Management Options and Potential to Sustainably Intensify Production of Planted Forets: A North American Perspective

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Sustainable Forestry

Meet the needs of the current generation for goods, services and processes from the forest without impairing the ability of future generations to meet their needs

Wood and Fiber
Non-Timber Forest Products
Wildlife and Fisheries Habitat
Air and Water Quality
Soil Productivity
Aesthetics and Recreation
Carbon Sequestration

Population, Forest Area and Wood Use in the World from 1980 to 2010

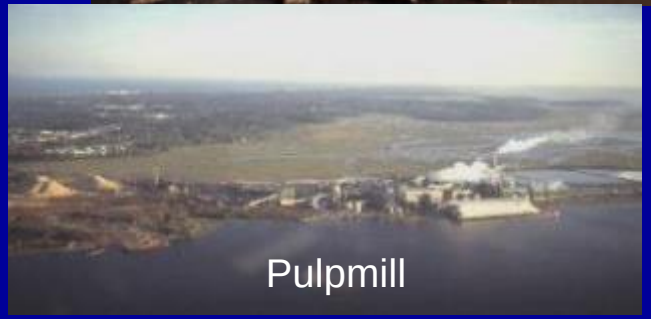
	1980	1990	2000	2010
Population (billion)	**4.4**	**5.3**	**6.2**	**7.0**
Forest Area (billion ha)	**3.6**	**3.4**	**3.2**	**3.0**
Wood Use (billion m^3)	**2.9**	**3.5**	**3.5**	**3.8**

Source FAO State of the Worlds Forest

Forest Aesthetics, Recreation, Wildlife Habitat, Clean Water, Carbon Sequestration, Non-Timber Products

Natural Hardwood Forest in Eastern United States

How do We Meet the Demand for Wood For Multiple Products?



Native Forest

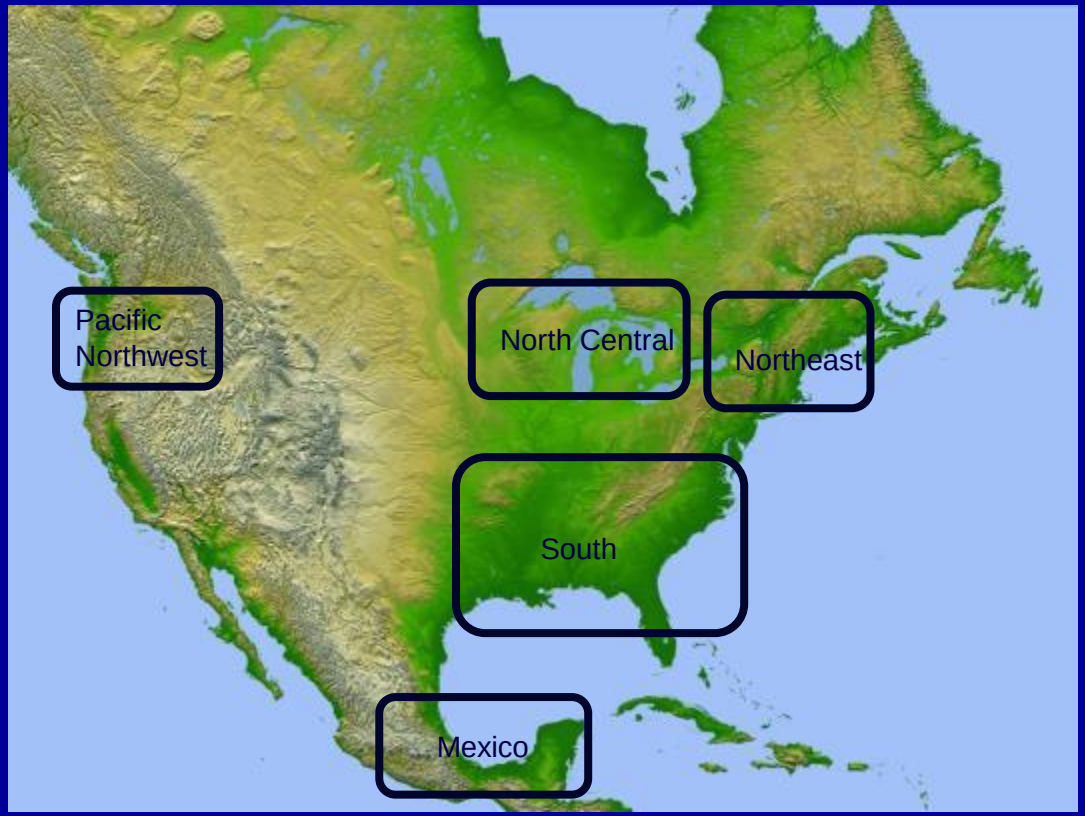
Growth rates in natural forests of the world average about 0.7 m^3/ha/yr. At this level of productivity about 4.7 billion ha of forest land would be required to produce the wood currently consumed worldwide. However, there are only about 3 billion ha of forest land in the world (Binkley, 1997)

