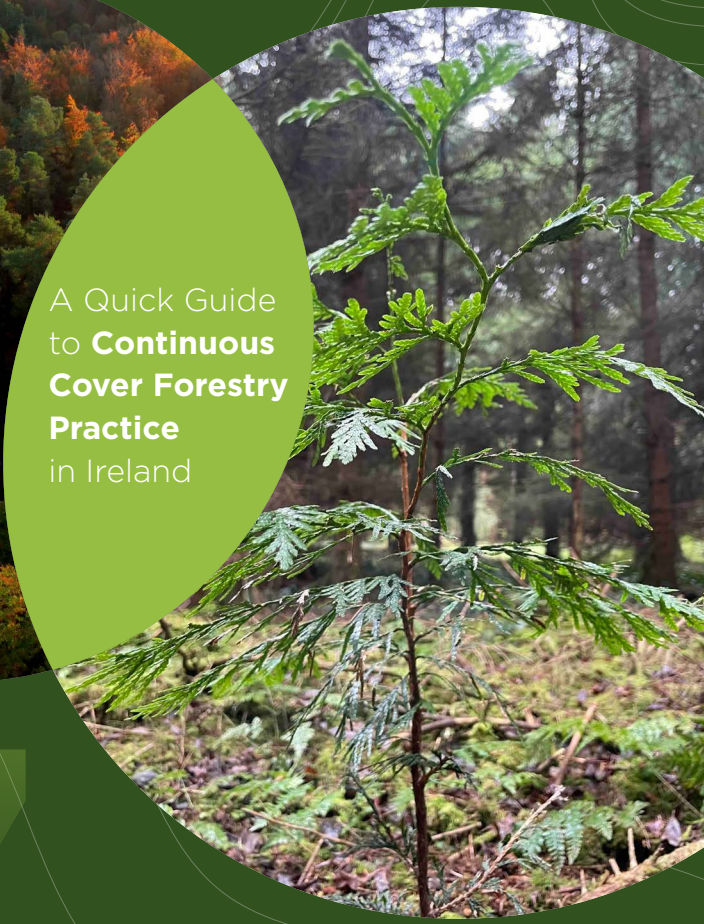
A Quick Guide to **Continuous Cover Forestry Practice** in Ireland



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Enrichment planting in CCF

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Why enrichment planting?

Under continuous cover forestry (CCF) management, natural regeneration is the preferred way to replenish the forest. Natural regeneration will usually establish over time. However, the species composition of that regeneration is limited by the seed sources present within or close to the site.

In some forests, the range of available seed sources is narrow, resulting in low species diversity or the absence of species that are desirable for timber production, biodiversity or long-term resilience. Ground vegetation may also impede the development of natural regeneration.

Enrichment planting and underplanting are used to address these limitations. Underplanting is the general practice of planting new trees in existing forests where natural regeneration is not establishing, while enrichment planting seeks to add new tree species in a targeted and deliberate manner. These operations complement natural regeneration rather than replace it.

When applied correctly, enrichment planting increases species diversity, improves future management options and strengthens the ecological and economic resilience of the forest.

Considerations for enrichment planting

When planning enrichment planting, CCF practitioners should consider the following factors:

- Suitability of species to site conditions, particularly soil type and moisture
- Current state of maturity of the forest
- Overall management objectives for the forest (timber production, biodiversity, resilience)
- Compatibility between existing and introduced species
- Current and anticipated light regimes; shade tolerance of species to be planted
- Relative growth rates and mature tree size
- Browsing pressure from deer and other herbivores

Successful enrichment depends on balancing species choice with site conditions and long-term management aims.

Species choice

As with afforestation, species selected for enrichment planting must be matched to site conditions, taking account of soil type, elevation and local climate.

Management objectives have an important role in species selection. Where conservation of native flora and fauna is a priority, native species may be favoured. In other cases, timber production objectives or structural diversity may justify the inclusion of non-native species.

Browsing pressure is a critical consideration, particularly for native broadleaves and other palatable species. In areas with high deer pressure, protection measures such as tree shelters or exclosures will be required to ensure establishment. These measures increase costs and should be factored into planting decisions at the outset.

