

Continuous Cover Forest Management



Continuous Cover Forestry (CCF)

Continuous Cover Forestry is a forest management approach suitable to both conifers and broadleaves. It allows for the production of commercial timber while retaining a forest cover at all times.

It often relies on harnessing natural forest processes such as natural regeneration of trees, mixed species, increased biodiversity and natural forest development (forest succession).

For this reason it is also known as Close-to-Nature Forest Management.

Working with natural forest processes.

Forests evolve naturally through stages from young, simple structures to older, more complex structures.

During this process productivity and resilience to threats from pests, diseases or wind, progressively increase until trees become over-mature, when productivity finally declines (Diagram 1).

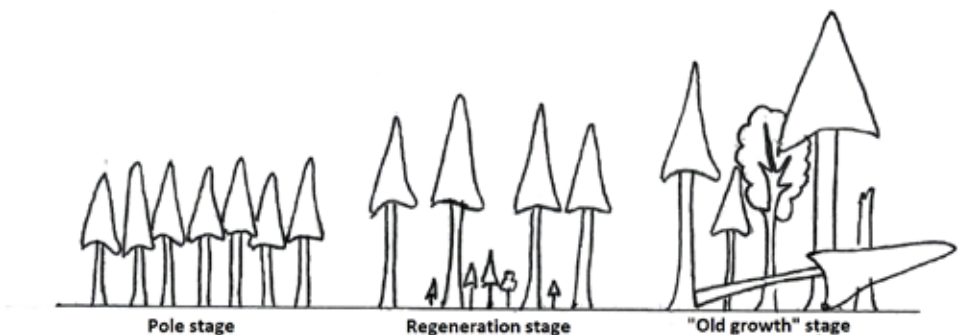


Diagram 1. Natural forest succession phases.

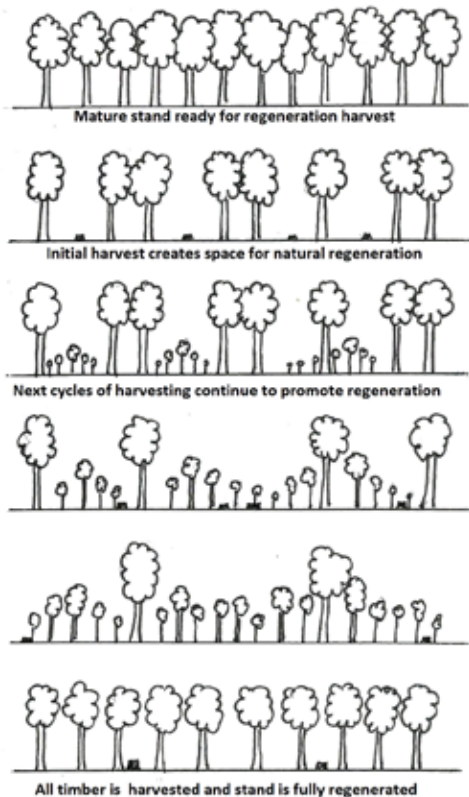


Diagram 2. Schematic representation of a CCF / group shelterwood system.

CCF management aims to work with this natural process. This maximises both productivity and resilience and is achieved by carrying out cyclical thinning.

Thinning can be applied either uniformly over the forest, or in groups according to the forest development stage and tree species characteristics.

CCF encompasses a number of silvicultural systems (such as selection and shelterwood systems) each suited to different circumstances (Diagram 2).

Single tree (or group) selection system:
single trees (or groups of trees) are removed, creating openings in the canopy.

Shelterwood system: the old stand is progressively removed while the new generation of trees gets progressively established.

Harvesting therefore not only generates a sustained yield income, but also rejuvenates the forest and makes room for new generations of trees to grow into the canopy. These usually come from in-forest seed germination (natural regeneration) but can also come from tree planting (enrichment planting) (see images on the following pages).



Group harvesting in Sitka spruce with onset of natural regeneration. Raheen, Co Clare.

Photo by Jonathan Spazzi.



CCF management in Baronscourt, Co Tyrone.

Photo by Donal O Hare.



Natural regeneration in Spruce under CCF transformation. Knockrath, Co Wicklow.

Photo by Phil Morgan.



Natural regeneration in high quality Douglas fir stand, Wales. Photo by Jonathan Spazzi.



