Growing quality timber in native woodlands through Continuous Cover Forestry

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Teagasc
Agriculture and Food Development Authority

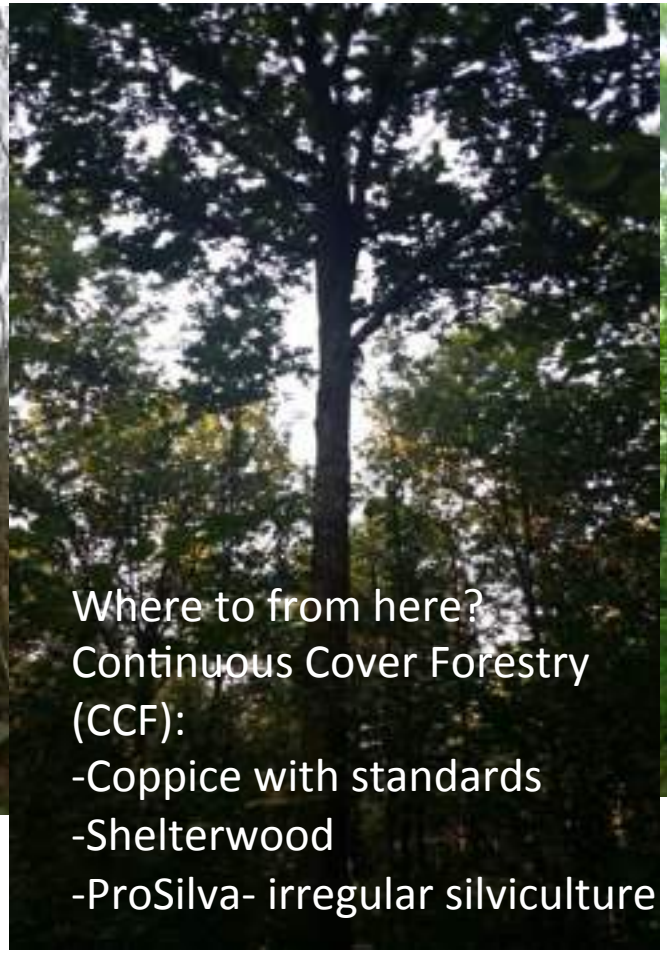
A new emergent Native Woodland resource:

Agriculture and Food Development Authority

Biodiversity Conservation and ecosystem services but… is there also potential for integrated timber production??


Historic Irish quality hardwoods production

Current performance of pole stage, well managed oak and other broadleaves plantations



Where to from here?
Continuous Cover Forestry (CCF):
-Coppice with standards
-Shelterwood
-ProSilva- irregular silviculture

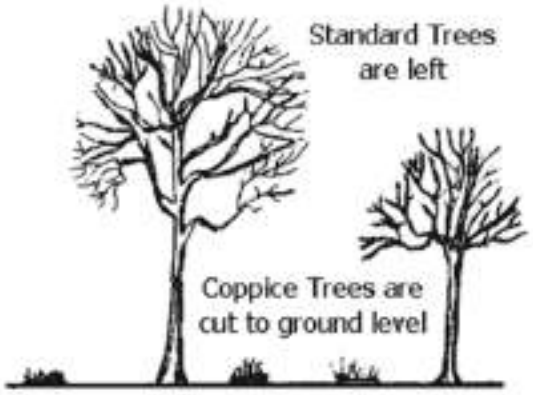
CCF / Silvicultural Systems : Coppice with standards

ADVANTAGES

- Traditional
- Wide range of products
- Simple prescriptive management
- Rich spring ground flora diversity
- Forest soil protection

DISADVANTAGES

- Low saw-log percentage with mostly small diameter timber production
- Needs local niche market for rods
- Deer browsing
- Uniform under-storey



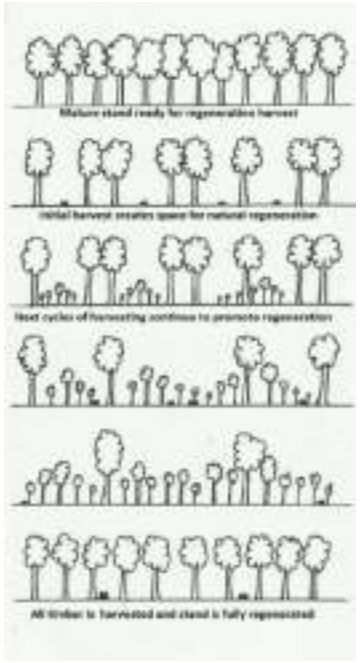
CCF / Silvicultural Systems : Shelterwood