Planted Forests

If managed planted forests could produce 10 m^3/ha/yr (a growth rate already achieved in most high yield plantations) then only 0.15 billion ha of plantations would be required to meet the current demand for industrial round wood in the world (Sedjo, 1997)

Intensively managed plantations will have to play a significant role in the world if we are going to meet the increasing demand for forest products without negative impacts to the remaining natural forests of the region and the world

Overview of Planted Forests in North America



Planted Forest Area (ha)

Canada: 425,000
US Pacific Northwest: 5,515,000
US North: 1,748,000
US South: 14,150,000
Mexico: 50,000
Total: 21,888,000

Total Forest Area (million ha)

Canada: 418
US: 302
Mexico: 55
Total: 775

Overview of Pla th America

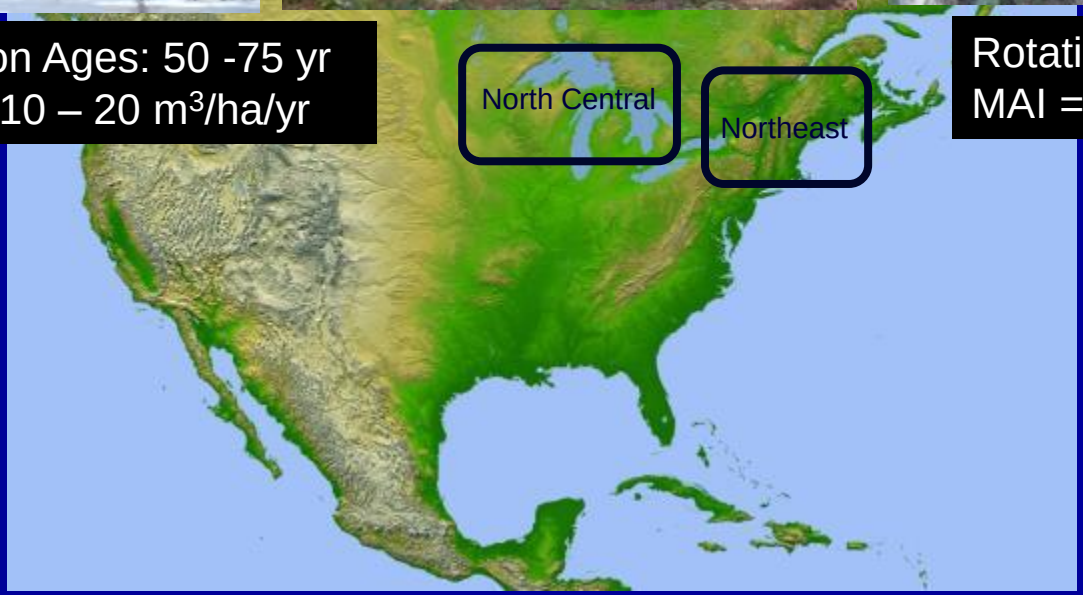
Rotation Ages: 30-45 yr
MAI = 15 - 20 m^3/ha/yr

