



Forestry Commission
England

Delamere Forest Plan

2016 – 2026

Summary

Delamere Forest Plan (1,098.3ha) comprises of 10 main areas of woodland that lies 12km east of Chester (Delamere Forest, Primrose Wood, Abbey Wood, Thieves Moss, Hornbys Rough, Petty Pool, Abbots Moss, Lobslack Hopyards and Uplands). The Forest Plan area consists of 623ha of conifers, 202ha of broadleaves, 76ha of land managed for recreation/buildings, 70ha of tree nurseries, 34.3ha of open water and 93ha of open space. The open space comprises largely of a mosaic of peat bodies which include dry, wet and open water habitats known as meres and mosses. Some of these areas are of international importance and have been designated as Ramsar, Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI).

Delamere Forest and Primrose Wood lie on the Cheshire Sandstone Ridge which rises up to 176m above sea level and overlook the surrounding Cheshire plain which comprises of an aggregation of small scale agriculture predominantly grassland with pockets of arable and a strong mosaic of broadleaved and conifer plantations. A network of main roads runs through the area linking large towns and cities. Principal views are from the A54 and A556 that run between the M6, Chester and north Wales.

The main objectives for the Forest Plan (FP) are the continued production of commercial conifers and broadleaves balanced with the provision of informal recreation; the restoration of former ancient woodland sites, to manage the forest for biodiversity and to make the economic potential of the forest more resilient in the face of a changing climate, pests and diseases. The plan details management operations including felling and restocking for the next 10 years with outline proposals for the next 50 years. The current threat to the primary conifer species in Delamere Forest Plan area from pests and diseases will lead to a diversification in species currently grown. To achieve this some of the Larch and Corsican pine stands will be removed early before they reach the end of their rotation and healthy stands will be retained beyond their economic rotation to ensure the retention of some high forest. Management will have to become more reactive in the face of current and future pests, disease and climate change to ensure it can grow the economic, social and environmental value of the forest into the future.

The FP will incorporate any features of cultural significance, trees of special interest, open habitats, Delamere peat bodies into its design to ensure these can be maintained and conserved while forestry operations are carried out.

Forestry Operations 2016 to 2026

Woodland Name	Grid Reference	Total Area (ha)	Felling (ha)	Natural Regeneration (ha)	Restocking (ha)	Open Space (ha)
Delamere Forest	SJ54747041	753	142	6	133	3
Primrose Wood	SJ54586754	99.4	17.2		16.4	0.8
Abbey Wood	SJ56326819	11.4	0			
Thieves Moss	SJ56576922	17.1	4.4	0.4	3.8	0.2
Hornbys Rough	SJ57517053	22.3	13.3		13	0.3
Lobslack Nursery	SJ58517056	52.7	0			
Abbots Moss Nursery	SJ59736854	72.7	0			
Petty Pool	SJ61476989	28.6	0			
Hopyards & Uplands	SJ65477570	41.1	1.1	1	5.9	



Central Forest District - Delamere Forest Plan (FP)

Contents:	Page No.
Summary	
A Application for Forest Plan Approval	1
1. Introduction	2
Fig 1 Forestry Commission England's Planning Strategy	3
1.1 Delamere FP – Survey Data	4
2. Management Objectives	6
3. Forest Plan Objectives	7
3.1 Woodland	
Fig.2 Current Landuse	
Fig.3 Current Species within Delamere Forest Plan	
Table.1 Current Species	8
Fig.4 Current Age Structure	
3.2 Environmental	9
3.3 Social	10
3.4 Restocking and Future Management	11
Table.2 Future Species Composition – 2064	12
Fig.5 Current / Future Forest Structure	13
4. Meeting and Monitoring Management Objectives	14
5. 2016 Forest Plan comparison against the 2004 Forest Plan	17
6. Consultees	18

Contents:	Page No.
7. Glossary	20
Appendix I – Forest Plan Brief	23
Appendix II – Key Features, Habitats and Wildlife	28
Appendix III – Delamere SSSI Citations	30
Appendix IV – Delamere's Lost Mosses project	40

Maps

• Location Map	43
• Designations & Constraints	44
• Recreation & Public Access	45
• Access Map	46
• Current Species	47
• Elevation Map	49
• Key Features	50
• Concept Map	51
• Silvicultural Systems Map	53
• Felling Map	54-66
• Intended Land Use	55-67

Pictures

Pic 1 View of Delamere Forest from Old Pale	4
Pic 2 Old Pale View Point	5
Pic 3 Black Lake SSSI – Delamere Peat Bodies	9
Pic 4 Paths around Blakemere	10

A Application for Forest Plan Approval

i Plan Area Identification:

Forest District:	Central Forest District
Beat:	Delamere
Name:	Delamere Forest Plan
Nearest Town:	Chester
OS Grid Reference:	SJ 5474 7041
Local Planning Authority	Cheshire East Council

ii Designations:

Secondary Woodlands, Ancient Woodland, Plantation on Ancient Woodland Site (PAWs), Scheduled Ancient Monument (SAM), Special Area of Conservation (SAC), Ramsar sites, Sites of Special Scientific Interest (SSSI) and lies within the National Character Area (NCA) 61 – Shropshire, Cheshire & Staffordshire Plain and NCA 62 – Cheshire Sandstone Ridge.

iii Date of Commencement of Plan

As soon as possible once approved.

Operations	Conifers (ha)	Broadleaves (ha)
Felling	178	
Restocking <i>(including 5.9ha of new planting)</i>	172.1	
Natural Regeneration		3.8
Delamere peat bodies restoration	8	

Total felling area 178ha

- Forest Plan maps are attached

In addition 272ha will be managed as Low Impact Felling Systems (LIS). This will be done through a thinning operation, removing no more than 40% of the stems within any single management unit/ compartment over the plan period. This operation will include;
Encourage Initial seeding, provide sufficient light to boost growth of understorey and

ground flora, allow adequate space for the development of crowns and stem form for quality timber and accelerate individual tree growth. This operation will also be supported, where needed by; supplementary planting in order to increase species diversity.

Operations	Conifers (ha)	Broadleaves (ha)
Low Impact Felling Systems (LIS)	65	43

I apply for Forest Plan approval for the area described above and in the enclosed Forest Plan.

I undertake to obtain any permission necessary for the implementation of the approved plan.

FDM Signed *[Signature]* Approved *[Signature]*

District *Central* Conservancy *NW & WM AREA*

Date Date *27/01/2016*

1. Introduction

This Forest Plan (FP) is updating an older planting plan prepared in 2004 and provides approval for felling and restocking over the next 10 years and sets out our management proposals for the next fifty years. FP's are operational plans and although they do take into account the presence of social and environmental features, their management will be dealt with in separate documentation.

This FP's is guided and directed by a number of policies and strategies - the main documents are summarised in Fig.1. Delivering this plan will require the Forestry Commission (FC) to be responsive to shifts in our operating environment and increasingly flexible in our approach, and to sustain this responsiveness over decades to come.

.Fig 1. Forestry Commission England's Planning Strategy

National Forest Policy

The FC sets out its vision and aims for Forestry in England at a **national** level. This is outlined in the Strategic Plan for the Public Forest Estate in England.



Forest District Strategic Plan

The District Strategic plan sits between the national and local planning levels and supports the aims and objectives within the districts, according to the FE England National Policy and gives direction for the management of woodlands at a **District** level.



Forest Plans

Forest Plans are used by the FC to demonstrate sustainable forest management on the public estate in the long term and to define a 10 year programme of approved work. They explain how a **local** area of forest will be managed and why and is produced in consultation with internal and external stakeholders, and following UKWAS, PEFC and UK Forest Standards.



Operational Site Plans (Ops 1's)

Management plan for **specific operations** on site, undertaken in accordance with the above and by following national guidance as set out in the UK Forest Standard.

1.1. Delamere Forest – Survey Data

Delamere Forest Plan (1,098.3ha) comprises of 10 main areas of woodland that lie 12km east of Chester and falls within the Mersey Forest. Delamere Forest (753ha) is the main block of woodland and contains the medieval hunting forest known as Old Pool and a collection of meres and mosses that have been designated as SSSI, SAC and Ramsar sites due to their importance. Delamere Forest and the outlying woodlands (Primrose Wood (99.4ha), Abbey Wood (11.4ha), Thieves Moss (17.1ha), Hornbys Rough (22.3ha) are all secondary woodlands dominated by conifer crops with limited areas of broadleaves. Petty Pool (28.6ha) is a former ancient woodland site now planted with conifers with limited areas of mature broadleaves. Abbots Moss (72.7ha) and Lobslack (52.7) are tree nurseries producing millions of seedlings each year and have limited areas of commercial timber grown there. Hopyards and Uplands (41.1ha) is a new community woodland planted in 2002 with broadleaves and conifers. There are a few small areas of mature broadleaves along water courses that run through and around the site but in general the woodland is young and only just becoming established.

