

WOODLAND MANAGEMENT PLAN 2009 - 2029

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Oakley Wood

Prepared For

Warwick District Council

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Oakley Wood

Management Plan

Date:	2009	to	2029
Owner / tenant:	WARWICK DISTRICT COUNCIL		
Agent / contact:	JUSTIN MUMFORD BSc(Hons) MSc MICFor CEnv, LOCKHART GARRATT LTD		

1. BACKGROUND INFORMATION

1.1 Location

Nearest town, village or feature	Bishops Tachbrook, Warwickshire
Grid reference	SP 305595
Total area (ha)	47.72 hectares

1.2 Description of the woodland(s) in the landscape

Oakley Wood is situated within the Dunsmore and Feldon Landscape Character Area (Character Area 96). The surrounding landscape is made up of farmland with large geometric fields divided by straight hedges with many hedgerow trees. Although the wider landscape is reasonably well wooded (particularly to the south west), the woodland blocks are divided by extensive open arable land on an open, flat plateau landscape.

There are strong urban influences from Royal Leamington Spa and Warwick, situated approximately three miles to the north, and Stratford upon Avon, situated approximately ten miles to the southwest. There is a busy road infrastructure flanking the wood, including the M40 only 200m from the northern boundary of the wood.

Land to the south of the wood is registered as parkland and part of Ashorne Hall (this is now a management college). Wiggerland Wood which is an Ancient Semi-Natural Woodland (ASNW) adjoins Oakley Wood to the southeast.

1.3 History of Management

Oakley Wood has been in existence as a woodland since at least 1600 AD. The woodland was, however, clearfelled with the exception of Cpts 4c, 5c and 5d during the late 1940s-early 1950s and replanted with predominantly Scots pine (*Pinus sylvestris*) between 1947 and 1981. At the time of clearfelling the woodland was under the ownership of the Forestry Commission. Further felling and replanting of mixed conifers and broadleaves was undertaken during the 1970s and 1980s with small-scale supplementary underplanting undertaken during the 1990s.

There appears to have been very little work undertaken within the woodland over the last 15 years with the exception of small-scale tree planting, maintenance of access and very occasional individual tree removal in order to meet the previous owner's firewood demand. This operation was undertaken with consent from a felling licence which is thought to have expired during the early 2000s.

Oakley Wood was purchased by Warwick District Council in 2008 with local public support. This report outlines a strategy for future management. A detailed survey was undertaken on 15 January 2009.

2. WOODLAND INFORMATION

2.1 Areas and features

2.1.1 Designated Areas	In Woodland	Adjacent to Woodland	Map
Special Areas for Conservation (SACs)			
Special Protection Areas (SPAs)			
Ramsar Sites (see note on Guidance)			
National Nature Reserves (NNRs)			
Sites of Special Scientific Interest (SSSIs)			
Other designations eg: National Parks (NPs), Areas of Outstanding Natural Beauty (AONBs), Local Nature Reserves (LNRs)	√		
Details A local record search indicates that the woodland is designed as an 'eco-site'. It is also a potential 'Site of Importance for Nature Conservation (SINC)'. An extended Phase 1 Habitat Report dated January 2009 has been undertaken by Lockhart Garratt Ltd in conjunction with this plan (document ref: 3328/C01/00-008). Such designations are county-based and non-statutory.			
2.1.2 Rare and important species	In Woodland	Adjacent to Woodland	Map
Red Data Book or BAP species			
Rare or threatened species			
Details No records of European Protected Species exist within the woodlands or within 2km of the woodlands. The wood is within the known range of otter, dormouse and great crested newt and provides suitable habitat for bat species. The pond within compartment 4c is suboptimal for great crested newt and otters.			
2.1.3 Habitats	In Woodland	Adjacent to Woodland	Map
Ancient semi-natural woodland (ASNW)		√	M2
Other semi-natural woodland			
Plantations on ancient woodland sites (PAWS)	√		M2
Semi-natural features in PAWS			
Woodland margins and hedges	√		M2
Veteran and other notable trees	√		M2
Breeding sites			
Habitats of notable species			
Unimproved grassland			
Rides and open ground			
Valuable wildlife communities			
Feeding areas			
Lowland heath			
Peatlands			
Others			

