The Need for Forest Stewardship

Andy Tait

Co-Executive/Forestry Director

NC Registered Forester #1791

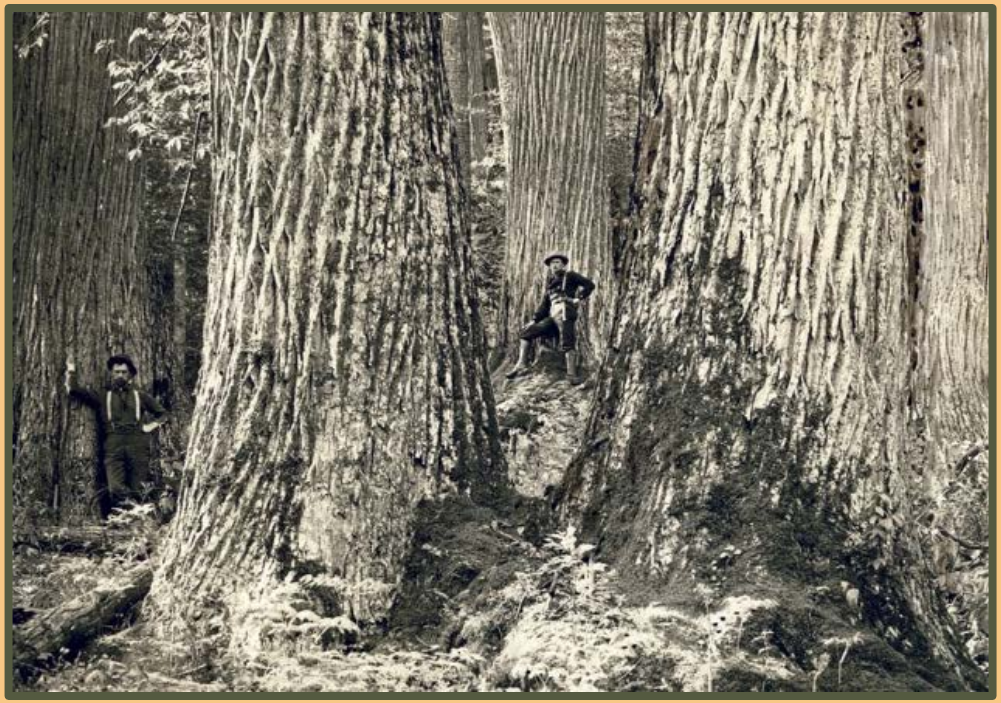
EcoForesters' Mission

EcoForesters is 501c3 non-profit professional forestry organization dedicated to conserving and restoring our Appalachian forests through stewardship and education.

EcoForesters.org

Forestry. Conservation. Education.

A Brief History of Southern Appalachian Forests



Southern Appalachian Forests were more diverse and of higher quality historically than they are *now*

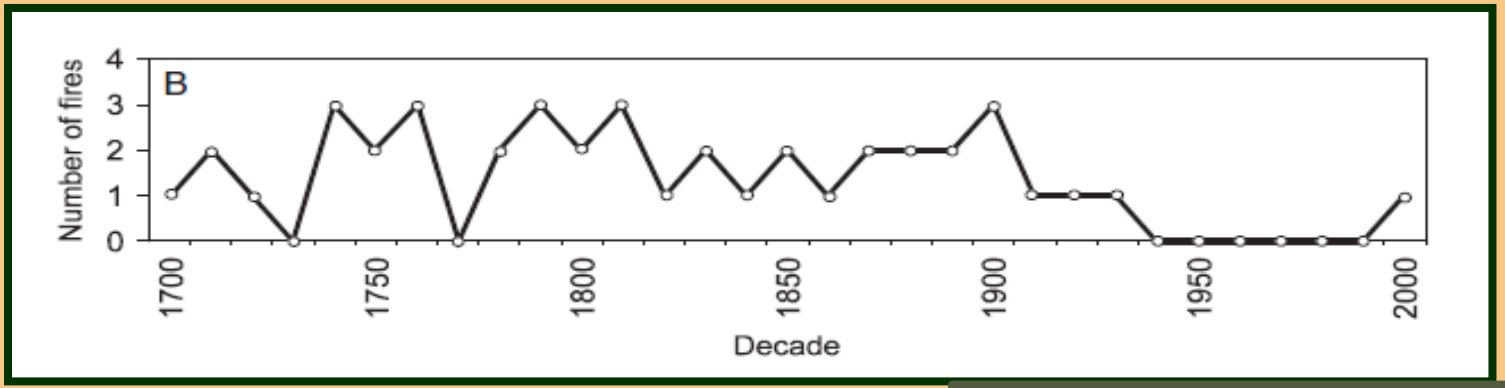
~1870's-1930's "The Big Cut"

