

Case Study 15

Wyre, Mortimer and Thetford Forests, Central England

Location and ownership of woodlands

This case study deals with three Forestry Commission sites in central and eastern England where premium Douglas fir is being grown under ATC systems:-

1. Wyre Forest, Bewdley, Worcs. [NGR SO 750745] compartments behind visitor centre with original stocking of p1920's Douglas fir, oak and mixed regeneration. Area of interest is ~80 ha. Area is a Planted Ancient Woodland Site (PAWS).
2. Mortimer Forest, Ludlow, Shrops. [NGR SO 472728] High Vinnals compartments with original stocking of p1920's Douglas fir and conifer-hardwood regeneration. Area of interest is ~20ha. Area is a Planted Ancient Woodland Site (PAWS).
3. Thetford Forest, Santon Downham, Suffolk [NGR TL 820868] compartments near forest office with original stocking of p1920's Douglas fir and conifer-hardwood regeneration. Area of interest is ~100ha. Area is within Breckland Forest SSSI.

Significance/ reasons for selection as case-study example

These sites were selected as case-studies within this project for two main reasons:-

1. They represent some of the best examples of the growth of high quality Douglas fir under alternative silvicultural systems on the national forest estate in England (adoption scenario 7). There is well developed natural regeneration of Douglas fir and hardwood species, often tending towards a complex structure (adoption scenario 10). These mature stands are in areas with an unusually high significance for public recreation and landscape amenity and also offer a potentially valuable source of future sustainable timber income to support district management costs.
2. The examples highlight the potential of Douglas fir in those drier, more lowland districts of England where existing crops of spruce are challenged by drought and of Corsican pine and the larches by emerging disease outbreaks. There is a need to consider stand diversification (adoption scenario 11) with Douglas fir one option.

Owner objectives for management (including adoption of ATC systems)

The Forestry Commission in England manages its estates for a combination of economic timber production, conservation and recreational amenity objectives. The balance between these objective sets varies with the type of forest and its location. ATC is employed on a site specific basis by FC in support of management objectives. At the three forest areas examined in this case-study, adoption of ATC was primarily stimulated by the retention of mature high-value Douglas fir from the late 1920's which was recruiting copious natural regeneration of Douglas fir itself and a variety of other conifer and hardwood species. Also, the three areas are seen as "trophy sites" within their respective forests and have above average importance for visitor and recreational amenity. Alternative silvicultural systems will allow both economic and amenity values to be perpetuated without clearfelling, using natural regeneration.

Biophysical characteristics of the sites

The Wyre Forest site is at 120-170m asl on gentle north-facing slopes. The climate is warm and rather dry [AT₅ of ~1640 dd, MD of ~155 mm, annual rainfall of ~700 mm]. DAMS score of 7 reflects very strong topographical shelter. Soils are developed over the Carboniferous Westphalian series and are therefore freely-drained and of moderate fertility [ESC SMR Fresh, ESC SNR Medium]. Forestry access - fair/ good.

The Mortimer Forest site is at 220-250m asl on north-westerly aspect. The climate is warm and fairly moist [AT₅ of ~1435 dd, MD of ~120 mm, annual rainfall of ~760 mm]. DAMS score of 9 reflects strong topographical shelter. Soils are developed over the Silurian Ludlow series and are therefore well-drained and of moderate fertility [ESC SMR Fresh-Moist, ESC SNR Medium]. Forestry access is good.

The Thetford Forest site is at 20-40m asl on level ground. The climate is very warm and dry [AT₅ of ~1790 dd, MD of ~220 mm, annual rainfall of ~620 mm]. DAMS score of 12 reflects moderate shelter on the Breckland plain. Soils are developed from acid sands overlying Cretaceous chalk at depth and therefore very freely-drained and of low fertility [ESC SMR Slightly Dry, ESC SNR Poor]. Forestry access is good.

Stand history and current composition

These three sites are dominated by the presence of mature, high value stands of premium Douglas fir, established in the late 1920's. This is the most valuable type of stocking found on the National Forest Estate, but represents only a small proportion of total area. Douglas fir provenances used in such early FC plantings were typically superior to those available in later decades. Timber sales achieve £80-120 per m³ from productive stands with YC 16-20. There are also other minor mature coniferous components in these stands - for example larch at Mortimer Forest, Corsican pine and larch at Wyre and Scots pine at Thetford. In the Wyre Forest example there is also a significant component of semi-mature native oak - probably a combination of semi-natural stocking and later replanting. At Thetford Forest sweet chestnut and sycamore, presumably originally planted, form valuable stand components. At least in recent decades, these stands have been reasonably well thinned and have begun to regenerate profusely with both Douglas fir and a diverse hardwood understorey component.

