A Quick Guide to **Continuous Cover Forestry Practice** in Ireland

08

Light forest operations

PRO SILVA IRELAND

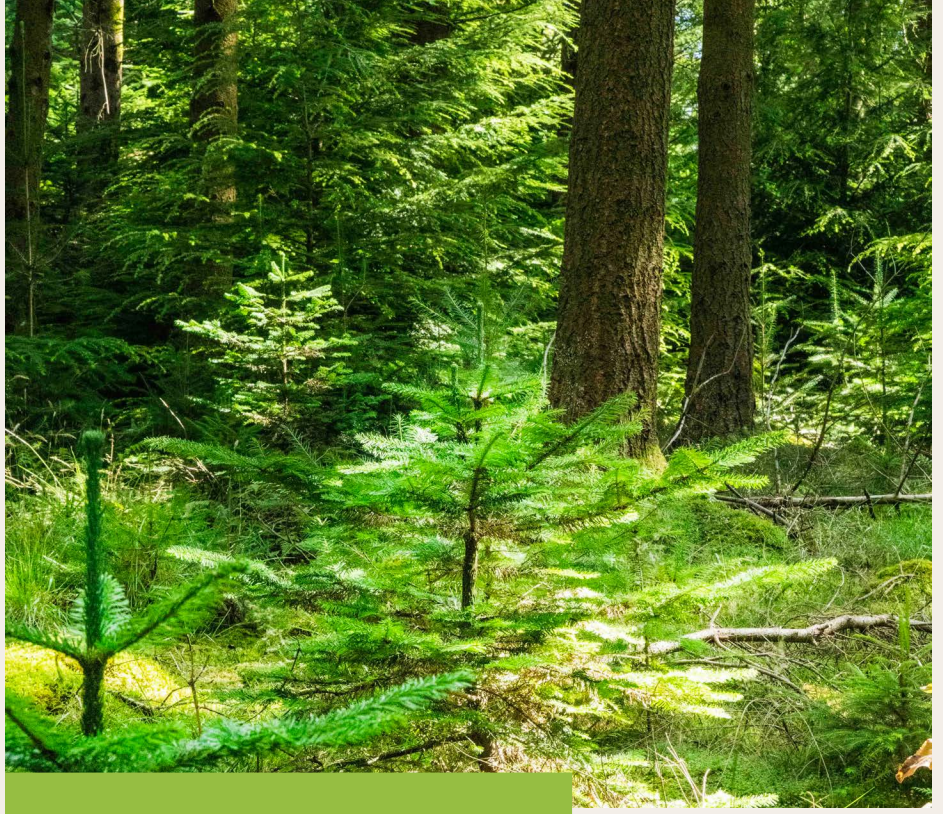
www.prosilvaireland.com

Continuous cover forestry (CCF) is an approach to forest management that works with natural processes to produce quality timber, while maintaining and enhancing other forest functions within a permanent forest structure.

In CCF, tree selection for thinning and harvest is the primary means for guiding forest development. This approach is supported by light forest operations, which are fundamental silvicultural interventions used to improve quality in a stand and to direct natural processes.

In young forests, light operations are essential tasks carried out between establishment and first thinning. These operations focus on successful forest establishment, improving tree form and preparing the plantation for future management operations.

As a forest under CCF management matures, the emphasis of light operations shifts to the understorey, where they are used to guide the development of natural regeneration beneath the main canopy.



Role of forest owners

Light forest operations are particularly well suited to active forest owners because they:

- Require minimal equipment
- Focus on a small number of key stems
- Offer a cost-effective means to improve long-term stand value

With appropriate training or guidance, forest owners can carry out these operations safely and effectively. By undertaking light forest operations, owners develop a deeper understanding of the natural processes underpinning timber production and gain insight into the unique ecological character and dynamics of their own forest.

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Young forests

Regardless of the long-term management objectives, all young forests require a degree of maintenance and light intervention to promote the development of high quality trees.

