woodland composition.

Deer: Three species are found in Hertfordshire, Fallow, Muntjac and recently Roe have also colonised the county. Deer are a natural component of our woodlands but Roe Deer are the only native species found in the county. Today, deer have no natural predators and are generally increasing in numbers, particularly Muntjac. They have increased to the point, where they are causing economic damage to forestry. In addition, increasing evidence now suggests that the current numbers are causing ecological damage to woodlands, particularly by inhibiting regeneration.

Too many deer cause damage in several ways; browsing (eating the leaves and shoots of trees), grazing the ground flora, bark stripping (for food), and tree fraying by rubbing newly grown antlers to clean them of velvet. If there are more deer present than a habitat can support, this also results in a less healthy deer population.

Any future increase in the area of woodland in the county may result in further increases in the deer population in the absence of any management, as the area of suitable habitat increases.

Grey Squirrels: This species was introduced to Britain in the last century and has rapidly colonised most of the island. The species is omnivorous, but the major threat it poses to woodlands is through its bark stripping activities. This damage is as a result of both feeding and social behaviour. While this species can undoubtedly be a serious pest to forestry, much less is known about its ecological impact. There is now some evidence to suggest that Grey Squirrels may have long-term ecological impacts, for example, by preventing the regeneration of Hazel, due to its liking for green nuts. However, further research is still required on the ecological effects of this species.

Rabbits: On a local scale, a large rabbit population may inhibit regeneration by grazing seedlings and ground flora. Rabbits may also kill young trees by stripping bark, however, the effects of rabbits will generally be localised, though can be severe.

Tree Species: The following species are a concern, particularly where they occur in ancient semi-natural woodlands; Sycamore, Sweet Chestnut, Rhododendron, Cherry Laurel, Turkey Oak, Norway Maple and some conifers which are now self sown.

Sycamore and Sweet Chestnut, although both introduced to Britain, have become established in many woodlands and are increasing. Sycamore, only invades old woodlands slowly, unless large clearings are made, while Sweet Chestnut is spreading fast in many old woods on light acid soils. Much conservation effort has been spent in removing both these species, but particularly Sycamore, from ancient woodlands. However, both species are now fairly well established and should the rises in temperature predicted from global warming occur, then both are likely to increase further. A re-assessment of their threat is therefore required.

Rhododendron can rapidly become established in woodlands and the other species also have potential to spread if not controlled. However, less is known about how much of a threat these other species are, since their distribution is generally localised and they are usually present in small numbers.

4.3.3.5 Environmental Changes

The fifth potential threat to the woodland biodiversity of Hertfordshire is the impact of wider influences such as climate change and pollution. Though it is not possible to predict future climatic changes with certainty, a rise in temperature and changing precipitation patterns are predicted and will encourage changes in the species composition of woodlands. For example, increasing drought stress will certainly threaten epiphytic mosses and lichens and invertebrates dependent on damper conditions.

Increasing acidification from air pollution will result in changes in soil chemistry and a reduction in species-richness, notably amongst the ground flora, mosses and lichens.

There is already evidence of these changes in Hertfordshire, with the spread of bracken since the 1930's, the decline in calcareous flora and a general reduction in species-richness, including ancient woodland bryophytes in woods in SE Herts (T.James, Pers.Comm.).

4.3.3.6 Recreation

The final threat to woodlands, concerns increasing recreational use of woodlands. Increased public access to the countryside is desirable but brings numerous problems. Almost all large woodlands in the county have public access, which is becoming increasingly formalised, resulting in more extensive and continuous disturbance to breeding birds and species such as badgers. Public access may also cause trampling damage to ground flora, erosion and result in increased rubbish dumping, particularly on the urban fringe. Other urban fringe problems include vandalism and fire. Management regimes can be disrupted, further threatening the economic return and therefore value of woodlands to landowners. Demands for safety management can result in the loss of valuable deadwood habitats. In response to this, public access needs to be well managed and in some areas may need to be limited if such problems are to be avoided.

4.4 THE FUTURE FOR WOODLANDS IN HERTFORDSHIRE

4.4.1 Ancient Woodland

The major issues currently affecting ancient woodlands in the county are therefore the type of woodland management and the small size and fragmented nature of the resource.

These woodlands, though only accounting for just over a quarter of the county's woodland, harbour the vast majority of woodland species. To conserve local woodland biodiversity, the remaining ancient woodlands in the county must be put under appropriate management regimes.

4.4.1.1 Management

To cater for the wide range of woodland species, each ancient woodland or group of ancient woodlands needs to have a continuity of all stages in the woodland succession, from open space to deadwood. This over-riding aim is likely to be best achieved through a combination of management approaches, including limited intervention, active conservation management (including “traditional management”), and sustainable commercial management whether as high forest or coppice.

4.4.1.2 Encouraging More Natural Woodland

In the largest woodland complexes, this may be achieved through natural processes such as storms, disease and natural regeneration. **A policy of limited intervention, encouraging natural processes and undertaking management which complements and works with the natural processes should be sought in a few of the major ancient semi-natural woodland complexes in Hertfordshire.**

The adoption of this policy will require a different approach to woodland conservation, based on understanding, restoring and managing key ecological processes rather than managing habitats. The two major natural processes which will influence local woodlands are **windthrow** and the levels of **grazing**.

Windthrow creates gaps in the woodland canopy thereby allowing natural regeneration of the woodland. It also results in the death of trees and therefore the creation of deadwood and the process of decay and nutrient recycling. It is the most important natural disturbance in local woodlands.

Levels of grazing, particularly by deer species, are the other key natural process in management of local woodlands. In moderate numbers they contribute to the natural functioning of the woodland, though in greater numbers begin to cause damage by inhibiting regeneration of woody and herbaceous species. This threat is considered in section 4.4.6 on species issues.

In large limited intervention woodlands there may also be a role for looking at other potential grazing animals, such as semi-wild cattle, ponies and pigs. Mixed grazing regimes are an important part of more natural woodlands elsewhere in Europe. The establishment of mixed grazing regimes at low intensities should be investigated as a more natural way of managing these woodlands. For example, rather than provide open

space by felling glades or rides, grazing will help provide and maintain the woodland open space.

Another potential advantage of this approach would be achieved through combining the management of surrounding grasslands with the woodland management. In this way, more natural gradations (ecotones) between habitats could be created rather than abrupt edges that characterise the modern man-made landscape. Such gradations are recognised as being of great value to wildlife and are mimicked in much current conservation management. However, there are many practical problems with grazing woodlands and controlled grazing may only be appropriate in a very few cases.