Delamere Forest is the largest wooded area in Cheshire and plays an important role in the local economy supporting a wide range of jobs directly through the timber industry and increasingly through leisure and tourism. The demand for public access into the forest for education, recreation and leisure has increased dramatically over the last 10 years and there are now over 700,000 day visitors to Delamere Forest alone.



Pic.1 View of Delamere Forest from Old Pale

The Delamere Forest and Primrose Wood rise up above a flat low lying landscape (NCA 61) on a Sandstone ridge (NCA 62). Old Pale hill in the southern half of Delamere Forest forms the high point of the Mid Cheshire Ridge at 176m above sea level, from which you get a 360 degree view into seven counties (Derbyshire, Lancashire, Shropshire, Staffordshire, Cheshire and the Welsh counties of Denbighshire and Flintshire). This is a popular view point close to the visitor centre and has good surfaced trails leading up to it and on site interpretation.



Pic.2 Old Pale View Point

The underlying geology is Triassic sandstone with sands and gravels and more fertile clays on the plain. The soils provide a good growing medium and rooting depth that produce good timber yields and stand stability.

The surrounding landscape is made up of small scale agriculture predominantly grassland with pockets of arable and a strong mosaic of broadleaved and conifer plantations. The areas traditional heavy industry has now gone but the ongoing pressures of modern day development now puts the forest plan in the urban fringe with an increased need for it to deliver more diverse forest services. Liverpool and Manchester are within one hour's drive and Delamere Forest has a direct rail link into the forest and over 6 million people now live with the forest catchment.

2. Management Objectives

Economic - produce sustainable timber yields, encourage and support new and existing business activity associated to the public forest estate and to make the economic potential of our forests and woodlands more resilient in the face of a changing climate. Growing and diversifying our income from a wide range of sustainable activity on the estate, including non-forestry activities.



Environmental - To increase where possible the environmental contribution made by the Estate to the range of ecosystem services delivered and to protect and enhance its overall biodiversity and heritage value at both the landscape and local level.

Social - Enable everyone, everywhere to connect with the nation's trees and forests so that they understand their importance and act positively to safeguard forests for the future.

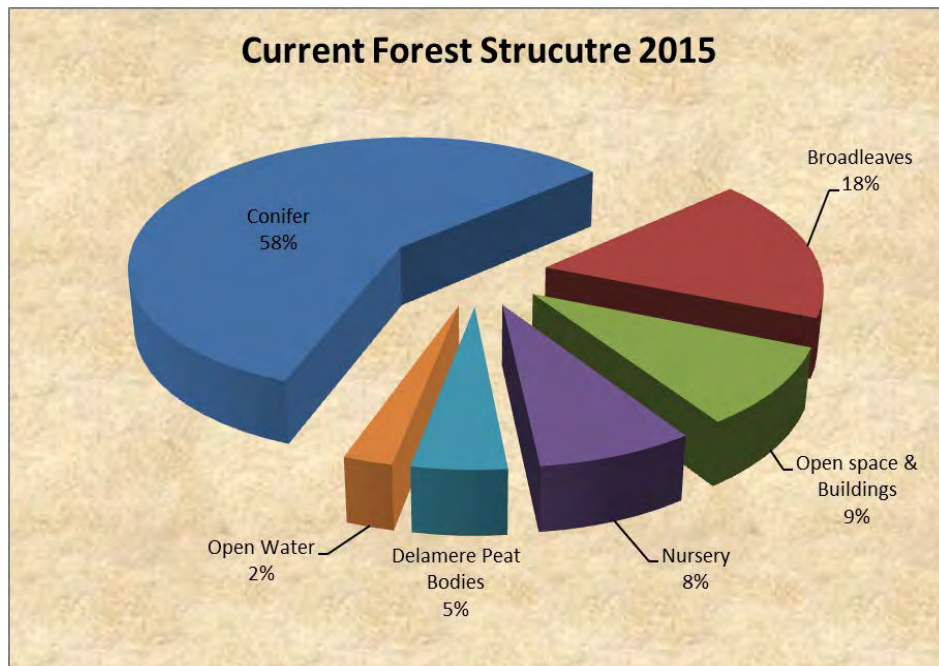


3.0 Forest Plan Objectives

3.1 Woodland

Delamere forest now incorporates 76% woodland cover, 2% open water, 5% peat bodies, 8% nursery's and 9% open space and buildings, Fig 2.

Fig.2 Current Landuse



Corsican pine is the most dominant species covering 356 ha and 43% of the woodland area. Broadleaves (192ha), Scots pine (182ha) and Japanese larch (49ha) are the other main species currently grown, Fig 3 and Table 1.

Fig.3 Current Species within Delamere Forest Plan

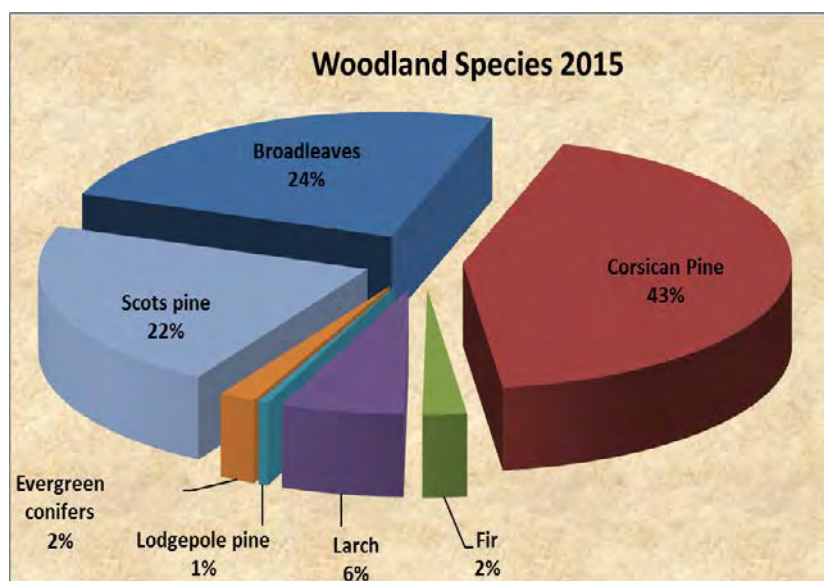


Table 1. Current Species

Species	ha	percentage
Broadleaves	192	18%
Corsican pine	361	32%
Scots pine	184.1	17%
Lodgepole pine	8	1%
Larch	54	5%
Fir	18	2%
Evergreen conifers	12.2	1%
Open Space (includes Rec, nursery's & Water)	269	24%
Grand Total	1098.3	100

Due to an active management programme the age structure across the management plan area is reasonably diverse, Fig.4. There are however still large areas, primarily in the outlying woodlands, where the crops are now reaching maturity and there has been limited felling and major restructuring now needs to begin.

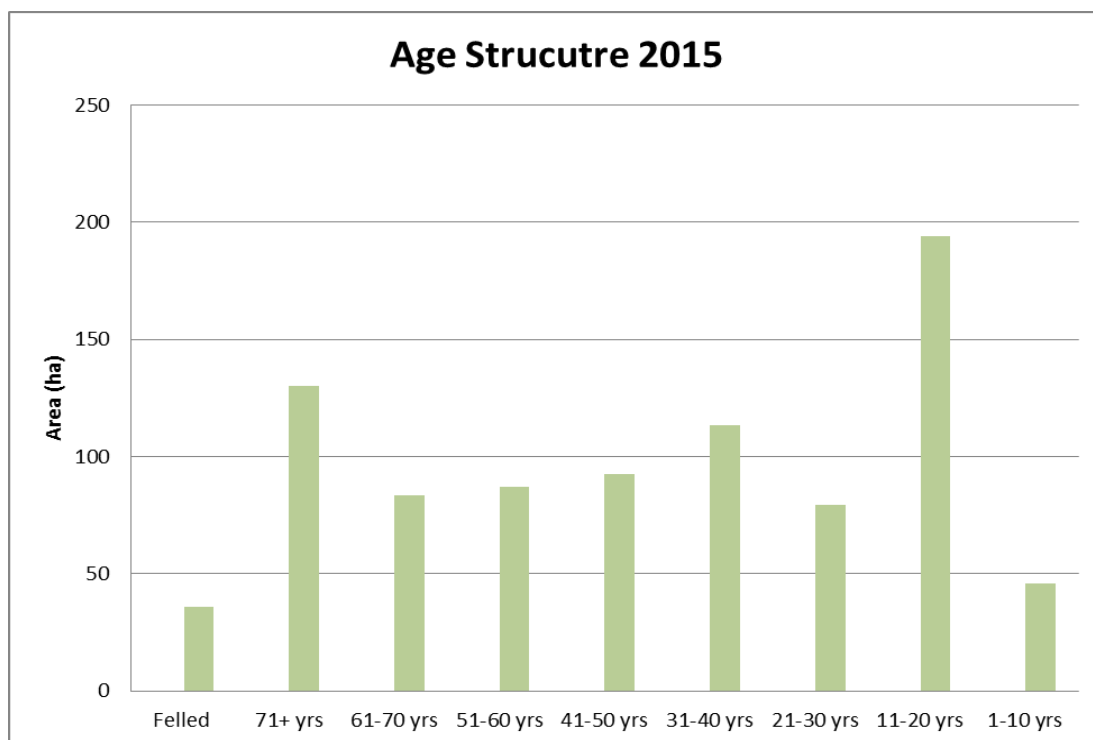


Fig.4 – Current Age Structure

Corsican pine was the most productive species in the area with an average annual yield of 15m³/annum but the fungal pathogen *Dothistroma Needle Blight* (DNB) is now affecting the pine stands leading to reduced yields and in some cases tree mortality. *Phytophthora ramorum* (notifiable disease) has now infected 2 stands of Larch within the Delamere FP

area and these have been felled. Old Pale is dominated by young Larch and the potential impact if these stands were to become infected and subsequently felled in one operation would have a devastating effect on the local landscape, access routes to Old Pale view point and the public arriving at the visitor centre.

