Case Study 28

Wyre Forest, Worcestershire and Forest of Dean, Gloucestershire

Location and ownership of woodlands

This case-study deals with two forests in western England where natural regeneration of oak using classic "uniform shelterwood" approaches has been attempted:-

1. Wyre Forest, Worcestershire [NGR SO 760760] - the Shelf Held Coppice, Longdon and Withybed Woods area of Wyre Forest extend to ~150 ha (~375 acres) and are managed by Natural England. This is ancient oak coppice that had been allowed to overstand to high forest and partially replanted with non-native conifers since the last war. Conifers have been felled recently under PAWS work. The woodland falls within Wyre Forest National Nature Reserve and SSSI site.

2. Forest of Dean, Gloucestershire [NGR SO 615090] the Nagshead (Russell's Inclosure) area of the Forest of Dean extends to ~92 ha (~225 acres) and is managed by the Forestry Commission. The area is a mid-nineteenth century oak plantation where alternative regeneration treatments have been applied since 1970. The area falls within the Nagshead SSSI site and is an Ancient Woodland Site.

Significance/ reasons for selection as case-study example

These examples were selected as case-studies in this project for two main reasons:-

1. They represent the best examples of adoption in Britain of alternative silviculture in oak which depends on broadcast natural regeneration of oak under uniform shelterwood or "seed-tree" working systems (adoption scenario 18). This is a common system in France but has met with variable success in Britain due to infrequent mast years, fertile sites with stronger weed competition and higher deer pressure. These examples have been successful due to a combination of unusually favourable site conditions for regeneration and atypically skilled oak silviculture.

2. These particular examples are being pursued mainly with oak woodland conservation objectives, but, where these techniques can be pursued effectively, they offer a potentially more economical route to securing a well-stocked crop of oak timber on less fertile sites. This can be applicable under some more rapid PAWS restoration scenarios or where pine or larch crops have failed from disease.

Owner objectives for management (including adoption of ATC systems)

These areas of woodland are managed primarily for oak woodland habitat and species conservation being within or adjacent to designated SSSI sites. Oak timber is produced from these sites in the form of mature stems from thinnings and group fellings and in the form of coppice material (at Wyre). The classic French "seed tree" regeneration system has been used in the Forest of Dean over several decades to regenerate mature oak plantations (and some semi-natural stands). At Wyre Forest, a similar situation has arisen as the result of recent felling of western hemlock and other conifers, with longer-term objectives combining coppice and high forest working.

Biophysical characteristics of the site

Wyre Forest - located on gently south-east facing slopes at 30-150m asl. Climate is warm and dry [AT_5 of 1724 dd, MD of 166 mm, annual rainfall 717 mm]. The site is very sheltered with a DAMS score of 7. The solid geology is of the Carboniferous Westphalian series producing freely-draining brown earth soils of low to moderate fertility, perhaps with some podzolisation [ESC SMR Fresh to Slightly Dry; ESC SNR Poor to Medium]. These would naturally support acid oak-birch woodlands.

Forest of Dean - located on gently west-facing land in the Cannop Valley by Parkend at 60-100m asl. Climate is warm and dry [AT_5 of 1790 dd, MD of 167 mm, annual rainfall 922 mm]. The site is fairly sheltered with a DAMS score of 11. The solid geology is of the Carboniferous Pennant sandstone with producing freely-draining brown earth soils of moderate fertility [ESC SMR Fresh to Slightly Dry; ESC SNR Medium]. These would naturally support oak-birch woodland of less acid types. Photographs from elsewhere in the Dean and at Dymock are used for illustration.

Stand history and current composition

The woodlands dealt with in this case-study consist of predominantly semi-mature (40-50 years) and mature (100+ years) stands of oak, with minor components of birch, hazel, holly, rowan and ash. Oak at the Forest of Dean sites is likely to be mainly of regular plantation origin, stemming from the period 1820-1870, following the Napoleonic Wars, when there was an imperative to create a national strategic reserve of oak timber. Some of the oak material may be of semi-natural/ self-sown origin. At the Wyre Forest sites, similar mature oak material was combined with a younger cohort of material arising from abandoned oak coppice, last actively worked during the 1930's. At Wyre Forest, some areas had been felled and densely replanted with shade-conifers (mainly spruce, fir and western hemlock) following the last war. The sites are ecologically similar and represent suitable conditions for ATC in oak. Over the past 30 years dense natural regeneration of oak has been recruited at both sites by felling significant proportions of the oak canopy, and, in the case of Wyre Forest sites, by removing conifer stands under the terms of recent PAWS restoration work. At the Forest of Dean sites, there is dense seedling and sapling oak regeneration, while at the Wyre Forest sites this is augmented by regrowth from re-coppiced stumps. At both locations, natural regeneration contains a proportion of birch, rowan, holly etc. At Wyre there is natural seedling regeneration of conifers, especially western hemlock.

Silvicultural treatments applied to date and intended future silviculture

Forest of Dean - there had been a tradition in the Dean of securing dense oak regeneration by "French style" seed-tree felling or uniform shelterwood working. This method was believed to have given rise to some of the best stands of timber oak in the Dean, from the period 1880-1920, such as those at Soudley Bottom. During the 1970's and 1980's, a number of mature oak sites were again treated in this way, with the objective of securing natural regeneration that could be tended into a good timber crop of oak. Some such trials were more successful than others, and there has perhaps not be the intensity of tending that should ideally be applied to oak regeneration. However on some sites, such as that at Russells Inclosure, oak regeneration is prolific.

