

## **Case Study 2**

### **Cirencester Park Estate, Gloucestershire**

#### **Location and ownership of woodlands**

These woodlands, primarily falling within Oakley Park (including Moss's Copse), lie to the north of the A419 road, 3 miles west of the town of Cirencester, Gloucs. Their total managed extent is of the order 500ha (1250 acres). NGR is SO 976026.

The woodlands are owned by the Cirencester Park Estate, ancestral seat of the Earls of Bathurst. At present ownership of part of the woodlands is vested in a family trust.

The vast majority of the site is an Ancient Woodland Site per the Ancient Woodland Inventory, but with all of that area being regarded as replanted/ PAWS, although some of the plantings are of site native trees. The woodlands are not SSSI designated.

#### **Significance/ reasons for selection as case-study example**

This site has been selected as a case-study within this project for two main reasons:-

1. It is one of the few British examples of application of small group selection and replanting, sustained over a period of 50 years or more, in mixed plantations of quality conifers (adoption scenario 10) and high quality broadleaves (adoption scenarios 2, 12). Application of this sophisticated forestry approach, as originally proposed by J.E. Garfitt in the 1950's, produces attractive and valuable woods.
2. The experience gained at Cirencester Park is of considerable potential value to growers elsewhere who are seeking to diversify their woodlands in anticipation of, or response to, drought impacts on beech, or to disease impacts on ash and larch. Group-wise replanting with more desirable/ resilient species, in some cases under the temporary shade of a partially-retained mature canopy, is a relevant approach, especially in estate woodlands where retention of amenity and shelter is a priority.

#### **Owner objectives for management (including adoption of ATC systems)**

As with most traditional estate woodlands, objectives of management here combine economic timber production, with a strong element of landscape amenity, including use for sporting purposes. Much of the woodland area forms a historic designed landscape, including formal avenues and a noted arboretum. Traditionally these woods were dominated by beech, but there are now a much wider range of species.

Non-clearfell silviculture has been applied at Cirencester Park at least since the 1950's, in order to balance the demands of economics and estate amenity. The noted forester J.E. Garfitt was instrumental in the early adoption of ATC at Cirencester and the woodlands are still managed by a retained head forester. There was a desire at that time to increase the range of tree species being grown following wartime fellings of mature beech and ash crops, with productive conifers introduced by small-block replanting. The main aim now is to retain that species diversity, promoting resilience.

### **Biophysical characteristics of the site**

The site is at 140-190 asl, occupying gentle slopes and undulating ground. Aspect is varied, but predominantly south-easterly, on the back slope of the Cotswold Hills.

The climate of the site is warm and moderately dry [ESC AT<sub>5</sub> 1635 dd, MD 154 mm, annual rainfall 823mm] with a moderately exposed wind regime [DAMS = 14] due to topographical position. The solid geology is of the Jurassic oolitic limestones of the Cotswold range. Soils vary in depth and texture over the limestone but are typically prone to summer drought, but have high fertility (ESC SMR Slightly to Moderately Dry; ESC SNR Rich to Very Rich). Some clay soil areas are less well drained.

Terrain is generally workable across the woodlands, but with some locally steeper banks, as at Moss's Copse. Timber extraction from many areas is over a network of grassed rides and tracks which can become soft after wet weather. There is direct egress onto the main A419, with estate forestry base and sawmill convenient to hand.

### **Stand history and current composition**

The original condition from which ATC adoption developed at Cirencester Park was a predominance of pure mature beech-ash plantation stands dating from 1750 to 1850. These had been heavily felled during World War II, leaving a partially depleted post-war condition with some retained mature stems of poorer form and patches of untended ash and sycamore regeneration. Noted silviculturalist J.E. Garfitt addressed this by planting in groups of pine, larch and beech among these gaps, creating a "patch-work" of small stands of different species and ages, as at Moss's Copse. Elsewhere the overstorey had already been completely removed and such areas were restocked with block-wise plantings of hardwoods and conifers with a retained hazel coppice understorey. Similar approaches, with adaptive modification, were continued under later estate head foresters, Arthur Lloyd and Keith Mills. The woodlands currently comprise three main stand categories (a) mature pre-war hardwood "landscape" stands of beech, ash and oak, including registered seed stands of beech; (b) mid-rotation post-war stands of ash and sycamore poles that are being thinned and underplanted/ regenerated and (c) mixed coniferous "patch-work quilt" stands of fir, spruce, pine, larch and hardwoods arising from group selection after the 1950's.