Details:			
Oakley Wood (all cpts) is designated as a Plantation on an Ancient Woodland Site (PAWS). A PAWS is defined as woodland which has been in continuous woodland cover since at least 1600c but has since been felled and replanted, in this particular case with predominantly Scots pine.			
The southern boundary of Cpt 3b and the western boundary of Cpt 4b exhibit approximately 18 over-mature oak which have been heavily pollarded at 1m above ground level. Pollarding was a traditional method of demarcating boundaries and should be considered as part of the cultural heritage of the wood. Pollarded trees which exhibit a lower centre of gravity can often be retained and allowed to grow on into veteran status.			
Wiggerland Wood which adjoins Oakley Wood to the south east is designated as an ASNW.			
2.1.4 Water	In Woodland	Adjacent to Woodland	Map
Watercourses			
Lakes			
Ponds	√	√	M2
Wetland habitats			
Details			
A small pond is situated within the south of Cpt 4c. A series of ponds are also evident within the field to the south of Cpt 3b. Two other small water bodies exist within the wood around the Scheduled Ancient Monument (SAM). The habitat value of these water bodies is low.			
2.1.5 Landscape	In Woodland	Adjacent to Woodland	Map
Landscape designated areas		√	M2
Landscape features			
Rock exposures			
Historic landscapes	√		
Areas of the woodland prominent from roads	√		M2
Areas of the woodland prominent from settlements	√		M2
Details			
The area immediately to the south of Oakley Wood is designated as a registered park and is part of Ashorne Hall.			
The SAM as detailed in Section 2.1.7 is very prominent on the ground with large earthbanks and ditches up to 3.66m (12ft) in height and 8.23m (27ft) wide at the base.			
The woodland is bound on three sides by public roads; B4087 on the western and northern boundaries, B4100 on the eastern boundary. The woodland is prominent from isolated individual farmhouses and the agricultural college to the south and east.			
Part of the western section of the wood has been developed into a crematorium. The surrounding woodland adjacent to the crematorium has been fenced off and is managed under a separate agreement as part of a memorial woodland. This part of Oakley Wood is not included within this report.			
2.1.6 Cultural Features	In Woodland	Adjacent to Woodland	Map
Public rights of way	√	√	M2
Prominent viewing points			
Permissive footpaths	√		M2
Areas managed with traditional management systems			
Details			
A public right of way (footpath) extends east-west along the northern quarter between Cpts 1 and 2, however extensive permissive footpaths extend along numerous desire lines throughout the woodland.			
There are no prominent viewpoints or traditional management areas.			

2.1.7 Archaeological Features	In Woodland	Adjacent to Woodland	Map
Scheduled monument	√		M2
Historical features			
<p>Details Monument number: WA12. Official name: Oakley Wood Camp.</p> <p>An area of approximately 3.64ha (9 acres) within the centre of the wood is designated as a Scheduled Ancient Monument. This area is thought to be an Iron Age fort or settlement and is roughly triangular in form. Earth banks and ditches extend along the eastern and northern boundaries which are thought to be part of the outworks of the main fort.</p> <p>Further research of the fort will be undertaken as part of initial management planning.</p>			

2.2 Woodland resource characteristics

Compartment information

Historic compartment plans based on those presented in the John Clegg & Co sales particulars have been used in the preparation of this report. Where required these have been updated to take into account changing crop type or new plantings.

A full compartment record is presented at Appendix 2, a compartment map is presented in Appendix 3 (M3).

In the majority of cases, compartment boundaries are clearly defined on the ground following existing rides, ditches or clear subdivisions of woodland structure.

Areas have been checked using digital mapping software and are presented to the nearest 0.01ha (areas may differ slightly from historic records as a result).

Woodland composition

The woodland composition is identified on plans in Appendix 4 (M4) and are characterised by five different woodland types. These are summarised as follows:

Mature conifer (Cpts 1a, 1b, 1c, 2a, 2c, 3a, 3b, 4a, 4b, 5a, 5b, 5d)

The majority of the woodland is made up of mature conifer planted between 1947 and 1961 (with the majority planted in the early 1950s). The predominant species is Scots pine (*Pinus sylvestris*), estimated at 80% species composition, with 20% Douglas fir (*Pseudotsuga menziesii*) and very occasional Norway spruce (*Picea abies*) and Western hemlock (*Tsuga heterophylla*) located as individual specimens or small groups particularly within Cpts 1c, 4a, 4b, 5a, 5b and 5b. The conifer was managed to a high standard during early years of establishment and has provided a high survival rate with good early development resulting from initial thinning operations.

There does, however, appear to be a lack of thinning intervention within the past 10-15 years, resulting in a high current stocking density for its age, with average basal areas estimated to be 37m²/ha compared to management guideline recommendations of between 26-32m²/ha.

The current high stocking density will reduce the potential size (girth) of trees and as a result the future potential economic value. It is currently estimated that products from a harvesting operation would produce 45% log material, 30% bar, 25% chip.

The conifer are non-native to the local environment and as a result would be considered as detrimental to the conservation value of the woodland, in particular valuable understorey and ground flora which is being heavily shaded and affected through increased pH from needle drop. There are, however, small pockets of locally native Silver birch (*Betula pendula*) and also the occasional oak (*Quercus robur*) or ash (*Fraxinus excelsior*) which may be part of the original woodland structure.

Thicket stage mixed broadleaf and conifer and pure broadleaf (Cpts 2b(i), 2b(ii), 2d, 3d, 4c)

A second phase of planting was undertaken between 1977 and 1981, comprising Scots pine and oak ranging between five (Cpt 2b) and seven (Cpt 4c) rows of Scots pine planted as a nurse and five rows of oak. Trees were planted at close spacing of 2m between rows x 1.5m within the row. Such planting patterns can produce taller, straighter broadleaf stems having been drawn up by the faster growing conifer. This has worked well over the majority of the stands, with oak now of good form and structure. The canopy has now reached closure and, if left, will suppress the oak and increase the mortality rate of this species.