Silvicultural treatments applied to date and intended future silviculture

The main silvicultural intervention carried out to date in these stands has been gradual thinning over the past 20-30 years, preserving their stability and reducing stand basal area below the threshold value for recruitment of Douglas fir regeneration. Thinnings will have produced valuable material for sale and improved the remaining crop, but may not have been specified particularly as ATC transformation interventions at the time. All of the stands are recognised as being of particular significance for visitor amenity and the main silvicultural aim has been to preserve them while producing some timber income along the way. The silvicultural systems actually recorded as being in force differ at the three sites - single tree selection at Wyre, uniform shelterwood at Thetford and minimum-intervention at Mortimer. However it is not apparent that this distinction has made any significant difference to management between the stands. While continued gradual thinning of the overstorey will remain

essential it will also be important to begin to intervene in the developing understorey, which in each case already has two or more cohorts/ layers. The understorey should not be allowed to become over-stocked, as this will compromise future stand development and value. There are however a range of approaches that can be adopted including preferring Douglas fir for economic reasons (perhaps most relevant at Thetford), preferring oak and other native species for PAWS restoration (perhaps most relevant at Wyre) or a mixed-wood development strategy (as at Mortimer). Early intervention in the developing understorey is important, but can leave these options open by eclectic selection of the better stems to promote, regardless of species.

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

These stands all reflect progress into *developmental category 2* (progressive/ mature transformation) by virtue of the maturity of the overstorey and recruitment of profuse, diverse and well-structured natural regeneration. They are therefore unusual for sites on the National Forest Estate, where clearfell restock working has been preferred in the past. The Wyre example is interesting as an example of a combination of premium Douglas fir and semi-natural oak, both regenerating naturally, on a PAWS site. It is, however, true that the development of these stands to date has been in part accidental, rather than a result of deliberately planned transformation interventions. Light thinning of the fir overstorey over a number of years has promoted regeneration. Continued development of ATC at these sites would require tending and respacing interventions in the developing understorey to direct its structure and composition.

Commentary on inventory and monitoring protocols/ demonstration potential

The growing stock at these three sites is monitored using the Forestry Commission's standard periodic system, assessing stocking and natural regeneration, but not so far using the more detailed enumeration methods recommended by FCIN45. All of the sites have open public access and would be suitable as self-guided ATC demonstration sites, given interpretation material (signage or portable), preferably including the results of more intensive enumeration work as for the FC ATC network, to which these stands could usefully be added as relevant Douglas fir examples.

Commentary on economic and operational implications of ATC adoption

The types of monitoring, thinning and regeneration tending operations required under ATC management in these stands will be more intensive and expensive than standard even-aged management, but given the extremely high timber and recreational values embodied by these stands, is justified. FC have access to necessary equipment/ skills.

Other relevant field examples recorded within the project

These examples highlight the potential of Douglas fir as a productive tree in areas of lowland England for which Corsican pine has been a preferred species - for example Sherwood (Case Study 20). Experiences on lowland estates such as Weasenham (Case Study 30), Longleat (Case Study 14) and Dunster/ Tavistock (Case Study 18) provide useful comparisons in terms of silvicultural systems and marketing approaches for premium mature Douglas fir whereas Cowdray Park illustrates mid-rotation ATC.

Photographic record



Left: mature Douglas fir with a mixed understorey of fir and oak

WYRE FOREST

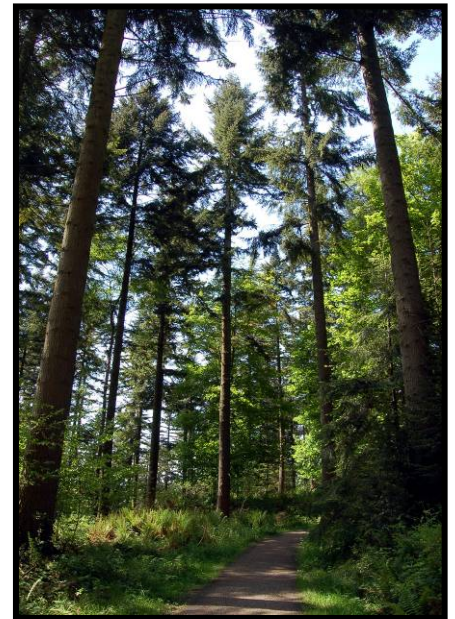
Right: mid-rotation Douglas fir recruiting advance regeneration



Left: mixed conifer hardwood regeneration under mature Douglas

MORTIMER FOREST

Right: premium Douglas fir managed by ATC for amenity



Left: Douglas fir advance regeneration under mature canopy

MORTIMER FOREST

Right: premium Douglas fir managed by ATC for amenity



Left: multi-storey complex structure in Douglas fir regeneration

THETFORD FOREST

Right: mixed conifer hardwood regeneration under mature Douglas



Left: multi-storey complex structure in Douglas fir regeneration

THETFORD FOREST

Right: Douglas fir advance regeneration under mature canopy