The threat to timber production from climate change and more directly from pest and diseases is already having a major impact on Delamere Forest. To ensure sustainable timber production the present tree species will be diversified in future rotations selecting species that are more resistant to the current and increased incidence of pests and disease.

A combination of clearfell and low impact felling systems (LIS) will be used to maintain the varied forest structure the public enjoys, open up landscape views in each of the woodlands and create a pattern of transitional open space which is so important to many of the flora and fauna. The size, shape and timing of felling operations is designed to enhance the aesthetic value along the main recreation routes creating a more diverse woodland edge habitat and interlocking stand structure. The pattern and frequency of LIS will be based on future stand structure, mast years and natural regeneration. LIS will not remove more than 40% of stems in a management area within the plan period.

3.2 Environmental

Delamere Forest Plan contains a wide variety of habitats that support a diverse list of flora and fauna (Appendix II). The most notable of which are the Delamere peat bodies which comprise of a mosaic of open water and peatland areas, together with fringing



Pic.3 Black Lake SSSI – Delamere Peat Bodies

heathland and woodland, provides habitats for locally and nationally rare species of aquatic plants, as well as for a host of invertebrates, including damselflies and dragonflies such as the nationally rare white-faced darter, and a

diversity of beetles and spiders also including a number of nationally rare species. Many of

these delicate or endangered habitats are so rare that they have been designated as Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI) and Ramsar sites to protect them.

The Forestry Commission is working in partnership with Cheshire Wildlife Trust, Nature England, DEFRA, Cheshire West and Chester Council to restore many of these Delamere peat bodies. Further information can be found in Appendix III.

Trees of special interest and deadwood habitats will be retained wherever possible across the forest plan to create long-term retentions. Individual and small groups of character trees if identified during management operations will be retained in perpetuity to create future trees of special interest, conserving their landscape value, increase deadwood habitat and diversify the available woodland ecosystems. There are a number of broadleaves along key public routes that are surrounded by conifers. These will be gradually opened up to develop full crowns, diversify the available habitat for wildlife and become feature trees.

Woodland edge habitats will be improved as the width of roads and rides are gradually increased when felling operations take place. This will create additional space for a shrub layer to develop between the short vegetation along access routes and the adjacent high forest.

3.3 Social



Delamere Forest centre is the key access point for the public attracting over 700,000 day visits a year to the visitor centre, café, bike hire/shop, Go Ape, Delamere Outdoor Fitness and Forest Explorers. As well as informal quiet recreation activities such as walking and horse riding Delamere Forest hosts a number of large scale events each year including Forest concerts, Hell Runner and Race for Life. The current use of the site is limited by the restricted vehicle site access and despite direct rail access the demand for access by the direct

Pic 4 Paths around Blakemere

rail access the demand for access by the public at peak times often exceeds the parking capacity at the visitor centre. The outlying woodlands have no formal facilities other than promoted trails for the public to use and the current demand for access into these woodlands comes mainly from local residents and dog walkers.

The Forestry Commission will continue to work in partnership to support local businesses in tourism and leisure to facilitate the growing demand for access into the countryside which generates over £2 million for the local economy each year. The Forestry Commission will explore opportunities to improve further its access and public facilities across the design plan area. See Recreation Map.

There are two scheduled ancient monuments (SAMs) in Delamere Forest (Glassworking remains & Eddisbury hill fort) which will be managed in accordance with the agreed management plan drawn up with English Heritage.

If in the future any other features of cultural significance were to be identified, these would be conserved wherever possible and where appropriate, in consultation with the Forestry Commissions Historic Environment Adviser, English Heritage and East Cheshire Council's Archaeology team.

3.4 Restocking and Future Management

Clearfell and restocking will remain an important system in regenerating the forest covering an area of 553ha. The size, shape, scale and timing of felling coupes have been designed in keeping with the landscape character of the area, enhance both internal and external views of the forest and surrounding landscape. The young Larch stands on Old Pale will be broken up through small scale clearfells. This will allow evergreen conifers to be established quickly helping to reduce the risk of any enforced felling that may arise if stands were to become infected by *Phytophthora ramorum*.

272ha will be managed using LIS to further enrich and diversify future stand structures. No more than 40% of stems will be removed in a single management unit within the plan period.

Sites due to be felled will be assessed to select the most appropriate species that will be best adapted to each site and the impacts of any future climate change whilst maintaining

species diversity. No one species will dominate the future forest structure and a wider variety of species will gradually become established over the next 50 years including some mixed stands. The future forest structure within the Delamere Forest Plan will comprise of mainly conifer species with some mixed conifer broadleaf stands. The areas of mature broadleaves will remain as broadleaved woodland while some of the more marginal areas will be restocked with conifers following felling operations. Petty Pool which is currently dominated by conifers will gradually be converted back to broadleaves as it is an ancient woodland site, see Intended Landuse maps.

The new species planted to diversify the forest will be increasing palatable to mammals compared to the Corsican pine and larch stands. A greater level of protection will be needed to ensure successful establishment, a combination of mammal control and fencing will be used achieve this.

281ha (24%) of the FP will be managed as open space, nursery, water, recreation and buildings. Woodland edges and open space will be cut periodically to create a diverse habitat which will create the appropriate micro-climates for the sites biodiversity and public use. Table 2 and Fig.5.

Table 2 Future Species Composition – 2065

Species	Area (Ha)	Percentage
Conifer	581	54%
Broadleaves	202	18%
Open Space & Buildings	104	9%
Nursery	86	8%
Delamere Peat Bodies	96	9%
Open Water	27	2%
Wet Woodland	2.3	0%
	1098.3	100%