ADVANTAGES

- Prescriptive management
- Most saw-log production, harvested within a 20 year window at the end of the rotation.
- Forest soil tree-cover maintained over time

DISADVANTAGES

- Low structural diversity
- Can be expensive to manage/respace early regeneration and tending
- Deer browsing
- In general offers reduced 'old growth' features
- Most of the production is at the end of the rotation



CCF / Silvicultural Systems : Pro-Silva Irregular Silviculture

ADVANTAGES

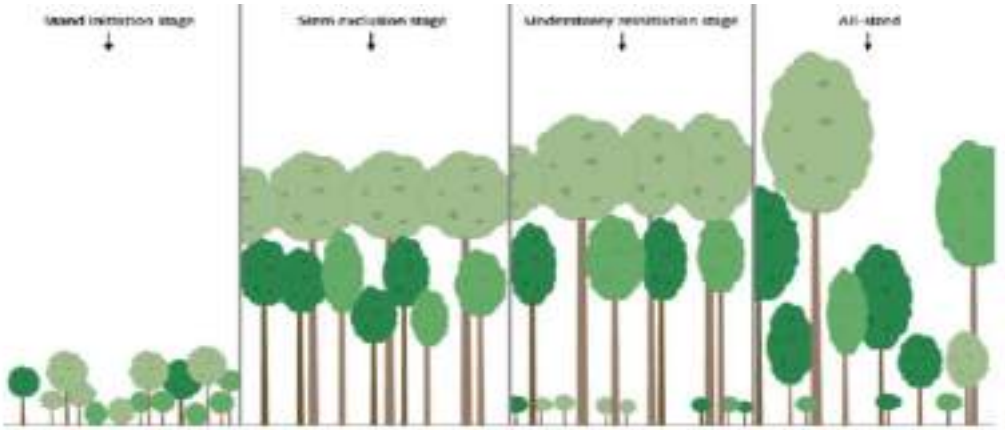
- High level of structural diversity
- Increased ecosystem resilience
- Very high quality timber production
- Potential integration with other products/services at stand level

(see pictures)

DISADVATAGES

- Requires regular inventory/monitoring
- Requires skills and trained practitioners
- Requires long term vision-planning

Pro-Silva, Irregular Silviculture:
Progressive Transformation mimics Natural Succession stages



From Kerr and Haufe, 2011

- **Stage 1-Establishment**
- **Stage 2-Stem exclusion:**
  Select and promote vigorous quality stems through crown thinning
- **Stage 3-Understorey re-initiation:**
  Reduce crown cover to facilitate natural regeneration establishment
- **Stage 4-Structural development and maintenance** (all sized):
  When a functional structure is achieved (sustained yield, natural tree replenishment **and** ecosystem resilience), maintain the structure by removing the increment mostly from large trees.

Dynamic equilibrium

Stage 2:Tending and thinning stage

Crown thinning and new "halo" thinning/active silviculture research

Teagasc Charlestown, "halo" thinning research site in Co Mayo

Fernelmmont 30 years oak free-growth experiment, Belgium 2016

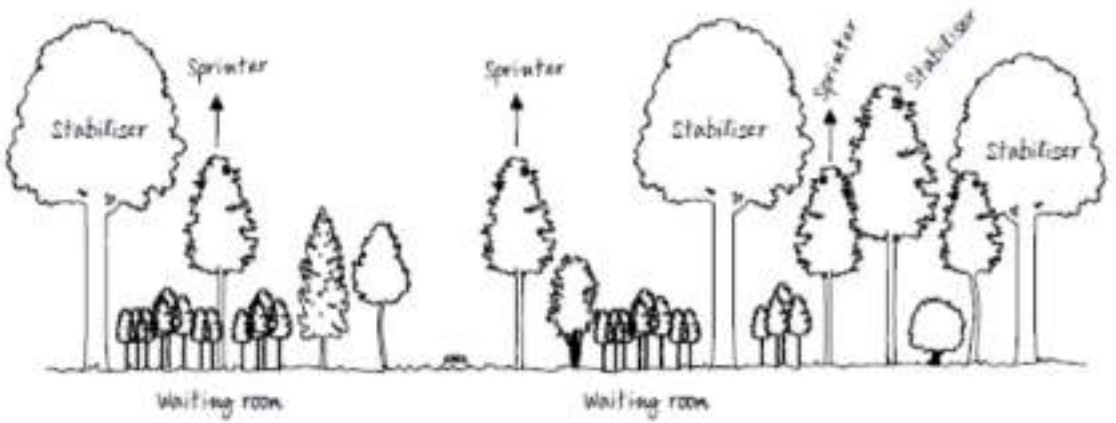
- 20 cm diameter reached at 20 years
- 1 cm sustained annual growth
- Well in excess of classic literature expectation

