

Case Study 8

Cowdray Park Estate, Sussex

Location and ownership of woodlands

This case study deals with a number of woodlands on the Cowdray Park Estate in West Sussex. These lie to both the north and south of the town of Midhurst, with the Cowdray Park Estate Office being at Easebourne [NGR SU 898224]. Some of the woodlands are on lower ground on either side of the Rother valley between Midhurst and Petworth to the east, while others are on the South Downs at Bepton/ Cocking.

Cowdray Park Estate manages some 2750ha (~6800 acres) of woodlands, with an initial trial application of alternative silvicultural systems to some 150ha (~370 acres), being some 5% of the total. A proportion of woodlands on the Cowdray Park Estate are currently regarded as being Plantations on Ancient Woodland Sites (PAWS).

Significance/ reasons for selection as case-study example

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

1. It is an interesting example of a traditional private estate with an excellent forestry pedigree which is now implementing alternative silvicultural systems at trial-scale. It presents a contrast with those estates that have been long-term proponents and practitioners of ATC. The main rationales for ATC adoption are use of natural regeneration, lower restocking costs and preservation of estate landscape amenity. The process of stand selection based on visual assessment of natural regeneration and flexible site-based adoption of thinning treatments can be “seen in action”. At this stage of ATC adoption, key decisions on inventory and monitoring are made.
2. The estate presents varied examples of adoption of uniform shelterwood working in mature Scots pine and irregular/ informal shelterwood working in semi-mature Douglas fir, grand fir (and, in future, w. hemlock) (adoption scenarios 4, 7 & 9).

Owner objectives for management (including adoption of ATC systems)

The main objective of forest management on the Cowdray Park Estate is economic timber production, with secondary objectives of estate amenity and conservation. Forest management is overseen by an experienced head forester with a forest works team, making Cowdray Park one of relatively few estates retaining this traditional system. Until recently, the commercial woodlands on the Estate were managed on a conventional coupe-wise clearfell and restock principle, respecting optimum harvesting ages on economic grounds. Much of the current coniferous stocking had been established in the 1950's and 1960's as an even-aged investment forestry crop.

In recent years, natural regeneration had been observed in a number of semi-mature compartments and it was decided to implement a trial application of alternative silvicultural systems, largely on the shelterwood model, with the objective of securing a successor crop at reduced outlay, while investigating the wider potential for ATC.

Biophysical characteristics of the site

The Cowdray Park woodlands range in elevation from 20m asl in the valley of the River Rother to some 230m asl on the South Downs ridge at Bepton. Both northerly and southerly aspects are found on either side of the Rother valley.

The climate of the lower valley sites is markedly warm and dry [ESC AT₅ ~1970 dd, MD ~210 mm, annual rainfall 870 mm] with a sheltered wind regime [DAMS = 10-11]. Conditions on the South Downs ridge will be less temperate. The solid geology is of Cretaceous series ranging from lower and upper greensand through Gault clay in the valley to the chalk of the South Downs. Soils vary accordingly from acid freely-draining sands through imperfectly drained fertile clays to shallow chalk downland soils [ESC SMR Moist to Moderately Dry, ESC SNR Poor to Very Rich/ Carbonate]. This variation in site conditions influences the choice of tree species and silviculture.

The Estate has relatively good access for management and timber extraction over a network of internal tracks and rides, connecting with minor public roads. The majority of woodland compartments have even and workable ground with moderate slopes

Stand history and current composition

Although large parts of Cowdray Park estate comprise long-established woodland, including PAWS sites, the areas of interest for this case-study are post-war conifer plantations. Some of these will have been created by restocking clearfell sites while others were planted onto open chalk downland. Fairly uniform investment forestry plantations were created between 1950 and 1970 with a range of conifer species, of which Norway spruce, Douglas fir, hybrid larch and Scots pine were predominant, with smaller components of grand fir and western hemlock. There was also a smaller area of retained pre-war conifer stands, primarily of Scots pine, which had been managed on a seed-tree/ uniform shelterwood basis over a longer period of time. Post-war conifer stands have generally received standard thinnings to date, reflecting the consistent standard of forestry management on the Estate, but some were perhaps slightly underthinned. Until recent years, most of these plantations did not have significant advance natural regeneration, but it had recently been observed arising under some p1960's Douglas fir and grand fir and p1950's western hemlock crops.

