

Irregular Silviculture Transformation in Practice

edited by James Walmsley of Bangor University, Woodland Heritage Trustee

“Let me tell you something. You need a transformation. I need a transformation. The way the forest is managed needs a transformation.” The reflective thoughts of David Lasala, one of the participants in this highly respected two day course run by Andy Poore and David Pengelly of SelectFor. Woodland Heritage generously supported six attendees of the most recent iteration (autumn 2016) and this article is an edited version of **individual write-ups** provided by each of the following attendees: Tom Haynes, Adrian Murray-Walker, David Lasala and the three Jonathans: Jonathan Burton, Jonathan Spazzi and Jonathan Tompson.

Background to the course and introduction

Delivered by Continuous Cover Forestry (CCF) experts Andy Poore and David Pengelly, this course comprises a series of lectures and field visits to educate participants on the practical steps required to transform even-aged stands to ‘permanent irregular’ stands. The beautiful and enchanting Stourhead (Western) Estate plays host to lectures and site visits, the combination of which makes a convincing case for the virtues of CCF. **Jonathan Tompson**

Over its history the forest at Stourhead has been managed for its aesthetic value and particularly as a backdrop to the Estate’s renowned gardens. So much so that in 1898 a policy against large-scale clearfelling was implemented. Through clearing only small areas at a time, the forest developed into a patchwork of small even-aged stands, each one varying from the next in age and species. When Andy and David got involved with the Estate in the mid-90s they began to break up this uniform stand structure by felling and thinning across boundaries, and managing not by area but on a tree-by-tree basis. Here the objective is to make the most of every good tree (in terms of timber production) and for every tree to reach its financial optimum. **Jonathan Tompson**



Participants select which trees to remove in a marking exercise. Factors such as quality, vigour, diameter and stability must all be weighed up in reaching a decision for each tree



Mixed conifer natural regeneration beneath small canopy openings. Later this will be respaced to favour Douglas Fir and Western Red Cedar due to their high timber value



"I arrived on day one with 15 minutes to spare and the course commenced in the village hall after tea/coffee and introductions. I was pleased to meet quite a wide and varied number of people from all over the UK and some fellow students from Bangor University. We received a very informative series of presentations from David Pengelly and Andy Poore which also kick-started some interesting debates from other attendees regarding the methodology for tree selection on the estate and the rationale/driver for adopting the selection system instead of other silvicultural practices."

Adrian Murray-Walker

Day 1 – morning

The first morning provided a brief and highly informative grounding in the fundamentals of irregular silviculture. The distinction between selection and shelterwood systems was defined and the suitability of each system to particular situations was made clear.

As the course focused on lowland CCF, selection systems were given priority. Day one focused primarily on conifers and the transformation of even aged stands to more diverse structures. A key principle in driving this transformation is the need to 'forget about spacing' and focus instead on the quality and vigour of individual

trees. In order to do this it is necessary to set a target diameter for trees based upon their optimum financial value. When this is done alongside having a target basal area based on fostering ideal light conditions for regeneration, a stand will progress through a number of structural stages until its optimum equilibrium structure is reached.

The morning session also provided a brief and informative introduction to the economics of irregular silviculture. The key is to see the forest as continually accruing interest each year through incremental growth: in order to profit from this, the growth should only be harvested at the optimum time.

Day 1 – visit to Dropping Gutter, Stourhead (Western) Estate

The course visited a host of varied and worthwhile locations to convey SelectFor's approach to transformation. The first visit was to Dropping Gutter at Stourhead Western, a site which is nearly halfway through its transition to an irregular selection forest (ISF). Participants' eyes were immediately drawn upwards to the





Marteloscope exercise in action

towering canopy trees of Douglas Fir (*Pseudotsuga menziesii*) intermingled with Sitka Spruce (*Picea sitchensis*) and the occasional Red Cedar (*Thuja plicata*). Once accustomed to the light levels, eyes were cast across the cones of regeneration. The instructors then drew us into their thinking, kindly imparting useful rules of thumb such as prioritising extraction layout and prioritising stems with a future rather than getting lost on developing regeneration: achieving the correct light levels can take care of that. Also discussed was the role of tending, thinning and harvesting operations to develop both quality and the desired mix of species within the compartment, whilst being guided by optimum felling diameter.

Jonathan Burton

Day 1: marking exercise using the Marteloscope method

A big draw of the course for many of the participants is the opportunity to pit their tree marking skills against the clock and against the experts – and to learn how best to mark stands for transformation. The use of this “Marteloscope” – a completely enumerated hectare plot – enables the recording of participants’ choices of which trees to fell and which to retain. This can then be accurately modelled using a spreadsheet to provide a detailed breakdown of the consequences of their actions on the future development – and transformation – of the stand.