Pacific Northwest

Rotation Ages: 7-10 yr
MAI = 20-30 m^3/ha/yr

Rotation Ages: 50 -75 yr
MAI = 10 – 20 m^3/ha/yr

Rotation Ages: 50 -75 yr
MAI = 3 -5 m^3/ha/yr



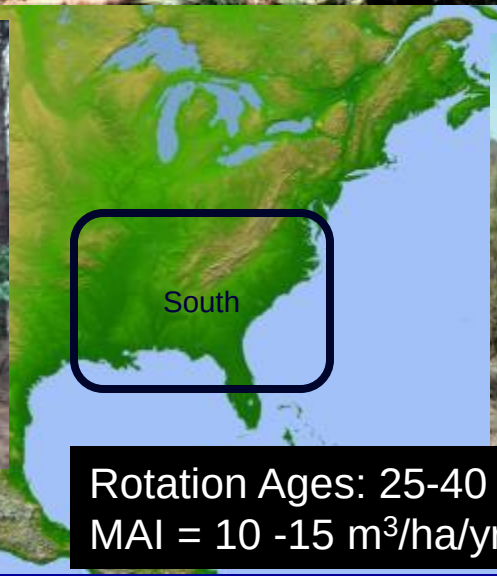
Overview of Planted Forests in No

Rotation Ages: 3 -4 yr
Yield = 20 - 35 odt/ha

Overview of P

Rotation Ages: 15-25 yr
MAI = 15-20 m^3/ha/yr

Rotation Ages: 15-25 yr
MAI = 15-25 m^3/ha/yr



Rotation Ages: 25-40 yr
MAI = 10 -15 m^3/ha/yr

Rotation Ages: 15-25 yr
MAI = 10-15 m^3/ha/yr

Liquidambar styraciflua

Rotation Ages: 7-10 yr
MAI = 10 - 20 m^3/ha/yr

Eucalyptus benthamii

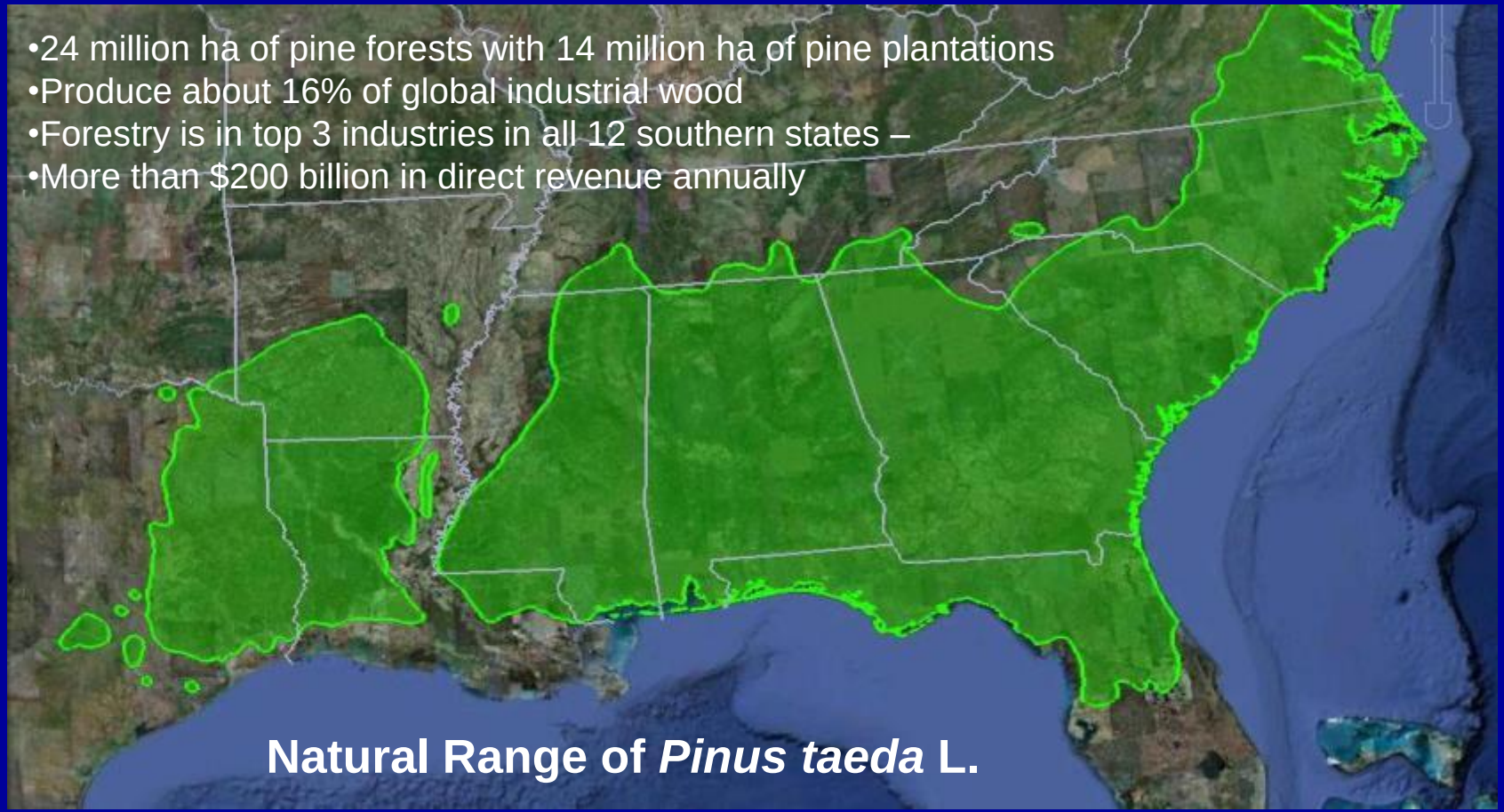
Rotation Ages: 7-10 yr
MAI = 30-40 m^3/ha/yr