Establishment phase

In newly planted forests, establishment and early maintenance works are typically overseen by the registered forester during the first four years after planting. However, forest owners should regularly inspect the planted site to ensure successful establishment. Key activities include:

- **Vegetation control**
  Essential to prevent grass and weeds from competing with young trees for light, nutrients and water.
- **Replacing failed trees**
  Monitoring and replacing dead or poorly performing trees to maintain target stocking levels.
- **Pest and disease control**
  Ongoing monitoring for pests such as pine weevil *(Hylobius abietis)*, which can cause high mortality in young plantations.
- **Shaping of broadleaf trees**
  Removal of forks in young broadleaves promotes straight stems and improves future timber quality.

Early development stage

As the forest develops, the following light operations become relevant:

- **Inspection paths**
  In blocks of conifers, once canopy closure has occurred and lower branches have died, inspection paths are needed to facilitate access and monitoring.
- **High pruning of conifer and broadleaf trees**
  A first “lift” is generally undertaken around the time of the first management intervention in broadleaves and after first thinning in conifers, when lower branches are removed from selected quality trees to produce knot-free timber. A second lift is carried out later, resulting in approximately 6 metres of clear timber.

Forest owners should ensure they understand correct pruning techniques before undertaking this work.

Detailed guidance on all early light operations is available from Teagasc: https://teagasc.ie/crops/forestry/advice/management/

Maturing CCF forests

In more mature CCF forests, light forest operations are carried out within the understorey tree community.

These operations include:

- Early identification of quality trees within natural regeneration
- Release of quality trees through respacing or halo thinning
- Management of species composition and diversity
- Quality improvement, including shaping and pruning where necessary

The light regime, species mix and stage of stand development all influence the type, timing, frequency and intensity of these interventions.

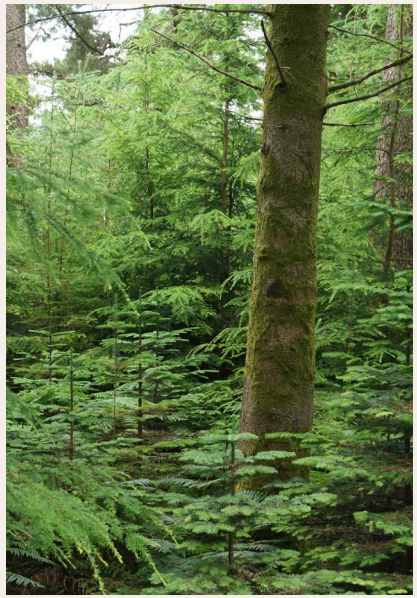
Guiding natural processes

In CCF management, the preferred method of improving tree form and timber quality is through natural competition. Close proximity between trees encourages upward growth, straight stem formation and reduced branching. This natural training of trees occurs throughout all stages of stand development in a CCF forest.

Two key concepts describe these processes: education and qualification.

Education

Education occurs primarily at the sapling and pole stages of tree development, where pockets of dense regeneration (or close planting) creates competition that forces individual trees straight up alongside their neighbours. As clear favourites emerge within a group, light operations are used to respace the group, allowing the best trees more room to develop while maintaining competitive pressure.



Qualification

Qualification refers to the suppression of side branches on pole stage and high canopy trees by species in the lower canopy layers. Saplings of high canopy species, along with low-growing species like hazel or holly, crowd around the trunks of high canopy trees. This shading discourages epicormic growth and helps preserve timber quality.

In some situations, particularly in early transformation where a layered understorey has not yet developed, it may be necessary to shape or prune selected sapling or pole stage trees to maximise future value.

Identifying quality and managing species mix

The first step in managing regeneration is the identification of quality trees within patches of understorey growth.

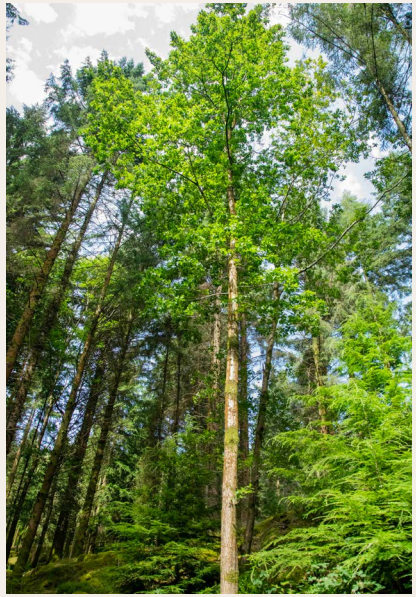
Young quality trees typically display:

- Strong vertical growth relative to neighbouring trees
- Good stem form and clear apical dominance
- Characteristics desirable for future timber production or stand function

The future species mix of the stand is shaped in the selection of quality trees to be released from competition. Desired species, or those underrepresented in the existing canopy, are favoured during early release operations.