An area within the northern part of Cpt 2b (listed as 2b(i)) shows extensive failure of the above planted crop, reasons for which are unknown. Semi-mature oak from previous planting and naturally regenerated birch make up the canopy.

There are also two isolated small blocks of thicket stage pure oak listed as Cpt 2d and Cpt 3d. These trees were planted during the mid to late 1980s at wide (3m x 3m) spacing. The trees have established well with good survival rates, however as a result of the wide spacing the form of the trees is poor. Individual tree guard protection has worked well and in many of the cases has fallen off and is now left redundant on site.

In Cpt 3d, an area of Grey poplar (*Populus canescens*) has established within the northern part of the subcompartment. This is an exotic, invasive species which will begin to encroach throughout the woodland if left unchecked.

Mixed age broadleaves (Cpts 1d, 3c and 5e)

Two narrow seams of broadleaf woodland running along existing rides appear to have been created during the late 1970s. Planting consists of one or two rows of hybrid poplar (*Populus sp.*), planted between 5-8m spacing with underplanting of oak of various ages up to as recently as five years ago. Hazel (*Coryllus avellana*) appears to have been coppiced at a similar time to the planting and has now grown back strongly from cut stools. Cpt 3c also has two rows of Western hemlock. The trees are of good to moderate quality, however the poplar and Western hemlock are considered exotic species within an ancient woodland context. Poplar is considered a relatively short-lived species and may begin to break up through windsnap and decay within the next 15-20 years. Western hemlock is an invasive species and may spread if left to regenerate.

Mature/Over Mature Ancient Semi-Natural Woodland (ASNW) (Cpts 4d, 4e, 5c, 5f)

Remnants of the ancient woodland can be found within the southern part of the wood in which a pure stand of mature/overmature oak exists in Cpts 4d and 5c. A more varied species mix exists in Cpt 5f including Sweet chestnut (*Castanea sativa*), cherry (*Prunus avium*) and Horse chestnut (*Aesculus hippocastanum*). The oak is of good form and quality, however at very low density, particularly within Cpts 4d and 5c. Enrichment planting was undertaken approximately 5-7 years ago, however there has been no follow-up maintenance in the form of weed/vegetation control around each individual tree and as a result all the trees have died. As the compartments are so open, dense bramble with occasional bracken prevails throughout. These would have been the native species for such ancient semi-natural woodland and soil types. Cpt 5f, which has a tighter canopy and which as a result has shaded out some of the bramble, exhibits a more varied understorey including birch, holly (*Ilex aquifolium*) and hazel.

Woodland fringe

The woodland fringe is made up of an attractive band of mixed broadleaves including oak, Sweet chestnut, Horse chestnut, cherry and rowan (*Sorbus aucuparia*) with a strong understorey of regenerated oak and ash. This screen is very important for the external landscape appearance of the woodland and will need to be managed very sensitively in order to remove dead and dangerous trees and to promote the development of natural regeneration and the substorey. The boundary has not been mapped in detail within this report as the exact ownership of the boundary between Warwick District Council and the Highways Authority was not known at the time of writing. This can be updated when confirmed.

2.3 Site description

Management Access

The woodland is accessible from the crematorium (although it would be considered insensitive and inappropriate to use this access for heavy plant and collection of timber). The remainder of the wood is bordered by minor roads which could provide vehicular access at existing gateways as detailed on plan reference M2.

There are no open hardstanding areas suitable for stacking felled timber within the wood which would be needed prior to the commencement of thinning.

Terrain

Mechanised operations over the entire holding are unconstrained by the terrain with the exception of the earth banks around the SAM. Typically the terrain as described using the Forestry Commission terrain classification system is assessed at:

- Ground conditions – Class 2 (good)
- Ground roughness – Class 2 (slightly even)
- Slopes – Class 2 (gentle)

Local terrain will affect operations principally through water logged soil.

Soils

The majority of the woodland is based on fertile loams derived from sandstone and mudstone, from the Permian and Jurassic period which are considered slowly permeable, seasonally wet basic loams. Cpt 1 and parts of Cpts 2b and 2c comprise more free-draining soils which are slightly more acidic in nature.

Climate

The holding falls within a continental climate zone which is characterised as 'warm, dry' based on accumulated temperature and moisture deficit. The average rainfall on the holding is around 685mm (27 inches) per annum.

Wind

The wood lies in a relatively un-windy part of the country with a DAMS windiness score¹ of 13 (on a scale of 3 to 36-windiest). Although thinning and felling operations are not severely restricted to windthrow risk, there is an increased propensity to windthrow as a result of the very tight stand structure which will have resulted in limited root and buttress development which can create instability once trees have been thinned and have more room to move.

¹ DAMS is a measure of site windiness developed by Forest Research (Forestry Commission). It is based on the location, elevation and exposure of a site.

2.4 Significant constraints, opportunities and threats

Constraints and Opportunities

Constraints and opportunities to management in the woodland are illustrated in Appendix 1 (map reference M2) and listed as follows:

Constraints	Opportunities
Public roads	Good stand quality
Public access routes	Remnant ASNW
Public rights of way	Good local support for management
Scheduled Ancient Monument	
Isolated ownership of land	

Threats

Deer

Muntjac deer are known to populate the area although there is no extensive browsing damage within the woodland which suggests a currently sustainable population. Populations for all deer species are increasing throughout the UK, and as a result management should continue to monitor the presence of deer in the wood to ensure that the resident population does not become detrimental.

