



**Forestry Commission**  
England

---

**Warwickshire Forest**

**Plan**

**2011– 2021**

## Summary

The Warwickshire Forest Design Plan outlines the felling and restocking areas for 4 woodlands (Arley Wood, Hay Wood, May's Wood and Weston and Waverley Wood) in Central and North Warwickshire. The design plan area consists of a total area of 287ha which is predominantly made up of ancient woodland. The plan details management operations including felling and restocking for the next 10 years with outline proposals for the next 50 years.

The main objectives for the Forest Design Plan are the continued production of commercial timber and maintaining biodiversity whilst the gradual reversion back to broadleaves takes place on the former ancient woodland sites. This reversion will be achieved by gradually opening up the canopy to allow trees to regenerate and then to become fully established in the upper canopy. The current areas of broadleaves will be managed using a selective felling programme that will ensure that there is a continuous broadleaf cover and seed source to help regenerate the former ancient woodland sites. There will be some restocking with conifers in Arley Wood for Red Wood ants.

New open habitats within the forest will be created along rides and in key areas which will enhance the woodlands' biodiversity and internal landscape value. The use of continuous cover management systems across most of the area will lead to the development of a more diverse woodland structure and species mixture. There are a number of Biodiversity Action Plan species found within the woodlands and the design plan objectives will be sympathetic to their needs. Features of cultural significance such as veteran trees and woodbanks will be maintained and conserved wherever possible while forestry operations are carried out.

### **Forestry Operations 2011 to 2021**

Woodland Name	Grid Reference	Total Area (ha)	Felling (ha)	Natural Regeneration (ha)	Restocking (ha)	Open Space (ha)
Arley Wood	SP278910	42	5.7		4	1.7
Hay Wood	SP210712	104	8.2			8.2
Weston and Waverley	SP354707	118	13.5	7		6.5
May	SP143645	23	2.5			2.5



Forestry Commission England - **West Midlands Forest District**

- **Warwickshire Forest Design Plan**

<b>Contents</b>	<b>Page No.</b>
<b>Text</b>	
Summary	
Application for Forest Design Plan Approval	
Introduction	
1. Key Characteristics	1.
1.1 Location	
1.2 Designations	
1.3 Geology and Soils	2.
1.4 Aspect	
1.5 Hydrology	
2. Woodland Status	
Fig.1 Woodland Status	3.
3. Management Objectives	4.
4. Design Plan Objectives	
4.1 Woodland	
4.1.1 Current Species, Age Structure and Yield Class	
Fig.2 Current Species by Area within the Warwickshire Forest Design Plan	5.
Table 1. Current Species by Area	
Fig.3 Current Age Structure	6.

<b>Contents</b>	<b>Page No.</b>
4.1.2 Ancient Semi Natural Woodland – Current Situation	
4.1.3 Ancient Semi Natural Woodland – Objectives/Planning Targets	
4.1.4 Plantation on Ancient Woodland Sites – Current Situation	7.
4.1.5 Plantation on Ancient Woodland Sites - Objectives/Planning Targets	
4.1.6 Secondary Woodland – Current Situation	8.
4.1.7 Secondary Woodland – Objectives/Planning Targets	
4.2 Retentions – Current Situation	
4.2.1 Retentions – Objectives/Planning Targets	
4.3 Social and Recreation Interests – Current Situation	9.
4.3.1 Social and Recreation Interests– Objectives/Planning Targets	
4.4 Biodiversity - Current Situation	10.
4.4.1 Biodiversity– Objectives/Planning Targets	
4.5 Archaeology - Current Situation	11.
4.5.1 Archaeology - Objectives/Planning Targets	
5. Restocking and Future Management	13.
Table.2 Future Species Composition – 2061	
Fig.5 Current/Future Forest Structure	13.
6. Meeting and Monitoring Management Objectives	14.
7. Option Testing & Selection	17.
8. Consultees	19.
9. Glossary	21.
 Appendix I – Design Plan Brief	 24.

## **Contents**

### **Maps**

1. Location Map
2. Access Map
3. Survey Details and Key Features
4. Current Species
5. Woodland Status and Natural Vegetation Map
6. Landform Analysis
7. Analysis Map
8. Concept Map
9. Silvicultural Systems
10. Felling Map
11. Restock Map
12. Future Forest Structure

## Introduction

Forestry Commission England has four planning levels: the 'England Forest Strategy', the Forest District Strategic Plan, the Forest Design Plan and Coupe Plans. The Forest Design Plan (FDP) is a key planning document, taking a holistic view of management at the landscape scale, outlining the objectives for each woodland and presenting a balanced approach to future management of the forest.

Each operation also has its own Coupe or Operational Site Plan (Ops1) written before operations begin. At this stage a visit is made by local staff and site specific interests are identified and their protection and management are outlined at a level of detail not appropriate in a Forest Design Plan. Once the forester has prepared a coupe plan it will be submitted to the Forest District Manager for approval prior to operations being carried out. For the Warwickshire FDP the protocol for this coupe level planning will focus on the production of commercial timber, reversion of PAWS back to broadleaves, the creation and management of open space along roads and rides for the conservation of flora and fauna, maintaining conifer woodland habitats for Red Wood ants, conserving the veteran trees, creation of new deadwood habitats and management for dormice.

The first stage in the planning process is to write a 'brief' for the Forest Design Plan; this is shown in Appendix I. This outlines the main objectives and perceived issues prior to the development of the FDP. This is written before the main consultation period and both objectives and emphasis may change during the plan production.

The Warwickshire FDP comprises 287ha woodland which lies on level ground with no more than a 10 metre fall across each of the woodlands. The FDP area is made up of 225ha (78.4%) of PAWS, 61ha (21.4%) Ancient Semi Natural Woodland (ASNW) and less than 1ha of Secondary Woodland. Pine is the largest single component (42%) with Corsican pine being the largest subspecies (20%), broadleaves cover 41% of the FDP and only 5% is managed as open ground. The woodland supports a number of woodland birds, butterflies and invertebrates that will in general benefit from the gradual reversion of the PAWS back to broadleaves and the increased areas of open space. Arley Wood, however, contains the only known population of Red Wood ants in Warwickshire and these require open, light, airy conifer stands. To ensure the long term continuity of the appropriate woodland habitat there

will be some restocking of conifers within Arley Wood. The future conifer stands will only have a limited impact on the future woodland structure with 90% of the FDP being restored to broadleaves or managed as open space.

