

CCF FOREST ESTABLISHMENT FOR RESILIENCE



Forest type 10 (FT10) Continuous Cover Forestry
Climate Resilience Reforestation Scheme

WHAT IS CCF?

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.

The four Pro Silva principles of CCF are

1. Conservation of ecosystems
2. Protection of soil and climate
3. Production of timber and other products
4. Provision of cultural, recreation and amenity services

PRO SILVA PRINCIPLES

Pro Silva — a European confederation of forestry practitioners who advocate forest management based on natural processes — promotes forest management strategies that optimise the maintenance, conservation and utilisation of forest ecosystems in such a way that the economic, ecological and social functions are sustainable and profitable.

CCF PRACTICE IN IRELAND

To date, CCF has largely been practiced in the transformation of legacy monoculture conifer stands to permanent irregular forest structures. The transformation process involves the introduction, enhancement and maintenance of tree species diversity. As part of the wider transformation process to CCF management, it can take up to 40 years to achieve the desired level of diversity.



Credit: Aidona Photography, 2024

CCF FOREST ESTABLISHMENT BRINGS DIVERSITY AND RESILIENCE

Planting a new forest or restocking a clear-fell site under CCF forest establishment principles presents a significant opportunity to introduce species diversity from the outset.


The Forestry Programme 2023-2027 offers two grant-aided schemes to support CCF forest establishment:

FT10 – CONTINUOUS COVER FORESTRY CLIMATE RESILIENCE REFORESTATION SCHEME

Establishing a forest under one of these schemes gives you

- Species diversity from the outset
- Species that are matched to site conditions and soil types, taking the micro environs of the site into consideration
- Irregularity in the distribution of species groups across the site

The introduction of CCF forest establishment to the Forestry Programme 2023-2027 is part of a wider recognition by the Department of Agriculture, Food and the Marine that CCF can help Ireland meet obligations to reduce biodiversity loss, and to mitigate and adapt to climate change, while ensuring future timber supply.



“One of the primary benefit of tree species diversity is greater forest resilience”

Credit: Ness Keeley 2023

Full details of these schemes can be found on the Department of Agriculture, Food and the Marine website.
<https://www.gov.ie/en/publication/e384e-forestry-grants-and-schemes/#forestryprogramme-2023-2027>

BUILDING FOREST RESILIENCE FROM THE START

Forests with greater species diversity are

1. more resilient to climate change
2. have greater resistance to pests and diseases
3. have a continual supply of diverse timber

CLIMATE RESILIENCE

Climate change is predicted to result in more extreme weather events, with more frequent and intense storms, heavy storm downpours and flooding, increased temperatures and longer periods of drought with water stress for trees.

- Mixed stands have greater stability with the roots of different tree species occupying different layers of soil.
- Different rooting systems also exploit different water levels, providing better forest resilience to drought events.
- Different species will respond differently to climate change. The CCF forest has options over time to adapt to shifts in climate, with the best suited species to new conditions naturally regenerating to replace those unable to cope with the change, thereby maintaining the forest ecosystem and some level of timber production.



Credit: E.R. Wilson, 2020

PESTS AND DISEASES

Pests and diseases are a serious threat to our forests, with monoculture stands particularly vulnerable. Mixed forests are more resilient to these threats due to lower densities of host tree species and their irregular distribution within sites, which slows the spread of pests and diseases.

Mixed forests tend to have free-growing, vital and vigorous trees that are better able to resist attacks by disease and insects. By contrast, trees in even-aged forests compete more with each other, are under more stress, and therefore more vulnerable.

TIMBER SUPPLY

Mixed forests deliver opportunities for diverse timber supply, different maturation timescales and adaptability to market conditions.

In the CCF establishment mix option for FT10, sawlog from fast-growing Sitka spruce will provide an early economic return, with slower growing high-value timbers, such as Douglas fir, Western red cedar and oak, along with naturally regenerating Sitka spruce, providing continued economic return into the mid- and long-term.



Credit: L. Byrne, 2023

CCF FOREST DESIGN: species composition and group mixtures

CCF forest design is focused on mixed multi-functional production forests to meet the urgent needs of carbon sequestration, production of sustainable building and manufacturing materials, as well as the creation and maintenance of biodiversity habitats.

