

Environmental Status Report – the Public Forest Estate in England

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Environmental Status Report

Executive Summary

This report looks specifically at the contribution of the Forestry Commission Public Forest Estate (PFE) in England to the delivery of environmental benefits as expressed in the Natural Environment aim (Aim 3) of the government's Strategy for England's Trees Woods and Forest (ETWF). It presents facts and figures to illustrate the contribution of the PFE to the Aim 3 objectives:

- ancient and native woodland, and veteran trees;
- wider habitats;
- rare and declining species; and
- landscape and cultural heritage.
- [supporting and regulating] ecosystem services (comments on the contribution to flood management are presented).

This report is one part of a suite of evidence for the study of the long-term role of the PFE.

The PFE covers approximately 258,000 ha. In total around 220,000 ha of this area is wooded, representing approximately 18% of the woods and forests in England. The remaining area is not forested and is composed of open habitats as well as other non-wooded land use types such as car parks.

The wooded habitat of the PFE is comprised of over 151,000 ha of coniferous plantation and more than 66,000 ha of broadleaved woodland. Approximately 24% of this woodland resource is ancient woodland. The area of Plantations on Ancient Woodland Sites (PAWS) restored to semi-natural woodland increased from 15,952 ha to 17,842 ha between 2002 and 2009, a 12% increase.

Native Woodland Habitat Action Plan habitats on the PFE have collectively increased from 24,815 ha to 27,224 ha during the five-year period from 2004-2009. These habitats now represent over 10% of the total area of the PFE. UK Biodiversity Action Plan priority open habitats have also increased by 10% since 2004, due to planned and targeted management. A further 12,415 ha of open habitat will be created by the end of current, approved forest design plans. This figure includes almost 5,000 ha of defined priority habitat. The other 7,000 ha is classified as a broad habitat type in the design plan. This is because the area could be composed of a mosaic of different priority habitats or the

end habitat may be yet to be determined. This change represents an increase of 30% on current levels.

The PFE includes 67,772 ha of Sites of Special Scientific Interest (SSSIs). In 2003, 71% of these SSSIs were classified as being in target condition, i.e.: favourable or unfavourable recovering. By 2009 this figure had risen to 98%. The government target is 95% by 2010.

The PFE plays host to a variety of important species. Although national level data was not readily available for inclusion in this report, some examples of the role of the PFE in England for important species or species groups are highlighted.

The Forestry Commission and Butterfly Conservation have developed a close working relationship to encourage and support *Lepidoptera* (butterfly and moth) populations on the PFE. Together, the Forestry Commission and Butterfly Conservation have identified 140 priority *Lepidoptera* sites, which cover approximately 3% of the PFE. These priority sites are found throughout England and support populations of some of the most endangered butterflies and moths in the UK, including the argent & sable, pearl-bordered fritillary and wood white.

The results of the Repeat Bird Survey showed that in terms of species breeding in woodland more species have increased than decreased. Generally the more common and generalist species have increased whilst those that are rarer and more specialist have fared less well. Whilst the report does not look specifically at the PFE the evidence suggests that the situation with regard to woodland birds on the PFE has followed the national trend.

Other examples of the PFE hosting locally and nationally important species include Bechstein's and Barbastelle bats on the Isle of Wight, nightjar and woodlark in Thetford Forest, East Anglia and red squirrel in Northern England.

Given the varying character of England's woods and forests and their history it is unsurprising that the heritage resource of the PFE is rich, including prehistoric burial mounds and settlement sites, Roman roads and buildings, mediaeval hunting lodges and a wide range of industrial sites. When compared to the national position for risk to scheduled monuments developed by English Heritage, those on the PFE were considered at lower overall risk of loss or damage. The Forestry Commission has management plans in place or under discussion for all scheduled monuments that it is responsible for and was cited as an exemplar of good management in the Heritage at Risk report published by English Heritage in 2008.

The PFE is the largest single land holding in England, and as such can deliver large-scale change or subtle alterations in the wider landscape context. The Forestry Commission used forest design planning on the PFE to ensure the potential impact of any changes is fully assessed and consulted on.

Across England 10% of the land area is designated National Park, of which more than 80,000 hectares is on the Public Forest Estate (31% of the PFE area). The Public Forest Estate also manages land in Areas of Outstanding Natural Beauty (AONBs), with 35,395 ha (14%) of the estate within this designation.

Forest Research has recently published research detailing the ways in which trees can help alleviate flooding. A partnership project in North Yorkshire will look at ways in which forestry can help prevent flooding in the Pickering and Sinnington areas.

Introduction

The Forestry Commission (FC) Public Forest Estate (PFE) covers approximately 258,000 ha - around 2% of the land and 18% of the woods and forests in England.

Hilary Benn, Secretary of State for Environment, Food and Rural Affairs, asked the Forestry Commission to undertake a study of the estate the Forestry Commission manages in England.