85% of Appalachians Clear Cut

“High Grading”
“Select Cut”
“Diameter Limit Cut”

Harvesting only **the** biggest and **best** trees, **leave the rest**

- “Removal of the fittest”
- Degrades the forest



Number of fires per decade in 4 montane-pine oak stands in the central Appalachians dating back to the early 1700's (from Aldrich et al, 2010)

Fire Suppression

Green River Gamelands, NC

Non-native insects, diseases, and plants

- 1930-40's: Chestnut blight & Dutch Elm Disease
- 1960-70's: Balsam wooly adelgid
- 1990's- :Hemlock wooly adelgid
- Asiatic bittersweet
- Tree-of-heaven

Increasing potential for non-native insect, disease, and plant outbreaks with less diverse, degraded forests

Already confirmed in NC:

- Emerald Ash Borer
- Spongy (formerly “Gypsy’) Moth – Now “Slow the Spread” is working in NC
  -Further weakening the already declining oaks

TOLEDO STREET BEFORE AND AFTER EMERALD ASH BORER

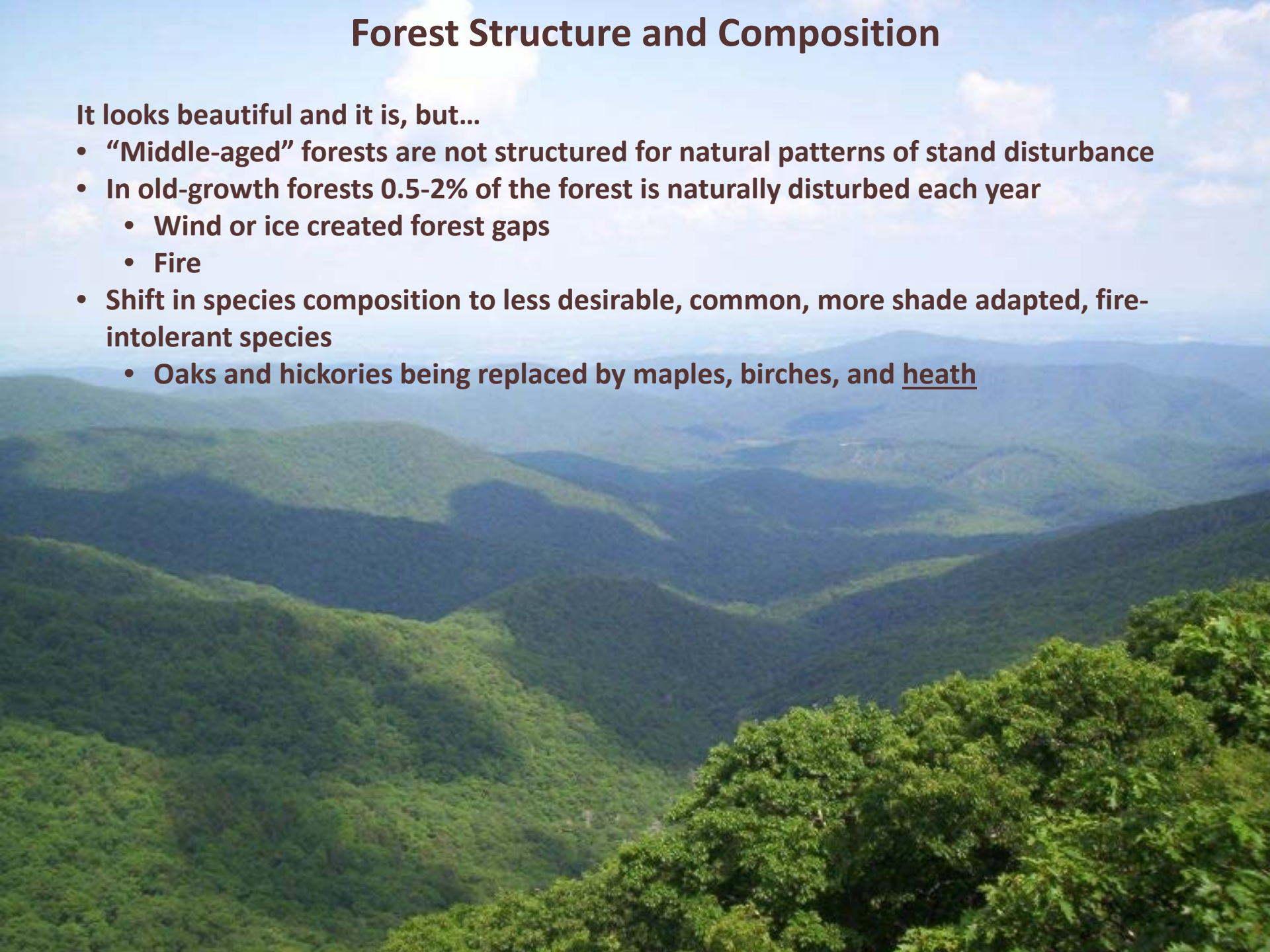
BEFORE: JUNE 2006 PHOTO COURTESY OF DAN HERMS, OSU AFTER: AUGUST 2009

Common Challenges to Forest Stewardship in WNC

- Education
- Funding $

- Impact of non-native invasive species
- Climate change and its effects on forests
- Past Mis-management
  - Lower species *and* structural diversity (very few age classes)
  - Low economic, and ecological, value of many stands due to past high-grading and other factors

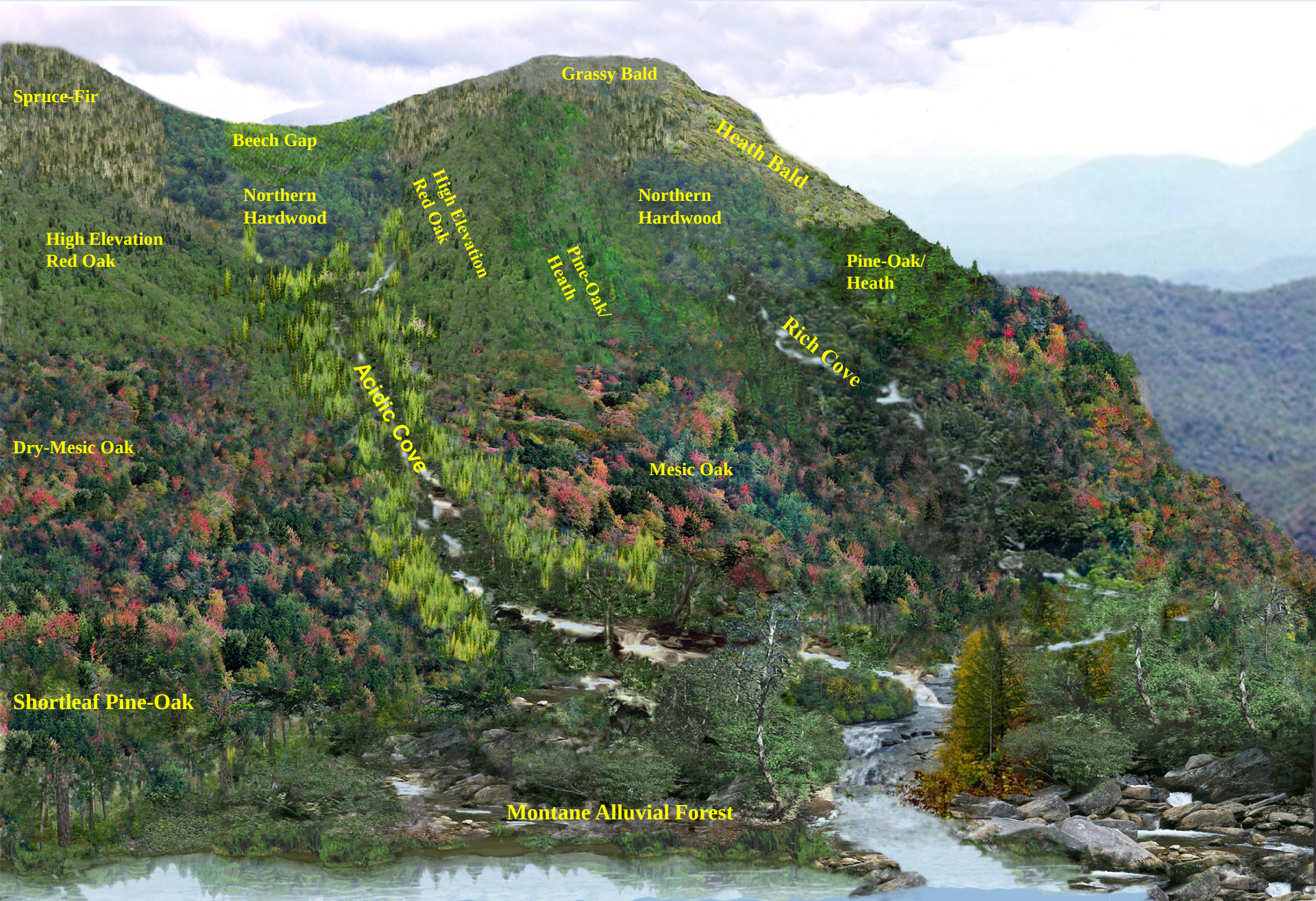
Forest Structure and Composition



It looks beautiful and it is, but…

- "Middle-aged" forests are not structured for natural patterns of stand disturbance
- In old-growth forests 0.5-2% of the forest is naturally disturbed each year
  - Wind or ice created forest gaps
  - Fire
- Shift in species composition to less desirable, common, more shade adapted, fire-intolerant species
  - Oaks and hickories being replaced by maples, birches, and heath