Rabbit and Hares

Rabbit and hares are potential threats to establishment stage crops. There is evidence that establishment of trees during the early 1970s and 1980s were protected by rabbit fencing and that all subsequent plantings have been protected by individual guards. At time of inspection there was no evidence of an excessively high population of either rabbits or hares within the wood, however this should continue to be monitored and suitable protection and control undertaken as required.

Grey squirrels

Live grey squirrels were seen on numerous occasions during the site inspection on 15 January 2009, however damage to vulnerable tree species such as beech (*Fagus sylvatica*) and oak was limited.

Although the conifer plantations are not susceptible to grey squirrel damage, at this moment in time the broadleaf element of the woodland (including the majority of the 1970/1980s planting) is now reaching the size which will be susceptible to grey squirrel browsing. Damage will occur between March and July, particularly on crops which have been recently thinned. A co-ordinated control of squirrels to ensure that a sustainable population is maintained will need to be undertaken.

Pine weevils

Pine weevils are not a severe threat to the mature crop. As it is not the intention to restock predominantly with pine, a future threat will remain minimal.

Red band needle blight (RBNB)

The fungal disease RBNB has not yet been confirmed at Oakley Wood, despite it being present in all of the Forestry Commission districts in England. Although the fungal infection has been reported on Scots pine, research has found that it rarely causes significant damage. It is Corsican pine (*Pinus nigra*) which is most severely affected by the disease, and there are no Corsican pine planted within Oakley Wood.

Vandalism

The extent of open access to the woodland does mean that the risk of anti-social behaviour such as fly-tipping, vandalism and arson is intensified. The strong community support of the woodland through such groups as the Friends of Oakley Wood will help to keep such anti-social behaviour to a minimum.

3. LONG TERM VISION, MANAGEMENT OBJECTIVES AND STRATEGY

3.1 Long term vision and management aims to achieve the vision

Vision

Oakley Wood is to be perpetuated for future generations as a prominent and attractive woodland feature within the local landscape, whilst over time becoming increasingly naturalistic in its composition and structure and thereby heighten its biodiversity value. The woodland is to be made available as a local resource for informal low impact recreational and educational use and management is to recognise and reflect the woodland as a renewable natural resource.

Management Aims to achieve the vision

In order of precedence the management aims are:

- i. To maintain and enhance the visual amenity of the woodland as a feature within the local landscape.
- ii. To safeguard and enhance the biodiversity value of the woodland and associated habitats.
- iii. To provide facilities for informal public access and environmental education and work with local interest groups.
- iv. To maintain the woodland as a renewable natural resource to be sustainably harvested in support of social and economic activities.

3.2 Management Objectives

No	Objective
i	<p><i>In Support of Aim 3.1 i – Landscape</i></p> <ol style="list-style-type: none"> a) Oakley Wood will be managed through the principles of continuous cover forestry to sustain it as a perpetual physical feature within the local landscape. b) Diversity of species, structure and age class distribution will be actively promoted to reduce the risks of woodland loss through, for example, wind throw, pests and diseases or fire. c) All tree felling, clearance and regeneration proposals will be considered against the potential visual and landscape impact they may have and all reasonable steps will be taken to mitigate short-term adverse consequences. d) Oakley Wood will be actively managed to enhance its physical stability and to minimise all reasonable risk of wind throw or woodland loss that could result in a detrimental visual or landscape impact. e) The SAM will be opened up over 3-4 thinning cycles to create a central glade.
ii.	<p><i>In Support of Aim 3.1 ii – Biodiversity</i></p> <ol style="list-style-type: none"> a) All legal provisions for the protection and conservation of cited species and habitats will be fully complied with. b) The retained woodland will be actively managed to support and enhance its biodiversity value in terms of both species and habitats. c) All woodland management interventions will be structured in such a way as to seek to identify and deliver positive ecological outcomes. d) Over time, Oakley Wood will be managed to slowly remove its exotic content to promote existing and newly regenerated native trees, shrubs and ground flora species. e) All woodland felling and regeneration plans will take into account the opportunity for the long-term retention of individual trees, especially those developing veteran tree characteristics. f) Oakley Wood will be actively protected from potential threats to its ecology value, such as those posed by invasive species.
iii.	<p><i>In Support of Aim 3.1 iii – Recreation & Education</i></p> <ol style="list-style-type: none"> a) Agreed facilities for permissive public access will be installed in compliance with all planning and statutory requirements. b) All public and private facilities will be maintained in a safe and serviceable condition fit for purpose. c) Opportunities for further informal and low impact recreational and educational facilities and activities will be fully and fairly considered, as identified by site management and on the request of external parties such as Friends of Oakley Wood.