All planning and operations aim to satisfy the Programme for the Endorsement of Stewardship Scheme (PEFC), UK Woodland Assurance Scheme (UKWAS) and the UK Forest Standard (UKFS).

## 1. Key Characteristics

### 1.1 Location

- See Location map.
- The Warwickshire FDP comprises 4 separate woodlands which lie in the county of Warwickshire. Arley is the most northerly and lies approximately 12.5 miles to the east of Birmingham. Hay Wood lies approximately 5 miles to the north west of Warwick, Weston and Waverley lies approximately 7 miles northeast of Warwick and May's Wood lies approximately 7.5 miles to the west of Warwick.

Grid Ref:	Arley	SP278910
	Hay Wood	SP210712
	Weston & Waverley	SP354707
	May's Wood	SP143645

The Warwickshire FDP comprises 4 separate woodlands that cover 287ha.

Arley (42ha), Hay Wood (104ha) and Weston Wood (52ha) are freehold and have been designated as Open Access Land, where the public have unrestricted access. May's Wood (23ha) and Waverley Wood (66ha) are leasehold and managed by the Forestry Commission on a long term lease.

Arley and Hay Wood have public rights of way running through them as well as a good network of forest roads and informal tracks. The woodlands are used on a daily basis by walkers and horse riders from the local area. The footpath through Arley forms part of the North Arden Heritage Trail and brings visitors into the woodland from the surrounding countryside. Hay Wood has a small picnic area and a provision for parking on the road that runs along the south west boundary. These are the only managed public facilities within the design plan area. May's Wood has no formal rights of way.

### 1.2 Designations

- Ancient Woodland Sites (AWS)
- Plantations on Ancient Woodland Sites (PAWS)
- Secondary Woodlands
- A number of national and local Habitat Action Plan (HAP) and Biodiversity Action Plan (BAP) species are found within the woodlands (Dormice, Argent Sable moths, White Admiral butterflies, Pipistrelle bats, veteran trees).

### **1.3 Geology and Soils**

- Arley has a geology of Westphalian and Stephanian. Hay Wood and May's Wood have a geology of Triassic mudstone including Keuper Marl, Dolomitic conglomerate and Rhoetic.
- Arley and Hay woods have predominately Typical stagnogley soils and Paleo-argillic stagnogley soils. May's Wood has Stagnogleyic argillic brown earths.

### **1.4 Aspect**

- The woodlands lie within a flat landscape which is predominantly mixed agricultural landscape interspaced by small woodland blocks and close to large urban settlements. The woodlands' topography is very level across all the woodlands with only a 10m variation on each site. Weston & Waverly is the lowest lying site 80m to 90m, May's Wood 90m to 100m, Hay Wood 120m to 130m and Arley 140m to 150m.
- As the woodlands lie on level ground they have a limited impact on the surrounding landscape and future felling patterns and shapes will not be too intrusive on their landscape appearance

### **1.5 Hydrology**

- The FDP area receives low to moderate rainfall levels throughout the year with an average of 750mm annually.
- Weston and Waverley and Arley wood both have small ditches running through them and some small ponds that retain water throughout the year. May's Wood has 4 old marl pits that now retain water and have formed small ponds. Hay wood has no water features.
- None of the streams, ponds and surrounding vegetation are being actively managed.

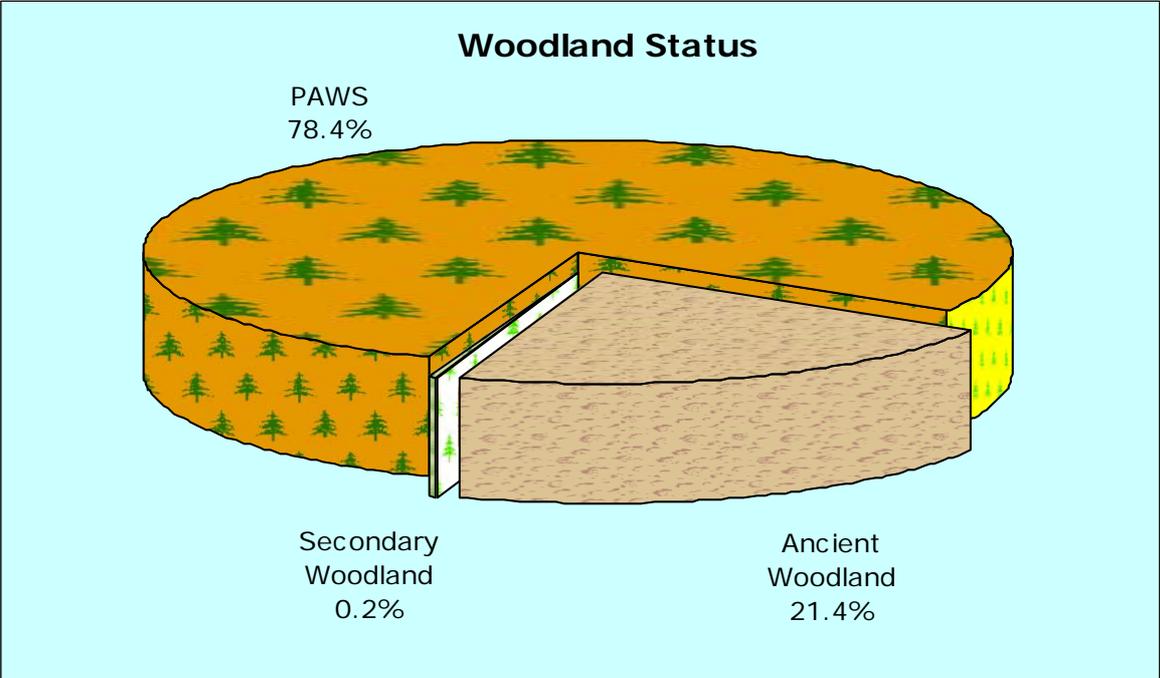
### **2.0 Woodland Status and National Vegetation Classification (NVC)**

- The FDP comprises 225ha (78.4%) of PAWS, 61ha (21.4%) of ASNW and less than 1ha of Secondary Woodland. See Figure 1.
- Arley, Hay and May's Wood are predominantly Plantation on an Ancient Woodland (PAWS) with small areas of ASNW scattered. Weston and Waverley has the largest single area of ancient woodland (45ha) which accounts for 15% of the woodland.
- The woodlands are comprised of a mixture of W10 (lowland mixed broadleaf woodland) and W16 (lowland oak-birch woodland). Arley is primarily W16 in the north and W10 in the south with a small section of W8 (ash woodland) along the northern and eastern boundary. Hay

Wood is predominately W16 and May's Wood is predominately W10. Weston and Waverley is a W10 woodland with a small area of W16 and W8 woodland.