### **Silvicultural treatments applied to date and intended future silviculture**

The main silvicultural approach implemented at Cirencester Park is the planting of small groups of trees of different conifer and hardwood species under an open mature hardwood canopy of beech (or on occasion oak-ash). The remaining overstorey is later removed and the young block plantings below are thinned and tended to produce quality crops of Douglas fir, Norway spruce, ash and sycamore. When these groups are in turn felled they are replanted, but a wide spectrum of group ages results. This approach has the advantage of perpetuating forest cover, creating structural and species diversity, and giving the opportunity to change species in any one block if performance is unsatisfactory or markets for alternatives appear more favourable. It is, however, quite an expensive approach due to reliance on replanting and the need to defend small groups against deer. There is increasing reliance on natural regeneration

of ash in more open hardwood stands and some experimental work has been done, cutting small canopy gaps into mature beech plantations to encourage natural beech regeneration to develop, rather than having to underplant those stands as previously. It is hoped that heavier thinning of the canopy in oak-dominated stands will secure advance regeneration, but some reliance on enrichment planting may remain where it is desired to perpetuate oak as an element of the stands, avoiding beech dominance.

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

Silvicultural work at Cirencester since the 1950's has reached *developmental category 2* (progressive/ mature transformation) for the forest as a whole but with some areas, notably Moss's Copse, having reached *developmental category 1* (complete or near-complete transformation) and others remaining at *developmental category 3* (early-stage transformation). In many areas the mature beech canopy has now been removed, leaving a spectrum of ages of group selection replanting/regeneration on a "chequer-board" layout. Elsewhere the forest has a two-storeyed shelterwood structure with semi-mature ash-sycamore poles over young planted/regenerated hardwoods and hazel coppice. Denser stands of mature beech are still to recruit any significant understorey, without opening of gaps. While there is natural regeneration of ash, sycamore and some beech, there is still considerable reliance on defended replanting, particularly with desirable conifers (Douglas fir/ Norway spruce) and oak. There is no current likelihood of ATC silviculture being interrupted as the guiding approach, given that integrated monitoring, assessment and silvicultural working can be maintained within the context of the management planning process.

### **Commentary on inventory and monitoring protocols/ demonstration potential**

In recent years there has been periodic assessment of stands under ATC systems for management planning and inventory purposes. This uses a combination of visual inspection and localised semi-quantitative approaches. In earlier years of the transformation there was perhaps a more formalised enumeration regime in place. This site has considerable demonstration potential and has hosted numerous organised forestry visits. Due to lack of public access, that would remain the appropriate mode.

### **Commentary on economic and operational implications of ATC adoption**

The silvicultural approaches adopted at Cirencester Park are relatively intensive and expensive, especially the reliance on small-block replanting with a variety of species, in treeshelters where necessary. The estate has its own forestry squad to support this and believes that the methods used best meet combined economic and amenity aims.

### **Other relevant field examples recorded within the project**

This example can usefully be compared with the lowland hardwood case-studies in Scotland - Dalmeny and Dalkeith Estates (Case Study 21) and Newbyth Wood (Case Study 3). The beech wood examples, particularly Chiltern Beechwoods (Case Study 24) are also relevant. Cirencester Park is unusual in having consistently applied a formal group selection system over several decades, involving both quality hardwoods and softwoods, inspired by Garfitt's original model.

## Photographic record



Left: Moss's Copse - successful use of group selection/ block re-planting with mixed species

Right: Moss's Copse - successful use of group selection/ block re-planting with mixed species



Left: use of small group planting to restock with quality hardwoods

Right: use of small group planting to restock with quality hardwoods



Left: use of block-wise small group re-planting with mixed species

Right: use of block-wise small group re-planting with Douglas fir



Left: restocking beech-ash stands by irregular shelterwood - hazel coppice and hardwood regeneration

Right: restocking beech-ash stands by irregular shelterwood - group replanting with larch and hardwoods



Left: importance of beech and specimen conifers in the estate landscape of Cirencester Park

Right: a mid-rotation registered seed stand of beech with sparse natural regeneration of ash



Left: mixed hardwood regeneration developing under widely spaced mature beech standards

Right: recruitment of mixed hardwood regeneration in small groups under mature beech canopy