Wyre Forest - here the aim has been to restore a more diverse structure in former coppice oak woodlands for the benefit of wildlife (including butterfly species) and to

remove non-native coniferous stocking. From the 1980's, trial working had involved heavy thinning and group-felling with natural regeneration in old oak coppices. By contrast with more fertile sites, oak regeneration recruits well within the Wyre. More recently, fellings of mature conifers and thinning of oak stands has resulted in similar prolific regeneration of oak on bare soil surfaces, with some conifer volunteers. Dense stands of young oak arising from this will either be thinned and promoted to high forest habitat, or in many cases may be placed on a rotational coppice working cycle.

Evaluation of current silvicultural status in terms of ATC adoption/ regeneration

These are atypical applications of alternative silvicultural systems for Britain, and are therefore difficult to assess against the same developmental criteria. They could be seen as essentially in ***developmental category 2*** (progressive/ mature transformation) as the natural regeneration systems and coppice management regimes that are being implemented have a long historical pedigree in France and England respectively (we know that they can work when operated consistently and proficiently). However they could be seen as only being ***developmental category 3*** (early-stage transformation) in that there is no guarantee that they will be able to be sustained at these particular sites. While there is a long history of their application in the Forest of Dean (oak natural regeneration) and Wyre Forest (oak coppice), the sites subjected to this form of management in the Dean over the past 30-40 years have not all been maintained, for a variety of reasons. It appears likely that this work will be continued in Wyre Forest as it meets conservation management and restoration objectives and is successful to date.

Commentary on inventory and monitoring protocols/ demonstration potential

These sites are not monitored using a detailed enumeration procedure. The Wyre Forest site is subject to Natural England habitat condition monitoring with periodic assessment of species composition, density and development of natural regeneration. Similar monitoring was previously carried out at the Forest of Dean site. These sites have considerable potential as demonstration locations for this particular ATC type, but it would be beneficial to prepare additional signage or interpretation materials.

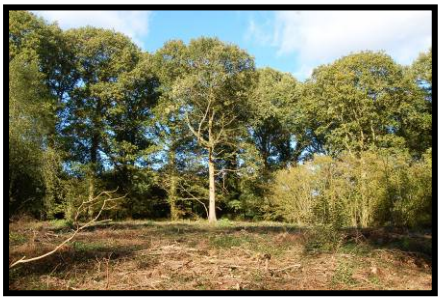
Commentary on economic and operational implications of ATC adoption

In principle the seed-tree felling/ uniform shelterwood approach to oak regeneration should be less expensive than replanting and is widely used in central France. Successful examples in Britain can be found in the Forest of Dean, New Forest and Windsor Forest. However, the general experience of uniform shelterwood working in oak in Britain has been problematic as compared to that in France, due to unreliable seed production/ mast years, stronger weed competition and herbivore browsing pressure. Where regeneration is not recruited, high replanting costs will be incurred.

Other relevant field examples recorded within the project

The most useful comparisons for this case study are with silvicultural approaches adopted in other native oak woodlands - primarily Salcey Forest and Bradfield Woods (Case Study 29 - restoration of coppice with standards) and Atlantic Oakwoods (Case Study 1 - diverse silvicultural approaches). The successful experience at Wyre and Forest of Dean with the classic "French style" uniform shelterwood/ seed tree regeneration of oak is uncommon, but some previous work at Windsor Forest relates.

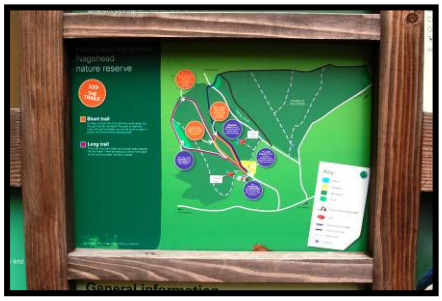
Photographic record



Left: shelterwood regeneration felling operation in oak, Dymock

FOREST OF DEAN/ DYMOCK

Right: visitor interpretation - Nagshead Reserve (oakwood managed for birds)



Left: Nagshead Reserve - widely spaced oak (from earlier seed-tree felling) with dense oak regen below

FOREST OF DEAN/ DYMOCK

Right: Soudley Bottom, Dean - premium oak from seed-tree felling ~100 years ago, with beech cleaning

Left: dense oak regeneration in a uniform shelterwood/ seed-tree felling area worked in the 1980's

FOREST OF DEAN/ DYMOCK

Right: Soudley Bottom, Dean - premium oak from seed-tree felling ~100 years ago, with beech cleaning

Left: handling of woodfuel material arising from recent regeneration felling operation, Dymock Woods

FOREST OF DEAN/ DYMOCK

Right: presentation of oak butts from standards in same operation hemlock, matrix being thinned

Left: felling of dense western hemlock (with brash baling) leaving widely spaced standard oaks

WYRE FOREST

Right: oak uniform shelterwood with dense seedling regen arising

Left: seedling regeneration on the site above, with a mixture of oak, western hemlock and grand fir

WYRE FOREST

Right: dense oak sapling regeneration, needing respaced in an earlier shelterwood felling area