Light operations are used to:

- Favour desired species
- Increase overall species diversity
- Correct imbalances resulting from historic management or dominant regeneration



For example, broadleaves such as oak or beech regenerating beneath a transforming Sitka spruce canopy will be favoured to increase diversity by selectively disabling or removing some of the more abundant Sitka spruce seedlings.

Releasing quality and maintaining diversity

Release operations can be carried out at various stages of regeneration development.

Early-stage release

In young regeneration at sapling stage, competitors can be disabled by snapping—bending the upper stem until it breaks.

This is the preferred method to disable competitors, as snapped trees remain alive and continue to provide shelter, education and protection for the quality tree.

Once competitors are too large to snap by hand, small hand tools such as a saw, billhook or slash hook can be used.

These early interventions may take the form of a mini-thinning or halo thinning, depending on the light requirements of the quality tree species.

For larger saplings or early pole stage trees, ringbarking may be used to disable competitors.

Later-stage release

Release may also be necessary at pole stage, depending on the tree species and whether earlier interventions were carried out.

At this stage, release can take the form of:

- Halo thinning, particularly for light-demanding species under strong competition, or
- Re-spacing, where only one or two key competitors are removed.

Re-spacing might also involve cutting back competing stems from the dominant stem (singling) regenerating from coppiced hardwood stumps created during earlier felling operations.

Where early-stage release has been effective, later non-commercial thinning of pole stage trees may be unnecessary, with a later combined CCF thinning proving sufficient.

Forest owners should consult their forester regarding species mix, timing and intensity before undertaking release operations.

Protection and Improvement Functions of the Understorey

While direct competitors to quality trees are selectively disabled, the wider understorey community should be retained wherever possible.

The understorey performs several important functions:

- **Protection**
  Forms a physical barrier that reduces browsing and fraying damage by deer
- **Education**
  Promotes vertical growth and straight stems
- **Qualification**
  Suppresses side branching and improves timber quality
- **Improvement**
  Sustained natural competition enhances form over time

These functions are central to CCF management and reduce the need for costly human interventions.

Timing, intensity and frequency

Decisions on when and how strongly to intervene are based on regular monitoring of regeneration, assessment of light availability and an understanding of species-specific light requirements.

General principles include:

- Light-demanding species, such as oak, require earlier and more intensive intervention
- Shade-tolerant species, such as western red cedar, can tolerate delayed and lighter intervention
- Early release is often most effective following a CCF felling operation, when the released trees can benefit from the increased levels of diffuse light

Managing competing vegetation

Ireland's climate and soils support the vigorous growth of competing vegetation, particularly on former agricultural land. Following canopy disturbance, brambles often expand from hedgerows.

While brambles provide ecological benefits, intervention may be required where competing vegetation overtops or suppresses quality regeneration.

Control should be targeted and minimal, typically involving localised slashing where regeneration is directly threatened.

Quick Field Check: Is Regeneration Getting Enough Light?

A simple assessment can be made by comparing growth at the crown tip:

- If apical (vertical) growth exceeds lateral growth, light levels are sufficient
- If lateral growth exceeds apical growth, light levels are likely inadequate

This quick check provides a practical indication of whether a release intervention is required.

Pro Silva Ireland is a registered charity founded in 2000 to advocate for, and educate on, continuous cover forestry. Part of the wider Pro Silva Europe network, Pro Silva Ireland is an all-Ireland organisation, embracing membership from both Northern Ireland and the Irish Republic.

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An Roinn Talmhaíochta, Bia agus Mara
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Other guides in this series:

- What is CCF?
- Benefits of CCF
- CCF and biodiversity
- CCF forests for water
- Understanding CCF transformation
- Tree selection and marking in CCF
- Enrichment planting in CCF
- Guidelines for CCF harvest operations
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