Even-Aged Management of Bottomland Hardwoods For Commercial Production and Wildlife Habitat
Outline

• Objectives
• Definitions
• Primary use of uneven-aged silviculture
• Primary use of even-aged silviculture
• Why most owners/managers use even-aged silviculture for hardwoods
• Recommendations
• Summary remarks
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The art and science of controlling the establishment, growth, composition, health, and quality of forest stands to meet the objectives of the owner/manager and society on a sustainable basis.
CONCEPTS

- Nothing more than applied ecology
- A set of tools to accomplish the goals of the owner/manager
- Just as valid for wildlife habitat, watershed, and recreation management as for timber
- Has both biological and economic aspects
- Silviculture is a decision-making process
Silviculture vs. Forest Management

- Silviculture – Biological aspects of forestry- stand is unit of consideration
- Forest Management – Business end of forestry – financial, economic considerations- forest
Overview of Hardwood Silviculture

- Systems and methods of silviculture
  - Systems
    - Even-aged
    - Uneven-aged
  - Methods of silviculture (regeneration)
    - Clearcut
    - Shelterwood
    - Coppice
    - Seed tree
CLASSICAL REGENERATION METHODS

UNEVEN-AGED

SINGLE TREE SELECTION

GROUP SELECTION
CLASSICAL REGENERATION METHODS

EVEN-AGED

- CLEARCUT
- SEED TREE
- SHELTERWOOD
- COPPICE
Even-aged stand

Balanced uneven-aged stand

Irregular uneven-aged stand

Number of trees per acre

D.B.H. →
FOREST OF UNEVEN-AGED STANDS
FOREST OF EVEN-AGED STANDS
FOREST OF UNEVEN-AGED STANDS

FOREST OF EVEN-AGED STANDS

Number of trees vs. D.B.H.
Primary Use of Uneven-aged Silviculture

• Early recommendations
• Use of tolerant species – redwood, sugar maple
• On relatively poor sites with no tolerant species or fast growing intolerants
• Beware of false assumptions
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Primary use of even-aged silviculture

• Usually used for intolerant or relatively intolerant species
  – Light requirements of the species for establishment and growth
DAYLIGHT LEVELS BENEATH A HARDWOOD STAND

Light Intensity (Micromoles/meters squared/sec)

Time (Hours - Military)

0600 0700 0800 0900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200
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Why most owners/managers use the even-aged system rather than the uneven–aged system for bottomland hardwoods?

- Most desirable species for commercial purposes and wildlife habitat are relatively intolerant
- Even-aged easier to apply and to track results
- Even-aged may be preferable for financial and biological reasons
Biological

- mainly regeneration phase
- uneven-aged system results in a decrease in composition of commercial species
“Forest vegetation is composed of plant communities or units of vegetation, developed and arranged in accordance with definite biological laws and is not an aggregation of trees and other plants brought together by chance.”

James Toumey
Financial

• Forest vs. stand considerations
  – Decrease in composition of more valuable species
• Management experience
• Research studies
Why most owners/managers use even-aged methods rather than uneven-aged methods for bottomland hardwoods?

• Best to work with nature – even-aged system represents a natural environment and system for most of the commercial species
  – Old field sites
  – Natural catastrophes
  – Clearcut harvests
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Recommendations For Use of Even-Aged Methods For Wildlife Habit and Commercial Production

• Timing of operations
• Use of shelterwood method
• Use of clearcutting – one cut shelterwood
Recommendations For Use of Even-Aged Methods For Wildlife Habitat And Commercial Production

• Timing of operations
• Use of shelterwood method
• Use of clearcutting – one cut shelterwood
• Use of irregular shelterwood (two-aged stand)
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Summary Remarks

• Cutting method alone is not the answer for successful management of bottomland hardwoods.

• Uneven-aged methods have the same requirements for regeneration of intolerant species as do the even-aged methods – advanced regeneration, good seed or seedling crop, and sufficient light levels.
Summary Remarks

• Specifying that a certain amount of the forest area must be in the regeneration phase is not the same as having that much area successfully regenerated.

• The DFC method is said to be a form or uneven-aged management - not sure that is true in the classical sense since it is not really done at the stand level – a 7-acre cut does not result in uneven-aged management
Summary Remarks

• Has been stated that uneven-aged stands result in more diversity especially of understory species – not at all sure that is true. May be true for early ages of plantations, but hardwood foresters have long recognized that the heavy understory in even-aged stands is one of the major detriments to regeneration.
Summary Remarks

• The DFC idea probably has real benefits on public lands and I congratulate the people who came up with the idea, I like thinking outside the box, but for most private landowners financial returns are important and they must be made aware of the long term results of any silvicultural method.
Information Needs

• Economic comparisons based on total forest rather than a single stand for one rotation.
• Valid comparison of plant and animal (e.g., birds) diversity in even-aged and uneven-aged stands.
• Ned to examine influence of other environmental factors (i.e. soil moisture) on survival and growth of reproduction in even-aged and uneven-aged stands.