iv.	<p><i>In Support of Aim 3.1 iv – Natural Resources</i></p> <p>Without compromise to the preceding objectives, opportunities to manage the retained woodland to render sustainably produced natural resources, such as forest products, will be identified and factored into management practices. This is in recognition of the moral obligation to manage natural resources wisely, to sustain their viability and to lessen the dependence on non-renewable resources and exploitative practices. Any money raised for the sale of such products would increase the funds available for woodland management in promotion of the above objectives.</p>
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3.3 Strategy

Restructuring

To achieve the stated objectives, a programme of woodland restructuring will be implemented over the next 50 years in order to produce diversity in age classes and species. This strategy will improve the landscape value, reduce the risk of devastation from single catastrophic wind events or disease attack and provide continuity of woodland cover in perpetuity. The restructuring operations will provide an opportunity to increase the proportion and diversity of native trees and shrubs, while providing more open space and edge habitat for the benefit of native ground flora, invertebrates and birds.

Rate of change

As the wood was planted over a relatively short timescale, a large proportion of that which remains is now mature, with a corresponding decrease in remaining useful life expectancy. For this reason, the rate of change in the woodland structure will be most rapid over the next 50 years, but will slow to a point where equilibrium is reached thereafter.

Management techniques

Restructuring will be achieved through the use of low impact management systems, often termed 'Continuous Cover' systems which allow the maintenance of continuous woodland cover on a site, with a range of trees from young plants right through to fully mature specimens in close and often intimate proximity to each other. Management techniques are expanded upon in Section 4.1 below.

4. DETAILED PRESCRIPTIONS FOR THE MAIN WOODLAND TYPES & ASSOCIATED FEATURES

4.1 Silvicultural systems

GENERAL PRINCIPLES

Group felling and replanting

To create gaps for replanting, small groups of trees will be felled across the woodland, concentrating on areas where an existing weakness in the canopy exists or where trees have reached the end of their useful life expectancy. Areas along rides and well-used paths will also be opened up to create a more natural native setting for walkers at the earliest opportunity. The size of gap, or coupe, will be determined by the shade tolerance of the planned successor species, with smaller gaps of 1.5-2 times the height of the trees for relatively shade tolerant species (e.g. ash, cherry, field maple), increasing in size as required by more light demanding species such as oak and hazel.

Natural regeneration will be accepted where seedlings are of a desired native species. However, it is thought that planting will be necessary to gradually convert the woodland to a more natural and native species distribution. Enrichment planting may be used to supplement natural regeneration where an important species (eg oak) is missing from the seedling bank.

The majority of planting within the woodland will be of locally native species, typically of the National Vegetation Classification W10 woodland type¹, as governed by the underlying soil.

Scots pine will be used to provide some landscape and habitat continuity between the new and existing areas of woodland cover, although this will be phased out from all areas by the end of the initial 50 years of management, excluding notable veteran specimens. Hornbeam (*Carpinus betulus*) will be used as it is a tree which holds its leaves in the winter providing some visual interest amongst the bare twigs of other broadleaves. Hornbeam is also well suited to hot, dry summers and may therefore be well adapted to future climate change.

All planting stock will be of local provenance as defined by *Herbert et al* (1999) and seed will have been sourced from Forestry Commission Seed Zone 403 where possible. Where suitable planting stock is not available from that zone, adjacent seed zones will be acceptable.

The species to be used are shown in Table 1 below:

Table 1

Major Tree Species	Minor Tree Species	Shrubs
English Oak	Downy birch	Hazel
Ash	Crab apple	Hawthorn
Field maple	Aspen	Blackthorn
Silver birch	Wild cherry	Grey willow
	Hornbeam	Guelder rose
	Holly	Wild privet
	Goat willow	Dogwood
	Scots pine	Spindle
	Holly	Wayfaring tree
	Yew	Purging buckthorn

Coppice

To increase structural diversity, some small areas will be cut and allowed to re-grow from the base (coppiced). This will be carried out on rotations of between 5 and 35 years depending on objectives. On ride-sides, coppice will be cut on relatively short rotations in order to keep rides open and provide diversity, while in other areas the cycle may be as long as 25-35 years. Coupes will be less than 0.5ha in size and will be of elongated shape where possible to increase the valuable edge habitat.

Thinning

A programme of frequent, light selective thinning will be implemented across the woodland in order to promote the development of specimen trees, while minimising the risk of windthrow from opening up the canopy suddenly. Thinning will be undertaken on a cycle of 3-10 years, with a 6 year cycle being the long-term norm. Thinning will be used as an opportunity to remove non-native trees in favour of indigenous species and for improving the development of retained trees. Thinning will concentrate on the removal of suppressed or deteriorating trees and will favour the retention of well-rooted, dominant trees with deep crowns and tapered stems.

¹ W10 : Oak – Bracken – Bramble woodland

BESPOKE RECOMMENDED MANAGEMENT

Mature Conifer

Short term (0-5 years)

Thinning within these compartments is required as a matter of urgency. Selective thinning will look to remove sub-dominant species and open up around existing broadleaves as detailed in the section above. Up to 20% of the standing volume should be removed in the first instance.