Crumbland 80! years oak free-growth experiment,Wales,2018

- By applying halo thinning oak can be grown to 60cm diameter 40 years earlier then expected (in 80 years instead of 120).
- Paper to be published in June

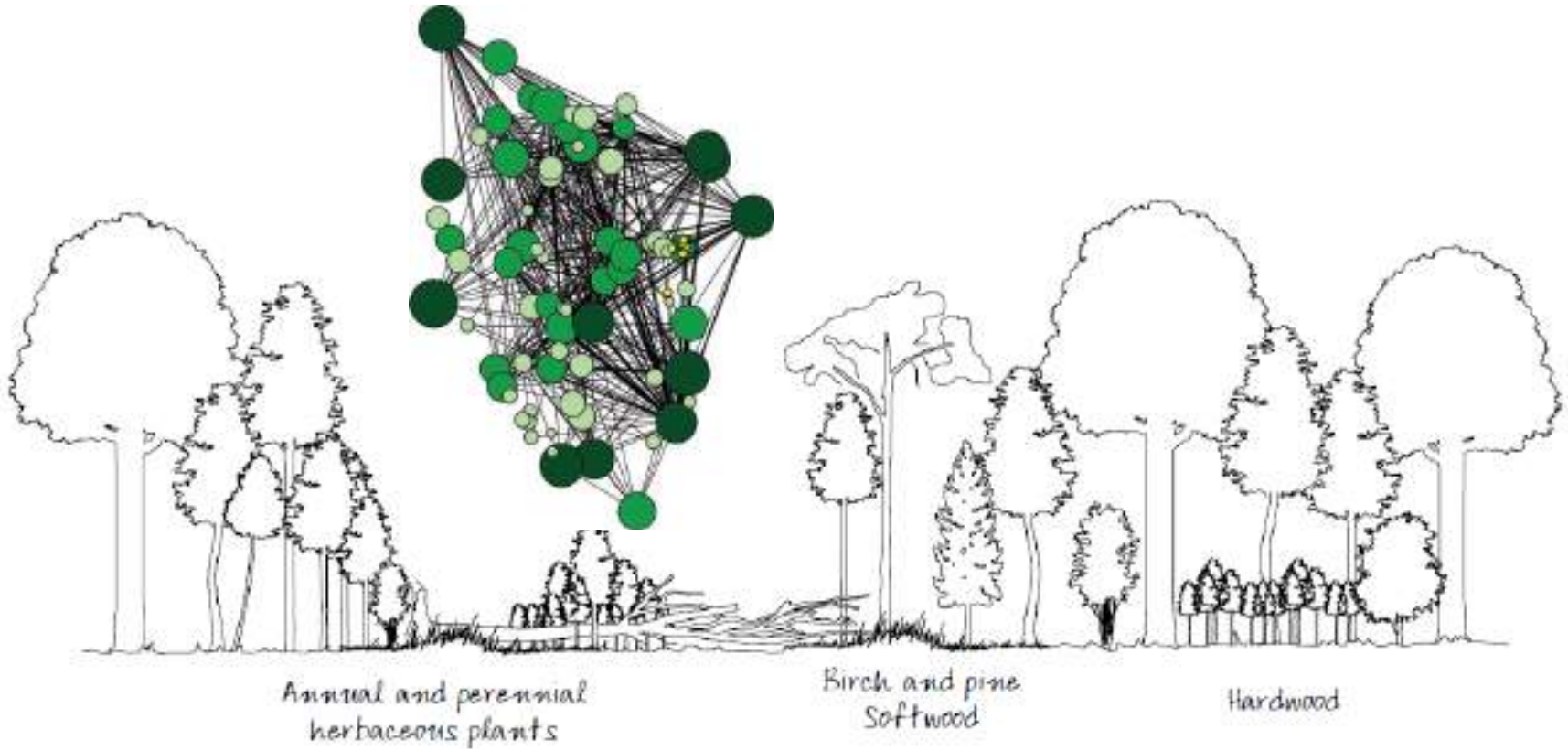
Stage 3:Understory re-initiation: the "waiting room" and "sprinters"

From Sanchez, 2017



From Sanchez, 2016

Stage 3: Shaping social classes distributions basal area towards dynamic equilibrium