Eucalyptus grandis

Overview of Planted Forest

Rotation Ages: 7-10 yr
MAI = 30-40 m^3/ha/yr

Southern Pine Forests in the US



DEVELOP SILVICULTURAL PRACTICES THAT INCREASE GROWTH AND IMPROVE FINANCIAL RETURNS OF FOREST PLANTATIONS THAT INTEGRATE GAINES FROM GENETIC IMPROVEMENT AND MANAGEMENT PRACTICES

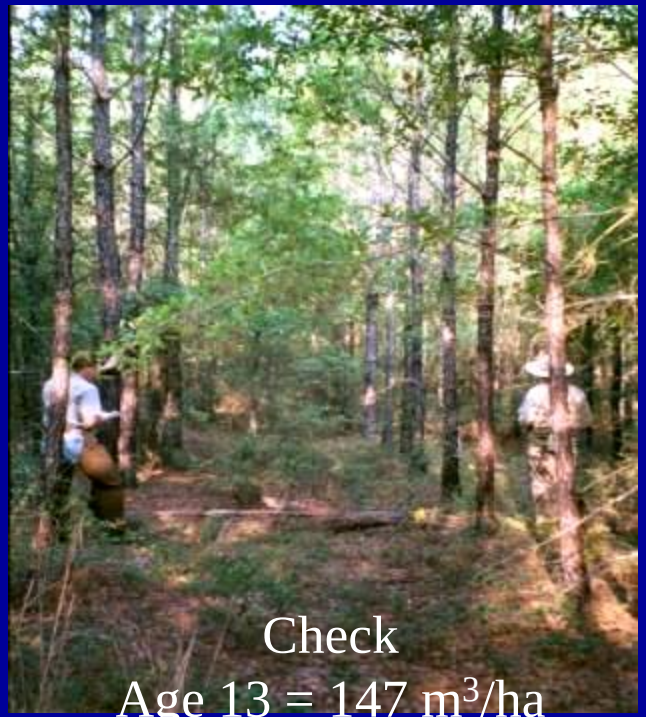
Genetics and Tree Improvement

Growth of Elite Loblolly Pine Genotypes
Age 4 Clonal Loblolly Pine

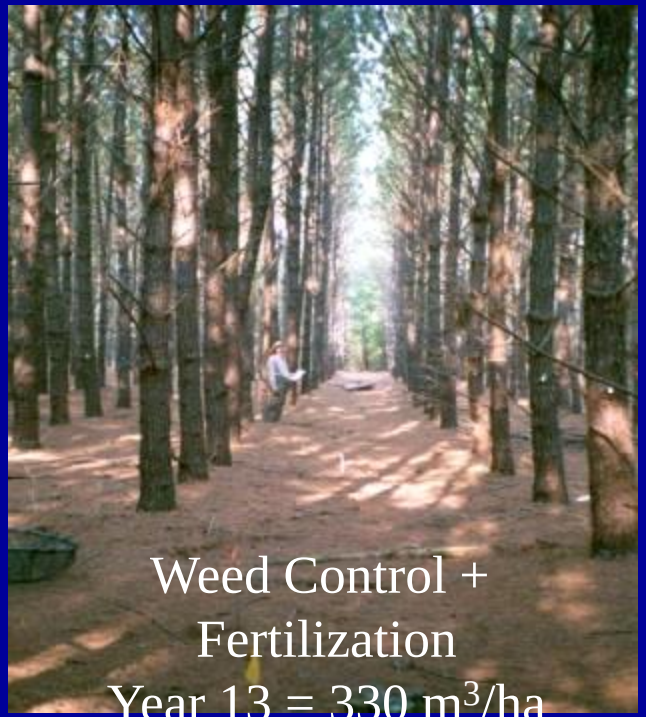
Courtesy of Cellfor