Long term (5 years +)

Ongoing thinning will be the main silvicultural tool within these areas for the next 40 years. The canopy will eventually be opened up in order to create suitable light levels for natural regeneration in order to develop the next generation of trees. On the second or third thinning operation, selected coupes should be identified, felled and replanted in order to diversify the age structure and species. The neighbouring compartment to those selected for felling should remain intact until development of replanting is at least 5m in height or has been growing for 10-15 years. It is the intention that 1ha is felled every five years following the second thinning operation. This will take the form of small coupes in order to incorporate an element of uniform shelter wood and will be used as one of a number of the different types of management to encourage natural regeneration and diversify the age structure.

Thicket Stage Stands

Short term (0-5 years)

Thinning within these compartments is now required as a matter of urgency, both systematic (removing every fifth row of Scots pine) together with selective thinning as detailed in the section above.

Following on from the initial thin, selective formative pruning should be undertaken on the oak in order to improve the potential timber value of the mature crop.

The mortality of the stand within Cpt 3b requires additional surveying in order to establish the cause of failure. This should include soil testing and analysis of dead trees in the first instance. Once the cause of the extensive failure has been established, replanting should be undertaken with this information in hand to guide the species choice and layout.

Long term (5 years +)

Continued selective thinning of the stands will be required on a five year basis, removing the Scots pine suppressing the oak.

Mixed Broadleaves

The stand of mixed broadleaves currently provides attractive and varied settings along prominent rides, however, in order to ensure that the open ground management of these features can continue, thinning and coppicing of adjacent vegetation needs to be undertaken. Poplar and Western hemlock should be removed over a 10-15 year period.

Grey poplar situated within Cpt 3d should be felled and removed with stumps treated in order to prevent regrowth and suckering.

Mature/Overmature Ancient Semi-Natural Woodland

Short term (0-5 years)

A restrictive covenant within the title deeds of the wood inhibits cutting down, maiming or removing mature oak along the southern boundary.

The thin strip of ancient woodland to the south of the woodland requires rejuvenation in order to restructure the age class. The open canopy and increased light levels from the open countryside to the south will allow replanting of oak under the current canopy structure (as has been undertaken

previously) although it is imperative that ongoing maintenance is undertaken to ensure that any replanting becomes established.

In order to perpetuate the genetic stock of the woodland, it is recommended that acorns are collected in the first instance and propagated off site to then be replanted as transplants at a later date.

Although there is standing value within the timber in Cpt 5f, it is recommended that this area could be considered for minimal intervention, with the exception of undertaking all required tree safety management adjacent to the road.

Further ecological assessments are recommended during the summer months in order to establish whether or not the ground flora is sufficient or suitable to consider creation of wood pasture as an alternative silvicultural system.

Long term (5 years +)

Small group planting should be repeated on a five year basis without further felling of the mature trees.

4.2 Other operations

Ride Management

The remnant ride network will be managed to maintain an open space network for management and recreational access.

Wider, grassy rides will be managed on a three zone system with a central strip being kept short by mowing annually, two strips of rough grassland outside this which are mown biannually on an alternate basis after flowering, and a shrubby edge of the ride maintained by coppicing every 5-8 years. A cross-section drawing illustrating the three-zone system is provided at Appendix 5.

Where appropriate, rides will be widened by selective felling and coppicing of trees on their edge. The felling will aim to create irregular, scalloped edges to increase edge length and avoid cold corridors that promote wind funnelling. **Where a narrow strip of native planting exists along ride edges, this will be maintained and enhanced through coppicing of understorey and removal of poplar before risk of windsnap increases significantly. Such rides with the narrow strip of native planting will not be widened further.**

Where shrub species are absent from the ride edge and the light conditions would allow their growth, the shrub layer will be added through planting of shrub species listed in Table 1 at section 4.1.

Rides where a three zone system is considered inappropriate, either due to the narrowness of adjacent stands of trees, the ride orientation, the lack of ride vegetation or the instability of the adjacent trees, will be managed on a two zone system. In a two zone system, the shrub zone is not managed and cutting is restricted to annual cutting of central grass strip and biannual cutting of rough grassland strips at either side.

Creation of hard standing access for timber collection

The creation of a single hard standing area for the stacking of timber and lorry access is not considered to be appropriate as this would mean loss of woodland cover and may encourage flytipping and illegal access.

As an alternative, improvement to the existing gateways as detailed on plan M5 in Appendix 6 could be undertaken. If it is safe to do, construction should allow for lorries to reverse off the public road along a 3.2m wide hard surface track with open, unsurfaced areas on either side of the track to allow for stacking of timber. This area of ground would be allowed to recoppice, thus creating a diverse habitat in between harvesting operations.

Pollarding

Boundary oak within Cpt 3b and 4b have been historically pollarded as boundary demarcation features. Repollarding in order to rejuvenate and continue this ancient management practice should be considered, but only following further investigation to ensure that the trees have the required vigour and structure to sustain such a process.

Access improvements

In order to address the key objective of providing informal public access and environmental education, the construction of access furniture and interpretation signs should be undertaken in order to inform users of the wood how and why management is being undertaken and how the woodland will be changing in the short to medium term.

Ponds and wetlands

The improvement of the pond to the south of the wood and associated wet areas will greatly benefit other aquatic/marginal species. A full ecological survey should be undertaken to then govern management needed.