If encouraging more natural woodland, the type of natural woodland and the management approach needed to establish this must be decided at the outset. Two different types of natural woodland can be aimed for (Peterken, 1996):

(1) **“Present natural woodland”** comprising those locally native species now present on the site and any others which colonise naturally. Future conservation would include limited intervention to prevent non-locally native species from establishing.

(2) **“Future natural woodland”** comprising all native, naturalised and planted species now on the site and any others which might colonise by natural regeneration in the future. Future species composition would not be managed.

In most ancient woodlands, the “present natural” approach will be the most appropriate, building on the existing features of conservation value. However, an example of at least one “future natural” woodland would be valuable to scientifically study the effects of non-locally native species on Hertfordshire woodlands.

Even with a change of management philosophy placing greater reliance on natural processes, there will remain important habitat features which may require management to maintain their biodiversity interest (this is recognised in the vision of *limited* not *non* intervention woodland). Limited intervention woodlands are important for “old growth” and mature woodland habitats, but some intervention is desirable to increase habitat diversity and protect key woodland features.

There are many management decisions which need to be made before a more natural approach is adopted in any woodland. An important issue is whether to let the woodland become more natural straight away, or whether to undertake management to create more natural components such as gaps and dead wood before letting natural processes take over. Influencing the starting point for more natural woodland, may also include re-introducing keystone species, such as grazing animals or a particular tree species.

The approach to natural disturbance is also critical, because a totally natural disturbance regime is not possible in our modern cultural landscape. While windthrow is a key feature of more natural woodlands, there may be a need to remove windthrown trees near paths or boundaries. In smaller areas such as those possible in Hertfordshire, there is considerable risk that the woodland may, by chance, miss the effects of high winds or

disease for decades. There may then be a need to simulate disturbance by artificially killing, felling or winching over trees to create gaps.

Other important issues include choosing the boundaries of a more natural woodland, determining appropriate grazing levels, deciding whether a buffer zone is required and controlling visitor numbers.

Overall, an approach to woodland conservation based on more natural woodland is best in well wooded districts, naturally disturbed woodland such as floodplain forests, or areas with very little ancient woodland.

The above discussion, sets out some of the general issues surrounding more natural woodland, but how does this relate to Hertfordshire ?

In a well developed county such as Hertfordshire there are only a few opportunities for extensive areas of more natural woodland. Such woodland has to cover large areas (ideally, at least 100 ha) to enable the natural processes to function effectively. Therefore locally, they would also beneficially include restored ancient replanted woodlands, secondary woodland and new woodlands developed preferably by natural regeneration, but also by planting.

The four major woodland complexes in Hertfordshire, which are among the most important for biodiversity and do potentially lend themselves to a more natural management approach are as follows:

- (1) Ashridge area;
- (2) part of the area from Broxbourne Woods to Hatfield, including Wormley Wood and Northaw Great Wood;
- (3) the Knebworth Woods complex and
- (4) the Whippendell Woods complex.

Other potential examples include Sherrardspark Wood and a few medium sized woodlands such as Harmer Green Wood.

However, in the short-term, this approach is only likely in those woodlands owned by public bodies or conservation organisations. In the longer term, it may require strategic acquisition by these bodies to establish more natural woodlands in the other areas.

The approach taken in each woodland will have to be developed through the production / revision of site management plans. The issues of restructuring or not, grazing, levels of public access and buffer zones should be addressed at this stage. One issue which does merit a little further discussion is grazing by semi-wild cattle, ponies and pigs.

While windthrow and controlled grazing by wild deer populations can easily play a more important part in the future development of these woodland complexes, the establishment of more natural grazing regimes based on mixed large herbivore populations is more problematic. The use of mixed large herbivore populations is probably only a realistic option in the short-medium term at Ashridge and Northaw Great Wood, are surrounded by areas of pasture and are developed from wood pasture and so have a history of grazing and open space within the woodland. Even in these

woodlands introduction of such grazing is subject to several practical problems such as securing boundaries (fencing is very costly), conflicts with public access and control of stock numbers.

The future more natural development of all these woodlands under the influence of windthrow and grazing would also provide a valuable baseline for monitoring and understanding natural processes in local woodlands. Such knowledge of natural processes would be invaluable in developing more natural conservation and commercial management practices.

Overall, the development of such large scale “more natural” limited intervention woodland would provide one of the greatest opportunities for woodland biodiversity in the future, particularly related to “old-growth” woodland, dead wood and conditions produced by more natural grazing. However, considerable research will be required to achieve this.

4.4.1.3 Managed Woodlands

Most ancient woodlands in Hertfordshire are too small and isolated to rely on natural processes to provide the whole range of successional stages. Expansion of these woods is a priority and is considered in later sections. A management based approach is essential in these woodlands. Management can be designed to simulate the variety produced by natural processes, particularly the structural diversity provided by open space and young growth. Management can also provide a sustainable resource of timber and wood products. Management may be solely for conservation, or more likely, developed as part of commercial forestry or game management, but **conservation should always be considered a primary objective.**

In large ancient woodlands, where a limited intervention approach is not possible or desirable, the aim should be to achieve a zoned management approach as is set out in section 4.4.7. Such an approach, adopting a variety of management regimes, can ensure the greatest diversity of habitats and woodland successional stages, as well as achieve economies of scale. The exact management options will depend on the individual wood(s), but commercial high forest and coppice management can be combined with conservation management, including smaller limited intervention areas.

Most ancient woodlands in Hertfordshire are however too small to adopt such a zoned approach. One of the following management systems is likely to dominate, though which one will depend on the past management history of the woodland, economic factors and social considerations.

4.4.1.4 Management Systems

Which ever management system is chosen, it is essential to maintain continuity of management, particularly in small, isolated woods, because many species are not very mobile and in the modern fragmented landscape the links between habitats have been lost limiting opportunities for re-colonisation.

Coppicing: As already noted, a majority of ancient woodlands in the county were formerly managed by coppicing, though many have not been coppiced for several

decades. A key question facing conservation and forestry managers is should a wide scale return to coppicing be promoted ?

The benefits of coppicing can be summarised as follows. Coppicing provides a diversity of habitats and supports many species dependent on open space or “young growth” woodland stages. It has also often ensured the survival of a locally native mix of tree and shrub species, largely present in their natural patterns and therefore has historic ecological value. It shows the history of the human link with and influence on nature, and so has cultural and social values as well as nature conservation values. Finally, coppicing also has scientific value as a long-term demonstration of sustainable resource utilisation.