- See Woodland Status and National Vegetation map.

**Fig.1 Woodland Status (Warwickshire FDP)**



## Management Objectives

- **Woodland** – The woodlands will be managed using a variety of silvicultural systems to allow for the production of commercial conifer and broadleaf trees and reversion of the PAWS areas back to broadleaf woodland whilst favouring retention of native species.
- **Biodiversity** – The woodlands' biodiversity will be conserved and enhanced through the retention and creation of deadwood habitats, management of riparian and wet woodland habitats and diversifying the woodland canopy structure through the timing and variety of future forestry operations. A more open woodland structure in Weston Wood will be maintained for dormice, honeysuckle for White Admiral, and conifers for Red Wood ants in Arley Wood. The length and variety of woodland edge habitats will be increased through the creation of open space adjacent to, and along, the forest roads, and the shape of future cutting patterns.
- **Recreation** – Arley and Hay Wood are all used on a daily basis by local residents and visitors to the area. Hay Wood, having a car park adjacent to the woodland, and Arley having promoted trails see the largest number of daily visitors, and the demand for access into these woodlands is increasing. The aesthetic value of the woodlands, both internally and externally, will be conserved and enhanced wherever possible through the planned forestry operations being used to meet the other management objectives.
- **Heritage** – There are no designated heritage features within the FDP area but the woodlands do contain a wide variety of cultural features that form a time line to the wide variety of uses the woodlands have been put to over the centuries. These features will be conserved and managed wherever possible while forestry operations are carried out, in accordance with the Forestry Commissions District Heritage Plan
- **Forest Standards** – The design plan will incorporate and use a variety of management objectives outlined in the UK Woodland Assurance Scheme (UKWAS), Programme for the Endorsement of Stewardship Scheme (PEFC), UK Forest Standard (UKFS) and Forest District Strategic Plan to ensure that the woodlands are managed sustainably. All forestry operations will be carried out in accordance with the above legislation.

### 4.0 Design Plan Objectives

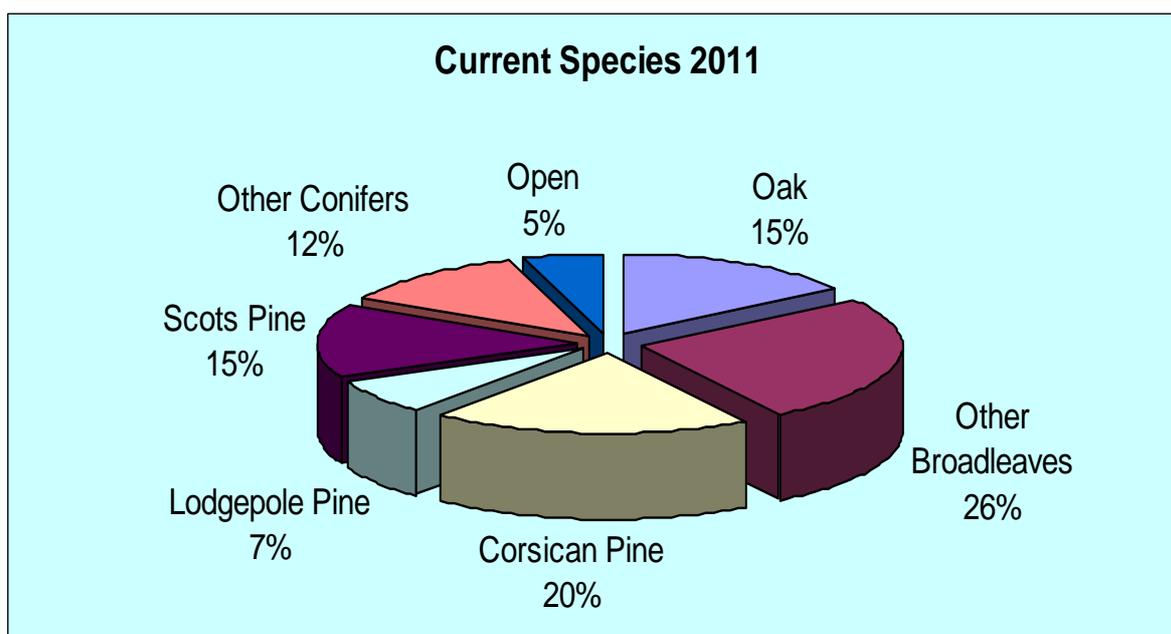
#### 4.1 Woodland

##### 4.1.1 Current Species, Age Structure and Yield Class

- The woodlands within the Warwickshire FDP are predominantly conifer woodlands with 41% covered by broadleaves and 5% currently open ground.

- The woodland is comprised of predominantly Pine (42%). The average yield class for Pine planted in the woodlands is 13.5. See Current Species map and Fig.2 Current Species and Table 1 below.
- The woodlands were planted between 1926 and 1972 with approximately 80% between 1956 and 1964. See Fig.3 Current Age Structure