More information about the study can be found at <http://www.forestry.gov.uk/england-estatestudy>

In December 2008 the Forestry Commission and Natural England published the Delivery Plan for the Government's Strategy for England's Trees, Woods and Forests (ETWF). ETWF is broken down in to 5 aims: a sustainable resource; climate change; natural environment; quality of life; and business and markets. The PFE is managed for multiple objectives, which means that each piece of land contributes towards more than one aim of ETWF.

The PFE is certified against the United Kingdom Woodland Assurance Standard (UKWAS). Compliance with this standard is a way of independently verifying that woodlands are well managed in accordance with economic, technical, social and environmental criteria defined in the standard. The UKWAS is also recognised by Forest Stewardship Council (FSC). A programme of external auditing against the UKWAS, gives FSC the assurance that the PFE is a legally and sustainably managed forest estate.

This report looks specifically at the contribution of the Forestry Commission PFE in England to the delivery of environmental benefits, Aim 3 of the ETWF. The Natural Environment aim states that it is to "protect and enhance the environmental resources of water, soil, air, biodiversity and landscape (both woodland and non-woodland) and cultural and amenity values of trees and woodland".

This report presents facts, figures and examples to illustrate the contribution of the PFE to the Aim 3 objectives:

- ancient and native woodland, and veteran trees;
- wider habitats;
- rare and declining species; and
- landscape and cultural heritage.

- “[supporting and regulating] ecosystem services”. For this objective comments on the contribution to flood management are presented. There is not data available on contribution to other supporting and regulating ecosystem services relevant to Aim 3 such as soil conservation and air quality.

This report is a part of the evidence base being gathered to support the Study of the Public Forest Estate in England. Some of the information reported in this document could be used as a baseline for the monitoring of future work, although much of it has been taken from the various monitoring reports annually carried out by the Forestry Commission in England and is already serving as reference data.

This document was compiled using both previously published data and recent analyses using the Forestry Commission sub-compartment database at the end of March 2009. Where possible, figures have been updated to show current trends. Further information and details about the source of published data can be found in the ‘Further Information’ section.

Where possible the data are presented at the national and regional level, some data are however presented according to Forest District – a sub-division of the estate for operational purposes. For clarity, a map is included in Annex 1 showing both Regional boundaries and the landholding within each Forest District.

Environmental Indicators

England's forests are a valuable habitat and species resource. Biodiversity conservation is an integral part of sustainable forestry, as detailed in The UK Forestry Standard and in the government's Strategy England's Trees Woods and Forests. The Forestry Commission contributes to the United Kingdom Biodiversity Action Plan (UKBAP) by helping to deliver habitat and species action plans as well as having a lead role in taking forward the Native Woodland Habitat Action Plans. The aim of these plans is to enhance the nature conservation value of all our forests and safeguard special habitats.

The PFE is primarily wooded but does contain a significant proportion of open land too. The wooded area can be broadly defined as either conifer or broadleaf, with the remaining land in the open category. A proportion of the broadleaf woodland and open areas will be further defined into UK BAP priority habitat types. In total more than 151,000 ha of land is under coniferous forest with a further 66,483 ha as broadleaved woodland. The remaining area is not forested and represents the Forestry Commission's priority open habitats as well as other land uses such as car parks (Figure 1).

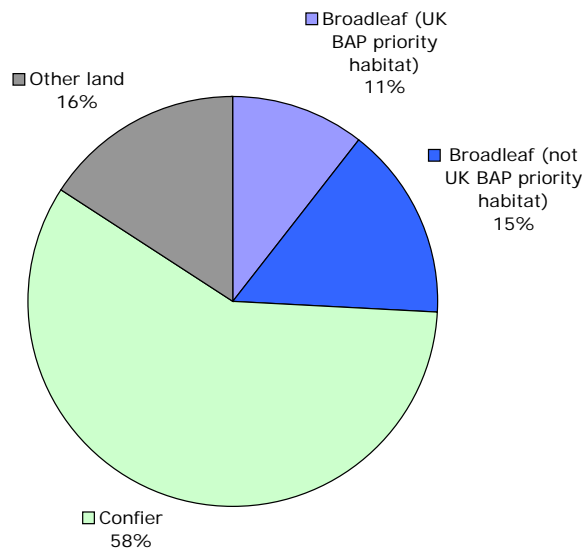


Figure 2: Type of land use found on the Public Forest Estate in England. Broadleaved woodland has been further split to show the proportion of broadleaved woodland that is defined as a UK native woodland priority habitat type.

Below we present examples of the variety of the ways in which the PFE contributes to Government targets and environmental objectives. Where possible historic data has also been shown to highlight trends.

Ancient Woodland

Ancient woodland areas in England are those which have been continuously wooded since 1600. Ancient woodland sites provide rich habitat for a range of rare and endangered species.

There are two sub-divisions of ancient woodland; ancient semi-natural woodland (ASNW) is composed of native trees on an ancient site. Examples of this habitat type can be seen at Bedford Purlieus in Northamptonshire and the Ancient & Ornamental woods in the New Forest. The other division within ancient woodland is Plantations on Ancient Woodland Sites (PAWS). These are of planted origin, and typically (though not universally) of non-native species.