The biodiversity benefits of a large scale return to coppice management are questionable. Species may be associated with coppice woodlands, but it is open space or dense shrubby habitats which they require, not the management system per se. If we are to see a recovery in those which have declined as a result of the cessation of coppicing, then it is these habitats which we must seek to provide in woodlands, either by coppicing or by incorporation of these features in other management systems.

In deciding to re-introduce coppicing, the balance of pros and cons will depend on the species found in each woodland and their habitat requirements, which will often relate to the age at which the wood was last coppiced. It is generally recognised that re-introduction of coppicing is only successful in woodlands which have been coppiced in the last 50 years and where areas of open space are still present. These factors ensure that the typical species of open space and “young growth” which would benefit from coppicing are still present within the woodland.

Coppicing is also best promoted in areas containing small (generally less than 20 ha), isolated woods, where other management systems such as high forest are not sustainable.

The final consideration is whether coppicing is economically sustainable. The two major products in the future will be firewood and charcoal. There are now several initiatives nationwide to produce charcoal. There are also other initiatives to encourage management of small woods, which include schemes to help find markets, such as “Woodlots”. The recent efforts to promote local charcoal and firewood production should be further developed. However, it is likely that some economic incentives, currently not available, will be required to establish such production as a sustainable long-term business, particularly with the importation of cheap charcoal from abroad and the generally saturated firewood market. It may be that this could be based around an increased density of timber trees within the coppice, with grant systems permitting planting at very low density, with the coppice and natural regeneration providing a nurse crop.

However, coppicing should be promoted in those ancient coppice woodlands worked in the past 50 years where it will have some biodiversity benefits and is commercially sustainable. One of the few good potential areas in Hertfordshire is around Hertford Heath, including the woodlands owned by the Local Authorities, Haileybury College and Forest Enterprise. In many woods coppicing will not be a

viable commercial proposition or desirable ecologically. Therefore future management is likely to focus on converting former coppice to high forest systems.

High Forest: High forest management has been practised in some woodlands, particularly the Chilterns beechwoods over a long period. However, it represents a major change to the majority of woods in the county which are former coppice. When carrying out such management it will be essential to maintain or re-create the important open space and dense shrubby habitats which coppicing provides as part of the management system, through networks of rides and glades. It is also essential to retain some deadwood and over-mature areas.

A further desirable trend for ancient semi-natural woodlands, is the development of alternative commercial management systems to the currently favoured clear felling and replanting methods based around **continuous cover ("close to nature")** methods. The continuous cover systems involve either uneven aged felling by **selection or group selection** methods or even aged **shelterwood** methods.

The selection methods only remove individual or small groups of trees at a time from areas of 0.1-0.3 ha, though perhaps up to 0.5 ha if shade intolerant species are being encouraged. The shelterwood system can be either regular or irregular and involves developing the new crop under the shelter of the old crop, some of which is retained after the first fellings. This may be done across a whole wood (regular) or by following patches of advanced regeneration (irregular). In all of the above systems the aim of felling is not only to produce timber but also to encourage natural regeneration and better growth in retained trees.

Some of the advantages of such systems are considered further in section 4.4.4 on plantations. Selection systems are most appropriate for woods dominated by shade tolerant trees, in Hertfordshire, Beech and Hornbeam. Shelterwood systems can maintain an existing mix of species, including shade intolerant species such as oak.

However, these systems require skill to implement successfully and there is still a lot of scepticism among the forestry profession. One way to start to overcome this is through the establishment of demonstration sites on publically owned sites, such as Hoddesden Park Wood.

4.4.1.5 Reasons for Management

Conservation Management: This will be aimed at working with natural processes and maintaining woodland biodiversity. It has generally mimicked the good bits of traditional systems to produce the desired habitats or communities or to create the conditions for particular species. However, in the future, as well as the traditional approaches, there is also likely to be a role for new techniques developed through research and through monitoring of more natural woodlands, particularly to conserve the favoured habitats of key species.

Conservation management is essential to protect the following processes, habitats and features, which can not be fully accomodated even in a sustainably managed commercial woodland (after Peterken, 1996):

- (1) Unmanaged stands which allow the development of natural woodland.
- (2) "Old-growth" and mature stands, with old, large trees and much deadwood.
- (3) Mature habitats, such as the native stands on ancient woodland, with their associated soils, ground vegetation and dependent fauna, which have been fairly stable for centuries.
- (4) Mosaics of woodland and other semi-natural habitats, interacting naturally.
- (5) Native mixtures of trees and shrubs, regenerating naturally.
- (6) Existing diversity, which favours most vulnerable species.
- (7) Traditional management and associated habitat conditions.
- (8) Historic features such as earthworks and the patchwork of rides and glades.
- (9) Specific treatments designed to favour rare and other vulnerable species which are not in the attractive groups of flowering plants, butterflies, birds and other vertebrates.
- (10) Conditions for long-term ecological research into natural processes.
- (11) Freedom of access within unmanaged stands.

Management purely for conservation is only likely to occur in nature reserves or publically owned woodlands. However, this is complementary to sustainable commercial forestry and even in commercial woodlands there is a need to retain key nature conservation features. In most woodlands the motive for any management will be economic, therefore it is essential to ensure that commercial management is sustainable (including with respect to nature conservation), particularly in ancient woodlands.

Commercial Management: It is likely that conservation work in many woodlands will only be paid for if a commercial return is also derived from a wood, either from timber or sporting management. Timber management will follow either a high forest or coppice system. If ancient semi-natural woodlands are managed commercially, either for timber or coppice or for recreation, then it is essential that the environmentally sound practices set out in the recently published UK Forestry Standard (FA 1997), Forestry Guidelines (FC 1990-95) and Forestry Practice Guides 1-8 on semi-natural woodlands (FC 1994), are adopted.

The following aspects are particularly important for nature conservation:

*** At the very least, 10% of each ancient semi-natural woodland or group of woodlands over 20 ha, either as whole woods or parts of larger woods, should be managed under a limited intervention regime.**

*** Natural regeneration should ideally be encouraged as the method for restocking.**

*** Should natural regeneration not prove possible, planting should ideally only use trees grown from locally derived seed sources, to conserve local genetic variations. If such seed is not available British seed must be used. Planting should reflect the semi-natural stand-type.**

*** At least 4 standard trees per hectare should be retained to biological maturity to ensure a continuous supply of dead and dying wood. Ideally, specific important trees should be identified through survey prior to management.**

- * **Up to 10-20% of woodland area should be open space, based around rides, glades, water features and existing open semi-natural habitats.**
- * **dead trees should not be removed unless dangerous.**
- * **dead branches should not be removed from important old trees or trees to be retained to biological maturity unless they are dangerous or present a risk to health.**
- * **only the minimum work necessary to make a tree safe should be carried out and some of the felled timber should be left on site.**
- * **at least one mature dead tree per hectare should exist, and where it does not a large tree should be killed in a situation where it poses a no risk to the public and provided this will not result in the loss of other important species.**

4.4.1.6 Restoration of Replanted Ancient Woodland

About a fifth of the woodland in Hertfordshire is replanted on former ancient semi-natural sites. Such sites often retain elements of the former more natural communities, particularly in any areas which were not cleared and along rides. On many of these sites only part of the wood was cleared leaving part as ancient semi-natural woodland.