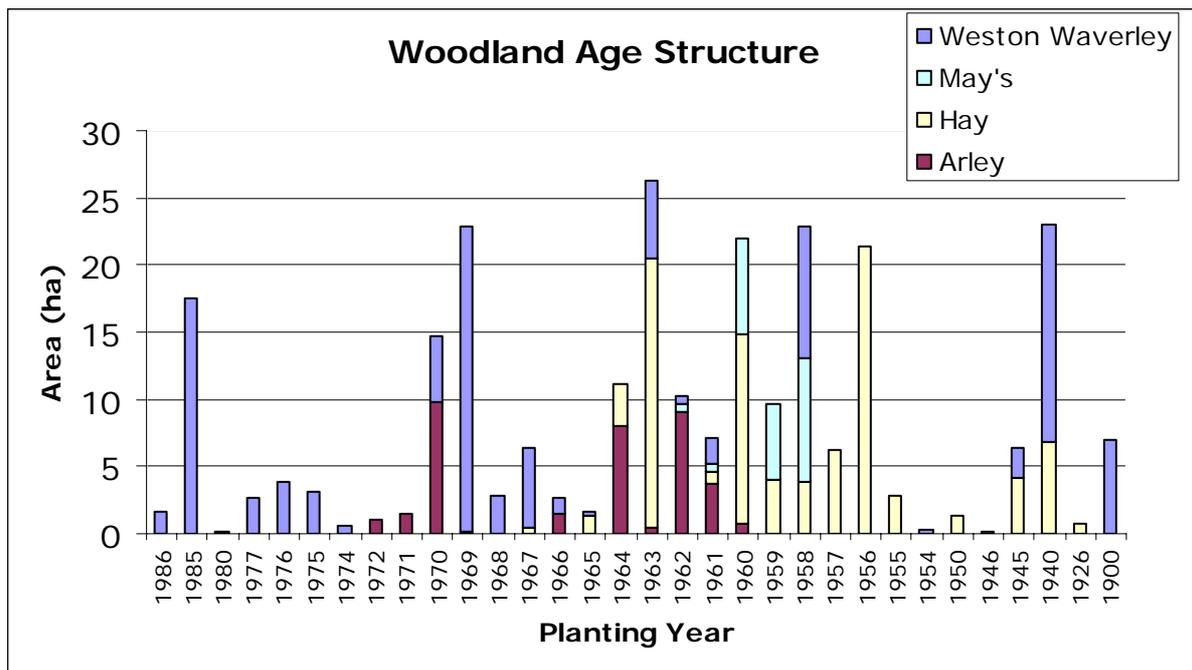
**Fig.2 Current Species within Warwickshire Forest Design Plan**



**Table 1. Current Species**

	Secondary	PAWS	Ancient	Total Area (ha)	Percentage
<b>Conifers</b>					
Corsican Pine	0.3	55.0	1.9	57.2	20
Scots Pine	0.0	40.0	1.4	41.4	15
Lodgepole Pine	0.0	17.2	1.4	18.6	7
Other Conifers	0.0	33.0	2.3	35.3	12
<b>Broadleaves</b>					
Oak	0.0	28.0	15.8	43.8	15
Other Broadleaves	0.0	38.0	37.3	75.3	26
Open	0.3	6.1	2.5	8.9	3
Open (Rides & Roads)	0.3	6.1	0.5	6.9	2
<b>Total</b>	0.9	223.4	63.1	287.3	100

**Fig.3 Current Age Structure**



#### 4.1.2 Ancient Semi Natural Woodlands (ASNW) – Current Situation

- There are 61ha of ASNW fragmented across the FDP area (21.4%) and this is stocked with oak, birch and hazel.
- Isolated specimen / veteran oaks can be found throughout the woodlands but primarily along woodland boundaries and Black Poplar in Weston and Waverley wood. There are only a limited amount of deadwood habitats.
- Regeneration in each of these woodlands is quite successful due to low predation from deer. Low level browsing in Weston and Waverly wood is now taking place by Muntjac deer.

#### 4.1.3 Ancient Semi Natural Woodlands (ASNW) – Objectives/Planning Targets

- ASNW will be managed through selective felling to create a complex woodland structure which will provide varied light levels for the ground flora, encourage natural regeneration, release established trees, ensure that the stands remain stable and any exotic species are removed.
- Small groups of broadleaves and individual native broadleaf trees that remain within the FDP area will be retained wherever possible to provide a seed source to restock adjacent areas.
- ASNW areas will be restocked through natural regeneration of indigenous species typical of the natural woodland characteristic.
- Retain small groups and individual broadleaves in perpetuity to provide long-term retentions and deadwood habitat.

#### **4.1.4 Plantations on Ancient Woodland Sites (PAWS) – Current Situation**

- 225ha of the FDP (78.4%) is currently PAWS woodland and has been stocked with uniform stands of Corsican pine, Scots pine, larch, evergreen conifers and sycamore. Most of these conifer stands are now reaching economic maturity being planted between 1956 and 1964.
- The restoration of AWS is a key objective within this FDP and the West Midlands District Plan.
- The Corsican and Lodgepole pine in the West Midlands district are now becoming badly affected by a fungal disease (Red Band Needle Blight (RBNB)) which in many cases causes tree mortality. The Corsican and Lodgepole pine stands in the FDP woodlands are currently showing moderate signs of infection.
- The PAWS areas are currently stocked with a mixture of broadleaves and conifers with conifers dominating most stands.
- There are good levels of broadleaf regeneration where openings have appeared in the stands and along ride sides.

#### **4.1.5 Plantations on Ancient Woodland Sites (PAWS) – Objectives/Planning Targets**

- RBNB is likely to have a major effect on the woodlands within the next 10 years, judging by the current speed and demise of the infected Corsican pine. Corsican and Lodgepole pine covers 27% of the design plan area. The future felling proposals will focus on the gradual removal of the Corsican and Lodgepole pine, although the forest management team will have to be reactive to any sudden rise in infection within specific stands.
- In Arley Wood group felling will be undertaken in the Corsican pine to allow small groups of conifers to be replanted to ensure the continuation of conifer cover which is needed to support the Red Wood ants communities. Any broadleaves that regenerate in these areas will also be retained to allow a mixed conifer broadleaf stand to develop.
- The remaining areas of PAWS will be managed largely through a selective felling programme where the exotic species are removed to allow the established broadleaves to dominate the canopy and encourage further natural regeneration.
- The speed of reversion in the PAWS area will reflect the current stand structure, the percentage of broadleaves and its age within the stand.
- PAWS sites will be restocked in the main through natural regeneration favouring indigenous species that are typical of the woodland characteristic. Some areas may require a degree of planting where natural regeneration is likely to be less successful. Exotic species will gradually be removed when thinning and felling operations take place.

- Areas adjacent to the fragmented ASNW areas and individual native trees will be targeted when management operations are carried out, opening them up to create adequate light and shelter to facilitate natural regeneration of indigenous species.
- The structural diversity within each woodland will be increased through the timing and intensity of management systems, and move towards a more complex structure, with varying canopy levels and developing understory within each stand.
- Small groups and individual conifer and broadleaves will be retained in perpetuity to provide long-term retentions and deadwood habitats.