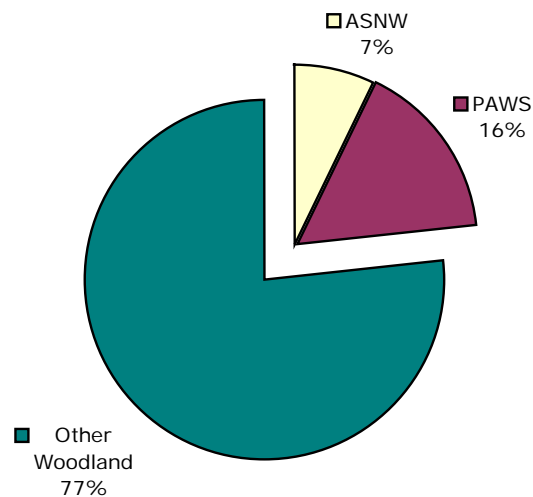


Figure 2: Proportion of woodland on the Public Forest Estate in England classified as ASNW and PAWS, from Spencer 2002.

The Forestry Commission was founded in 1919 to maintain and enhance Britain's timber resource. As a result, many areas of ASNW were converted to plantations of commercial conifer crops. These PAWS woodlands, although their biodiversity value has been

reduced through the planting of conifer species, often retain many of their characteristic features including both wildlife and heritage interest. Experience has shown that after the removal of the introduced trees, sites are often able to recover to functional native ancient woodland with relative ease.

The Forestry Commission Estate in England is comprised of almost 220,000 ha of woodland. In 2002, 53,128 ha, or 24%, of this was found to be ancient woodland as outlined in the survey report, 'Ancient Woodland on the Forestry Commission Estate in England' (Figure 2). This is below the national average as approximately one third of the woodland in England is ancient. The ancient woodland on the PFE represents almost 16% of the total ancient woodland resource in England (Figure 3).

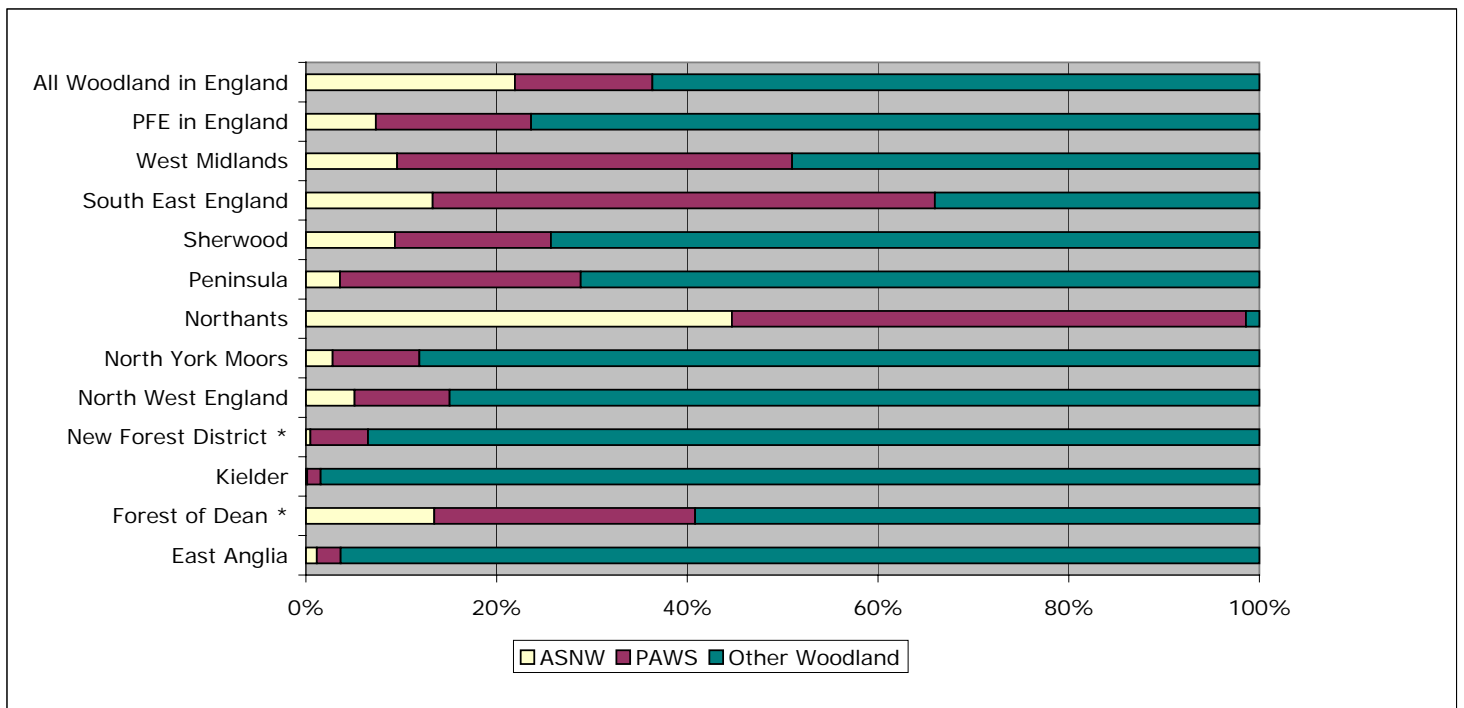


Figure 3: Proportion of ancient woodland as a percentage of total woodland resource across Forest Districts in England in 2002. * excludes the statutory inclosures of the New Forest and Forest of Dean.