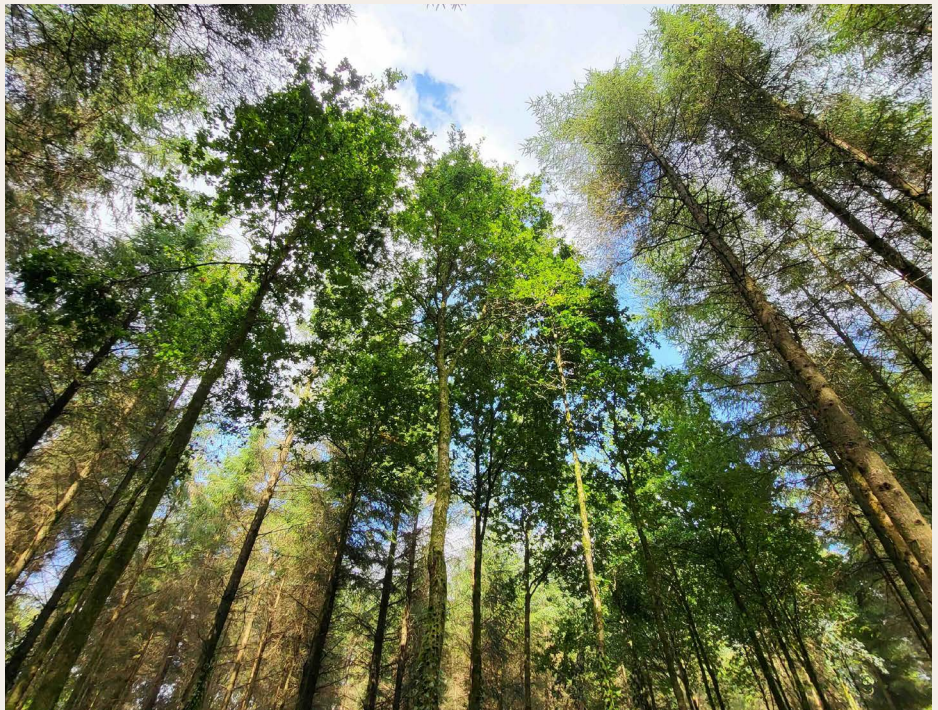
Light and species compatibility

Light availability, both current and anticipated, is a key determinant of success in enrichment planting.

Shade-tolerant species are particularly useful in CCF systems, as they can establish and persist under lower light conditions. They may be planted earlier in the transformation process and can reside in the understorey while the canopy is opened up over time. Maintaining lower light levels can also help suppress competing vegetation such as brambles.

Light-demanding species require higher light levels and must be planted where sufficient light is available, either immediately or in the near future. Species compatibility in mixed stands is largely driven by differences in light demand, but growth rate and mature crown size are also important considerations.

Differences in growth rate and longevity can be advantageous in mixed CCF forests, contributing to a more continuous timber supply over time. However, careful thought is required when selecting species and deciding where to place them, particularly when planting in small groups.



Targeted planting

Enrichment planting should always be targeted and concentrated in areas where establishment and long-term success are most likely.

Light-demanding species

Gaps created in felling or natural disturbance offer ideal locations for targeted introduction of new species, where required. These gaps are particularly suitable for light-demanding species such as oak, provided planting densities and spacing encourage straight, vertical growth rather than excessive branching. When planting within gaps, more light-demanding species should generally be placed toward the northern edges, where light availability is greatest.

Shade-tolerant species

More shade-tolerant species, such as beech or western red cedar, are better suited to areas of diffuse light, including partial canopy openings or shaded positions beneath an irregular canopy. When transforming an even-aged forest, enrichment planting (even of shade tolerant species) is not recommended until at least two transformative thinnings have been conducted. Even-aged stands are generally too dark for seedling development before such time.

It is generally best to plant fewer trees overall, grouped in favourable locations and well protected, rather than planting large numbers of trees in an intimate mix across the site. Concentrated planting improves survival, makes protection easier, when needed, and allows better integration with future thinning interventions.

Enrichment planting should not take place on the permanent rack network.

Tree species light & shade tolerances

Below is a simple table indicating light and shade tolerances of common Irish forestry species. The references expand on the topic and consider other factors in species' relationships in mixes and with regards to light, including stage of development and growth rates.

Species (Ranked from demanding to tolerant)	Light & Shade Tolerance
European & Japanese larch	Very light demanding
Rowan	
Birch species	
Scots pine	
Lodgepole pine	
Poplar species	
Pedunculate oak	
Alder	
Cherry	
Sessile oak	Light demanding
Ash	
Norway maple	Intermediate
Spanish chestnut	

Species (Ranked from demanding to tolerant)	Light & Shade Tolerance
Norway & Sitka spruce	Moderately share tolerant
Douglas fir	
Hornbeam	
Sycamore	
Hazel	
Beech	Shade tolerant
Western red cedar	
Lawson cypress	
Western hemlock	
Silver & Grand fir	
Yew	

References

Kerr, G., Haufe, J., Stokes, V. and Mason, B. (2020). Establishing robust species mixtures. *Royal Forestry Society Quarterly Journal of Forestry* 114(3): 164–170.

Pommerening, A. (2023). *Continuous Cover Forestry: Theories, Concepts, and Implementation*. First ed. John Wiley & Sons

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
- Light forest operations
- Guidelines for CCF harvest operations
- Supports for CCF

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