*Natural regeneration in Spruce CCF/ timber production system, Clocaenog, Wales.
Photo by Jonathan Spazzi.*



Timber as the Forest Interest



Under CCF management the timber is, in essence, viewed as the **interest** generated by the growing **forest capital**.

High quality Douglas fir sawlog in CCF forest, England. Photo by Phil Morgan.

In many respects, managing a forest for timber under CCF can be compared to the process of rearing a herd for beef production. To the suckler beef system, the suckler cows are the capital and the calves are the interest:

	Beef	CCF
Capital	Selected breeding herd animals	Selected high quality standing trees providing seed
	Herd genetics, quality and productivity improves	Forest genetics, quality and productivity improves
Interest	Live weight of beef sold	Timber sold



Conifers and broadleaves managed as mixtures under CCF. Raheen, Co Clare. Photo by Jonathan Spazzi.



CCF management in broadleaved forest. Photo by Phil Morgan.



Forests fulfil a wide range of services (water protection, landscape, biodiversity) important to society well-being, Co Clare. Photo by Jonathan Spazzi.

Benefits and Constraints

Compared to the current clearfell / replant system where all trees are harvested / replanted once at the end of the rotation, CCF offers the possibility to harvest a similar timber volume over the same period of time but in regular instalments (3-6 years) and without any loss of forest cover. This has a range of potential benefits but also some constraints.

Benefits

- Regular income and forest capital value increase
- Higher quality timber potential and greater proportion of sawlog from each harvest
- Market flexibility and greater timber assortment
- Sustained skilled rural employment potential
- No large scale, or open field, replanting
- Increased pest protection
- Soil and water protection
- Permanent flood protection: permanent deep rooted forests intercept, slow and retain large amounts of water due to deeper soil percolation
- Enhancement of biodiversity in forest by maintaining forest condition
- Wildlife and landscape enhancement
- Climate change resilience and long-term carbon store
- Opportunities for alternative forest uses (e.g.: eco-tourism, game shooting, wild edible mushrooms)

Constraints

- No large timber sale or payment at any one time
- Regular monitoring required
- Possible higher level of road density and maintenance required
- The greater species range and larger dimensions of timber (>50cm Diameter at Breast Height or dbh) typical of CCF might be more difficult to sell to current Irish sawmills
They are currently predominantly set up for one species (Sitka spruce) of smaller uniform dimensions (generally <40cm dbh)

Plantation Transformation Process

Most current Irish forests are young, single-aged monocultures. To be managed as permanent forests, a transformation into a more complex, stable structure is required.

Transformation involves crown thinning, where some dominant and co-dominant trees are removed from the upper canopy.

Stand stability is an important factor in considering transforming to CCF. It is not an option for all sites as issues with elevation and soil quality might undermine forest wind stability during the transformation.



*Selective thinning in CCF transformation showing better quality trees (marked in white) and stumps of removed competing trees, Ballycullen, Co Wicklow.
Photo by Jonathan Spazzi.*

Sheltered sites with free-draining soils are most suited. High deer density sites would also be difficult to transform to CCF due to browsing of young trees if adequate deer management is not in place.

The transformation process can be summarised as follows:

Development Stage	Activities
Forest in transformation	<p>Selection for quality involves conventional early first thinning and a more selective approach from second thinning onwards where trees of good quality are retained, regardless of their size.</p> <p>Gradual improvement of forest stock through the selection and retention of high quality trees from which natural regeneration will be derived.</p> <p>Grow your quality forest stock to optimum tree dimensions and volume.</p>
Successfully transformed to continuous cover forest	<p>Harvest a regular volume of quality timber, resulting in the rejuvenation of the forest.</p> <p>Learn from your forest and refine management over time.</p>

Forest owner Paddy Gleeson selecting and promoting a quality tree in his 20 year old broadleaved plantation. Bodyke, Co Clare.

Photo by Jonathan Spazzi.



CCF in Ireland

CCF is relatively new to Ireland but has been practised widely throughout Europe for many years. In recent years, Coillte and a growing number of private forest owners across Ireland are initiating transformation to CCF. In addition, a number of CCF monitoring sites has been established.

All of the above will provide useful insights on best practice for this forest management approach under Irish conditions.



Pro Silva Ireland CCF field day. Pro Silva Ireland promotes CCF management through open days, forest site visits, discussions and information dissemination (www.prosilvaireland.wordpress.com). Photo by Jonathan Spazzi.

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