Northants Forest District has the largest proportion of Ancient Woodland, with 98.7% of the woodland being classified as ancient. This is split almost evenly between Ancient Semi Natural Woodland (ASNW) and Plantations on Ancient Woodland Sites (PAWS).

Many of the PAWS sites on the PFE are being progressively converted to native woodland. Stands are assigned a semi-naturalness class dependent upon what proportion of canopy species are native (Table 1).

| Semi Naturalness Class | Criteria |
|-----------------------------------|---|
| 1 Semi-natural | Sub-compartments with a canopy cover of more than 80% native species. This category also includes pre-1930 beech woodlands within their natural range. |
| 2 Reasserting Semi-natural | Sub-compartments with more than 50% and less than or equal to 80% native canopy species. |
| 3 Plantation 1 | Sub-compartments with more than 20% and less than or equal to 50% native canopy species. |
| 4 Plantation 2 | Sub-compartments with less than 20% native species. This category also includes all beech plantations outside their natural range. |
| 0 Open Space | Open space within Ancient Woodlands |

Table 1: Criteria used to assign woodland stands a semi-naturalness class.

Increases in semi-naturalness class 1, semi-natural woodland, record the progress of PAWS restoration. As stands are restored the species composition changes and becomes more native, when the canopy is composed of more than 80% native species it is considered restored. Movement from classes 4, to 3 and to 2 show progressive change towards restoration, as the canopy becomes more native.

The 2009 report on the area of PAWS shows that restoration to semi-natural woodland has led to an increase in semi-naturalness class 1 from 15,952 ha in 2002 to 17,842 ha, a rise of nearly 12% across the PFE.

UK Biodiversity Action Plan

In 1994 the United Kingdom Government published the UK Biodiversity Action Plan which sets out the conservation priorities to halt the loss of biodiversity. These were revised in 2007. In the UK list of priority habitats and species, 1,150 species and 65 habitats have been highlighted as priorities for conservation action.

The PFE is wide-ranging, varied and complex, made up of a variety of different habitat types, several of which are those highlighted by UKBAP. The Table 4, in Annex 1, shows the increase in the area of priority habitats on the PFE.

Native Woodland Habitat Action Plan habitats (such as upland oak and wood pasture) have collectively increased from 24,815 ha to 27,224 ha during the five-year period from 2004-2009 (see Table 6, Annex 1). These habitats now represent over 10% of the total area of the PFE. There are a total of 284,000 ha of non-ancient broadleaved woodland in England, therefore the Forestry Commission resource represents nearly 10% of the national total.

Through planned management, priority open habitats have increased by 10.5% since 2004. This rise is made up of increases across the suite of habitat types but the largest of these increases is an additional 857 ha of lowland heathland. The graphs below shows this increase over time as well as highlighting changes in the two other most prevalent priority open habitat types namely upland heath and blanket bog.

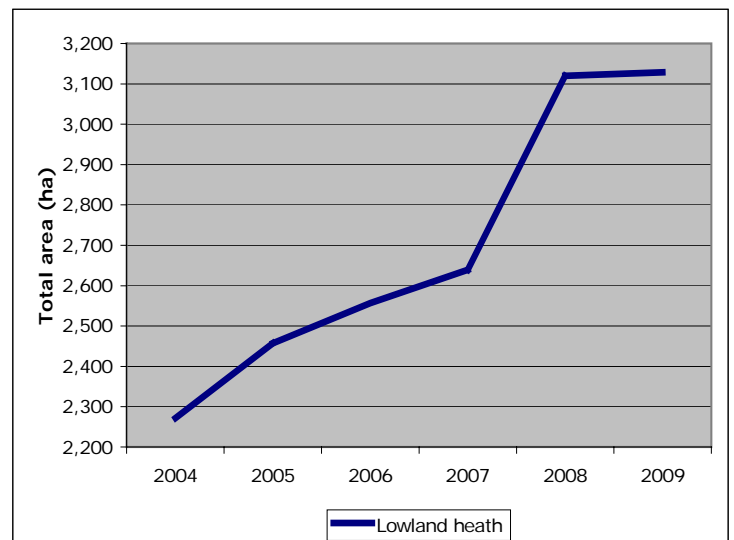
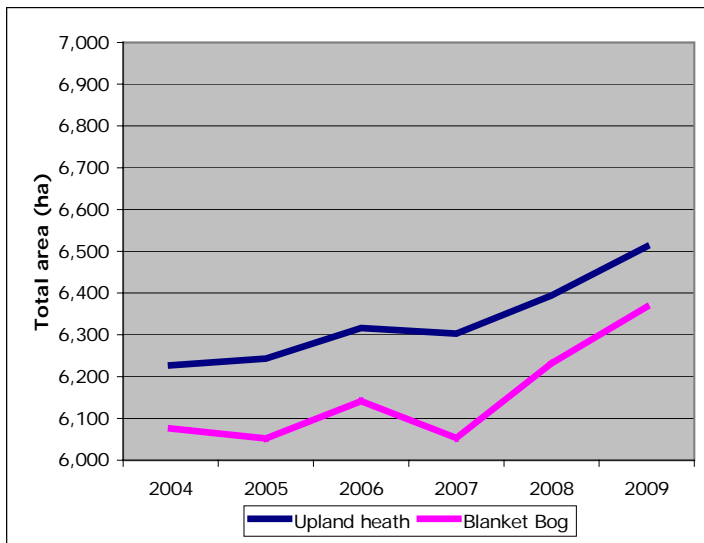