Site Specific Silvicultural Practices Are Needed To Achieve Optimal Growth

Impact of Weed Control and Fertilization on Growth of Loblolly Pine in Georgia

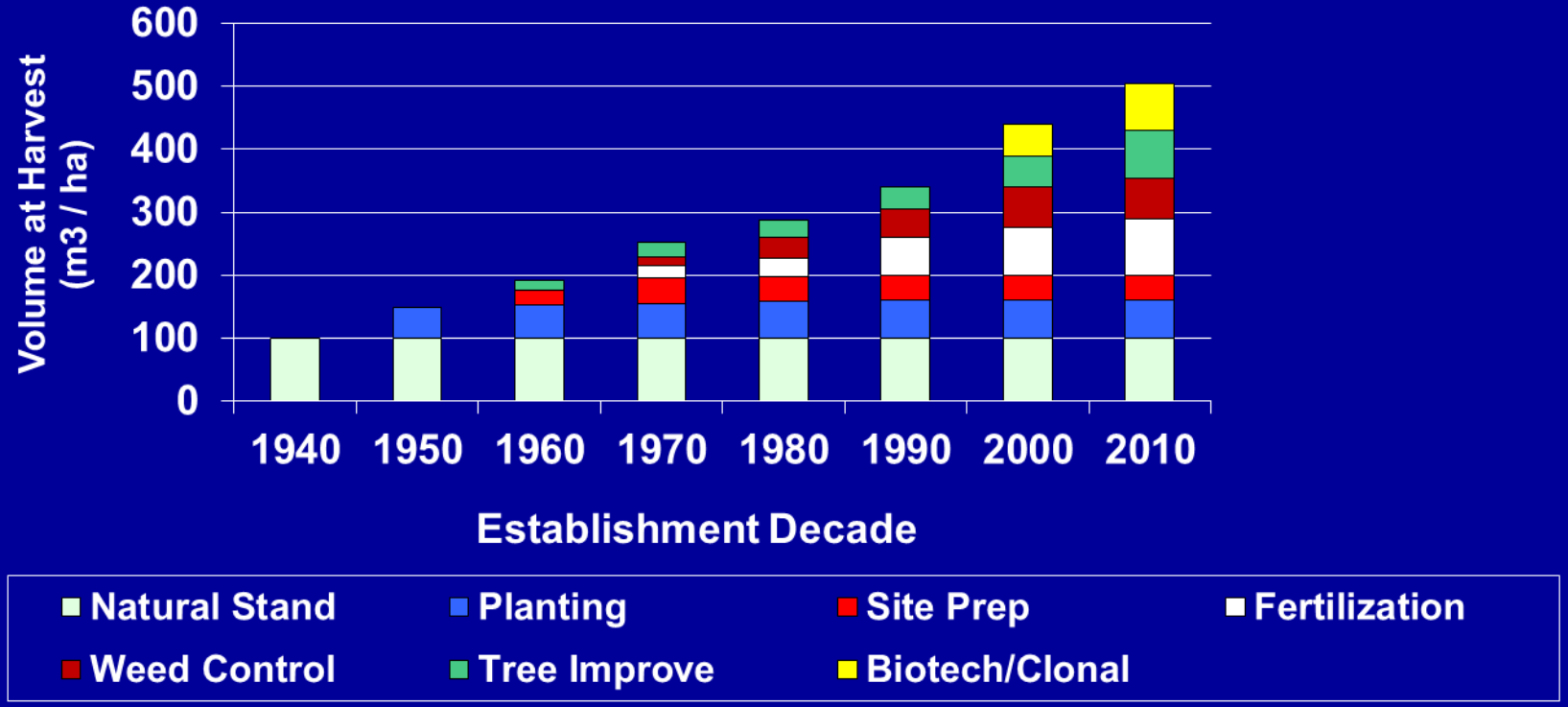


Check
Age 13 = 147 m^3/ha



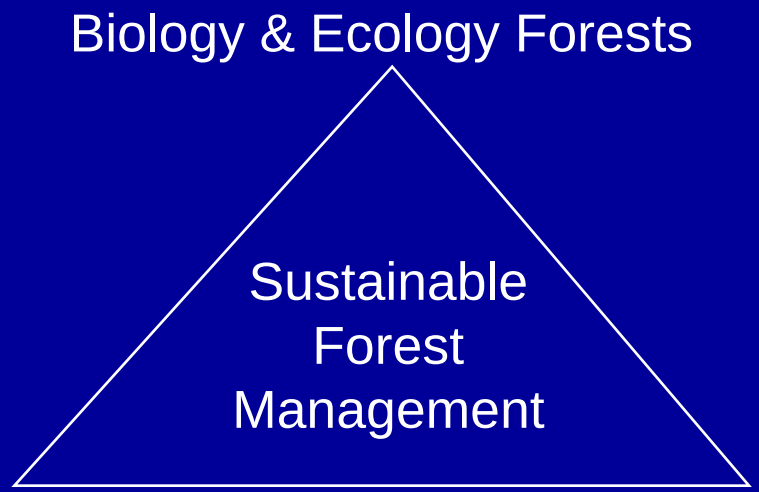
Weed Control + Fertilization
Year 13 = 330 m^3/ha

Contribution of Silvicultural Practices to Productivity Improvements in Pine Plantation in the Southern USA



(Fox et al. 2007)

Our goal is to develop sustainable forest management regimes based on forest biology and ecology that are environmentally & socially acceptable and that generate acceptable financial returns from the forest



To Meet Stewardship Responsibilities and to Achieve Acceptable Financial Returns from the Landbase, Site-Specific Management Regimes Must be Implemented

- Intensively Managed Plantations
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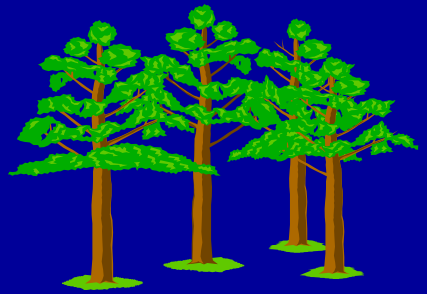
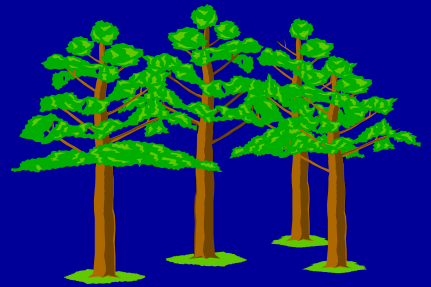
- Stands Managed Using Natural Regeneration
- Stands Managed Primarily for Objectives Other Than Timber Production (SMZ's)