Tree Safety

A defensible tree management strategy will be implemented following agreed principles.

This will involve a regular inspection of trees with frequency and level of inspection related to the risk to people and property. Tree safety inspections will be undertaken on trees adjacent to public roads, property and the route of permissive accesses.

Utilising timber to best value and product

The adjacent crematorium is heated through a 60Kw biomass heating system (information taken from Warwickshire Climate Change Partnership report dated 27 February 2006). It is understood that the annual woodchip demand for this system is approximately 45 tonnes of fuel/annum. Low grade timber resulting from forestry operations within Oakley Wood could supply the boiler on a sustainable basis. Sawlog and bar material should not be used for woodchip but sold into higher value markets.

4.3 Protection and maintenance**4.3.1 Pest and disease management****Pest and disease management**

Commitment to reducing the use of pesticides wherever practicable will be undertaken, however pesticides are still recognised as important tools that provide effective and efficient treatment for many forestry operations.

The use of chemicals will reflect guidance expressed in Forestry Commission Field Book 8. Primary use of pesticides is as:

Herbicides: to control vegetation competing with young forest trees still in establishment phase, maintain designated conservation habitats and control poplar re-growth.

Fungicide: apply to cut stumps.

Deer

Deer damage may become a threat to the sustainable management of the woodland and associated habitats. Browsing of young seedlings and saplings by muntjac deer is likely to prevent the establishment of young trees and may be detrimental to the woodland ground flora. It is proposed that deer numbers are controlled through culling by professional deer stalkers if needed and planted trees are protected and monitored if need be by appropriate individual protection.

Grey squirrels

The number of grey squirrels resident in the woodland is not known. The risk of damage is relatively low to most of the woodland at present as damage is most likely to be to broadleaf trees between 10 and 40 years old. However, as the period of the management plan progresses, more young trees will enter the vulnerable stage.

Of the species originally planted, oak are most vulnerable to damage. Some of the new species to be planted will also be vulnerable, such as hornbeam. Squirrel damage to trees will be monitored and if damage is considered unacceptable, a programme of control using baited hoppers and/or live trapping with humane despatch will be employed. All current legislation and best practice for squirrel control will be complied with.

Fungal/bacterial pathogens and insect pests

Conifer stumps will be treated with urea to prevent the spread of *Heterobasidion annosum* butt rot with the aim of preserving the integrity of the remaining uninfected conifers which are to be retained for their amenity value. *H. annosum* is not a threatening pathogen of broadleaf trees and therefore the risk posed will reduce over time.

Thinning of the conifer trees to provide improved aeration of the crowns will be undertaken which will reduce the likelihood of a RBNB outbreak. No Corsican pine will be planted during restocking.

4.3.2 Fire plan**Fire plan**

The principal fire risk in the woodland is fire starting by children or young people, either intentionally to burn the woodland or as an unintended consequence of other unlawful activity e.g. burning of stolen cars, lighting bonfires. This risk will be greatest during school holidays, especially the long summer holidays.

The susceptibility of the vegetation to burn i.e. the fire hazard will generally be low as the lack of grassland vegetation means that there is generally little suitable material for sustaining a ground fire. The susceptibility of trees to crown fires will be very low in all but the most extreme drought conditions. However, fire hazard will increase with the proportion of trees in establishment phase during the plan period.

A plan for the prevention and management of fires in the woodland will be prepared. Measures to prevent fires will include management of the amount of flammable dead wood material left on site following felling operations and the regular mowing of the central portion of ridings to maintain a short, green, sward. Action to be taken in the event of discovering a fire will be publicised with notices on access points to the woodland.

4.3.3 Waste disposal and pollution

The disposal of waste will be carried out so as to minimise any negative environmental impact. Examples of this will include:

- Chemical containers being returned to suppliers where possible or disposed of as per the label's recommendations and guidelines.
- Plant bags will be re-used for other purposes where possible.
- Tree shelters will be re-used/recycled where possible.

Where there is a risk of pollution from any operations (eg chemical use, fuel, etc) the hazard would be identified in the operational risk assessment and controls such as the carrying of a spillage kit and adhering to Forest Water guidelines would be put in place.

4.3.4 Protection from unauthorised activities

Motorised access to the woodland will be controlled by the installation and maintenance of lockable steel barriers or gates at the main access points. This should reduce the risk of stolen cars being dumped and set alight with the attendant forest fire risk. It will also reduce the likelihood of fly-tipping.

4.4 Protecting and enhancing biodiversity

4.4.1 Management of designated areas

All designated areas will be managed in agreement with the relevant statutory body in order to achieve woodland objectives.

4.4.2 Measures to enhance biodiversity

Management of rides

Management of rides will be undertaken with the detail provided in Section 4.2.

Management of deadwood

Deadwood, both standing and falling, is of enormous conservation benefit. Management will allow for the retention of deadwood where it does not pose a hazard for public safety of personnel working in the woodlands. As a consequence, deadwood standing, fallen and or on live trees will be retained wherever possible and brash will generally be left on site to breakdown.

