

Case Study 19

Bowhill and Eildon Estates, Scottish Borders

Location and ownership of woodlands

This case-study deals with two separate areas of woodland on the Buccleuch Estates in the Scottish Borders. These are on the Bowhill and Eildon Estates:-

1. Bowhill Estate, by Selkirk [NGR NT 432275]. The land is owned by Buccleuch Estates and managed by Buccleuch Woodlands. The area under ATC management extends to 150ha on Parnassie Hill and in the Cants area to the east.
2. Eildon Estate, by Newton St. Boswells [NGR NT 560324]. The land is owned by Buccleuch Estates and managed by Buccleuch Woodlands. The area under ATC management extends to 46ha on the southern slopes of the Eildon Hills.

These woodlands are all regarded as long-established plantations rather than PAWS.

Significance/ reasons for selection as case-study example

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

1. Taken together with the woodlands at Drumlanrig Estate (also managed by Buccleuch Forestry) these sites represent among the most consistent and advanced applications of alternative silvicultural systems to any private forestry in Scotland. An approach centred on group selection has been applied for several decades to ensure combined outcomes of quality timber production and high landscape amenity close to the major estate houses of the Duke of Buccleuch and his family.
2. The use of fairly intimate silvicultural approaches in stands of mixed shade-tolerant conifers and hardwoods (adoption scenarios 2, 7, 9, 10) is atypical for Scotland and more comparable with reported examples in south-west England. With wider use of species such as Douglas fir, silver firs, western hemlock, coast redwood and beech being considered in Scotland, these are now relevant models.

Owner objectives for management (including adoption of ATC systems)

Woodlands on the Buccleuch Estates are managed primarily for economic timber production, with emphasis on the production of high value coniferous and hardwood stock. Those areas of woodland within designed landscapes and close to the major houses at Bowhill and Eildon are also managed for estate amenity, sport and landscape. Bowhill Estate is open to the public with waymarked woodland trails.

All of the Buccleuch Estates properties have an element of continuous-cover forestry/ ATC and are noted for its successful application, over many years, under successive head foresters. It currently represents some 14% of their estate woodland resource. Buccleuch Woodlands see ATC as an effective way to combine viable timber production with estate landscape amenity and visitor attraction potential of woods.

Biophysical characteristics of the site

Bowhill Estate - located between the Ettrick and Yarrow Waters, ranging from 130-250 m, with predominantly south-easterly aspects. Climate is warm and moist [AT₅ of 1288 dd, MD of 121 mm, annual rainfall ~970 mm]. The site is moderately sheltered with DAMS score of 12. The solid geology is of the Silurian Llandoverly shales with good forest brown earth soils [ESC SMR Fresh; ESC SNR Medium]. Access for forestry management, harvesting and extraction is good, but with amenity constraints.

Eildon Estate - located on the southern face of the Eildon at elevations ranging from 150-300 m. Climate is warm and fairly moist [AT₅ of 1236 dd, MD of 115 mm, annual rainfall 721 mm]. The site is moderately sheltered with DAMS score of 12. The solid geology is of the Silurian Llandoverly shales with good forest brown earth soils [ESC SMR Fresh; ESC SNR Medium]. Access for forestry management, harvesting and extraction is good in parts, but locally constrained by steep slopes.

These forestry sites have distinct ecological and silvicultural similarities and are within nine miles of each other in the Scottish Borders.

Stand history and current composition

These sites had carried mature broadleaved “policy woodland” stocking throughout the 18th and 19th centuries, predominantly of oak, ash, sycamore and beech, with specimen conifers. From the 1920’s onwards, under the seventh and eighth Dukes of Buccleuch, a programme of stand diversification with Douglas fir, grand fir, western hemlock and larch was pursued, using a small group fell-and-replant strategy. Hence current stocking in those areas managed under ATC is very mixed with a roughly even division between conifers and hardwoods. Some parts of the woodlands retain a detectable group structure with distinct stands of Douglas fir, grand fir, larch, beech and mixed oak-ash. Other areas, especially near the Bowhill House and at Eildon, comprise intimate selection mixtures of beech, sycamore and a wide variety of conifer species. Natural regeneration varies across the woods - in many older beech and conifer stands there is an understorey of shade-tolerant coniferous regeneration (grand fir and western hemlock) but a period of under-thinning in the 1970’s and 1980’s tended to restrict or delay the development of natural regeneration of less shade-tolerant species such as Douglas fir, oak, ash and larch, which are only now emerging.