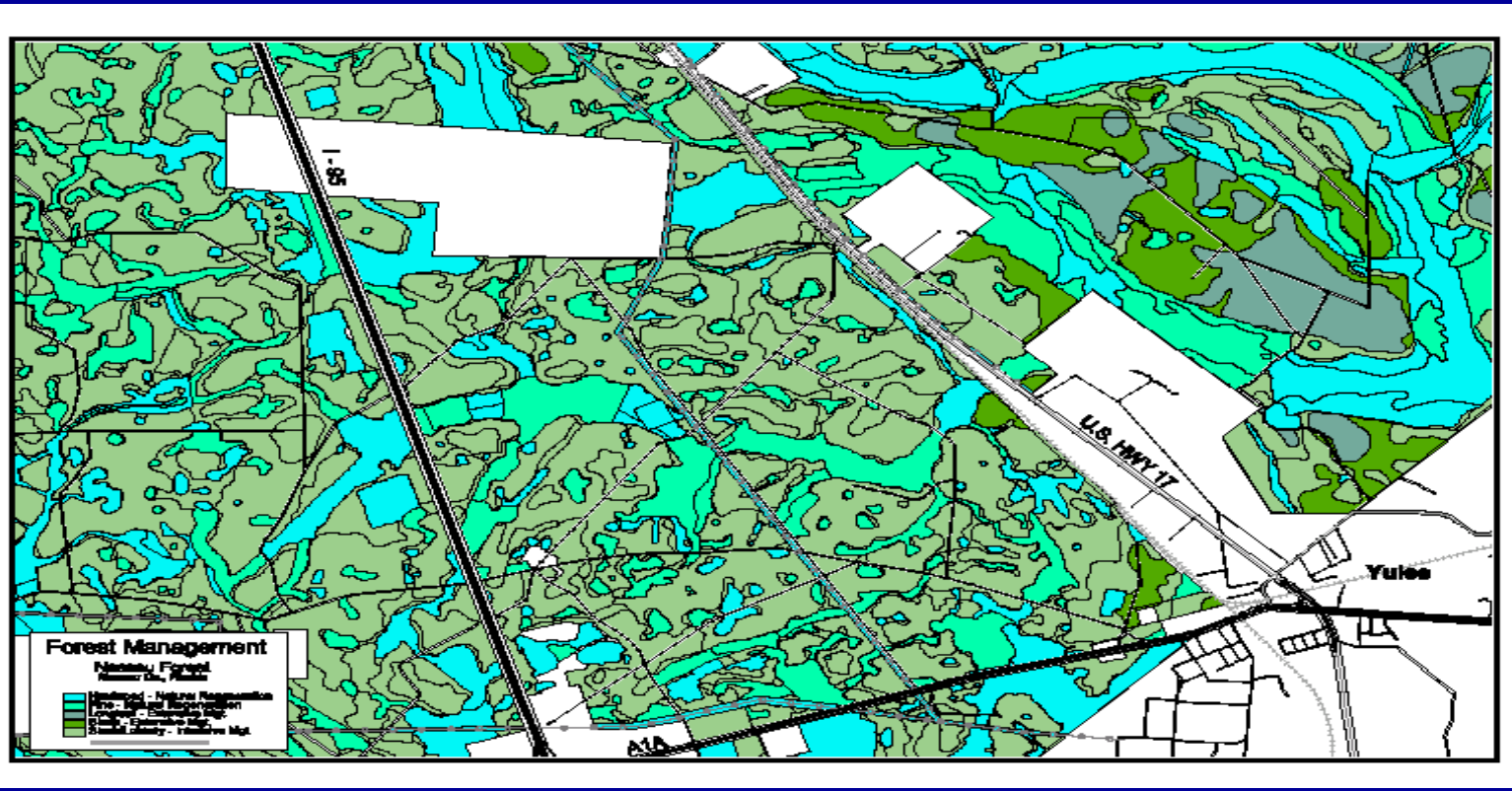


Site Specific Silvicultural Silviculture Prescriptions Based on Soils,

Soil Variability

Soil Map as a GIS Layer

Soil Based Management Guidelines for Forest Management



Remote Sensing, GIS and GPS Technology for Precision Silviculture

Planted Forests and Natural Forest Both Have Values and Complement One Another on the Landscape