Small Trees	Medium Trees	Large Trees+ Very Large Trees
10-25%	30-50%	45-60%

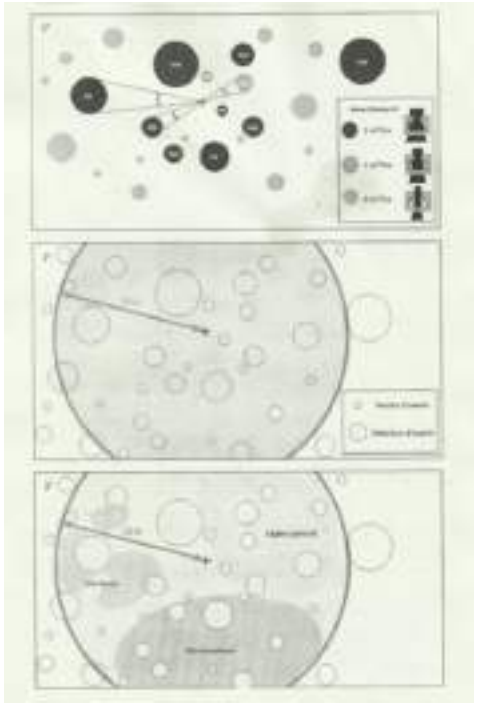
From Poore, 2007; Sanchez 2017; Beiler et al 2009

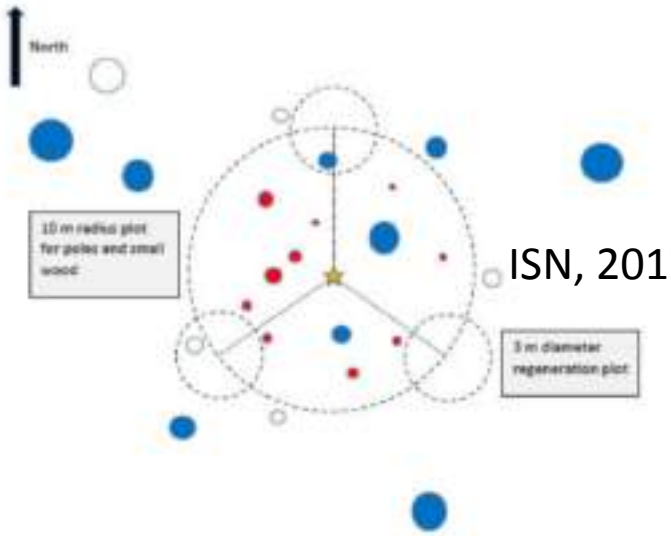
Stage 4:Maintenance of Dynamic Equilibrium by removals mostly from large saw-log trees

From Sanchez, 2017

Central role of regular, cost effective inventory

From Sanchez and Van Dressche, 2016





ISN, 2017

Species	Ba Small Trees	Ba Medium Trees	Ba Large Trees	Ba V Large Trees	BA%
birch	3.9	0.85	0,15	0.00	28.3
oak	0.70	0.95	2.45	0.95	29.2
Scots pine	2.65	2.05	0.45	0.00	29.8
larch	0.00	1.00	0.10	0.00	6.4
rowan	0.7	0,4	0.00	0.00	6.4
BA TOT	7.95	5.25	3.15	0.95	Tot 17.3 m2/ha
BA % TOT	46	30	18	5	

TYPOLOGY	Overeppresent.	Optimal	underrepresented

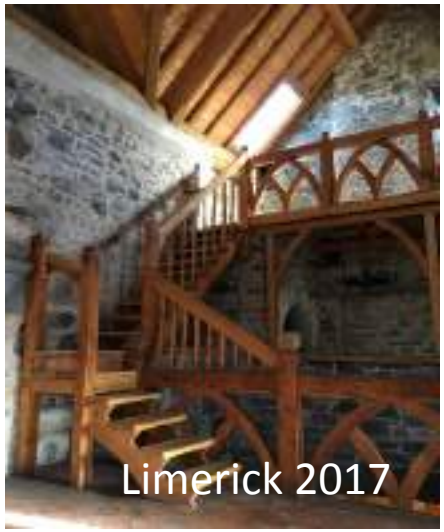
Ideal BA structure	Small trees 10-25%	Med. Trees 30-50%	Large Trees 45-75%

Production roadmap: firewood, craft material and small-diameter saw-log

On-going EARTH project funded by COFORD. NUI Galway, Teagasc and GMIT Letterfrack exploring potential to add-value to small diameter hardwoods

Teagasc

Production roadmap: Large Saw-log developing market /Irish examples


Limerick 2017


Letterfrack ,2018


Teagasc “Talking Harwoods” event ,Mitchelstown 2017

Latest research and practice indicates that active and adaptive management in Native Woodland can lead to increased Ecosystem services, resilience ,quality timber production, and ultimately contribute to Sustainable Rural Development