THE FT10-CCF SPECIES MIX

- Sitka or Norway spruce, main component (maximum 55%); first to produce sawlog
- Other conifer species (20 to 25%); chosen to match site conditions and for later production of sawlog
- Broadleaves (minimum 20%), including native species; matched to site, with long-term production of high-value sawlog as well as habitat provision for native biota by native tree species.

Credit: Aidona Photography, 2024



GROUP LAYOUT AND DESIGN

Different species grow at different rates and have different requirements regarding soils, drainage and light.

These differences have to be balanced with one another through the location and arrangement of species groups, stocking numbers per species and with the intended management aims.

For simplicity and efficiency, Pro Silva Ireland recommends planting in square groups of species within the grid layout of the FT10 2m x 2m spacing requirement.

These square groups will soften over time through subsequent thinnings, as a more irregular and natural layout emerges within the forest.

The reason trees are planted in groups rather than in intimate mixes is because tree species need a degree of separation and strength in species numbers to thrive.

“Tree species should be matched to the conditions and microenvironments within the site”

KEY DESIGN CONSIDERATIONS

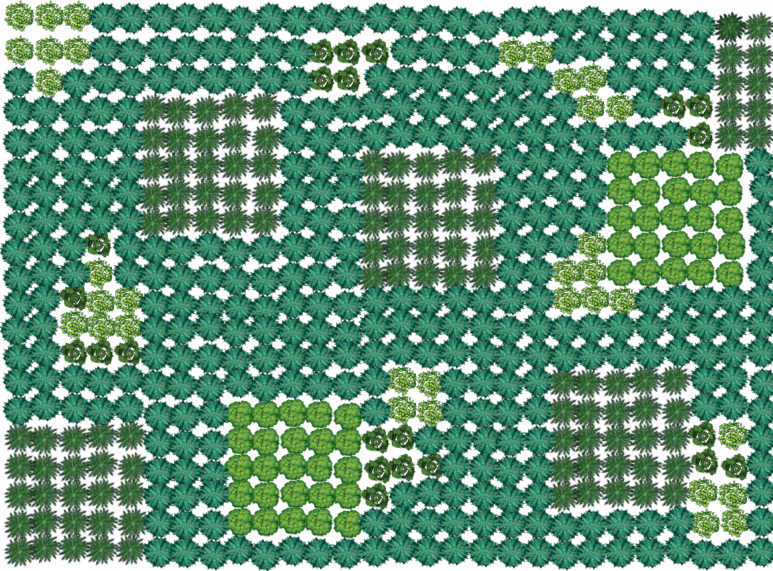
- Species should be planted in groups, located where conditions are most suitable and with groups across the site in an irregular layout
- Group size should be big enough to ensure that slower growing species are not smothered by faster growing trees before first thinning
- Plant species adapted to wetter conditions where they exist
- Use shade tolerant species in areas with less light (e.g. close to retained existing trees or hedges)
- Use pioneer species in exposed areas
- Incorporate existing trees or natural regeneration into the planting plan
- Plant native species in field corners where hedgerows intersect; they will coexist better with native hedgerows and preserve the hedgerow as a future seed source








Credit: Aidona Photography, 2024

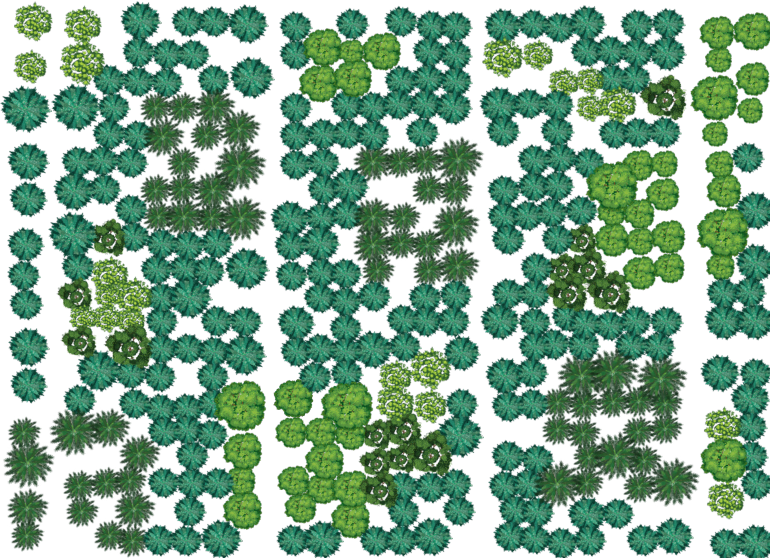
FT10 PLANTING EXAMPLE OVER TIME

YEAR 4



-  Sitka Spruce @ 55%
-  Douglas Fir @ 25%
-  Pedunculate oak @ 10%
-  Birch @ 5%
-  ADB @ 5%