Additional measures to enhance biodiversity

- Avoid damage to wet areas through limited trafficking
- Avoid woodland operations during the bird nesting season
- Avoid damage to wood banks and other historical features.

4.5 Management of social and cultural values

4.5.1 Archaeology and sites of cultural interest

All operations will be undertaken in accordance with best practice (FC Forest and Archaeology Guidelines). Forest and woodlands do provide a stable context for the conservation of archaeological sites but it will be ensured that planning is required to avoid risk of damage during felling and harvesting operations. As the coniferous canopy is slowly removed from the site, consideration and consultation with the local archaeologist will be undertaken in order to review how management as open ground can be achieved.

4.5.2 Public access

Public access is to be enhanced as detailed in Section 4.2. The public right of way which runs through the middle of the wood will be maintained to legal requirements as an absolute minimum.

5. CONSULTATION

Organisation/individual	Comment	Response/action
Friends of Oakley Wood	Ensure that local interest is taken into account before, during and after all operations	Continued communications and information will be passed to the Friends of Oakley Wood with regards to all ongoing work.
Forestry Commission	Management of consent and grant documents	Continued communications and information will be passed to the Forestry Commission with regards to all ongoing work. Grant opportunities will be explored.

6. MONITORING PLAN SUMMARY

Objective number, issue or UKWAS Requirement	Indicator	Method of assessment	Monitoring period	Responsibility	How will information be used
Landscape feature	Prominence in the landscape	Fixed point photography from prominent viewpoints.	Every 10 years	Owner/Agent	Feedback into felling and thinning planning.
Structural diversity	Structure and regeneration following harvesting and enhancement/restoration work.	Fixed point photography. Walkover survey.	Every 5 years. Annually	Owner/Agent	Feedback into planning of harvesting and need for additional regeneration and tending.
Public access	Condition of footpaths. Number of guided walks	Walkover survey of footpath. Number of visitors.	Annually	Owner/Agent Local representatives	Identification of problems with footpaths will facilitate remedial action. Feedback into planning schedule of guided walks.
Damage through pests	Squirrel and deer damage extent	Survey damage noting areas most effected. Record number culled (if undertaken).	Annually in spring/summer	Owner/Agent	Feedback into planning for control levels.

7. WORK PROGRAMMES

7.1 Outline long-term work programme (2009 to 2029)

Please refer to plan M5 for the 20-year vision.

Compartment or area	Activity	Year		
		6-10	11-15	16-20
All	Thinning	✓	✓	✓
All	Selective fell	✓	✓	✓
All	Restore coppice	✓	✓	✓
All	Replant copse	✓	✓	✓

7.2 Short-term work programme (2009 to 2013)

The majority of the woodland is now in urgent need of thinning in order to promote the development of dominant trees and increase light levels to the forest floor so as to diversify the ground flora. There are two options in which this work can be undertaken:

Option 1: Thin the whole woodland in one operation

Undertaking thinning of the woodland in one operation would be the most cost effective and logistically simplest way of undertaking work. Thinning will require large-scale mechanical harvesting plant which would undertake thinning of the whole wood within a 2-3 month period.

The disadvantages of thinning in one operation are:

- a large stacking area would need to be created to hold all of the cut timber prior to collection;
- all of the woodland would need to be closed as the tree felling operation will be a health and safety risk to recreational walkers;
- revenue and woodfuel would be concentrated within a single year;
- the impact of thinning operations may be seen as detrimental by members of the public but, if undertaken on a smaller scale, may be perceived to be more acceptable;
- Risk of extensive windblow is increased.

Option 2: Undertake initial thinning over a three-phased programme (as shown in attached plan M5)

This would entail thinning one-third of the wood every other year. The advantages of splitting the work would mean that a more regular supply of woodfuel can be created for the crematorium, perceived impact on the wood can be reduced and it prevents having to close the wood for long periods of time. It may also be possible to reduce the extent of stacking areas needed.

The disadvantage of undertaking thinning on such a small scale is the logistical costs of bringing large machinery to site will be increased and, as a result, the return on timber will be reduced.

Compartment or area	Activity	Year				
		1	2	3	4	5
Whole wood 1,2,3,4,5 2,3,4,5 2,3,4,5 3	See Map 5 (Appendix 6).					
	Thinning	√		√		√
	Ride widening and clearance	√	√	√		
	Planting	√			√	
	Ongoing maintenance	√	√	√	√	√
	Grey poplar clearance	√				
	Construct hard standing access points	√		√		
	Interpretation signs, way marks & benches	√	√			
	Tree surgery on roadsides, boundaries & footpaths	√	√	√	√	√

8. APPENDICES

Appendix No	Description
1	Estate Constraints & Opportunities Map Ref M2
2	Compartment Schedule Ref 00-007
3	Woodland Compartment Map Ref M3
4	Woodland Crop Type Map Ref M4
5	Diagram showing three zone ride management
6	5 Year Work Programme Map Ref M5
7	20 Year Vision Plan Map Ref M6
8	Outline 5 Year Cashflow Budget 2009 – 2013 Ref 00-010
9	Photographic Record Ref 00-013
10	References and Bibliographies