Figure 3a & 3b The trend in total area of three priority open habitats (lowland heath, upland heath and blanket bog) on the Public Forest Estate in England.

The Forestry Commission is currently leading a process to develop government policy on restoring and expanding open habitats from woodland in England (see www.forestry.gov.uk/england-openhabitats). As a part of this work, a project report was published (Spencer and Edwards, 2009), providing information about current and planned open habitat on the PFE as well as using surveyors to gauge how much potential open habitat could be restored or created on the PFE.

The report shows that in current Forest Design Plans (FDPs) the area of woodland planned for conversion, over the life of current approved Forest Design Plans, to open areas is 12,415 ha, 4,979 ha of this can be allocated to a particular priority habitat type with the remaining 7,436 ha allocated to a broad habitat type. The classification of broad habitat type does not represent the end habitat in all cases. For example, the

area could be composed of a mosaic of different priority habitats or the end habitat may be yet to be determined. This change represents an increase of 30% on current levels.

Forest Design Plans are periodically revised with a rolling 10-year programme. 94% of the PFE in England is currently covered by a Forest Design Plan.

By the end of current approved Forest Design Plans the area of upland heath will have increased by 709 hectares, blanket bog by 346 hectares and the area of lowland heath by 1,933 hectares. It is likely that some of the areas currently classified as broad habitat types will ultimately become priority. This could be due to there being a mosaic of different priority habitat types or that the end habitat is yet to be determined. As an example, acid grassland is a broad habitat type but these areas could become lowland dry acidic grassland or lowland heath or in upland areas upland heath.

After this analysis of the current levels of open habitat and that already committed to in FDPs, the report looked at the area of the PFE that has retained potential for effective open habitat restoration. The results showed that there are some 54,474 ha of land with potential for restoration and expansion of open habitats. However, some of this land has constraints on it in terms of, for example, being leasehold, or where there are social issues, or needing a lot of remedial action after felling and high on-going management costs. The area restored will be decided after the Government's open habitat policy is published.

Condition of Sites of Special Scientific Interest (SSSIs) in England

In 2003 the Government announced a new Public Service Agreement (PSA) to achieve 95% of SSSIs in favourable condition by 2010. The PFE includes some 67,772 ha of Sites of Special Scientific Interest (SSSIs), of which 19,000 ha is broadleaved woodland, 21,000 ha conifer forest and 26,000 ha other habitats. At the time of the launch of the PSA, 71% of FC owned SSSIs were in target condition.

By September 2009 the figure had risen to 98% of FC owned SSSIs currently in target condition (i.e. 'favourable' or 'unfavourable recovering'). For woodland SSSIs on the Forestry Commission estate 99% were in target condition in September 2009. Comparable data for woodland SSSIs not on the PFE showed 87% were in target condition.

In all, 24 broad habitat types are represented in the SSSI portfolio on the PFE, ranging from dwarf shrub heath and calcareous grassland to inland rock and upland bogs. The most common habitat types are Coniferous woodland and Broadleaved, Mixed and Yew Woodland – Lowland, which account for 21,898ha and 19,382 ha respectively.

Priority Species

Due to the time scale and scope of this report, national level species data was unfortunately unavailable. Local level species data is collated but is held in a variety of formats and is not necessarily complete for all areas. The Forestry Commission is developing a central record database to allow access to the information for future monitoring and analysis.

Populations of butterflies in England

The Forestry Commission and Butterfly Conservation have developed a close working relationship to encourage and support *Lepidoptera* populations on the PFE. Together, the Forestry Commission and Butterfly Conservation have identified 140 priority *Lepidoptera* sites, which cover approximately 3% of the PFE. These priority sites are found throughout England and support populations of some of the most endangered butterflies and moths in the UK, including the argent & sable, pearl-bordered fritillary and wood white.