These ancient replanted sites often have considerable potential for the restoration of a more natural woodland, particularly where areas of ancient semi-natural woodland are in close proximity. This increases the potential for colonisation by ancient woodland specialist species. To conserve remnant ancient woodland species in these woods, **they should be returned to a more natural broadleaved woodland community, based on the appropriate NVC woodland communities, at the end of the current cropping cycle. Important features of former management such as pollards and open space should also be included.**

Restocking such woodlands should where possible be based around **natural regeneration**, though this is only likely to be practicable where there is an adjacent ancient woodland seed source and where there is no intention to continue commercial forestry. In many cases, planting is likely to be the only practicable method of restocking. However, even where this is the case, some use should be made of natural regeneration to encourage a more natural and varied woodland. **Planting should only use trees from locally derived seed stock** and should be done in such a way as to resemble as closely as possible the NVC woodland communities for the soils. Such planting is also acceptable where the aim is to replace oak and beech which has been planted in ancient woodlands in the past, though again natural regeneration is favoured.

A priority area for such an approach is the Broxbourne Woods complex and a plan has recently been developed for most of the woods in this complex through the Countryside Management Service Wildwoods Project. This is summarised in the case study in section 4.4.7.

In order to achieve restoration of these ancient woodlands, it is likely that economic incentives or direction from the Forestry Authority will be required to ensure it happens.

4.4.1.7 Balance between Management Types

Overall it is likely that of the 5000 ha approximately of ancient woodland left in the county, about 10% could be managed as more natural woodland reserves in 3 or 4 large blocks. Approximately 25% could be managed under coppice regimes producing charcoal, firewood or pulp, with the remaining 65% managed as high forest.

It is estimated that of the total ancient woodland, 30% could be managed primarily for conservation by public authorities or conservation bodies, including the more natural woodland and areas of both coppice and high forest. The other 70%, mostly in private ownership would be managed commercially, but with nature conservation an integral part of the management system.

4.4.2 **Wood Pasture / Parkland**

There are no active wood pastures remaining in Hertfordshire and restoration of the traditional system is not practical. However, grazing in future limited intervention woodlands, particularly those which were formerly wood pasture, such as Ashridge, would contribute to maintaining key features such as the open space. Likewise, continuation or reintroduction of grazing in parklands is also important for many invertebrates associated with the old trees, whose adult stages require the nectar sources present in the open space. The key component of these habitats is however the veteran trees.

Conservation of the veteran trees associated with parkland and former wood pastures is a priority. In order to achieve this, a properly funded strategy is urgently required to identify the important trees through survey of key sites, to develop management programmes for these key sites and important individual trees and to ensure the provision of future veteran trees.

Survey: Surveys of the value of veteran trees are essential, but time consuming due to the difficulty in identifying the key species groups such as lower plants, fungi and invertebrates associated with them. For example, a survey of Panshanger Park took 16 days.

Management: Specific management must be carried out to ensure a continuity of dead and decaying wood, because even by planting replacement trees now, there will be a 200 year gap between these future parkland trees and the existing trees, many of which may not last that long unless actively managed.

Methods of managing individual veteran trees (which are often pollards) include **re-pollarding, propping up trees and surgery to extend the life of the tree.** Because of the age of many of the veteran trees, pollarding is now very difficult. Success varies from species to species with Hornbeam being relatively easy to pollard and Beech very difficult. However, the general principle is to avoid re-pollarding and to concentrate on extending the life of existing veteran trees through minimal surgery and providing new pollards and veteran trees for the future. In order to provide a continuity of old deadwood on a site, it may even be necessary in some circumstances to kill a large tree to speed up the natural decay process.

A further management issue, is that of over-tidyness in the treatment of mature trees. This is discussed further in chapter 10, particularly in reference to urban parks, but also applies to trees in the countryside and on nature reserves. The following good practice guidelines must be adopted in the management of all mature and veteran trees:

*** dead trees should not be removed unless dangerous.**

*** dead branches should not be removed from important old trees or trees to be retained to biological maturity unless they are dangerous or present a risk to health.**

*** only the minimum work necessary to make a tree safe should be carried out and some of the felled timber should be left on site.**

Planting: Planting of a new generation of future veteran and pollarded trees is essential to replace the existing trees. An active programme of planting new trees in parklands and starting new pollards in these parks and in relic wood pastures should commence immediately.

4.4.3 Secondary Woodland

Some secondary woodland has developed over a long period, 200 hundred years or more. If it developed in an area with a large amount of ancient woodland, it may have acquired considerable conservation interest. One such example is Sailor's Grove, near Bayfordbury, where a woodland has developed since the late eighteenth century across an ancient banked trackway. In such woodlands, it is important that conservation principles are generally given an equal weighting to commercial considerations, with important ancient features being protected and managed sympathetically.

Much secondary woodland is, however, of more recent origin, having developed in the last 150-200 years. Such woodlands, unless immediately adjacent to a rich ancient woodland, are unlikely to have been colonised by many specialised woodland species. There is therefore greater scope in such woodlands for commercial woodland management to be developed. However, good practice conservation principles should still play a part in any woodland management, since all the woodlands in the county make a contribution to the biodiversity resource.

Naturally developing secondary woodlands of long-standing are of ecological interest and a selection should be chosen and allowed to develop naturally. A selection of important more recent scrub successions should also be selected. These will provide an important resource for the study of ecological processes. Examples of suitable woods include part of the Whippendell Woods complex, part of Oxhey Woods and Pryors Wood nature reserve, near Stevenage. Examples chosen should cover all woodland types found in the county.

4.4.4 Plantations

The large area of plantation woodland in the county is where commercial timber production should continue to be concentrated. However, even these woodlands,

which represent a large proportion of the local woodland resource, contribute to the county's woodland biodiversity. Good practice conservation guidelines, as set out in the UK Forestry Standard, should therefore be included as part of all forestry operations.