The SelectFor approach to selection

Firstly trees are graded from A to D. Grade A trees (‘stems with a future’) are favoured at each intervention and retained until they reach their target diameter. Many of the low quality C and D grade trees, and trees that have either reached their target diameter or are unlikely to increase in value, are removed. In a more conventional system you might have to keep poor quality trees that are well spaced and remove the higher quality ones that are not, but CCF is not constrained in this way. When marking a thinning,

David and Andy don’t fell a good tree purely because of where it is (unless it’s on an extraction rack). In fact, ‘clumpiness’ is a desirable stand attribute, and those areas with a lower basal area will benefit the more light demanding species both in the understorey and the mid-storey.

The marking exercise

Participants were tasked with achieving the hypothetical goals of maintaining or enhancing future increment, improving the quality of the stand, and removing an ideal volume. In order to do this, they used a target diameter for each tree species, as well as class and grade of tree, and then proceeded to mark trees equivalent to approximately 25% of the basal area for future felling. Participants found the marking exercise to be extremely useful in reaffirming the principles that had been discussed in the morning session. Deciding which trees to mark for removal entailed selecting a balanced mix of high quality large dimension Douglas Fir that had reached its optimum financial value, alongside lower value poorly formed or oversized specimens. Advice and discussion between groups and the course leaders regarding trees for removal made for a fun and thoroughly enjoyable method of learning. Andy and David were available throughout the exercise to discuss approaches and reinforce rules of thumb – a favourite being “*Think twice about removing a below optimum sized tree, and then leave it*”.

Results from the marking exercise

There was by no means a consensus; certain trees were not selected by any group, whereas other trees were marked by everyone. Yet the results were found to be very useful in helping to understand the implications of each individual removal – or retention. Variation between groups was mainly due to a select few high value Douglas Fir either being retained or removed. The principal of focusing on removing the poorer quality trees had been applied successfully by every pair and meant everyone had understood the primary objective of the exercise. Some pairs found that they could have removed a greater quantity of material – there was a tendency to be over-cautious.

“Being able to interpret your practical decisions within a real plot was extremely worthwhile, especially in developing an understanding of your own personal attempt at marking a transformation thinning. The experience will form an important future reference point for many of us.”

Jonathan Burton

Harvesting and marketing of timber from irregular stands

Day one finished with another classroom session, this time focusing on the harvesting and marketing of timber in irregular stands. In order to implement selective harvesting systems, a thorough and comprehensive network of extraction racks and tracks are absolutely essential.

Detailed advice and guidance on implementing this infrastructure in various types of stands was provided and the numerous advantages and drawbacks were outlined. Successful marketing is crucial in making CCF systems sustainable. In the case of Stourhead large diameter Douglas Fir offered the most profitable return, unlike large diameter Spruce which accrues very little value above 45 cm dbh. The key point regarding marketing of timber was that every possible market should be explored, no matter how niche or unlikely.

Day 2 – irregular silviculture in broadleaf stands

The morning session explored the problems faced when trying to achieve sufficient, but not excessive, natural regeneration in broadleaf stands. This can be controlled through careful manipulation of light conditions and ground vegetation. The session concluded with an introduction to how irregular silviculture can be conducive to the restoration of plantations on ancient woodland sites (PAWS). Successful restoration often requires numerous thinning interventions and continued protection and expansion of natural remnants. Careful consideration should be given to ground flora, an equally important component of any ancient semi-natural woodland (ASNW). **Tom Haynes**



A diverse understorey at Stourhead

Despite that fact that hazel coppice was abundant, numerous attempts to market coppice material had not been successful. Yet, even without a market, the dense coppice cut prior to each intervention earned its keep by suppressing coarse vegetation and providing a conducive environment for canopy regeneration – clearly providing a valuable service.

Concluding remarks

One of the major benefits of a permanent irregular system is that regeneration niches stay open for longer due to the retention of the canopy as a control mechanism for ground vegetation. Equally, canopy retention can serve to control potentially excessive (and undesirable) levels of natural regeneration, which may be costly to respace. Ideally, regeneration is not desirable in high densities; its distribution and quality is much more important, as only those individual trees of the best form, and which are in the right place within the stand structure, will be recruited to the canopy.

CCF is also beneficial operationally due to its ability to deal with stands that are inherently variable in terms of species, size and quality. This is of particular importance to UK forestry given the more recent trend in planting mixtures of species. Mixed species stands naturally develop greater stand structure variability due to variations in growth rates between species, so it is imperative that we develop the expertise and capacity to capitalise on this.

Jonathan Tompson

“The patience and expertise of the course leaders, coupled with a friendly learning environment, encouraged an open and honest exchange of ideas and knowledge.” Tom Haynes

Individual write-ups are available on request. Each and every one of these participants expressed their gratitude to Woodland Heritage for supporting their attendance and extended notes of appreciation to David Pengelly, Andy Poore, and to the various estates which hosted such invaluable site visits.

EDITOR'S NOTE

Our sincere thanks and appreciation go to James Walmsley for editing these six reports.