

therefore leading to still shallower rooting. On this evidence at least it would appear that the long term viability of a clearfell system may be in doubt.

Finally, continuous cover forests are by definition more environmentally sustainable, and are more pleasant places to spend time in – another important consideration in view of our forests' recreational role.

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countries; and across Europe the size of clearfelling coupes allowed has been steadily decreasing. At a theoretical 25 hectares, our maximum felling coupe size is one of the largest allowed in any European state – itself rather bizarre given our small total forest cover, and small average forest size. Both the FSC and the PEFC certification standards for Ireland incorporate provisions to limit the extent of clearfell as a proportion of the total woodland area, and to ensure that even-aged woodlands are gradually restructured to allow a greater diversity of ages and habitats. All these trends are set to continue, moreover society at large is becoming increasingly uncomfortable with the scars on the landscape caused by clearfelling – whatever about the disturbance to wildlife, even the most die-hard proponents of the system are unlikely to argue that a recently clearfelled site is a tourist attraction.

But this is to view CCF as an alternative in a negative light, when in fact it has many advantages. To look first at what some would see as a disadvantage, Irish foresters tend to be shocked at the level of management input when first visiting examples of CCF in Europe. Even though in many cases the forests are huge in comparison to our own, they are often sub-divided into small management units and their managers have an intimate knowledge of the growing stock, sometimes right down to individual tree level. But management is no bad thing, provided it's focused in the right direction – no business ever suffered from good quality management and attention to detail.

Once the conversion to CCF has been achieved, the financial benefits can be significant. Rather than concentrating the bulk of the returns at the end of the rotation, followed by the considerable expense of replanting and then no income at all for 15-25 years, CCF provides the owner with a regular income in perpetuity, and, it is argued, much lower costs. The system concentrates on removing the best, largest and most valuable trees, while the smaller trees are left to grow on, and only the increment is removed as income, so the forest “capital” is retained. As the species mix becomes more diverse, it opens up greater marketing opportunities.

Permanent forests are healthier and trees perform better in a CCF system. They benefit from the microclimate which is created by the permanent forest conditions, and the understorey helps to maintain moisture levels and a constant temperature within the stand. They are also rather more stable, a particularly important consideration in Ireland where the risk of catastrophic windblow in our conventional plantations remains high.

European experience has shown that continuous cropping of Spruce can result in a deterioration of stand quality over time. While it is true that the second rotation, especially, will usually be a of a higher yield class than the first, subsequent rotations have proved to be less robust and productive. One explanation is that this is due to the shallow rooting system typical of Spruces – constant swinging in the wind results in increased soil compaction, reducing aeration and

- In these early thinnings, selectively thin the poorest quality trees, regardless of size. The intention is to gradually improve the overall quality of the growing stock, which will vary in size.
- Don't be overly concerned about spacing – resulting gaps will create opportunities for the manual introduction of other species and natural regeneration.
- Once a stand of consistent quality has been achieved, change the thinning regime to remove the largest trees. As these are the most valuable in the stand, thinning will quickly become more profitable. This is perhaps the hardest aspect for foresters used to the conventional system to embrace as we are all programmed to select the largest stems as our final crop trees and to thin to these.
- Never thin more than the increment – the aim, after all, is *sustainable* forest management.

Over time, this regime should produce the conditions where regeneration will naturally follow. However there are certain conditions which will prevent this if allowed to persist. These include browsing mammals, which must be controlled; an unreceptive seed bed – scarification may sometimes be necessary; and competition from weeds, as there is always a delicate balance between allowing sufficient light for seedlings to thrive and not so much that invasive weeds suppress them. On occasion chemical control is necessary.

While natural regeneration is the goal, sometimes it's slow to get going at first, in which case some planting after the first and second transformation thinnings may be required. Experience has shown that natural regeneration usually follows quite quickly after such planting.

In Ireland, interest in CCF has been growing steadily since the Irish branch of Pro Silva had its inaugural meeting in 2000, since when a number of forest owners, including Coillte, have started the transformation process in some of their woodlands. Pro Silva is a European federation of foresters and forest owners committed to the concept of CCF, and acts as a forum for the dissemination of views, knowledge and experience gained.

Part 3

Last week I wrote about the concept of continuous cover forestry (CCF), also frequently called close to nature forest management, and gave a few pointers on the methods employed to convert a conventional plantation to a CCF system over time. This week I will look at some advantages of close to nature forest management.