#### **4.1.6 Secondary Woodland – Current Situation**

- Less than 1ha of the FDP is classified as Secondary Woodland: Arley 0.2ha and May's Wood 0.3ha.
- The secondary woodland is currently stocked with Corsican pine (75%) and the remaining area is open space (25%).
- The existing commercial conifer stands within the secondary woodland, which do not become infected by pest or disease, will be managed to their economic rotation to maximise timber resources and produce sustainable yields.

#### **4.1.7 Secondary Woodland – Objectives/Planning Targets**

- The current conifer stands within Arley and May's Wood will be managed in the same way as the rest of the woodland area with a gradual restoration to broadleaf woodland. These areas are too small to be managed economically with a clearfell and restock programme with evergreen conifers.

### **4.2 Retentions – Current Situation**

- All of the FDP woodlands are being formally managed and the only variation is within the research plot in Weston and Waverley Wood where management operations are carried out by Forest Research.

#### **4.2.1 Retentions – Objectives/Planning Targets**

- Within the new Forest Design plan 5% (14.8ha) of the forest area will be managed as a natural reserve. These areas will be managed under a limited intervention policy where operations will be restricted to those necessary on Health and Safety grounds or where alternative management systems have high conservation or biodiversity value.

- Any timber resources removed from these areas will be a secondary benefit of operations necessary to conserve, create and stabilise the areas managed as a biological reserve.
- Each natural reserve, although having specific management objectives, will also create a wildlife oasis within these commercially managed forests.
- Veteran and old deadwood will be retained wherever possible in each of the woodlands to create long-term retentions. Individual and small groups of trees will be identified during management operations and these will be retained in perpetuity to create future veteran trees, increase deadwood habitat and diversify the available woodland ecosystems.

### **4.3 Social and Recreation Interests – Current Situation**

- Arley, Hay Wood and the southern half of Weston and Waverly Wood (Weston Wood) are freehold and have been dedicated under the Countryside and Rights Of Way Act 2000 as Open Access Land. The research plot in Weston Wood has been excluded from the dedicated Open Access land. The lease under which Waverley and May's Wood are managed provide no access to the public (see Access Map).
- The level of access into the freehold woodlands is continuing to increase steadily although the level of use is still quite low.
- The public enjoy access to the freehold woodlands on foot, bicycles and horseback. The only limitations on access would be on Health and Safety grounds when forestry operations or special events are carried out.

#### **4.3.1 Social and Recreation Interests – Objectives/Planning Targets**

- The main recreation access routes through the freehold woodlands follows the network of forest roads and old carriageways. When forestry operations are carried out in these areas some small distinct groups of trees and shrubs may be retained and patterns of open space created to diversify the woodland edge.
- There are no plans to provide additional recreation facilities on any of the sites. The picnic area at Hay Wood will continue to be maintained and the off road parking is part of the Public Highway and its future maintenance will be adopted by the local authority.
- When forestry operations are carried out adjacent to the main public access points and routes through the forest, opportunities to conserve key features and diversify the woodland edge will be utilised. By widening access routes to increase the light levels, retaining key trees to provide permanent cover and creating new open spaces, the woodland edge will become more structured and diverse. This will help to increase the public's enjoyment and appreciation of the forest and the flora and fauna found there.

- The network of forest roads and major rides that runs through the forest will be maintained to provide access to walkers, cyclists and horse riders.

#### **4.4. Biodiversity – Current Situation**

- Arley Wood plays host to the only known Red wood ant community in Warwickshire and specific management objectives for these have been outlined within the Warwickshire Species Action Plan.
- Weston wood is a stronghold for dormice and this has been actively surveyed for a number of years now.
- There are a number of veteran trees of varying species found within most of the woodlands, with Black Poplar being found in Weston and Waverly Wood.
- There is limited open space (5%) and this is primarily associated with the network of roads and rides and some transitional open space following felling operations.
- Arley wood has a wide variety of ground flora and this has been surveyed on a regular basis by the Warwickshire Flora Group.
- There are a number of ditches running through the woodlands, one pond in Arley Wood and two in Weston Wood. These are not currently being formally managed.

##### **4.4.1 Biodiversity – Objectives/Planning Targets**

- To ensure the continuation of open conifer stands that the Red Wood ants require, a small group felling operation will commence in the Corsican pine stands and these will be partially replanted with small groups of evergreen conifers and the remaining area allowed to regenerate with broadleaves.
- The management objectives will be to try and establish a new crop of evergreen conifers as quickly as possible before the Corsican pine is defoliated by Red Band Needle Blight (RBNB) - a fungal disease.
- The Forestry Commission policy is not to plant exotic species on an AWS but this is outweighed by the benefit to the community of Red wood ants living in the wood. In the future forest structure, more than 50% of Arley Wood will be reverted to broadleaf with the conifer being the minor component with the overall woodland structure.
- Veteran trees, as well as a few small stands of conifers throughout the design plan area, will be retained in perpetuity to provide long-term retentions for high nesting birds and increase the volume of deadwood habitat.

- New areas of open space will be created in each of the woodlands and these will be cut and managed to create a diverse pattern of short woody and soft vegetation. Forest roads and rides will be opened up to increase light levels and woodland edge habitat.
- The forest design plan will, through a programme of restoration thinnings and felling operations, revert the conifer stands on the areas of PAWS back to broadleaves over the next 80 years. In the main, natural regeneration will be used to restock these areas and native broadleaves typical of the area will be favoured when forestry operations are carried out.
- The shape, size and frequency of felling patterns will be designed to create a more diverse canopy structure, and, through the retention of key features within stands and along the edge of stands being managed, the available woodland habitats will increase and diversify. Due to the increased effect of RBNB on the Corsican and Lodgepole pine stands, future felling patterns may have to be revised and stands felled prematurely to try and reduce the speed of infection to adjacent stands.
- Weston Wood will be managed to create a more open canopy with approximately 80% tree cover. This will create a varying level of understory to develop and be beneficial to the Lepidoptera and dormice.
- The woodlands contain a number of woodland birds who will all benefit from the gradual reversion of the PAWS back to AWS.
- Management of roadside for Argent Sable in Hay Wood and White Admiral in Weston and Waverly Wood is on going and carried out in conjunction with Butterfly Conservation.
- Weston and Waverley Wood form part of the Princethorpe Woodlands Living Landscape Scheme and the Forestry Commission management objectives will complement the Schemes objectives for conserving and linking the fragmented ancient woodlands that remain in Warwickshire.