These include management of buffer zones around woodland streams, provision and management of open space and "young growth" habitats, protection and management of ancient features and allowing a proportion of trees to grow to biological maturity to provide a deadwood resource.

Methods of production based on clear felling and replanting conflict with natural processes and are not the most beneficial for woodland biodiversity. Some species will use clear felled areas, the return of the Nightjar to Hertfordshire being a good example. However, "close to nature" continuous cover forestry systems which work more closely with natural processes and maintain a more natural and constant wooded environment are generally more favourable from the biodiversity point of view and are more publically acceptable.

Other advantages of such systems include, more stable deer populations, less threat from some forestry "pest" species, less cost in obtaining the next generation of trees (if natural regeneration is good), less damage to watercourses than under clear felling and a regular supply of timber. There are some disadvantages too, however, further research into the development of these systems should ensure that these can be overcome.

Conifer plantations will continue to be managed by clear felling and planting, but even here there is scope for a more varied woodland. For example, Forest Enterprise (the managing arm of the Forestry Commission) have already begun restructuring their plantations to improve the diversity of age ranges. However, for broadleaved or mixed plantations, the development of continuous cover forestry systems should be promoted, where economically realistic. These are based around selection, group selection or irregular shelterwood systems. However, it may be that in Hertfordshire the scope for such systems is limited by forestry economics in the short term, though there is real potential in the beechwoods of the Chilterns and also in some oak and oak-hornbeam woodlands.

In the longer term it has been predicted that it could be possible for up to 50% of woodland to be managed under such systems. However, for such an uptake, there will need to be a change in the way that woodlands are viewed economically. At present much forestry is based around treating the woodland as a "cash crop". Continuous cover forestry implies viewing woodlands as a "permanent investment" which provides a regular "interest payment" in the form of timber.

4.4.5 New Woodland Creation

In order to reduce the threats to the future of specialist woodland species and ancient woodlands, the area of woodland and the size of individual woods needs to be increased dramatically. However, the location of new woodland will be as important as the quantity if significant benefits for biodiversity are to be achieved.

In the Government Rural White Paper, on the future of the English countryside, the government endorsed a target of doubling the area of woodland in England over the next

50 years. However at present, the incentives for woodland planting through the combined Woodland Grant / Farm Woodland Premium Scheme are insufficient to encourage extensive new planting in Hertfordshire. In future there will therefore need to be increased support for the establishment of new woodlands.

Any significant increase in woodland cover will only come about if there is also economic value to landowners. Most new woodlands will therefore have to produce good quality timber, though establishment of new woodlands to provide game cover will also be an attractive option to some landowners.

Other current initiatives aimed at increasing the area of woodland include the 12 Community Forests and National Forest established in England through the Countryside Commission. In south Hertfordshire, the Watling Chase Community Forest has been established as one of the twelve.

CASE STUDY - WATLING CHASE COMMUNITY FOREST

The Community Forest covers an area of 72 square miles between Watford, St Albans, Hatfield, Potters Bar, Barnet and Harrow, of which about 45 square miles are in Hertfordshire. A Forest Plan has been prepared with wide consultation amongst local authorities and organisations, local landowners and the wider population. The Forest plan was adopted in 1995 and has a vision of increasing the area of woodland within the Forest area from 8% to 30%, by 2024.

The plan includes a series of policies covering all aspects of creating a community forest, including community involvement, landscape, agriculture, forestry, nature conservation and recreation and provides a blueprint for turning the vision into reality. The aim is to create a mixture of larger areas of "forest", small woods, open spaces and well managed hedgerows and parkland trees on the urban fringe. Other aims include promoting education and recreation, management of existing woodlands and investigating the possibility of re-establishing traditional markets for woodland products and employment. This is to be achieved through partnership action by co-ordinating the action of countryside organisations and public authorities working in the area and through targeting advice and grant aid to landowners. The Countryside Commission and the Forestry Authority view Community Forests as priority areas for receiving grant aid.

However, the voluntary approach adopted for achieving action in the Community Forest areas is also limited by the levels of grant available, which do not encourage landowners to commit themselves to long-term woodland creation. Woodland is often view by landowners as "sterilisation" of agricultural land and the long-term commitment involved in tree planting does not fit into European agricultural policies which seem to change on an annual basis.

The Community Forest area is also important for the creation of new heathlands (Chapter 6) and new neutral grasslands (Chapter 7). There is therefore a need for a strategic approach to habitat creation and restoration, with key areas for each habitat type identified.

The key principles in any expansion of the local woodland resource is the need to build upon the existing resource, through expansion, linking and buffering. Establishment of new woodland adjacent to existing woodlands, particularly ancient

woodlands, provides the greatest opportunities for colonisation by woodland species, particularly those which are slow colonisers and require a long continuity of woodland cover. The new woodland will also have the benefit of buffering ancient woodlands from surrounding land uses, such as the influence of roads, or agricultural chemicals. This will also lessen the "edge effects" on the woodland and so enhance the habitat for species dependent on the darker and damper conditions of the woodland interior. The final principle concerns linking together fragmented woodlands to create a larger area of wooded habitat. **However, new woodland should not be created on sites with an existing nature conservation interest.**

Natural regeneration is the ideal method of establishing new woodlands, as it creates a more natural and varied woodland of greater value to wildlife. Expansion of ancient woodlands, in particular, should occur by natural regeneration. However, to achieve a substantial increase in woodland cover and particularly where timber production is an aim, many new woodlands will be planted. Again the principles of using locally derived planting stock and planting in mixes resembling the natural communities appropriate to the soils and geology, should be applied to achieve the greatest benefits for local woodland biodiversity. Some natural regeneration should also be included in planting schemes to help diversify the woodland. New woodland should therefore be broadleaved, rather than conifers, though the use of conifer nurse crops may help establishment and provide an interim financial return.

The recent launch of the "Trees of Time and Place" initiative, which includes Community Forests, BTCV and ESSO among the partners, is promoting the principle of using locally derived planting stock. It is encouraging local residents to collect seed from approved local sources, plant them in small nurseries and grow them on to trees. There is also a need for professional nurseries to grow local planting stock.

While all ancient woodlands would benefit from expansion, there are existing important concentrations of woodlands which should be prioritised for the creation of new woodlands. These are south-east Hertfordshire between Hoddesdon, Hatfield and Potters Bar; the Chilterns dip slope, including the woodlands west of Watford and the woodlands west of Stevenage (see map 4.1).

Two additional priorities include the Watling Chase Community Forest area and to expand ancient woodlands accessible from the urban areas to lessen the recreational pressures that these suffer.