Before foresters and owners alike dismiss CCF as a viable, even desirable, option for their forests, perhaps they would do well to consider the long term global trend towards the more sustainable stewardship of all our resources. Certification of sustainable forest management is in all likelihood here to stay; as we have seen, clearfelling is now illegal in some European

quickly as possible previously forested land that had been lost to agriculture. While Sitka Spruce is not normally a pioneer species, it has nevertheless served this function extremely well.

This alternative view is the one taken by the proponents of an entirely different form of silviculture, known as continuous cover forestry (CCF), or sometimes “close to nature” forest management. This is a management system that works closely with natural processes to ensure the forest cover is maintained indefinitely, and ultimately benefits the forest owner, the environment and society in general.

CCF is far from a new concept and has been practiced widely throughout Europe for generations. In some countries, for example Slovenia where, with Switzerland, the “modern” concept of CCF was pioneered in the late 19th century, clearfell is illegal. A number of other countries with very similar afforestation histories to our own are now implementing it as policy – in Denmark it is now national forest policy that all forests are managed using a close to nature system, and in Wales the policy is that 50% of all forests are to be similarly managed.

Part 2

The ultimate goal of CCF is to achieve an uneven-aged, mixed species woodland, where conditions conducive to natural regeneration are fostered, obviating the need to replant manually, and where individual trees are micro-managed to maturity. The end result leads to greater biodiversity, a healthier woodland, and one to which people, as well as plants and animals, undoubtedly respond more positively. Is it possible, though, to change course mid-rotation and convert a typical plantation of a few hectares of Sitka Spruce, originally planned with three or four thinnings in mind before clearfelling, to a continuous cover system of management? The answer to this question is that yes it is, on many sites, and provided an informed decision to do so is taken early enough.

The first thing to accept is that nothing in forestry happens overnight, with the exception of catastrophic events such as fire and windblow. Conversion to CCF will take many years, but it is achieved through the thinning process so income from those thinnings during the conversion period will still be realised. A series of “transformation” thinnings must be undertaken, however these entail a different approach to that taken in conventional thinning. A few tips on how to go about transformation thinning can be summarised as follows:

- Thin early, and often. This will have the added effect that individual trees will develop a lower centre of gravity and therefore become more windfirm.

Continuous Cover Forestry

Part 1

Over the last century, a combination of the State and thousands of private landowners has succeeded in establishing an almost entirely new forest estate that now covers about 10% of the country. This is a remarkable achievement by any standards, and one that could not have been possible without the introduction of foreign species of tree, principally Sitka Spruce and Lodgepole Pine, with to a lesser extent species such as Norway Spruce, Douglas Fir and Larch. It was doubly impossible to achieve this level of forest cover without the introduction of these ‘alien’ or ‘exotic’ species because, due entirely to geological accident, Ireland has a very limited range of native species with which to work.

The silvicultural practices we have adopted and developed with these plantation forests are essentially not dissimilar to food production – the land is prepared, the crop planted and tended, and finally harvested. The difference, of course, is in the length of time between sowing and harvesting the crop, but in many respects our conventional forest management can equally well be described as “tree farming”.

The clearfell system of silviculture that we practice has a number of attractions. It is straightforward to plan and execute, it is relatively easy to predict how a plantation is going to behave, and the final harvest is simple – just remove every tree from the site before replanting and starting the cycle again. In fact, after 100 years and with our favourable conditions which result in such high growth rates, in some areas we are now already well into our third such cycle.

However, despite all these attractions there are a number of distinct disadvantages. Is our current system in fact the best approach to adopt for even the medium, let alone long, term management of our forests? Increasingly such questions are being asked, and many experts believe that planting, clearfelling and replanting on a 35-40 year rotation is not the best way forward.

Because of their permanence, forests are fundamentally different to other forms of agricultural land use. Over time, flora and fauna colonise them in a way that is impossible in annual crops; they form permanent landscape features; and they become culturally very significant, sometimes iconically so. It is now universally accepted that for a forest to be managed in a truly sustainable manner, economic, environmental and social criteria must all be served equally.

The conventional approach regards our plantations as commercial ventures where the felling and replanting will be repeated in perpetuity. A different approach is to view them as pioneer forests, albeit ones that have been pioneered by man rather than their becoming established through natural processes; in other words, they have been planted artificially in order to reclaim as