#### **4.5 Archaeology – Current Situation**

- There are no Scheduled Ancient Monuments within the FDP woodland. There are a number of historic relics like the marl pits, ditch and mound and woodbanks found within the FDP area.

##### **4.5.1 Archaeology – Objectives/Planning Targets**

- The historic relic and any features of cultural significance, that may in the future be identified, will be conserved wherever possible and managed in accordance with the West Midlands District Heritage Plan and, where appropriate, in consultation with the English Heritage and Warwickshire County Council Archaeology team.

## 5. Restocking and Future Management

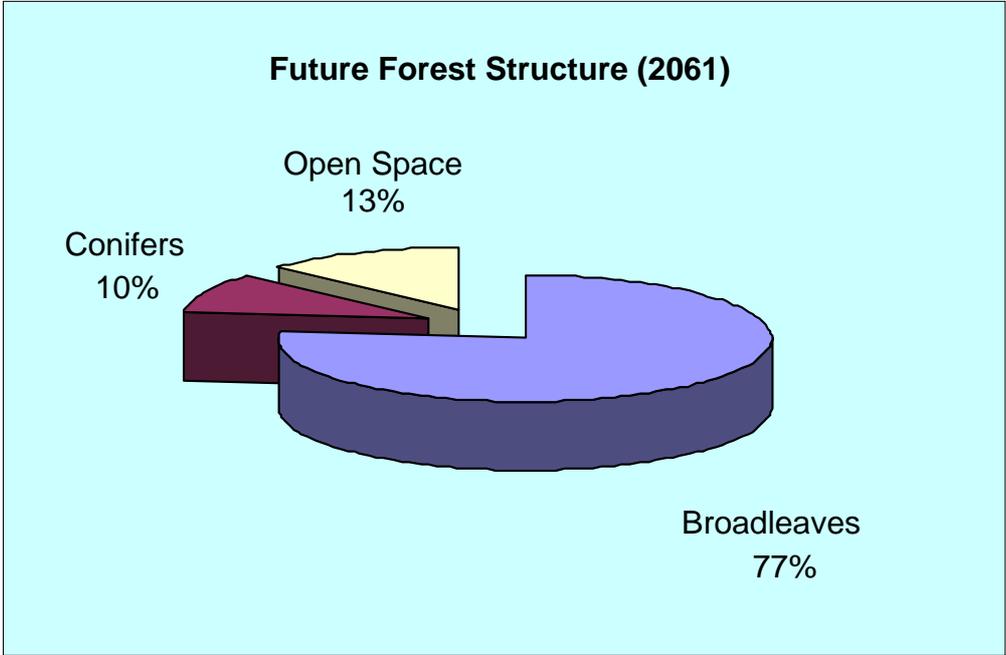
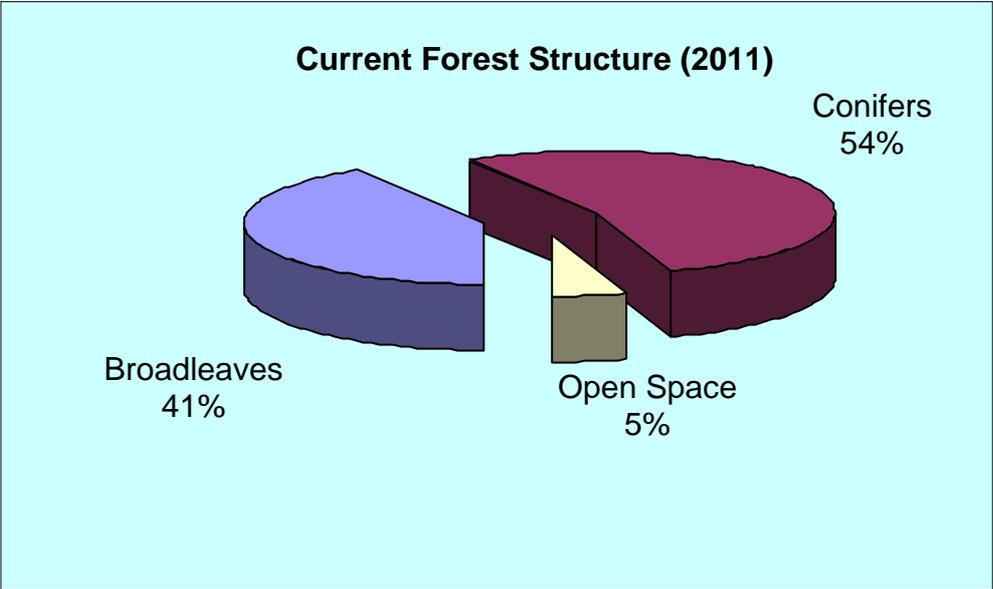
- Over 70% of the FDP area will be reverted to mixed broadleaved woodland, predominantly native species, to be managed as high forest. These stands will comprise oak, birch and holly as the primary species.
- 5% of the FDP area (15ha) within Arley wood will be restocked with conifers to ensure the correct woodland habitat can be maintained to support the Red Wood ants.
- 85% of the design plan area will be restocked through the natural regeneration of mixed broadleaves. When stands are cleaned and thinned, indigenous species typical of the woodland's native woodland characteristics will be favoured. This will allow the forest area to develop over the next, and subsequent rotations, into a native broadleaved woodland which is well structured and linked throughout by diverse patterns of woodland habitats (open spaces, woodland edge, wet woodland, deer glades) see Table 2 and Fig.4.
- Mammals will need to be controlled to allow the recruitment of mixed broadleaves and conifer restock to establish successfully.

