

Irregular Silviculture in the Lowlands:

Transformation in Practice course

by Dan Brown and Frank Tiramani

The day began with a presentation, liberally interspersed with discussion and tea, led by Andy Poore of SelectFor. The presentation introduced the key ideas and principles of Irregular Silviculture.

We attended the course run by SelectFor at the Stourhead Western Estate in April to learn about transforming even-aged plantations into effective Continuous Cover Forestry (CCF) systems, where the estate has some of the finest working examples in the country. Having mostly been taught the dark art of conventional, even aged forestry at Newton Rigg during our degrees and during work placements at the Cowdray Estate (Frank) and Pryor and Rickett Silviculture (Dan).

Walking into the forest at the Stourhead Western Estate gave the impression of walking into another country with an even more alien world of silviculture and mensuration to match. Here, Douglas Fir was growing commercially to 100 years or more with successful regeneration being raised in clumps of different ages and sizes amongst other species including Spruce, Western Red Cedar, Larch and hardwoods.

Coming to the course we wondered how it would be possible to teach the intricacies of such management on a one day course, but left very impressed and wanting to learn more after having this mysterious world opened up to us by thorough yet easy to grasp explanations in the classroom and hands-on experience in the forest. Also, by first looking at the driving forces behind transformation to CCF, we were able to put the system into context and appreciate its relevance today and the future. The two main driving forces are economics and sustainability.

The Course concentrated on the creation and management of permanently irregular structures, otherwise known as the selection system. Having been involved in forestry for a few years now, the principles and practices upon which the selection system is built were often intriguing to us, and we can very well see how to those being involved in



forestry for some time longer, they could be seen as somewhat more radical!

Typical Advice

“Forget about spacing...”
“Don’t fell a good tree because of where it is...”

“Clumpiness is good...”

Neither is the selection system to be grouped with irregular shelterwoods, for there are some fundamental distinctions. Interventions in shelterwood systems are directly related to regeneration. The selection system is primarily concerned with the whole stand, and as such, interventions are not planned around regeneration. The regeneration and subsequent structure in irregular stands

occurs as a result of management interventions, not as an aim.

Why Irregular Silviculture?

But why should we consider the selection system instead of, say, an irregular shelterwood system? The main reason is competition. Due to our relatively fertile soils (in the lowlands) we will undoubtedly get severe competition from weeds which don’t have such a hold over the Channel where Oak can regenerate abundantly in well managed shelterwood systems.

Some of the soils in France where Oak is grown are so acidic that if the forest managers get the regeneration wrong they can end up with heather, in which case those responsible get the sack! This creates a need to manage the canopy so that an optimum level of light reaches the potential seed bed below.

Looking to economics, the utilisation of natural regeneration is an aid in breaking the association of harvesting income with restocking costs. The selection system allows any natural regeneration to be utilised fully, working towards an ideal of no restocking/regeneration costs at all.

Then, interventions, based around the given principles of maintaining all vigorous, quality stems until they reach their financial peak (different to your

usual maximum mean annual increment age), creates a system of optimisation at tree level as opposed to compartment level. The financial optimum varies between species and their markets; most striking was how Douglas Fir reaches its peak when the DBH is around 90cm. As well as being a premium large timber, this optimum was related to the discovery that it puts on increment at a faster rate later in life when the canopy was exposed and isolated. Due to the immense size of the individual trees, only two are needed for a load so this again reduces the harvesting costs (of course being motor manual) compared to the same volume of smaller diameter timber.

Sustainability, being another driving force behind irregular silviculture, is in-built in the system,

“Resilience is the ability of a system to absorb disturbance and still retain its basic function and structure”

According to Forest Research, wind-throw as a result of climate change is set to have an increasing effect on forests in the UK. A selection system whereby clearfelling is avoided is likely to withstand wind-throw even than a shelterwood system. In the event that the larger trees do blow over, there will be an established younger generation ready to take over in time rather than a bare site. Additionally, over time, permanently irregular stands become seed orchards for ‘plus trees’ in themselves. Years of selecting for good form through removal of poorer phenotypes, naturally means the genetic makeup of the stand becomes improved, giving regeneration of better form trees.

The science behind irregular silviculture is well researched and documented and with help from the AFI (Association Futaie Irreguliere) and their established network of research sites, a key tool which has made its way into the CCF practitioner’s box is the Marteloscope. *The Marteloscope is a one hectare plot in which every tree is located, numbered, measured and graded.* An associated Excel workbook clearly displays all stand characteristics including volume distributions by species and quality, number of stems per species and crucially where capital is held. This allows proposed harvesting data to be entered and the resulting stand structure can be analysed, showing the financial and remaining value results which different interventions may bring.

Conversion to an Irregular Structure

Principles used in Central Europe were related and transformed to work with the climate, soils and existing species we have here. The key one is Douglas Fir, but other species including Western Red Cedar, Larch, Sitka and Norway Spruce, Oak and Ash were discussed and even included in the Marteloscope stand.

As already mentioned, controlling the light that reaches the forest floor and potential seed bed by using the canopy is paramount to allow regeneration, but to avoid potentially disastrous weed growth. Of course different species have different shade tolerances so naturally the light levels can be altered to suit what you intend the dominant tree regeneration to be. Light is a hard factor to measure and in turn manage, so the principle of using Basal Area (BA) as an indicator of stocking and therefore light levels was introduced. In general, when converting from an even-aged stand you would of course initially try to remove the poorer quality stems in your first thinnings, but when it comes to the age where the crop is able to seed, you should anticipate this and knock the BA down to below what the ideal BA would be in the long term (again differs according to species) to enable any regeneration to grow.

Clumps of regeneration can then be tended to once they are well established where unwanted species can be removed and the better quality stems (so called stems-with-a-future) can be selected and re-spacing be carried out.

One such ‘unwanted’ species is usually Western Hemlock. Interestingly here they actually used its ease of growth under a shady canopy and the dense shade it then imparts to their advantage; using it to keep the soil and potential seed bed below free from other weeds and receptive to seed fall and germination. Once the time came for thinning and therefore letting light in for the desired regeneration, the Hemlocks can be removed while at the same time exposing the receptive seed bed below.

The Course

An enormous amount of useable information was squeezed into the course and, because it included a practical marking exercise, analysis of our own work and succinct handouts, most of that information has been retained! The structure of the course was excellent; just as it seemed that the inevitable fidgeting associated with putting a dozen or so foresters, woodsmen and general outdoorsy types indoors on a (reasonably) fine day, seemed to be getting out of hand, we were out in the woods and marking trees for ourselves.

And the setting was perfect. The grounds, and in particular the woods, at the Stourhead Western Estate are really superbly managed. In fact, describing the woods as being impeccably managed to sound scientific principles is to do them an injustice; they’re also beautiful. Highly productive woods, ecologically diverse and robust, and in harmony with the landscape; sustainably managed, and showing financial returns. Surely, this is what it’s all about. 