4.4.5.1 Planting Proposals

Maps highlighting priority areas for woodland planting (and areas to be avoided) should be developed. These will identify the areas where the creation of new woodlands would be of most value and therefore where grants should be targeted. The guidelines for location of new woodland in the UK Forestry Standard must be adopted. These stress the need **to avoid planting on sites of existing nature conservation value**, as well as considering the landscape and archaeological implications.

4.4.6 Species Issues

Deer - The deer populations present in the county need managing if the threat they pose to woodland biodiversity and timber interests, is to be countered. Further research is required into the levels and dynamics of the county's deer populations, in order to be able to develop effective management programmes, but some level of control is inevitable. Because of the wide ranging nature of deer populations across both woodland and farmland habitats, effective management will of necessity require the co-operation of neighbouring landowners. **The establishment of Deer Management Groups covering all the major deer populations in the county should be promoted.** Exact methods of control chosen will depend on each case, however, a variety of options, including culling, habitat management to limit damage and fencing will be required. Further research into such methods is ongoing, but culling will be the major method. The deer culled should be used as a sustainable supply of venison.

Grey Squirrels - While further research on the ecological effects of Grey Squirrels is still required before widespread control is advocated, management of the existing populations will be essential in areas where new woodland is created. Again a co-operative approach to management will often be required on adjoining landholdings. Research is ongoing into other effective control methods in addition to the currently used poisoned hoppers, which are not publically acceptable.

Rabbits - Control of rabbits is likely to be essential where new woodlands are being created by planting or natural regeneration. As with management of other species, a co-ordinated approach will often be required by landowners.

Tree Species - A county wide policy on the various species mentioned in section 4.3.3 and their presence within ancient woodlands needs to be produced. A policy of eradication is unlikely to be practicable or desirable for all species. However, the damaging effects of Rhododendron and Cherry Laurel dictates the adoption of an eradication programme from ancient woodlands. Norway Maple, Turkey Oak and some self sown conifers are generally not well established in ancient woodlands at present and could therefore be successfully removed. None of these species should be planted in ancient woodlands.

Both Sycamore and Sweet Chestnut are, however, well established and are likely to naturally increase with potential climatic changes. They could therefore be considered to be naturalised species. A decision should be made on whether both species are to be fully accepted as naturalised species or whether, as at present, control to varying extents is undertaken on a site by site basis. In the meantime, the current pragmatic site by site approach to control should be continued. Neither species should be deliberately planted in ancient semi-natural woodlands, especially if they are not already present in the woods.

MAP 4.1 - MAJOR ANCIENT WOODLAND COMPLEXES

4.4.7 A Strategic Approach

4.4.7.1 County Woodland Strategy

Hertfordshire County Council produces a woodland strategy for the county, which is currently being revised (autumn 1996). This covers the general principles and policy guidelines for management of all aspects of the woodland resource, including nature conservation, timber production, recreation and access, woodland creation, landscape, archaeology and education and aims to promote sustainable multi-purpose forestry. The basis of the strategy should be the maintenance and enhancement of the woodland biodiversity resource of the county.

The strategy should include the targets set out in this habitat action plan. It should also identify the priority areas and woodlands for developing management zone plans, for establishing new woodland, for recreation and timber production.

The strategy should also promote specific initiatives aimed at improving the management of the county's woodlands, particularly marketing of local small woodlands and their products. The development of a local charcoal initiative is one such example.

4.4.7.2 Management Zone Plans

A combination of different management regimes, including minimal intervention and "close to nature" timber production and coppicing, is likely to be required to ensure that individual or groups of woodlands can maintain their associated biodiversity.

Woodland management zone plans should be developed for woodland complexes over 100 ha. Such a strategic approach, will often result in different woodlands or parts of individual large woodlands being **zoned**, for one or more uses such as conservation, recreation or forestry. Zoning enables conflicts, such as between conservation features sensitive to disturbance or trampling and public access, to be separated. This ensures that management is co-ordinated to achieve multi-purpose forestry objectives and to maximise the opportunities for woodland biodiversity.

Ensuring the continuity of management from one generation to the next is also important. Woodland management typically occurs over a period longer than a human lifespan and the reasons for carrying out work can be forgotten. All management and the reasons for it should therefore be explicitly recorded.

The priority woodland complexes for adopting such an approach should be the major ancient semi-natural woodland complexes of Broxbourne Woods (already in preparation - see below) and surrounds, Ashridge and Tring woodlands, Knebworth Woods and surrounds and the Whippendell Woods complex.

CASE STUDY - BROXBOURNE WOODS COMPLEX

The Countryside Management Service have recently written a management zone plan for 7 of the woodlands in this complex, covering an area of 320 ha and four different owners. The woodlands range in size from 10 to 120 ha and include both ancient semi-natural woodland and ancient replanted woodland. They include the Wormley Wood - Hoddesdon Park Wood SSSI, NNR and proposed SAC.

The overall objective for this zone aims for mixed use sustainable forestry, with conservation, timber production and recreation being catered for. A large part (120 ha) of the proposed SAC is to be left as a minimum intervention zone. The other ancient semi-natural woods will be mainly managed on an irregular shelterwood (continuous cover) high forest system to produce quality timber, with small areas of coppice.

The areas of ancient replanted woodland with conifers are at various stages of growth. The plan aims to revert all of these plantations to broadleaved oak-hornbeam stands by the end of the current cropping cycle and to eventually achieve a "normal" varied forest structure. The long-term aim is to manage all these new oak-hornbeam woods on an irregular shelterwood forestry system.

The plan also includes proposals for ride management, management of the important woodland streams and riparian zones through the complex, management of the ancient woodbanks, deer control, and provision for dead wood. Management of the rides will be linked to public access.

An additional proposal is to set up a Forestry Authority approved local seed stand which will produce seeds with the local genetic makeup for use in regeneration of the woodlands, where natural regeneration is insufficient.

Finally, by considering the individual woods as one zone, economies of scale can be made when selling timber and maintenance contracts.

4.5 **A VISION FOR WOODLANDS**

In 50 years time, the area of woodland in Hertfordshire will have been increased from the existing 15000 ha (9% of the county area) to approximately 20000 ha (12% of the county). Woodland expansion will occur in all areas of the county, but will particularly be concentrated in the following areas:

- * South-east Hertfordshire
- * Chilterns dip slope
- * Woodlands west of Stevenage
- * Watling Chase Community Forest (where 30% woodland cover will be achieved)
- * Adjacent to existing ancient semi-natural woodlands, particularly where accessible from urban areas.