**Table 2 Future Species Composition – 2061**

	Secondary Woodland	Ancient Woodland	Total Area (ha)	Percentage
<b>Conifers</b>				
Evergreen Conifers		30	30	10
<b>Broadleaves</b>				
Oak	0.3	97	97.3	34
Other Broadleaves		124.3	124.3	43
<b>Open</b>				
Open Ground	0.3	22.1	22.4	8
Open Rides & Roads	0.3	13	13.3	5
<b>Total</b>	0.9	286.4	287.3	100

**Fig.5**

**Current / Future Forest Structure**



## 6. Meeting and Monitoring Management Objectives

- Meeting Objectives

Objective	Description	Proposals	Methods of Monitoring
<b>Woodland</b>	The woodlands will be managed to produce commercial conifer and broadleaf timber using a variety of silvicultural systems which will be chosen to meet the other management objectives.	The timing, scale and shape of future felling operations will be designed to create a diverse woodland structure. Clearfells will be used predominantly to open up rides creating areas of permanent open space and for the removal of Corsican pine in Arley and Waverley Wood. In PAWS areas, a single tree and group selection system will open up the canopy of the uniform conifer stands and encourage the development of a broadleaf understory before the conifer overstory is removed. Conifer stands will be managed to their full economic rotation but the retention of native broadleaves will be favoured when thinning operations are carried out, allowing a mixed woodland to develop.	Monitored through Sub-compartment database.
	Red Band Needle Blight (RBNB) is now in West Midlands and affecting the Corsican and Lodgepole pine stands.	There are moderate signs of RBNB infection and tree mortality at present. The planned fell years may have to be reviewed to respond and be reactive to future outbreak of RBNB.	Monitor annually by beat team and at FDP review.
Objective	Description	Proposals	Methods of Monitoring
<b>Woodland</b>	Small areas of Ancient Woodland remain but these are fragmented across the FDP area.	Areas of Ancient Woodland and mature native broadleaves will be conserved and managed as continuous cover stands and provide seed trees to help regenerate the current ancient woodland stands and adjacent PAWS areas. Adjacent stands of exotic species will be heavily thinned to create	Monitored through Sub-compartment database

		adequate light levels for these seed trees to regenerate in.	
<b>Biodiversity</b>	<p>Several European Protected and biodiversity action plan species are found within the woodlands including dormice, bats, Argent and Sable moths, White Admiral butterflies and Red Wood Ants</p> <p>There is a scattering of mature/veteran trees found throughout the design plan area. These comprise predominately oak, ash and a few Black Polar, Wild service trees and Small-leaved lime in Waverley Wood.</p>	<p>New areas of open space will be created for the various Lepidoptera and a cutting programme along forest roads will create the appropriate feeding and breeding habitats. When thinning operations take place, trees with honeysuckle will be retained wherever possible. The woodland structure within Weston Wood will be cut to maintain no more than 80% canopy cover and create the appropriate habitat for dormice. Large areas will be left as Natural reserves to provide undisturbed areas for wildlife. In Arley wood the Corsican and Lodgepole stands will be gradually felled and restocked by small groups of conifers to provide the continuity of woodland habitat favoured by the Red Wood ants.</p> <p>The mature/veteran trees will be retained in perpetuity wherever possible to provide future veteran trees and increase the available dead wood habitat.</p>	<p>Monitor annually by beat team and at FDP review.</p> <p>Monitored by wildlife ranger and at FDP review.</p>
<b>Objective</b>	Description	Proposals	Methods of Monitoring
<b>Biodiversity</b>	<p>Open space is limited at the present time and only covers 5% of the design plan area.</p> <p>Limited areas of deadwood</p>	<p>Through the widening of the road and ride side networks, as well as the creation of several areas of clearings in the forest which will remain open, the overall area of open space will be increased to 13% of the FDP area. These areas will be cut on a rolling programme.</p> <p>Standing snags will be left and individual and small groups of trees will be retained beyond</p>	<p>Monitored by wildlife ranger and at FDP review.</p> <p>No monitoring required.</p>

	<p>Areas of Natural Reserves have been identified to provide undisturbed areas for wildlife.</p>	<p>their economic rotation, to become veteran trees and provide additional deadwood.</p> <p>Low levels of change within the designated areas will allow the ecological development of a more natural woodland ecosystem that will be beneficial for biodiversity (high nesting birds, deadwood, indigenous flora and fauna). Alternative management may be implemented where they have high conservation or biodiversity value.</p>	<p>No monitoring required Monitoring at FDP review</p>
<p><b>Social &amp; Recreation</b></p>	<p>The demand for access into the FDP woodlands has increased over recent years.</p>	<p>Informal access will continue within the freehold woodlands and future forestry operations will create a more diverse woodland structure with open woodland habitats, which will increase the aesthetic value of the woodlands to visitors and local residents.</p>	<p>No monitoring required Monitoring at FDP review</p>
<p><b>Heritage</b></p>	<p>There are no scheduled ancient monuments (SAM) within the FDP</p>	<p>Archaeological features found will be avoided wherever possible during forest operations.</p>	<p>Monitoring at FDP review</p>

## 7. Option Testing & Selection

Non-Market Benefits	Option 1	Option 2	Option 3
Description of silvicultural system	New coupe shapes using predominantly continuous cover management systems with clearfell operations limited to Corsican pine in Waverley Wood and along forest roads	New coupe shapes using clear fells and selective felling based on economic rotations.	Clearfells using original large scale coupe shapes with limited areas of low impact felling
Economic	The reduction in clearfell volume will be offset short term by increased thinning volume but there will be a reduced output in the medium to long term	Will prioritise the financial return and market value of the logs produced.	Will maximise out turn of timber but the timing of operations will be very irregular.
Environmental	The increased areas of open space, creation of mixed stands with a varied open woodland structure will create more varied woodland habitats and be beneficial to the wide variety of woodland flora and fauna and BAP species.	The patterns of felling will not as sympathetic to the habitat needs of the woodland flora and fauna.	The original large scale felling will have a negative impact on the available woodland habitat, and does not take into account the requirements of the site's flora and fauna and BAP species.
Social	The gradual change in the woodland structure and the creation of more open habitat and open woodland structure will create a more diverse woodland and increase the aesthetic value to visitors to the woodland.	The timing and scale of felling will create some dramatic changes in the current woodland structure users of the woodlands enjoy.	The size of felling would involve a large scale loss of woodland habitat which would have a dramatic impact along the forest roads people currently use.
Economic Forecast	47,981m <sup>3</sup> of timber will be harvested over the next 50 year period	46,587m <sup>3</sup> of timber will be harvested over the next 50 year period	54,984m <sup>3</sup> of timber will be harvested over the next 50 year period
<p><b>Option Selection and Justification</b></p> <p>Option 1 will be adopted as this will allow a gradual transition of the PAWS while conserving the woodland habitat associated to the BAP species.</p>			