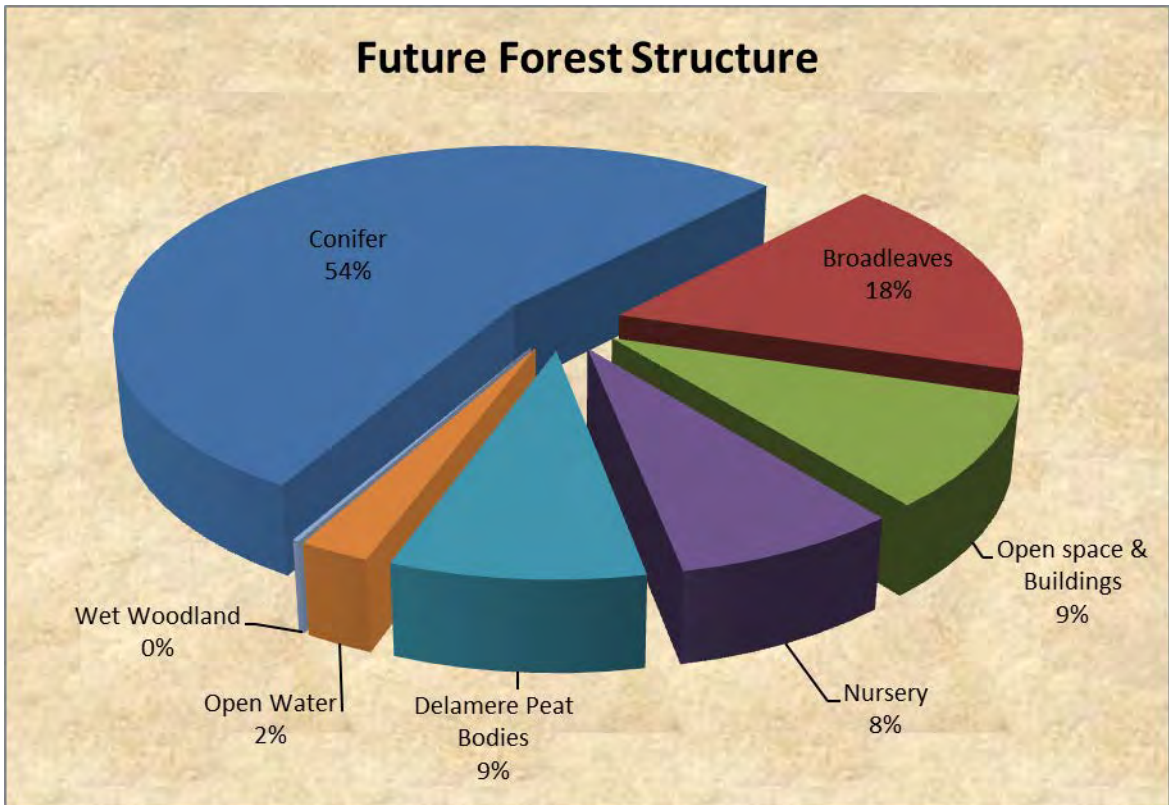
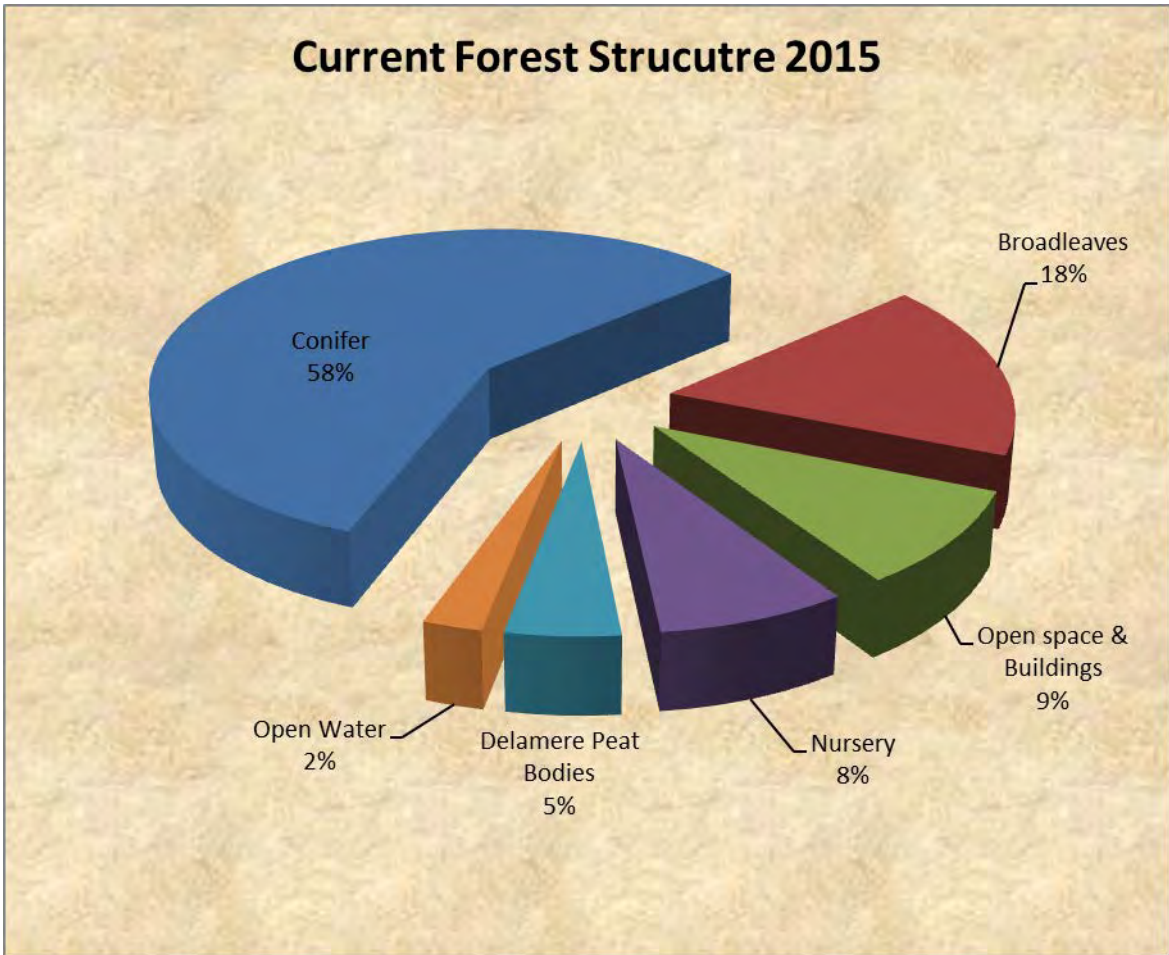


Fig.5 Current / Future Forest Structure

4. Meeting and Monitoring Management Objectives

Objective	Description	Proposals	Methods of Monitoring
Woodland	<p>The woodlands will be managed to produce commercial conifer and broadleaf timber using a variety of silvicultural systems which will be chosen to aid establishment.</p> <p>Dothistroma Needle Blight (DNB) is now affecting the Corsican pine stands. Phytophthora ramorum is now present in Delamere FP woodlands.</p> <p>Restocking and future species.</p>	<p>Conifer stands will be managed to their economic rotation to maximise production. The planned fell years may have to be reviewed to respond and be reactive to the impacts of pests and disease.</p> <p>Broadleaf stands will generally be managed as high forest to produce quality timber.</p> <p>Any stands badly affected by pests and diseases will be felled early and replanted with alternative tree species that will be more resilient. If Phytophthora ramorum is identified, then as a notifiable disease, infected stands will have to be clearfelled within a short timescale.</p> <p>Conifer stands will be diversified using a range of species best suited to the site conditions and resilience to predicted climate change, pest and disease. Broadleaf stands will use both restocking and natural regeneration. AWS site will favour native species.</p>	<p>Monitored through Sub-compartment database.</p> <p>Monitor annually by beat team and at FP review.</p> <p>Monitored through Sub-compartment database</p>

Objective	Description	Proposals	Methods of Monitoring
Biodiversity	<p>Restoring Delamere's lost moses.</p> <p>Any BAP species and HAP features that lie within the woodlands will be identified and recorded.</p> <p>There is a good collection of trees of special interest (TSI) in the FP area but limited deadwood.</p> <p>Nightjar – Primrose Wood</p> <p>Open space.</p>	<p>The Forestry Commission will continue to work in partnership with Cheshire WT, NE and DEFRA to deliver the agreed restoration of these wetland habitats.</p> <p>Future management operations and planned recreation activities will take into account the presence of these key species/habitats and the associated legislation.</p> <p>The TSI will be retained in perpetuity wherever possible. Potential TSI will be identified and conserved which will increase the available deadwood habitat. The current and future TSI will be surveyed and tagged.</p> <p>A pattern of small scale clearfells will be introduced to create the transitional open space across the woodland that is vital for the nightjars to breed successfully</p> <p>A varied cutting programme will be used to maintain and gradually diversify open spaces and woodland edge habitats. Felling operations will create transitional open space across the forest. The management of riparian areas will help conserve water quality and wetland habitats.</p>	<p>Monitored at FP review.</p> <p>Monitor annually by beat team and at FP review.</p> <p>Monitored by wildlife ranger and at FP review.</p> <p>Monitored by wildlife ranger.</p> <p>Monitored by wildlife ranger and at FP review.</p>

Objective	Description	Proposals	Methods of Monitoring
Biodiversity	<p>SSSI management.</p> <p>White-faced darter.</p> <p>Limited areas of deadwood</p> <p>Small areas to be left unmanaged to create biological retentions and to provide undisturbed areas for wildlife.</p>	<p>The designated areas of SSSI will be managed in accordance with the agreed conservation plan to maintain these in a favourable condition.</p> <p>The FC will continue to support the reintroduction programme for the white-faced darter by providing favourable habitats for them to colonise.</p> <p>Standing snags will be left and individual and small groups of trees will be retained beyond their economic rotation, to become TSI and provide additional deadwood habitats.</p> <p>In areas with low demand for public access areas will be left unmanaged.</p>	<p>Monitored through Operational Plans and at FP review</p> <p>Monitored through Operational Plans</p> <p>No monitoring required.</p> <p>Monitored through Operational Plans and at FP review.</p>
Social & Recreation	<p>The demand for access into the Delamere woodlands has increased over recent years and is set to increase further.</p>	<p>The Forestry Commission will continue to manage its recreation and education facilities to cater for the demand for access and environmental education. The Forestry Commission will continue to work in partnership with local businesses and stakeholders to facilitate the future demand for recreation and tourism.</p>	<p>No monitoring required</p>
Heritage	<p>There are 2 scheduled ancient monuments (SAM) within the FP.</p>	<p>The SAMs will be managed in accordance with the agreed management plan drawn up by English Heritage. Any other significant heritage features found will be avoided wherever possible during forest operations.</p>	<p>Monitoring at FP review</p>

5. 2016 Forest Plan comparison against the 2004 Forest Plan

The main management objectives in the new FP remain unchanged and focus on the production of sustainable conifer and broadleaved timber. The main variations will be new management coupe shapes and the timing of felling operations. These have changed to ensure as felling operations take place they fit better into the internal landscape, around recreation trails and address the health and potential threat to the current stands from both pests and disease. This will involve the early removal of some stands before they reach economic maturity and to offset the increased volume this may generate, some older healthy stands will be retained beyond their normal rotation length.