The overall woodland resource will be managed for a variety of objectives, including conservation, recreation and timber production, with multi-purpose woodland management standard practice. Zoning strategies will ensure that management of the woodland resource achieves the maximum benefit for each major objective. Management zone plans will have been drawn up for all woodland complexes greater than 100 ha in size.

All 3280 ha of ancient semi-natural woodland will be managed sympathetically, with conservation being a primary objective. Key areas containing large blocks of ancient semi-natural woodland will be managed as limited intervention woodland, with natural processes being encouraged. A reasonable balance would be 10% of the ancient woodland area managed as limited intervention, 25% as coppice and 65% as high forest, depending on timber markets.

All 2100 ha of replanted woodland on ancient sites will have been or be in the process of being restored to locally native broadleaved woodland.

All relic wood pasture sites and parklands will be sensitively managed, to ensure a continuity of veteran and pollarded trees and all veteran trees in the county will be protected and managed sensitively.

Important old species-rich and early successional secondary woodlands will be managed with conservation given priority over other management objectives. Key examples will be allowed to develop naturally.

Sustainable forestry as set out in the UK Forestry Standard will be practised in all woodlands. Commercial forestry production will have begun to move towards "close to nature" ("continuous cover") management systems largely based around locally native tree species. Plantation forestry will, however, continue to account for a significant proportion of timber production.

Coppicing will be restored to ancient woodlands last coppiced after 1945, where this will have biodiversity benefits. In addition, the coppice products will be supplemented by the establishment of new coppice woodlands in traditionally coppiced

areas, specifically to produce wood to supply "environmentally sensitive" local charcoal, firewood and to ensure a sustainable market.

Key woodland species, such as deer and squirrels, will be managed on sustainable principles recognising their important ecological role and ensuring that they do not cause unacceptable damage to woodland biodiversity.

Woodlands, both ancient and more recent, will continue to provide a valued recreational for the local population. Access will be increased, but well managed, to meet the needs of many different users by providing a wide spectrum of opportunities from informal to more formal activities and to protect sensitive areas.

Educational objectives will be included in the management of all publically owned woodlands. Visitors will be informed about the reasons for different woodland management regimes and the wildlife, landscape, cultural, historical and economic value of woodlands.

An expanded woodland resource will be highly valued as a wildlife, recreational, educational and timber resource. The necessary economic conditions to establish and manage this multi-purpose resource will be in place, thereby ensuring the future for woodlands and woodland biodiversity in Hertfordshire.

4.6 TEN YEAR TARGETS

To protect and prevent any further loss or damage to ancient woodlands.

To have 50% of the woodland area and 75% of the ancient woodland area managed sensitively in line with the UK Forestry Standard by 2010.

To have undertaken a feasibility study on the creation of large limited intervention woodlands within the county.

To have begun the restoration of at least 500 ha of ancient replanted woodland to the appropriate local woodland type.

To have begun the establishment of 1200 ha of new woodland.

To ensure all parkland and former wood pasture sites containing veteran trees are under sympathetic management regimes.

4.7 PROPOSED ACTIONS

(HWS aim) - cross reference to Hertfordshire Woodland Strategy Action Plan.

4.7.1 Policy and Legislation

W1. Lobby for improved forestry grants and economic incentives to encourage:

1. Conservation management and environmentally sensitive economic management of all ancient woodlands.
2. The restoration of replanted ancient woodland sites to more natural woodland communities.
3. The establishment of new woodlands, particularly on farmland.
4. Conservation management of wood pastures, parklands and veteran trees.

Action: TGA, CLA, EN, CoCo, WCCF, NSWA, LA's. *(HWS aim 45)*

W2. Ensure that all woodlands receiving public money and / or consent for management works are managed according to the UK Forestry Standard and have long-term management aims, incorporating biodiversity targets.

Action: FA.

W3. Ensure the County Woodland Strategy is implemented. Update this Strategy once every 10 years, next review 2007. The Strategy to include the targets in this action plan.

Action: HCC, HWWG. *(HWS aims 57, 58, 59)*

W4. Promote the limited intervention approach through the County Woodland Strategy and through zone management strategies and plans for key woodland complexes. Confirm approach by 2001.

Action: HMWT, CMS, HCC.

W5. Continue support for Watling Chase Community Forest.

Action: CoCo, FA, HCC, SADC, HBC, WHC. (HWS aim 43)

W6. Prepare a county policy on introduced tree species, as part of a wider pest control strategy, by 2000.

Action: HCLC, HWWG, HCC, LA's.

4.7.2 Site Safeguard and Management

Site Safeguard

W7. Ensure that all proposals for work to ancient and other important woodland Wildlife Sites accord with the UK Forestry Standard, and are assessed by a competent ecologist to ensure they will conserve biodiversity.

Action: FA, EN.

W8. Ensure all Local Plans have site and habitat policies protecting and encouraging appropriate management of ancient woodlands, at the next review.

Action: LA's.

W9. Local Authorities, in partnership with nature conservation bodies, to identify and designate suitable woodlands as LNR's. The following to be designated by 1999 Oxhey Woods (designated April 1997) and Bishops Wood (Three Rivers); Sherrardspark Wood SSSI and Northaw Great Wood SSSI Country Park (Welwyn Hatfield); Whomerley and Monks Wood (Stevenage); Howe Wood (Dacorum); Batch Wood (St Albans). At least 8 others to be designated by 2007.

Action: LA's, EN, CMS.

Management

W10. Local Authorities to develop and maintain woodland management programmes for their woodland holdings, based on the principles of this action plan by 2000.

Action: LA's. (HWS aims 19, 22)

W11. Establish a series of demonstration woodlands across the county showing:

1. Good practice in conservation management, including limited intervention, coppicing, high forest and ride management (1 wood in each CMS area by 2000).
2. Implementation of best practice multi-purpose forestry (1 wood in each CMS area by 2000).
3. "Close to nature" (continuous cover) forestry management (2 woods by 1998). Hoddesdon Park Wood and Oxhey Woods are possible examples.
4. Natural secondary woodland successions. Possible examples include Oxhey woods (part), Whippendell Woods SSSI (part) and Pryors Wood, Stevenage.

Action: CMS, WCCF, WT, LA's, HMWT. (HWS aims 2, 19, 22, 29)

W12. Zone management strategies should be developed over the next 10 years for all woodland complexes over 100 ha in size, covering conservation, public access, landscape, recreation and forestry. The following ancient woodland sites / complexes, should take priority, with plans developed by 2005: Broxbourne Woods and surrounds (completed), Whippendell Woods and surrounds (by 1998), Northaw Great Wood (by 2000), Knebworth and surrounds (by 2002) and Ashridge / Tring woodlands. Extra resources will be needed to take forward Northaw Great Wood, Knebworth and Ashridge / Tring plans.