Silvicultural treatments applied to date and intended future silviculture

The original approach to transforming stands to alternative silvicultural systems at Bowhill and Eildon was to fell small groups of trees (mainly mature broadleaves) and replant the resulting gaps with desirable conifer species such as Douglas fir or larch. The intention then was that these groups would be thinned, gradually moving the forest towards a complex, irregular structure within which natural regeneration would become the main method of restocking over time. The group felling and replanting work was pursued over several decades from the late 1920’s until the 1970’s, but there was a lack of thinning in the 1970’s and 1980’s, resulting in an increase in stand basal area that precluded natural regeneration other than of the more shade-bearing species (*Abies* firs and western hemlock). Over the past twenty years the emphasis has

been on resumption of thinning to allow a wider range of species to regenerate, but there remains a role for group replanting in some areas of the woodlands. Around 80% of the stands under ATC are managed under this “group selection” system. A further 10% of the area nearest the houses at Bowhill and Eildon is managed on a “single-tree selection” basis for landscape and amenity reasons, with tree species and size classes in intimate mixture. The final 10% of the area is managed on a “irregular shelterwood” system where the overstorey will eventually be removed, allowing the planted or regenerated understorey to grow away - this approach is favoured in quality hardwood stands and in situations where a predominance of conifers is to be kept.

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

Due to the long-established practice of alternative silvicultural systems at Bowhill and Eildon (essentially based on group and single tree selection) many areas of the woodlands can be considered to be in *developmental category 1* (complete/ near complete transformation), with much of the remainder being in *developmental category 2* (progressive/ advanced transformation). Natural regeneration does occur, particularly of the shade-tolerant conifers (e.g. *Abies* and *Tsuga*) with beech, but there remains a considerable reliance on small coupe replanting with desirable species. While there may well need to be adaptation to climate change and pest/ disease factors in the selection of preferred tree species (e.g. larch), there seems every likelihood that ATC will continue to be the main approach applied at these sites.

Commentary on inventory and monitoring protocols/ demonstration potential

Simple semi-quantitative assessments of growing stock are made to guide thinning and group selection fellings, but there is no detailed enumeration of the FCIN45 type. Both Bowhill and Eildon Estates have long fulfilled an informal role as ATC demonstration sites by hosting organised forestry visits. That would remain the most suitable approach at Eildon, but self-guided interpretation materials could perhaps be prepared for the Bowhill woods, consistent with the current access and trail routes.

Commentary on economic and operational implications of ATC adoption

Buccleuch Estates have developed considerable experience in operating their woods under alternative silvicultural systems and marketing valuable/ specialist timber arising from this management (particularly large-dimension Douglas fir and larch). There are no significant operational issues. It is difficult to compare this approach to more conventional plantation forest management on economic grounds, as there are few properties that place such emphases on production of premium timber grades.

Other relevant field examples recorded within the project

Due to the mix of shade-tolerant coniferous species used for productive forestry under ATC at Bowhill and Eildon Estates (together with Drumlanrig), there are relevant comparisons with Cirencester Park Estate (Case Study 2), Tavistock Estate and Dartington Hall (Case Study 18), Longleat Estate (Case Study 14), Ffrwdgrech Estate (Case Study 5) and Weasenham Woods (Case Study 30). Buccleuch Estates are unusual in Scotland in adopting this range of species and silvicultural methods.

Photographic record



Left: landscape view of the
Pernsassie Hill block

BOWHILL ESTATE

Right: stand combining high quality
larch with shade-tolerant conifers



Left: mixed stands of hardwoods
with western hemlock and *Abies*
firs, The Cants

BOWHILL ESTATE

Right: natural regeneration of mixed
conifers under group selection



Left: advance regeneration of
western hemlock

BOWHILL ESTATE

Right: advance regeneration of
Abies firs



Left: landscape view of the Eildon
Hall woods from the south

EILDON ESTATE

Right: typical mixed hardwood-
conifer selection stand at Eildon



Left: typical mixed hardwood-
conifer selection stand at Eildon

EILDON ESTATE

Right: mixed species natural
regeneration under beech
shelterwood



Left: group selection replanting with
conifers and hardwoods

EILDON ESTATE

Right: recruitment of mixed
coniferous regeneration group under
beech shelterwood