Future forest management will incorporate felling patterns that are sympathetic to the sustainable recreation and leisure interests of our partners and local businesses. The woodlands now supports a diverse range of wildlife and the new FP will continue to diversify the forest structure and available woodland habitat for biodiversity. The new FP has been designed to directly deliver a wide range of ecosystem services and helps deliver the Strategic Environmental Objectives as set out in NCA 61 and 62 through the restoration and preservation of Delamere peat bodies, AWS restoration, increase biomass production and ensuring multiple benefits for people and place.

8. Consultees

<i>The consultation undertaken in the preparation of this plan has been wide ranging and extensive. Full documentation including letters, notes of conversations etc. are held at our District Offices.</i>				
Consultee	Date Contacted	Date Response Received	Issues Raised	Forest District Response to Issues
David Wright		Drop in meeting	Concern about Nightjars at Primrose Wood and grasslands on Old Pale	FC future clearfell patterns have been designed to create appropriate transitional open space need by Nightjars, concerns of herbicide use has been passed onto beat team.
Nathan Head	18/06/15	Online consultation	Concerned about recreation and environmental management	Following discussion and additional information been sent to Nathan he was happy that the plan addressed his areas of interest
Claire Oliver	18/06/15	Online consultation	Wanted to see reference to the Mersey Forest Plan and in particular Policy C15 which details keeping the Sandstone ridge open and tree from tree cover.	The FP was amended to make reference that the woodlands lie within the Mersey Forest. No reference to Policy C15 was included in this FP revision.
Cynthia Moore	18/06/15	Online consultation	Concerned about Environmental impact of forestry operations, but please with the details outlined in the new plan.	No action needed
Mike Earnshaw	18/06/15	Online consultation	Concerned about recent proposals for developments within the forest and the order of reference to economic, social and environmental objectives	No action need
Alun Evans	18/06/15	Online consultation	Concerned about some omissions of broadleaves in future plan but pleased to see the reversion of Petty Pool back to broadleaves	The FP was revised to show all existing stands of broadleaves retained in the future forest structure.

Sarah Bennett – Cheshire Wildlife Trust	18/06/15	10/07/15	CWT identified a number of designated areas incorrectly mapped and questioned the intended landuse shown on these sites. They asked for Meres & Mosses to be referred to as Delamere peat bodies	FC has amended the FP following CWT observations and ensured all the designated sites are correctly mapped and the intended landuse amended appropriately. Text was amended to now refer to Delemere peat bodies and ensure there is no confusion with work on Mosses and Meres elsewhere in the region.
Robert Duff – Natural England	18/06/15	20/08/15	NE wanted to see more reference to some of the key conservation assets and noted that some of the designated sites were not recorded correctly and that intended landuse are likely to have a significant effect on these.	FC has amended the FP so that all the SAC, Ramsar and SSSI are correctly and clearly marked out and amended the intended landuse maps to show these being managed in the future as open habitats with buffers. Reference has been made to the work programme for peatland restoration and management of the white – faced darter.
Ian Marshal – Sandstone Ridge Trust	18/06/15		Would like to see increased open space/woodpasture and the use of livestock for management	The Fc contacted Mr Marshal to explain that the FC believes the new FP will deliver sustainable benefit for people, wildlife and the economy and the FP will deliver an appropriate, balanced outcome.
Mike Towers – Secretary Delamere Forest Golf Club	18/06/15	07/07/15	Grass on the 15 th hole green effect by shade form trees in Hornby Rough Wood.	No immediate action to be taken. As and when the adjacent trees are thinned out this will be taken into account and where appropriate the canopy opened up to increase light onto the green
63 letters were sent out to stakeholders, local residents and businesses in the area as part of the consultation exercise, signs were placed within the woodland, copies of the plan were available in local libraries and a public Drop in Meeting was held at the Forestry Commissions office Delamere. Any comments received and action to be taken have been recorded above				

9. Glossary

Biological Diversity

The richness and variety of wildlife and habitats.

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.

Canopy

The mass of foliage and branches formed collectively by the crowns of trees.

Clearfell System

The removal of all trees in one operation > 0.5ha.

Compartments

Permanent management units of land within a forest, further divided into subcompartments.

Coupes

Areas of forest that have been or will be managed together.

England Forestry Strategy (now England's Trees Woodlands and Forests)

Describes how the Government will deliver its forestry policies in England and sets out the Government's priorities for the next five to ten years.

Forestry Commission Guidelines

Outline the principles and standards of good management practices in forests and woodlands to enable landowners, land managers and their advisors to satisfy

Forest Plan (FP)

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 Plans (HAP)

Habitat recognised as internationally important, for example those designated under the EU Habitats Directive; nationally or locally important.

Historic Environment

These are the physical remains of every period of human development from 450,000 years ago and include earthworks, buried remains, structures and buildings.

Landscape Character

England is renowned for its rich, diverse and beautiful landscapes which have their own distinct local character. These have been shaped over many thousands of years by natural influences such as soil and landform and by generations of human activity.

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.

Low Impact Felling Systems (LIS)

Where thinning operations, removing no more than 40% of the stems within any single management unit, encourage initial seeding, provide sufficient light to boost growth of understorey and ground flora, allow adequate space for the development of crowns and stem form for quality timber and accelerate individual tree growth.

National Character Areas (NCAs)

England is divided into 159 distinct natural areas. Each is defined by a unique combination of landscape, biodiversity, geodiversity and cultural and economic activity.

Natural regeneration

The growth of trees from seed found in the soil or cast from adjacent trees and shrubs.

Natural Reserve Are predominantly wooded, they are managed under minimum intervention unless alternative management systems have high conservation or biodiversity value.

Operational Plans (Ops1)

Detailed site plans that are prepared in advance of all major forest operations and identify site constraints, opportunities and areas requiring special treatment or protection.

Restocking

The re-establishment of trees where felling has taken place. Restocking may be achieved through natural regeneration but as a term, it is more usually associated with replanting.

Scheduled Ancient Monuments (SAM)

Nationally important archaeological sites which are protected under the Ancient Monuments and Archaeological Areas Act, 1979.

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 aim 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.

Sub-compartments

Areas of forest comprising a more or less homogeneous crop in terms of age, species composition and condition. Their boundaries may change as the forest develops after felling and restocking.

Strategic Plan

Serves as a guide to the management of woodlands within Central England Forest District. It divides the district into zones for the purpose of management and ensures that forestry activities reflect the local ecological, social and cultural individuality of woodland. Strategic objectives for each zone are presented within the context of the Government's strategic priorities for forestry in England (e.g. forestry for rural development; forestry for economic regeneration; forestry for recreation, access and tourism and forestry for the environment and conservation).

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 Forestry Standard (UKFS)

Outlines the Government's criteria and standards for the sustainable management of forests in the UK.

UK Woodland Assurance Scheme (UKWAS)

A voluntary scheme for the independent assessment of forest management in the UK. The Scheme has been developed by a partnership of forestry and environmental organisations in response to the growing consumer demand for timber products from sustainably managed forests. It has been designed to ensure that it reflects the requirements of both the Government's UK Forestry Standard - and through this the guidelines adopted by European Forestry Ministers at Helsinki in 1993 - and the Forest Stewardship Council's (FSC's) GB Standard.

Trees of Special Interest (TSI)

A tree that is of interest biologically, aesthetically or culturally because of its age, or a tree that is in the ancient stage of its life, or a tree that is old relative to others of the same species.

Yield Class

Yield class is a measure of the growth rate of a tree crop and is the maximum average rate of volume increment (increase) that a particular crop can achieve.

Appendix I

The Delamere Forest Plan Brief

Delamere Forest Design plan comprises of 10 separate woodlands (Delamere, Primrose Wood, Abby Wood, Thieves Moss, Hornby's Rough, Lobslack, Abbots Moss, Petty Pool, Hopyards & Uplands) which lie between the villages of Delamere and Northwich, Cheshire. The design plan area covers 1,098.3ha of woodland which is currently stocked with 56% conifers, 19% broadleaves and 25% open ground. The woodland structure is quite diverse, with most of the stands being planted in the 1950s and 1960s widespread harvested and restocking has been underway for the last 20 years. The design plan area is historically secondary woodland (97%) with 1% designated as an ancient woodland site (AWS) and 2% plantation on an ancient woodland site (PAWS). The main influences on the future management will be the production of commercial timber, the conservation wetland habitats, provision of informal recreation, restoration of the PAWS back to AWS, management of open space and associated habitats that support the many unique flora and fauna found within the woodlands. The Delamere landscape character forms part of the Cheshire Sandstone Ridge which has a mosaic of broadleaved mixed woodland comprising of ancient woodland and some post medieval conifer plantations. Remnants of a Royal Hunting forest survive in Delamere main block and Old Pale was a medieval deer park. The landscape is punctuated by numerous ponds and meres which form the largest and most important grouping of lowland wetlands in England and is of international importance.