Action: CMS, owners. (HWS aims 18, 27, 28)

W13. In addition to the zone strategies for the 4 key woodland complexes, detailed conservation management plans should be developed for the ancient woodlands within these by 2005. Extra resources will be required to prepare these.

Action: CMS, HERC, LA's, owners.

W14. Undertake a feasibility study on the creation of large limited intervention woodlands within the county by 2000. This will have to assess possible sites, opportunities, constraints, extent of intervention / management and survey and research requirements.

Action: UH, HMWT, NT.

Restoration

W15. Target restoration of ancient replanted woodland to key woodland complexes and Wildlife Sites initially, to achieve the greatest gains for biodiversity. Produce plans and start implementation on all local authority owned ancient replanted woodland sites by 2000.

Action: LA's, HMWT, CMS, EN. (HWS aim 17)

W16. Establish Broxbourne Wood as a demonstration site showing the restoration of a more natural woodland community in an ancient replanted woodland by 2005.

Action: CMS, HCC.

Creation

W17. Target the creation of new woodlands to sites adjacent to existing ancient woodland, particularly those in the priority areas, and those close to urban areas, through the production of map based planting guidelines, by 2000.

Action: WCCF, CMS, HMWT, LA's. (HWS aims 46, 47, 48)

W18. Establish at least 2 demonstration sites showing the creation of new woodlands through natural regeneration and planting by 2003.

Action: CMS, WCCF, LA's, HMWT.

Partnerships

W19. Public authorities and voluntary nature conservation organisations to form partnerships to bid for funding to promote strategic woodland conservation. If required, this should include the purchase of woodlands and the establishment of new woodlands, in key woodland complexes. Prepare strategic approach by 2001.

Action: HCC, LA's, HMWT, WT, NT, WCCF.

4.7.3 Species Management and Protection

Notable Species

W20. Implement current species action plans and prepare list of additional species requiring plans, by 2000.

Action: HERC, HNHS, HMWT, RSPB, HMG, HMBG, HertsBC, BTO, BC.

Dormouse. To maintain current range of species in Hertfordshire (Chapter 12).

Stag Beetle. To establish current status of species in Hertfordshire and draw up action plan to reverse decline (Chapter 22).

Additional species:

Bats. To maintain current range of species in Hertfordshire.

Hawfinch. Research cause of decline and draw up action plan to halt and reverse decline.

Silver-washed Fritillary. Manage existing sites to maintain and increase the populations. Encourage expansion towards former range and ensure at least 2 occupied sites within 10 years.

Coralroot Bittercress. Maintain current population.

Species Control

W21. Demonstrate best practice management of individual species, through demonstration sites, training courses / seminars and provision of literature. One event annually.

Action: FA, Herts Deer Management Group, Thames & Chiltern Squirrel Control Group.

W22. Establish a series of Deer Management Groups covering the whole county by 2003.

Action: Herts Deer Management Group, Landowners, CLA, NFU, FWAG, CMS, WCCF, HWWG.

W23. Continue studies to assess the current status and dynamics of deer and Grey Squirrel populations and other potential pest species, such as rabbits, and the current levels of damage caused. Report every 5 years at least.

Action: FA, EN.

W24. Continue investigations of the ecological implications of species such as deer, Grey Squirrel and other potentially damaging species and disseminate knowledge and best practice in their management. Report every five years at least.

Action: FA, EN.

4.7.4 Advisory

W25. Management advice and available grants to be targeted to owners within the key woodland complexes and owners of woodland Wildlife Sites as a priority by 2001.

Action: CMS, HMWT, WCCF, CWP, FA, EN.

W26. Support the Chilterns Woodlands Project as an advisory service to private landowners in the Chilterns and as a means of promoting WoodLots.

Action: HCC. (HWS aim 5)

W27. Target management advice to owners of veteran trees, encouraging sensitive management and provision of new trees for the future. Parklands and relic wood pasture sites with concentrations of veteran trees to take priority, by 2000.

Action: CMS, WCCF, HMWT, LA's, FWAG.

W28. Organise at least 1 training course / seminar annually for woodland managers and the general public on:

1. The ecology and management of woodlands.
2. The restoration of more natural woodland communities.
3. Implementation of multi-purpose forestry.
4. Creation of new woodland.

Action: FA, TGA, NSWA, EN, CMS, WCCF.

4.7.5 Research and Monitoring

W29. Complete survey of woodland resource of Watling Chase Community Forest area by 1998.

Action: WCCF.

W30. Begin compilation of an inventory of veteran trees in Hertfordshire during 1998.

Action: HERC, HCLC, HMWT, WCCF. (HWS aim 15)

W31. Establish a programme to monitor management of ancient woodlands through site integrity monitoring associated with the Woodland Grant Scheme and more detailed monitoring on selected sites, by 2002.

Action: FA, HERC, EN.

4.7.6 **Communication and Publicity**

W32. Organise events in public and conservation woodlands, demonstrating woodland management and conservation and the links to everyday life. Examples include guided walks and woodland craft days. One event per CMS area annually. Also publicise best practice through publications.

Action: LA's, CMS, WCCF, HMWT, EN. (HWS aim 24)

W33. Compile a central library of literature on woodland management issues for use by LA's, NGO's and woodland owners by 1998.

Action: CMS. (HWS aim 25)

W34. Produce a "woodland management pack" containing leaflets covering all aspects of woodland management by 1999. Use existing leaflets where possible and produce new leaflets to fill in gaps.

Action: HWWG, CMS, WCCF, LA's, FA, TGA, NSW. (HWS aim 23)

W35. Establish a Hertfordshire Woodland Working Group linked to the Hertfordshire Countryside Forum to oversee implementation of the Hertfordshire Woodland Strategy and this action plan by 1998.

Action: HCC, CMS, TGA, CLA, HMWT, LA's, FA, NFU. (HWS aim 55)

W36. Establish a series of woodlands as outdoor classrooms for schools by 2005.

Action: HO, WCCF.

W37. Establish 10 community managed woodlands of 5-20 ha, within or close to urban areas where the local community participates in all aspects of management, by 2007.

Action: CMS, LA's, WCCF. (HWS aim 54)

W38. Encourage community involvement in the management of all publically accessible council owned woodlands.

Action: LA's, WCCF, CMS.