Priority sites are further graded into A, B or C categories. Sites graded A are the highest priority sites and support at least one woodland BAP Priority species. These sites often require specific woodland operations, such as coppicing or ride management, to be carried out to maintain the butterfly interest. Grade B sites support more generalist priority species or species of conservation concern and do not need specialist woodland management to thrive. The same is true of grade C sites, although these are judged to be of lower priority, as they will have a less diverse group of species associated with them.

The greatest concentration of priority sites can be found in South East England. The sites in this area support a variety of species, including Duke of Burgundy, heath fritillary and pearl-bordered fritillary. The wood white butterfly is supported by all of the 20 sites found in Northants. A summary of sites and species can be found in Table 8 in Annex 1. For a complete breakdown see the conservation strategy for *Lepidoptera* on Forestry Commission Land in England, 2007-2017.

The Forestry Commission are also involved in a project helping to conserve the distinctive orange fritillary butterflies that inhabit a Site of Special Scientific Interest (SSSI) in the Wyre Forest, near Bewdley, West Midlands.

The 'Back to Orange' project benefits from a £74,000 grant from the SITA trust, which will be used to restore approximately 300 hectares of the forest where the pearl-bordered fritillary, small pearl-bordered fritillary and silver-washed fritillary can be found – particularly around Hurst Coppice, Dowles Brook, and Longdon.

Populations of wild birds in England

There has long been concern over declining wild bird populations in the UK. Declines in farmland birds are well known but this is also true for woodland species, many of which have been added to the red and amber lists of 'Birds of Conservation Concern' following declines from 1974 to 1999.

In 2003/04 the Royal Society for the Protection of Birds (RSPB) and British Trust for Ornithology (BTO) undertook a re-survey of breeding bird populations in broadleaved and mixed woodlands. This project is known as the Repeat Woodland Bird Survey (RWBS) and was supported financially by organisations including English Nature, Defra and Forestry Commission.

The results showed that out of the 34 species recorded eight showed decreases of more than 25%. Species such as willow tit, tree pipit and wood warbler were all noted to have significantly declined. Eleven species including blue tit, treecreeper and wren, however, showed large (>25%) national increases. The overall findings showed that in terms of species breeding in woodland more species have increased than decreased. Generally the more common and generalist species have increased whilst those that are rarer and more specialist have fared less well.

The report does not look specifically at the PFE. The evidence indicates that the situation with regard to woodland birds on the PFE will have followed the national trend.

Important Bird Areas (IBAs), identified by Birdlife International, provide a valuable network of sites to aid the conservation of wild bird populations. To be considered an IBA the area must fulfil at least one of the following three criteria:

- Hold significant numbers of one or more globally threatened species
- Are one of a set of sites that together hold a suite of restricted-range species or biome-restricted species
- Have exceptionally large numbers of migratory or congregatory species

In England the total area of IBAs is over 1,000,000 ha. More than 7% (or 73,836 ha) of this area lies within the PFE (29% of the area of the estate). The majority of the IBAs on the PFE are concentrated in 3 main areas: around Dorset and the New Forest;

Thetford Forest and Breckland in East Anglia; and North York Moors. Smaller areas can be found in the Forest of Bowland and Laughton Forest, Lincolnshire. The full distribution of IBAs on the PFE can be found in table 9, annex 1.

Examples of species found on the Public Forest Estate

The PFE provides habitat for a huge variety of species. Areas of Ancient Woodland and priority habitats have been mentioned above and are of significance both locally and nationally. However, many areas of plantation and secondary woodland also have inherent wildlife value. Some examples of the importance of the PFE are outlined below.

Nightjar and woodlark

Thetford Forest now consists of a complex mosaic of plantation, open heath and grassland, clearfells and wide rides. The area supports large populations of nightjar and woodlark in such numbers that the whole forest has been designated a SPA (Special Protection Area) as a result. The forest is also of regional importance for its bird communities as a whole which thrive on the complex mosaic, with many woodland edges and successional stages. The forest has been described by the BTO (British Trust for Ornithology) as being the most important area in East Anglia for woodland birds, heathland birds *and* farmland birds.

Red squirrel

As a result of its extent, the preponderance of small-seeded conifers and the virtual absence of large-seeded broadleaves such as oak, Kielder Forest remains the last stronghold for red squirrels on mainland England. Populations can also be found on the PFE in Whinlatter Forest, Cumbria and on the Isle of Wight. The Forestry Commission in Northern England is working with Save Our Squirrels and other partners to help secure the long-term survival of red squirrels.

Bechstein's and Barbastelle bats

Bechstein's and Barbastelle are two of the rarest woodland bats in England. Recent surveys have found populations of both these bats thriving in woodlands on the Isle of Wight, three of which are managed by the Forestry Commission. As a result of this study the island has been identified as the most important area for woodland bats in Europe.