Environmental Issues

- Delamere's peat bodies form part of a group of internationally important series of wetland habitats some of which have now been designated as SSSI and Ramsar sites. The restoration of Delamere's meres and mosses has been underway during the last plan period (2004-2014) and the Forestry Commission will continue as part of the Meres and Mosses Wetland Partnership to consolidate the restoration work underway and where appropriate explore the possibility of further restoration projects.
- Remnant AWS areas will be managed through low impact felling systems where practicable to minimise the impact future felling operations have on the woodland ecosystem and provide a valuable seed source.
- Some areas of woodland will be managed as biological retentions and all commercial forestry operations will cease. Future management will be carried out

to try and maintain the woodland's microclimate required by some of the rare lichen and mosses found there.

- Wet woodland habitats and riparian areas will be managed to increase the indigenous species and reduce the risk of siltation into the local watercourses.
- Areas of open space will be managed sympathetically to increase the current woodland edge habitat and biodiversity.
- Trees of Special Interest (Veteran trees) are scattered throughout many of the woodlands and form avenues along many of the public roads and forest trails. These will be mapped and conserved as part of the design plan process and ongoing management. Additional notable trees and small groups of both conifers and broadleaves will be identified and retained as long-term retention's to provide the next generation of veterans.
- Deadwood habitats are limited within the woodland areas and future forest management will retain wherever possible snags and laid deadwood habitats.

Social Issues

- The Delamere Woodlands are visited annually by over 700,000 visitors. Visitors are made up of local residents as well as day trip visitors and people on holiday in the area. The number of people who come to enjoy the woodlands and network of paths and bridleways in the area has increased steadily over the last few years.
- Tourism is of increased value to the local economy and the woodlands are a key component of the local landscape that attracts people into the area.
- The Delamere Forest provides a café, visitor centre, bike hire, events area and draws visitors into the forest from across the region.
- The woodlands retain a wide variety of historical features that link the forests back to medieval times. These features will be conserved wherever possible providing a link into the past for visitors to the forest of man's changing land uses.
- There are a number of key viewpoints in the local landscape and these will influence the scale and timing of felling operations. Internal viewpoints will be managed to maintain the aesthetic value the woodlands provide visitors and local communities.
- Increase pressure from public access is likely to occur in the future and forestry operations will try to facilitate this wherever possible and help minimise their impact on the woodland ecology.

Economic Issues

- Corsican Pine and Scots Pine are the primary commercial conifer species grown covering 52% of the design plan area and comprising of 80% of the conifers grown in the FP woodlands. The conifer stands produce yields of between 8 and 22 with a mean yield class of 15 and broadleaves an average yield of 5.
- Broadleaf stand currently cover 18% of the design plan area (202ha) of which approximately 25% is managed for conservation rather than commercial timber production.
- Corsican pine is the dominant species in Delamere Forest and this is now being affected by Dothistroma Needle Blight (formally Red Band Needle Blight), a fungal disease that defoliates the trees, leading to a significant loss in production and in some cases mortality. Phytophthora ramorum has now been identified in larch stands in Petty Pool Wood and as a notifiable disease, these stands have to be clearfelled within 6 months. If Phytophthora ramorum becomes more wide spread it could have a major impact on Old Pale where larch is the dominant species.
- In future rotations, sustainable timber will remain a principal objective for 68% of the design plan area whilst meeting all the above environmental, social and economic objectives.
- Restocking of AWS and PAWS will be encouraged through natural regeneration of mixed broadleaves favouring native broadleaves that are characteristic of the woodland type. Where resources are available, and if there is a need, some enrichment planting will take place using broadleaves.

Consultation Issues

- Due to the large numbers of visitors to the woodlands and surrounding area and the close proximity of the local villages a Public 'Drop in Meeting' will be held in Delamere Forest on Tuesday 30 June 2015 from 3.30pm to 7.30pm. Notices will be posted on site to inform users of the forest about the meeting and where they can comment on the plan.
- Landowners, neighbours, Council, Natural England, local authorities and other relevant public bodies will be contacted by letter to allow them to comment on the plan, inform them of the meeting and make the Forestry Commission aware of any data sets they may have for the woodlands.

- The Forest Plan will be made available online for the public and stakeholders to view and comment on.
- The Forestry Commission's Woodland Officer will be closely involved in the plan development.
- The consultation period will run until 10th July 2015.

Appendix II

Key Features Habitats and Wildlife

The table below identifies a number of the key features found in Delamere Forest, their status and stakeholders who have been involved in the surveillance and management.

Key Feature	Status	Partners
Delamere peat bodies	SAC, Ramsar, SSSI, Local Wildlife Site	Cheshire WT, NE, DEFRA
Adders	BAP	
Nightjar	BAP	
White-faced darter dragonfly	BAP	Cheshire WT
Great crested Newts	EPS	
Bats	EPS	
Wet woodland	HAP	
Ancient Woodland	HAP	
Fen	HAP	
Lowland Raised Bog	HAP	
Heathland	HAP	
Trees of special interest	HAP	

Appendix III

Delamere SSSI's Citation

COUNTY: CHESHIRE

SITE NAME: **LINMER MOSS**

DISTRICT: VALE ROYAL

SITE REF: 15W9X

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authority: CHESHIRE COUNTY COUNCIL, Vale Royal Borough Council

National Grid Reference: SJ 547707

Area: 2.35 (ha.) 5.81 (ac.)

Ordnance Survey Sheet 1:50,000: 117

1:10,000: SJ 57 SW

Date Notified (Under 1949 Act): –

Date of Last Revision: – Date

Notified (Under 1981 Act): 29 September 1994

Date of Last Revision: –

Other Information:

New site. Proposed Ramsar site.

Site Description and Reason for Notification:

The meres and mosses of the north-west Midlands form a geographically discrete series of nationally important lowland open water and peatland sites. The finest examples are considered to be of international importance. They have developed in natural depressions in the glacial drift (sands and boulder clays) left by the ice sheets as they retreated from the Cheshire-Shropshire Plain some 15,000 years ago. The majority lie in Cheshire and not Shropshire, with a small number of outlying sites in adjacent parts of Staffordshire and Clwyd.

The origin of most of the hollows can be accounted for by glaciation but a small number have become deepened by more recent subsidence resulting from the removal in solution of underlying salt deposits.

More than 200 hollows are scattered individually or in localised clusters across the Plain. Their size varies widely, ranging from less than a hectare to 70 hectares, with depth ranging from about one metre to 30 metres.

Although the majority of the meres are nutrient-rich (eutrophic) the water chemistry is very variable, reflecting the variable nature of the drift deposits surrounding each site. Both

water chemistry and depth influence the development of associated fringing habitats such as reed-swamp, fen, carr and damp pasture. The different emergent and terrestrial plant communities which have developed at each mere are important to our understanding of how environmental factors affect vegetation succession in open water.

The development of swamp and carr causes the accumulation of peat which in some cases has led to the complete infilling of the basin. Eventually the vegetation growing on the peat surface becomes raised above the surrounding ground water and, supplied only by rainwater, becomes nutrient poor (oligotrophic) and acidic, thus allowing species such as the bog mosses *Sphagnum* spp. to colonise it. Hence, over many thousands of years, some meres have developed into mosses, and an invaluable record of the detail of this process is preserved in the layers of peat and mineral sediments. In a few unusual cases, where the water surface becomes directly colonised by floating vegetation and then *Sphagnum* mosses, a quaking bog known as a 'schwingmoor' is formed.

Linmer Moss lies in a steep-sided asymmetrical basin within the extensive glacial sands of Delamere Forest. Although small, it is particularly important for the fen community at its centre which is unlike the typically *Sphagnum* dominated communities of other basins throughout the Delamere cluster of peatlands.

The development history of the site has been shown to be complex, including a period around 1600 when its open water was used for washing flax, and more recently when birch and *Sphagnum* were known to dominate the wettest central area. Drainage from the basin is aided by a drainage system outflowing to the south-west, which has periodically become blocked bringing about rapid changes to water levels and water quality. Studies of peat cores from the site suggest that buoyant surface layers separated from firmer underlying peats when water levels rose, leaving an inundated floating raft with semi-fluid zones beneath.

Under these very unusual conditions the vegetation has become dominated by greater tussock-sedge *Carex paniculata* with reedmace *Typha latifolia* and several patches of marsh fern *Thelypteris palustris*, a county rarity. Also notable are small areas of *Sphagnum squarrosum* with marsh cinquefoil *Potentilla palustris* and scattered white sedge *C. curta*, marsh bedstraw *Galium palustre* and cuckooflower *Cardamine pratensis*. There is also a small patch of heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus*, possibly a relic of the pre-flood community. Likewise the extensive birch cover of earlier times became

flooded and died, leaving today's standing and fallen dead trunks which have been replaced by maturing alder *Alnus glutinosa* and willows *Salix spp.* which continue to colonise the fen.

COUNTY: CHESHIRE

SITE NAME: **BLACK LAKE, DELAMERE**

DISTRICT: VALE ROYAL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act, 1981, (as amended).