## 9. Glossary

Ancient Semi-Natural Woodland (ASNW)	A classification for a woodland that has been in continuous existence since before 1600AD.
Biodiversity	The variety of ecosystems and living species, including variations within species groups.
Biodiversity Action Plan (BAP)	Describes the UK's biological resources and details the protection of these resources, including 391 Species Action Plans, 45 Habitat Action Plans and 162 Local Biodiversity Action Plans.
Biological Retention	A habitat or woodland ecosystem that will be conserved and actively managed i.e. deadwood, coppice, wet woodland, grassland.
Clearfell System	The removal of all trees in one operation > 0.5ha.
Continuous Cover Forestry (CCF)	Silvicultural systems where the forest canopy is maintained at one or more level, e.g. Shelterwood, Group Regeneration, Selective Felling, Regeneration Thinnings.
Forest Design Plan (FDP)	An approved plan that outlines felling operation over a 10 year period, outlining proposals over the next 50 years. The FDP's are reviewed every 5 years and redrawn and approved every 10 years.
Forest Stewardship Council (FSC)	An internationally recognised body made up of non-government organisations promoting sustainable forest management to the forest industry and consumers.
Habitat Action Plan (HAP)	Habitat recognised as internationally important, for example those designated under the EU Habitats Directive; nationally or locally important.
Limited Intervention	An area of stable clumps or stands of trees where forestry operations are limited to those necessary to meet biodiversity objectives, on health and safety grounds and the need to protect the surrounding forest >1% of the woodland area.
Long Term Retention	Trees that are being retained beyond their economic rotation.
Native Broadleaves	A species of tree or shrub which arrived and

	inhabited an area naturally, without the deliberate assistance of man and was present after post-glacial recolonisation and before historic times.
Natural Regeneration	Plants growing on a site as a result of natural seed fall or suckering.
Natural Reserve	Are predominantly wooded, they are managed under minimum intervention unless alternative management systems have high conservation or biodiversity value.
Natural Vegetation Classification (NVC)	A comprehensive classification of vegetation in the UK which is used to describe and assist in the evaluation of woodland habitat that would naturally occur there.
Plantation of Ancient Woodland Site – PAWS	Classifies an AWS that has been cleared of trees at some point in its history and then replanted. The woodland may also contain natural regeneration.
Public Rights of Way (PROW)	Access routes open to the public through legal designation.
Regeneration Thinnings	When the volume of timber removed in a thinning operation is increased to open up the canopy thereby increasing light levels onto the forest floor and assist the natural regeneration of the next stand of trees, allowing it to become well established prior to the mature stand being removed.
Secondary Woodland	Woodlands that have been established on land that was formally used as pasture, meadows, arable, quarries etc and has not continually been wooded.
Selective Felling	Where individual trees of varying sizes are selected and removed from a stand. The whole stand is worked and its aims is to maintain full stocking of all tree sizes and ages, from seedlings to mature trees, in any one area.
Silvicultural Systems	Techniques of managing a forest through a variety of cutting / felling patterns and time scale.
Warwickshire Biodiversity Action Plan (SBAP)	This is the local biodiversity action plan that outline the Species Action Plans and Habitat Actions Plans associated to the county.

Thinning	The removal of a proportion of the trees in a sub-compartment to improve the quality of the remaining trees, accelerate individual tree growth and provide income.
UK Woodland Assurance Scheme (UKWAS)	A certification standard recognised internationally that is awarded to woodland owners who are managing their forests using sustainable management systems.
UK Forest Standard (UKFS)	The governments approach to sustainable forest management which was developed following international agreements on sustainable forest.
Veteran Trees	A tree that is of interest biologically, culturally or aesthetically because of its age, size or condition.

# Appendix I

## **The Warwickshire Forest Design Brief**

Written by Alan Dowell 2008 and amended in 2011 by Alastair Semple

The Warwickshire FDP comprises 4 separate woodlands that cover 287ha. Arley (42ha), Hay Wood (104ha) and Weston Wood (52ha) are freehold and have been designated as Open Access Land, where the public have unrestricted access. May's Wood (23ha) and Waverley Woods (66ha) are leasehold and managed by the Forestry Commission on a long term lease. Arley lies on the edge of Old Arley, Hay Wood lies 5 miles north-west, Weston and Waverly Wood 7 miles northeast and May Wood 7 miles west from the historic town of Warwick.

### **Environmental Issues**

- Each of the woodlands are classified as Plantations on Ancient Woodland Sites or Ancient Woodland and the priority for management will be conversion of native species by the gradual removal of exotic species
- Rides and open space will be widened and created for butterflies
- Birch regeneration on ridesides and open space will be encouraged in Hay Wood to improve the habitat for the Argent and Sable moth, a UKBAP priority species
- Notable groups and individual trees will be retained where appropriate
- Where known to exist, appropriate measures will be undertaken during all operations to protect European Protected Species as per FC guidelines
- The known nests of red wood ants in Arley will be conserved

### **Economic Issues**

- Regeneration thinnings or other Low Impact Silvicultural Systems will be preferred in all the PAWS areas covered by this plan in line with current FC guidance, to increase light levels and promote the natural regeneration of native species
- The use of these silvicultural systems will in future have both a long-term and short-term effect on the timber produced from these woods

### **Social Issues**

- Hay Wood, Arley Wood and Weston Wood are freehold, with open access for informal recreation. May's Wood and Waverley are both leasehold with no provision for access except via the public rights of way. However informal access by locals does take place.
- Recreation provision within Hay Wood is currently via unmarked trails, and roadside parking will be created in the near future. The existing car park will remain closed for the foreseeable future due to previous anti-social behaviour
- Recreation in Arley wood is informal via a network of paths and is primarily local use only

### **Consultation**

- Due to relatively low public access throughout the FDP area, consultation will be via on-site notices and letters to immediate neighbours
- Letters will also be sent to tenants, statutory bodies, interested parties and wildlife interest groups
- The FC will be closely involved in the plan development