Silvicultural treatments applied to date and intended future silviculture

Trial adoption of alternative silvicultural systems at Cowdray Park reflects the interest of the owner and head forester and responds to observation of advance regeneration. It is hoped that greater reliance on natural regeneration, coupled with effective deer control, will reduce costs of restocking stands and may also avoid issues with coniferous replanting on PAWS sites. Work is being carried out under an English Woodland Grant Scheme. In pre-war Scots pine crops, successful seed-tree fellings have been undertaken, resulting in prolific natural Scots pine regeneration. Comparable work could be undertaken in post-war larch stands as these mature, if regional *Phytophthora* impacts do not force a change of species in due course. In p1960's Douglas fir, thinning intensity has been increased to reduce basal area to the threshold for recruitment of natural regeneration, and a system of regeneration

monitoring plots has been instituted to assess regeneration levels and differential impacts of browsing. This amounts to uniform shelterwood approach. In p1960's grand fir stands a more group-based (group shelterwood) approach has been employed releasing and developing spontaneous concentrations of regeneration. Ephemeral advance natural regeneration has also been observed in p1960's western hemlock stands but has not yet recruited, perhaps due to excessive basal area. Some post-war Scots pine stands on downland sites have developed a dense understorey of partially intruded broadleaves (mainly birch and hazel coppice) which has proven difficult to tend on an economic basis to date, due to a high density of small stems.

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

Implementation of alternative silvicultural systems at Cowdray Park largely represents *developmental category 3* (early-stage transformation) as it has only been initiated in recent years - for example in p1960's Douglas fir and p1960's grand fir stands where advance natural seedling regeneration has now been recorded. The Scots pine areas with seed-tree felling and profuse natural regeneration have progressed to *developmental category 2* (progressive/ mature transformation), although the intended structure there remains a simple one. Some areas remain in *developmental category 4* (preliminary-stage adoption) as advance natural regeneration is not yet in place (for example under stands of Norway spruce, western hemlock and larch). Future adoption of ATC at Cowdray Park is uncertain and depends on the trial outcomes.

Commentary on inventory and monitoring protocols/ demonstration potential

The head forester carries out periodic quantitative assessments of stocking and natural regeneration in those compartments being operated under ATC and small permanent regeneration monitoring plots have been established in some areas for seedling counts. Larger enclosure plots are used to assess the impacts of deer on the vegetation. Cowdray Park Estate has potential for demonstration of the process of early-stage ATC adoption and has hosted organised forestry society visits. Given the scatter of stands involved on the Estate, this, rather than self-guiding, looks the best approach.

Commentary on economic and operational implications of ATC adoption

ATC adoption on Cowdray Park is at an early stage and on a small scale, such that economic and operational implications so far have been minor. It is likely that slightly higher investment in stand tending and monitoring (by the estate forestry team) to secure advance natural regeneration is more than offset by avoidance of replanting costs. If ATC adoption expanded, economic comparisons would become possible.

Other relevant field examples recorded within the project

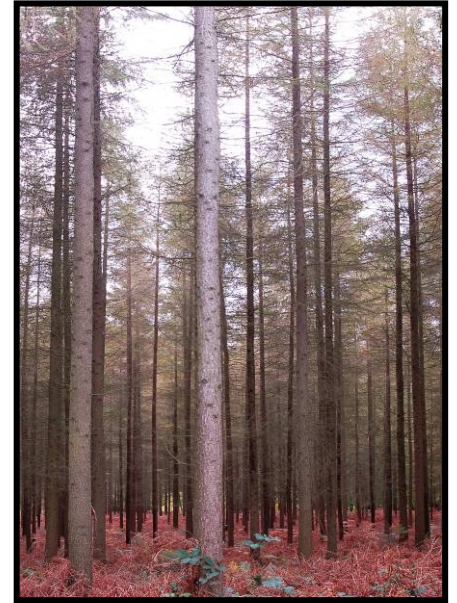
While the Scots pine shelterwood particularly resembles the Scottish examples at Blelack Woods (Case Study 6) and Curr Wood (Case Study 7) the Cowdray Park experience primarily relates to an estate making an initial foray into ATC working across a range of species - hence there is a useful comparison to be made with Hooke Park (Case Study 22) and Whittingehame and Abbey St. Bathans Estates (Case Study 26). Cowdray Park benefits from experienced management and timber marketing.

Photographic record



Left: James Quarry - successful natural regeneration of Scots pine using the seed tree method

Right: mid-rotation crop of larch, promising form, gradual thinning



Left: James Quarry - successful natural regeneration of Scots pine using the seed tree method

Right: mid-rotation crop of larch, promising form, gradual thinning



Left: Verdley Gate - thinning of p1960's Douglas fir stand to recruit advance natural regeneration

Right: Verdley Gate - thinning of p1960's Douglas fir stand to recruit advance natural regeneration



Left: Verdley Gate - quadrat monitoring of Douglas fir regen.

Right: Bepton Woods - monitoring of deer browsing impacts on natural regeneration levels under EWGS



Left: Turner's Copse - group selection/ gap formation in p1961 Grand fir promotes regeneration

Right: Turner's Copse - group selection/ gap formation in p1961 Grand fir promotes regeneration



Left: Venus Wood - p1958 western hemlock has produced a carpet of regeneration but this has not thrived

Right: Venus Wood - mixed hardwood regeneration under Scots pine poses management challenges