There are now more than 20 Bechstein's and six Barbastelle maternity roosts, which is a dramatic improvement from 1998 when the UK Biodiversity Action Plan identified only one known maternity roost across the whole of the UK for each of these species.

Within one ancient oak in the PFE's Parkhurst Forest there can be found the world's largest single maternity roost for Barbastelle bats, with over 115 individuals. The growth in the bat population follows the Forestry Commission's efforts in successfully maintaining the forest as a designated SSSI. The FC has also been shaping the wider landscape through the Jigsaw Project, which has been linking up a fragmented countryside. This provides corridors the bats can use during their 20-kilometre foraging trips.

Western Wood-vase hoverfly

A hoverfly, once listed as extinct and now classified as an endangered species, was recently discovered by a local naturalist at the Forestry Commission's Welshbury Wood in the Forest of Dean.

The Western Wood-vase Hoverfly (*Myolepta potens*), breeds in wet rot holes of mature deciduous trees. Welshbury Wood is a mix of old broadleaf trees, including small-leaved lime coppice. The hoverfly requires pools of water that collect in rot-holes in trees, or where branches join the main trunk, for eggs to be laid and larvae to develop.

Wild gladiolus

The Wild Gladiolus (*Gladiolus illyricus* Koch) is one of the most prized and emblematic wild plants of the New Forest. This is a nationally rare species listed in Schedule 8 of the Wildlife & Countryside Act. It occurs throughout the New Forest within a species-rich mosaic of grassland and woodland herbs beneath bracken. This is the only place in Britain where this species can be found.

The Forestry Commission carefully manages the bracken component in the vegetation community where wild gladioli occur. This involves ensuring the level of the dead bracken litter layer does not become too thick so as to prevent the growth of these rare plants, yet is deep enough to help buffer the Gladioli corms from potentially damaging winter frosts or grazing by commoners livestock.

Heritage

Given the varying character of England's woods and forests and their history it is unsurprising that the heritage resource of the PFE is rich, including prehistoric burial mounds and settlement sites, Roman roads and buildings, mediaeval hunting lodges and a wide range of industrial sites. Parts of designed landscapes have also been incorporated into the estate over a number of years. Below is a summary table from a

recent inventory of assets detailing the type of historic assets that can be found on the PFE.

| Scheduled Monuments | Listed buildings | Registered parks and gardens | Battlefields | World heritage Sites |
|---------------------|------------------|------------------------------|--------------|----------------------|
| 872 | 80 (24) | 39 | 1 | 2 |

In addition to the designated assets there are many more archaeological sites of significance. The conservation of sites, both designated and not, is taken into account during the forest design planning process, with all operations being subject to a checking procedure to meet relevant guidelines and standards and to safeguard the assets.

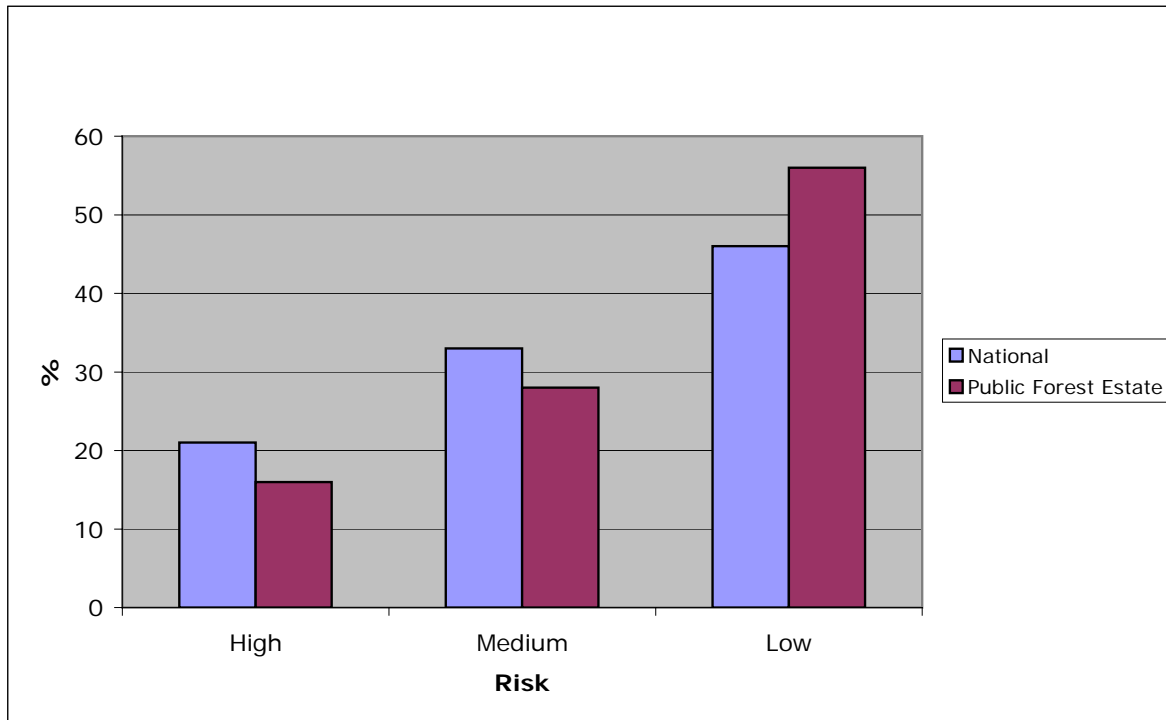
The Forestry Commission has management plans in place or under discussion for all scheduled monuments that it is responsible for and was cited as an exemplar of good management in the Heritage at Risk report published by English Heritage in 2008.