Local Planning Authority: CHESHIRE COUNTY COUNCIL, Vale Royal District Council

National Grid Reference: SJ 537709

Area: 1.75 (ha) 4.32 (ac)

Ordnance Survey Sheets 1:50,000: 117

1:10,000: SJ 57 SW

Date Notified (Under 1949 Act): 1963

Date Notified (Under 1981 Act): 1984

Date of Last Revision: – Reasons

for Notification:

This site is notified because it represents a very early stage of a *Schwingmoor* type basin fen and occurs in association with dystrophic open water. The rare white-faced darter dragonfly *Leucorrhina dubia* which is restricted to a small number of locations in the County has been recorded from the site.

General Description:

The Meres and Mosses of the north-west Midlands form a nationally important series of open water and peatland sites. These have developed in natural depressions in the glacial drift left by the ice sheets which covered the Cheshire-Shropshire plain some 15,000 years ago. The majority lie in Cheshire and north Shropshire, with a small number of outlying sites in adjacent parts of Staffordshire and Clwyd.

The origin of most of the hollows can be accounted for by glaciation but a small number have been formed at least in part by more recent subsidence resulting from the removal in solution of underlying salt deposits.

There are more than 60 open water bodies known as 'meres' or 'pools' and a smaller number of peatland sites or mires known as 'mosses'. They range in depth from about one metre to 27 metres and have areas varying between less than a hectare to 70 hectares.

Although the majority of the Meres are nutrient rich (eutrophic) the water chemistry is very variable reflecting the heterogeneous nature of the surrounding drift deposits. Associated fringing habitats such as reedswamp, fen, carr and damp pasture add to the value of the meres. The development of these habitats is associated with peat accumulation which in some cases has led to the complete infilling of the basin. During this process the nutrient status of the peat surface changes and typically becomes nutrient poor (oligotrophic) and acidic thus allowing species such as the bog mosses *Sphagnum* spp. to colonise it. The resulting peat bogs are the mosses. In a few cases colonisation of the water surface by floating vegetation has resulted in the formation of a quaking bog known as a 'schwingmoor'.

Black Lake has been selected to represent a very early stage of *schwingmoor* development. The site consists of a small pool and bog vegetation lying in a natural depression bounded by a bank on one side and an artificial embankment on the other. The site also encompasses surrounding land that slopes towards the pool. This forms the pool's surface water run-off catchment and comprises of an area of coniferous forestry plantation. All stages from nutrient poor open water to more-or-less consolidated schwingmoor with invading Scots pine *Pinus sylvestris* are represented. However, the 'building' moss species *Sphagnum papillosum* and *S. capillifolium* do not yet occur. A large colony of sundew *Drosera*

COUNTY: CHESHIRE

SITE NAME: **ABBOTS MOSS**

DISTRICT: Vale Royal

SITE REF: 15WAT

Status: Site of Special Scientific Interest ((SSSI)) notified under Section 28 of the Wildlife and Countryside Act, 1981 as amended

Local Planning Authority: CHESHIRE COUNTY COUNCIL, Vale Royal Borough Council

National Grid Reference: SJ 594687, SJ 598691, SJ 601687 Area: 38.98 ha.

Ordnance Survey Sheet 1:50,000: 117, 118 1:10,000: SJ 56 NE, SJ 66 NW Date

Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 24 June 1984 Date of Last Revision: 30 September 1994

Other Information:

Site boundary extension and reduction. Part of the site is listed in 'A Nature Conservation Review' edited by D A Ratcliffe, Cambridge University Press, 1977. Part of the site is managed as a nature reserve by Cheshire Wildlife Trust. Proposed Ramsar site.

Site Description and Reasons for Notification:

The meres and mosses of the north-west Midlands form a geographically discrete series of nationally important lowland open water and peatland sites. The finest examples are considered to be of international importance. They have developed in natural depressions in the glacial drift (sands and boulder clays) left by the ice sheets as they retreated from the Cheshire-Shropshire Plain some 15,000 years ago. The majority lie in Cheshire and north Shropshire, with a small number of outlying sites in adjacent parts of Staffordshire and Clwyd.

The origin of most of the hollows can be accounted for by glaciation but a small number have become deepened by more recent subsidence resulting from the removal in solution of underlying salt deposits.

More than 200 hollows are scattered individually or in localised clusters across the Plain. Their size varies widely, ranging from less than a hectare to 70 hectares, with depth ranging from about one metre to 30 metres.

Although the majority of the meres are nutrient-rich (eutrophic) the water chemistry is very variable, reflecting the variable nature of the drift deposits surrounding each site. Both water chemistry and depth influence the development of associated fringing habitats such as reed-swamp, fen, carr and damp pasture. The different emergent and terrestrial plant communities which have developed at each mere are important to our understanding of how environmental factors affect vegetation succession in open water.

The development of swamp and carr causes the accumulation of peat which in some cases has led to the complete infilling of the basin. Eventually the vegetation growing on the peat surface becomes raised above the surrounding ground water and, supplied only by rainwater, becomes nutrient poor (oligotrophic) and acidic, thus allowing species such as the bog mosses *Sphagnum* spp. to colonise it. Hence, over many thousands of years, some meres have developed into mosses, and an invaluable record of the detail of this process is preserved in the layers of peat and mineral sediments. In a few unusual cases, where the water surface becomes directly colonised by floating vegetation and then *Sphagnum* mosses, a quaking bog known as a 'schwingmoor' is formed.

Abbots Moss SSSI is a complex acidic wetland site within Delamere Forest, an extensive area of glacial sands towards the north of the Cheshire plain. It is of particular importance nationally because of the presence of two large basin mires, South Moss and Shemmy Moss, one draining into the other, and a series of small peaty hollows or pools showing various types and stages of mire development. The site contains the drier sandy catchments of the mires which typically support heathland relics and open semi-natural woodland.

A mature schwingmoor has developed in both of the major basins and the underlying water lenses are becoming infilled by loose peat. The floating surfaces are dominated by common cottongrass *Eriophorum angustifolium* and cranberry *Vaccinium oxycoccos* in a carpet of the bog moss *Sphagnum recurvum*. South Moss is more varied botanically than Shemmy Moss owing to the presence of distinct wetter and drier areas, the latter with more heather *Calluna vulgaris* and cross-leaved heath *Erica tetralix*.

A number of uncommon species occur at both mires, for example, round-leaved sundew *Drosera rotundifolia*, crowberry *Empetrum nigrum*, hare's-tail cottongrass *Eriophorum vaginatum*, bog-rosemary *Andromeda polifolia* and white beak-sedge *Rhynchospora alba*. Firmer parts of the mires have been colonised by birch *Betula pubescens* and Scots pine *Pinus sylvestris*.

To the north of the disused railway which traverses the site are a series of acidic, nutrient-poor, peat-stained *oligotrophic/dystrophic* pools. These pools display several different biological processes involved in the development of mire from open water.

Gull Pool, to the north-east, is the largest. Sharply contrasting communities are found in its two parts which have developed separately since the construction of the railway embankment. To the south, the very shallow depression has rapidly developed a hummocky, *Sphagnum recurvum* lawn with abundant cranberry, very like the larger Shemmy and South Mosses. However, to the north of the embankment, mire development has been slight, leaving a large area of open water which is dominated by the aquatic moss *Drepanocladus fluitans*. Emergent vegetation is confined to a narrow margin, dominated by soft-rush *Juncus effusus* and the mosses *Sphagnum recurvum* and *Polytrichum commune*, with marsh pennywort *Hydrocotyle vulgaris* and bottle sedge *Carex rostrata*; willow *Salix* spp and, to a lesser extent, birch colonise its landward edge.

Lily Pool is much deeper, and although acidic, accumulates more nutrients from its catchment, and schwingmoor is developing in a different way. The water surface has beds of white water-lily

Nymphaea alba and enlarging rafts of *Sphagnum* mosses. The water's edge is much steeper than in Gull Pool, but there has been more peat development, with a broad marginal lawn of *Sphagnum* which in places coalesces with the floating rafts. Lesser bladderwort *Utricularia minor*, a Cheshire rarity, is abundant around the edges of the rafts.

The mosaic of open water and peatland habitats together with fringing heathland and woodlands, prove extremely attractive to invertebrates. Gull Pool is the County's most important dragonfly and damselfly site. Fourteen species have been recorded (with breeding confirmed for eleven species) including the nationally rare whitefaced-dragonfly *Leucorrhinia dubia*, and the downy emerald *Cordulia aenea* and black darter *Sympetrum danae* which are both rare in Cheshire.

One hundred and forty-eight species of spider, including two national rarities, have been recorded from South and Shemmy Mosses.

The Abbots Moss complex is one of only two known sites in Cheshire for adders *Vipera berus*, a protected species. *rotundifolia* has colonised the surface of the *Sphagnum* lawn. White sedge *Carex curta* which is rare in Cheshire, occurs.

The rare white-faced darter dragonfly *Leucorrhinia dubia* occurs at the site. Other

Information:

The pool comprises part of the Meres and Mosses Ramsar site.

COUNTY: CHESHIRE SITE NAME: **PETTYPOOL BROOK VALLEY**

DISTRICT: Vale Royal SITE REF: 15WCA

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authority: CHESHIRE COUNTY COUNCIL, Vale Royal District Council

National Grid Reference: SJ 620700 Area: 47.02 (ha.) 116.19 (ac.)