YEAR 20



First thinning completed and racks installed

Wolf trees removed

1 or 2 competitors with quality trees of any species removed

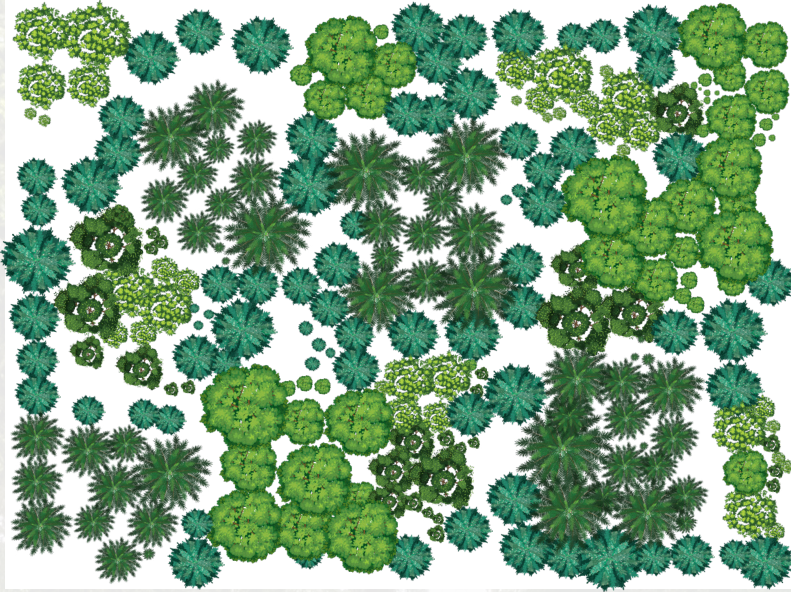
Other trees removed to favour species diversity

Some irregularity of height, trunk & crown size emerging between trees

Irregularity of tree distribution beginning

Mineral site planted with Sitka spruce, Douglas fir, oak and additional broadleaves (ADB)

YEAR 45



Sitka sawlog harvested, some trees retained for future seed source & habitat

Emergent natural regeneration

Greater irregularity in height, trunk & crown size achieved through different growth rates between individuals and species

Greater irregularity of distribution achieved through thinning for quality and diversity

YEAR 75



Douglas fir sawlog harvested

Ongoing thinning and harvest of individual trees of all species at regular intervals

Deer population at low enough numbers to allow natural regeneration of broadleaves

Sitka spruce and birch dominate regeneration but oak, Douglas fir and ADB also represented. Some respacing may be required

IMPLEMENTATION

Any afforestation project is a collaboration between the landowner and the forester, and the forester must balance the needs and wants of the owner with the site conditions and the specifications of the afforestation/reforestation scheme. Most agricultural land that is approved for afforestation will be able to support a tailored FT10 CCF mix.

Maximising the opportunities for CCF forest design requires careful management of the planting process, site layout and location and size of groups.

KEY CONSIDERATIONS

- Level of experience of the planters
- Quality of communication between the forester and planters
- Scale of the project

“The sustainable long-term production of timber, as well as all other forest functions, depends on a functioning forest ecosystem”





Pro Silva Ireland has been advancing CCF practice through education and demonstration since 2000, promoting knowledge, policies and practical examples of continuous cover forestry management on the island of Ireland.

Pro Silva Ireland is a non-profit organisation, a recognised member of the international confederation of Pro Silva organisations, which was founded in Slovenia in 1989, and is Registered Charity (Number CHY 20060770).

Since 2018, Pro Silva Ireland has engaged with the Forest Service on CCF mixture options.

FURTHER INFORMATION AND LINKS

Forestry Grants and Scheme

www.gov.ie/en/publication/e384e-forestry-grants-and-schemes/

(Video) Pro Silva Ireland Webinar on Forest Establishment Design for Continuous Cover Forestry

<https://prosilvaireland.com/videos/>

(Article) Continuous Cover Forestry Group (UK)

Planting new woodland with the aim of continuous cover management

www.ccfg.org.uk/about/planting-new-woodland/

Cover Photo: Aidona Photography, 2024



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