English Heritage's 'Heritage at Risk Register' published in autumn 2008 shows the national position of risk to Scheduled Monuments as:

| | | |
|-----------------|--------------|----------------|
| High Risk (21%) | Medium (33%) | Low Risk (46%) |
|-----------------|--------------|----------------|

The data for only the PFE were:

| | | |
|-----------|-------------|----------|
| High Risk | Medium Risk | Low Risk |
| 16% | 28% | 56% |



Graph 4: The percentage of Scheduled Monuments in each of risk category, as defined by English Heritage

The total figure in this context is not the total number of registered Scheduled Monuments but rather the number of individual features. For example, if a scheduled site is comprised of 5 distinct features, each of these features has been counted separately.

Landscape

There are 10 National Parks across England, providing areas in which people and wildlife can thrive. Across the country 10% of the land area is designated National Park, of which more than 80,000 hectares is on the PFE (31% of the PFE area). The New Forest is the largest example of this, with 26,759 ha of the PFE within the National Park. There are also large landholdings within Northumberland National Park and North York Moors National Park. In contrast there is no National Park designated land within either the East or West Midlands regions.

Many sites of environmental significance have also been designated as Areas of Outstanding Natural Beauty (AONB). The PFE represents a major landholding in Areas of Outstanding Natural Beauty, with 35,395 ha (14%) of the estate within this designation. With areas such as the Chilterns, High Weald and the North and South Downs AONBs,

the South East England is the region with the largest area of PFE land in AONBs with, 12,850 ha.

In their response to the public consultation for the study of the long-term role of the PFE, the National Association of Areas of Outstanding Natural Beauty (AONBs) was positive about current delivery and trends seen on the PFE. They highlighted long-term sustainable woodland management as the most important role for the PFE and called for closer working between the Forestry Commission and AONB teams.

Table 10 in Annex 1 shows the distribution of both AONBs and National Parks across the Regions in England.

The Forestry Commission recently produced a discussion paper on the appreciation and handling of landscape issues within the Study of the PFE in England (Vaughan, 2009). To complement this, we present below a brief summary of how wider landscape issues are addressed in forest planning and the contribution the PFE makes to designated landscapes.

The Forestry Commission's forest design plan (FDPs) show how individual or a group of woodlands will benefit the landscape and economy of an area whilst also creating increased opportunities for recreation, heritage and biodiversity.

The design plan objectives illustrate how the forest will contribute to requirements of current policy, such as the Government's Strategy for England's Trees, Woods and Forests (ETWF), Keepers of Time on ancient and native woodland, United Kingdom Forestry Standard (UKFS) as well as Regional Forestry Frameworks and Spatial Strategies.

Forest design plans are also influenced through stakeholder consultation and local issues. Each forest design plan shows how a group of woodlands will be managed over the next 10 years in some detail. It also outlines the plans for the following twenty years and describes how the woodlands could look in thirty years time.

Subtle landscape alterations can be achieved through this process, as well as large-scale change.

Water

The role of forests and woodland in helping to alleviate flooding issues has been the focus of recent research. A study by Forest Research has shown that trees help reduce the risk of downstream flooding in three main ways. Firstly by reducing the volume of run-off, secondly by promoting rain infiltration to the soil and so reducing the rate of

run-off and thirdly by delaying the downstream passage of flood flows (Broadmeadow and Nisbet, 2009).

The Forestry Commission is a partner in a scheme to reduce the risk of flooding in the Pickering and Sinnington areas of North Yorkshire. The £700,000 scheme is one of three pilot schemes nationally chosen by Defra to assess how land management upstream can reduce flooding in vulnerable communities. The scheme will last for two years and is a partnership between the Environment Agency, Forestry Commission, Durham University, North York Moors National Park Authority, Natural England and Ryedale District Council.

The areas to be studied include the PFE's Cropton forest. The project will examine the effect of: tree planting; blocking drains on the surrounding moorland; and creating buffer strips that run along the watercourses, on the time it takes heavy rain to flow from the upper catchment to arriving as flood waters in the lower valley around Pickering and Sinnington.

Further Information

Strategy for England's Trees, Woods and Forests

www.defra.gov.uk/rural/forestry/strategy.htm

Ancient Woodland on the Forestry Commission Estate in England. Spencer, J, 2002. (FC)

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