Ordnance Survey Sheet 1:50,000: 118 1:10,000: SJ 66 NW, SJ 67 SW

Date Notified (Under 1949 Act): 1951 Date of Last Revision: 1979

Date Notified (Under 1981 Act): 1991 Date of Last Revision: –

Other Information:

Boundary amendment (addition and reduction). Site formerly known as Petty Pool.

Description and Reasons for Notification:

The wetland communities at the head of Pettypool, and those downstream along the course of Pettypool Brook, comprise Cheshire's most extensive and diverse valley mire system. The mature woodland with its abundant dead wood, and the extensive peatland habitats, offer a diversity of refugia which are particularly attractive to a wide range of insects. The site supports populations of a number of national and county rarities, making it one of the county's foremost invertebrate sites.

Situated on the north edge of Delamere Forest, 4 miles south west of Northwich, the valley lies in an undulating landscape of sandy soils deposited during the last glacial retreat. Where the flow of acidic water draining from these sands has been impeded accumulations of peat have formed locally along the valley floor. Variations in local conditions and land management have subsequently allowed the development of a wide range of habitats including open water, emergent reedbeds, marginal fen, mossland, extensive carr woodland and small areas of dry acidic grassland and woodland.

The open water of Petty Pool, an artificially enlarged mere, supports small patches of floating vegetation and a narrow broken band of emergent swamp vegetation which is best developed where Pettypool Brook enters the pool. Stands are dominated by amphibious bistort *Polygonum amphibium*, yellow water-lily *Nuphar lutea*, lesser bulrush *Typha angustifolia*, bottle sedge *Carex rostrata* and common reed *Phragmites australis*.

The fen vegetation throughout the valley is typified by the presence of greater tussocksedge *Carex paniculata* either in association with *Sphagnum* mosses, bottle sedge and marsh cinquefoil *Potentilla palustris* or, in more nutrient rich areas, by tall herbs and rushes such as reed canary-grass *Phalaris arundinacea* and sharp-flowered rush *Juncus acutiflorus*. The extensive mosaic of poor and rich fen at the southern end of the site is the best example of these communities in Cheshire and supports a number of plant species of local rarity such as cyperus sedge *Carex pseudocyperus*, marsh pennywort *Hydrocotyle vulgaris*, marsh violet *Viola palustris* and common spotted-orchid *Dactylorhiza fuchsii*. Alder *Alnus glutinosa* and sallow *Salix cinerea* scrub is colonising the fen from the surrounding woodland margins demonstrating succession from fen to carr woodland.

Another area of poor fen north west of Churchill Wood grades into dry acidic grassland dominated by mat-grass *Nardus stricta*, a rare species in lowland Cheshire. In areas where there is limited lateral water movement, the more acidic conditions have favoured the development of *Sphagnum* mossland with purple moor-grass *Molinia caerulea* under a canopy of downy birch *Betula pendula* as in the basin in the north west of the site.

The presence of greater tussock-sedge marks the transition into the alder dominated

woodland more typical of the site. The frequency of the shade tolerant fen species such as common nettle *Urtica dioica*, yellow iris *Iris pseudacorus* and marsh-marigold *Caltha palustris* indicate the woodland's origin and its development in nutrient richer situations. A different type of alder woodland rarely found in lowland Cheshire has developed on flushed slopes north west of Petty Pool. It contains very old coppiced alders with a ground layer of mosses and opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium*. Areas of dry woodland also occur throughout the site. They are particularly important for their ancient specimens of pedunculate oak *Quercus robur* and beech *Fagus sylvatica*, the dead wood of which supports a characteristic invertebrate fauna. Clumps of over mature beech are scattered around Petty Pool, and many old oaks are found on open bracken *Pteridium aquilinum*-dominated slopes north west of the pool.

The attractiveness of the site to a wide variety of insects is one of its most important qualities and arises from both the diversity of habitats and the stability of the microhabitats and refugia they offer. The surroundings of Petty Pool have a long history of rare insect discoveries. In recent years, from dead wood on the site, the nationally rare beetle *Xyloterus signatus* has been refound, with new records for the scarce species *Gnathoncus buyssoni* and *Oxypoda procerula*. Equally important are the invertebrate habitats offered by the tussocky vegetation and ancient tree bases of fen and carr areas. Another nationally rare beetle, *Dryocoetinus alni*, and the scarce *Psammoecus bipunctatus*, have been discovered recently in Churchill Wood.

Appendix IV

Delamere's Lost Mosses: Restoring Delamere's lost meres and mosses to create a living landscape where wildlife can thrive, disperse and recolonise.



Cheshire

4 Years: Oct 2013- Oct 2017

Cheshire Wildlife Trust is working in partnership with Cheshire West and Chester Council, Natural England and the Forestry Commission as part of a wider vision for the Meres and Mosses Natural Area. The Delamere meres and mosses have been identified as an Area of Prime Importance within the meres and mosses wetland landscape area delivering Wetland Vision targets. This project takes forward the delivery of Biodiversity 2020 targets within the 'meres and mosses development area' identified by Cheshire EConet (and also a Natural England spatial priority area) and aims to establish a landscape scale complex comprising of habitats characteristic of the Meres and Mosses Natural Area with particular focus on transition mire habitat, an Annex I habitat of European importance under the EU Habitats Directive. The term 'transition mire' relates to vegetation that in floristic composition and general ecological characteristics is transitional between bog and fen. Over four years the Delamere's Lost Mosses project will work with 8 landowners to deliver 120 ha of priority habitat management, and detailed survey and monitoring of priority species to determine habitat quality and its contribution to habitat connectivity at a landscape scale.

By 2017 this project will aim to deliver:

- 86.1 ha of existing transition mire brought into positive management towards favourable condition (7.74% of Lowland Fen LBAP Target)
- 34.2 ha of transition mire brought into positive management towards favourable condition through restoration of relic sites within the historic meres and mosses landscape (83.4% of Lowland Fen LBAP target)
- Support the dispersal of key transition mire/fen species including the white-faced darter dragonfly
- Increased community engagement and local ownership of the Delamere meres and mosses landscape

Working with:

- A suite of local landowners including the Forestry Commission to deliver habitat management
- Local community groups such as Pettypool Trust and Reaseheath College to develop local ownership
- Partnerships such as the Delamere Landscape Partnership, Sandstone Ridge Trust and the Midland Meres and Mosses Landscape Partnership to ensure cohesive ways of working

Key species to benefit from this project include aquatic invertebrates (including the white-faced darter dragonfly), lepidoptera (including the green hairstreak), wintering woodcock and snipe and mossland specific plants such as cranberry, bog rosemary and royal fern.

Through monitoring a combination of measures such as habitat quality and odonata and lepidoptera dispersal we will demonstrate the change made to the quality of the relict mossland and subsequently its contribution to the landscape as the core from which wildlife can thrive, disperse and recolonise.

Nature Improvement Areas

The establishment of local Nature Improvement Areas, alongside the development of the nationally recognised Meres and Mosses of the Marches NIA is a priority for the government-recognised Cheshire region LNP. The Delamere Lost Mosses Project takes forward a significant landscape scale scheme, Delamere Sandstone, within the proposed Sandstone Ridge local Nature Improvement Area having the potential to deliver substantial biodiversity benefits.

Other project outcomes:

- Achieving condition across 3 sites which are designated SSSI, Ramsar and SAC
- The development of dystrophic pools, another habitat of international importance recognised under the Habitats Directive, and one that tends to develop alongside and within the restoration of drained peat basins.
- 7 Local Wildlife Sites brought into positive management
- Creation of priority habitat management statements for groups of adjacent holdings where coordination of management at a broader scale is required to influence the restoration of the core sites
- GIS map of existing data and new information generated by the project for both habitats and species
- Baseline survey and monitoring of indicator species populations and distributions
- Analysis of habitat patch size and connectivity based on species requirements within the landscape
- Detailed survey and mapping of each site including peat depth, hydrology, vegetation, features and constraints
- Analysis of the distribution of existing mossland habitat identifying gaps in connectivity
- A 'volunteer network' will be established to provide on-going support
- 4 training workshops will be held
- 12 public events (guided walks and talks) will be held
- 4 Volunteer traineeships provided through project
- 400 Volunteering opportunities will be provided over the life of the project

Important features of the project are:

- Providing a professionally managed project with a Project Officer
- Support for landowners who want to manage their land better for wildlife.
- Creation of core areas of biodiversity from which wildlife can thrive, disperse & recolonise.
- Improving the scarce resource of transition mire, quaking bog and dystrophic pools, Annex 1 habitats of high conservation importance within the European Union under the Habitats Directive
- Improving connectivity between meres and mosses sites
- Baseline survey & monitoring of indicator species distribution
- Providing involvement & training for people in a wide range of conservation disciplines.
- Involvement with the local communities & public in general with regard to voluntary work & public events so creating a better awareness of biodiversity initiatives.