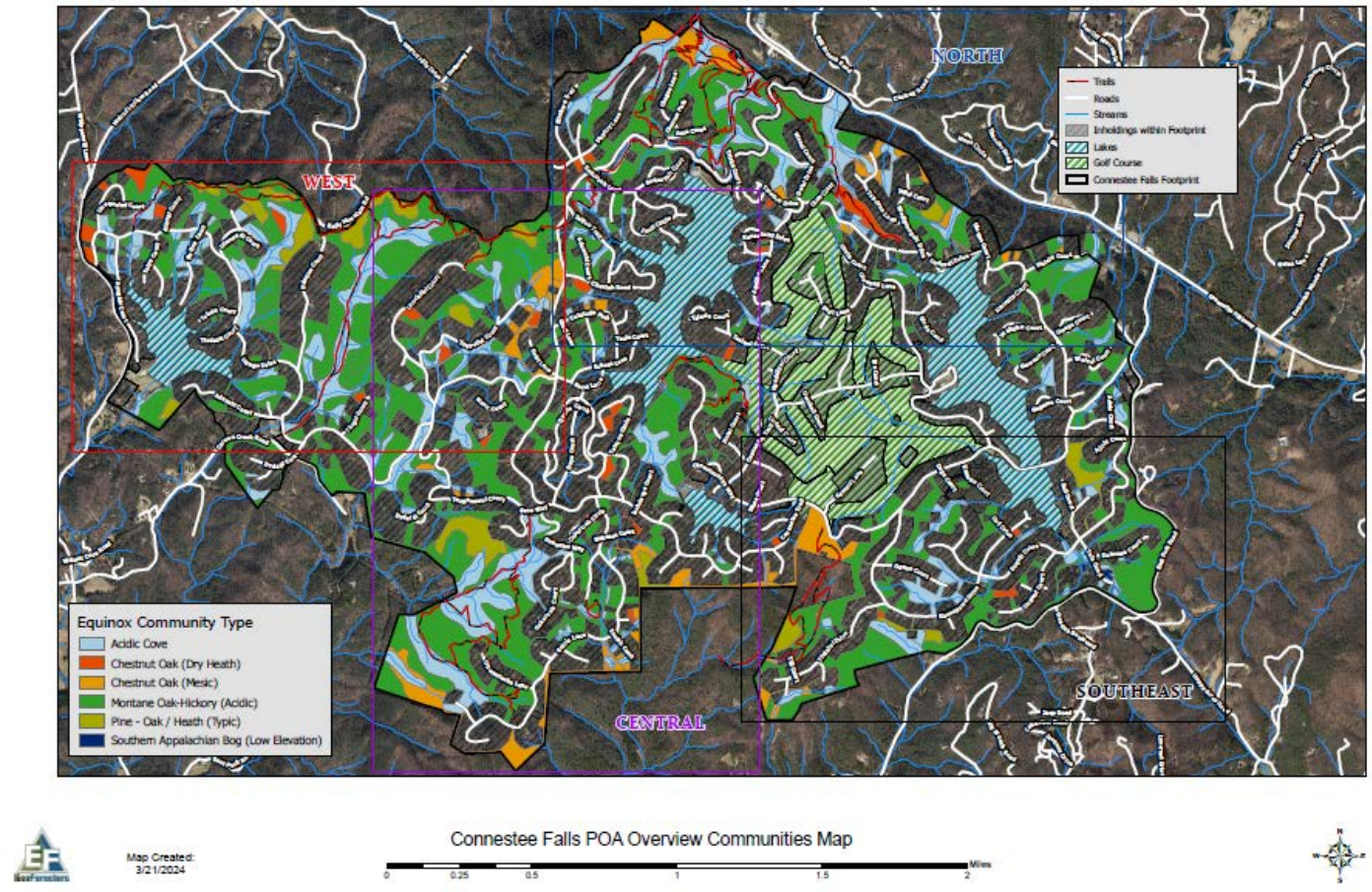
Natural Communities on the Landscape

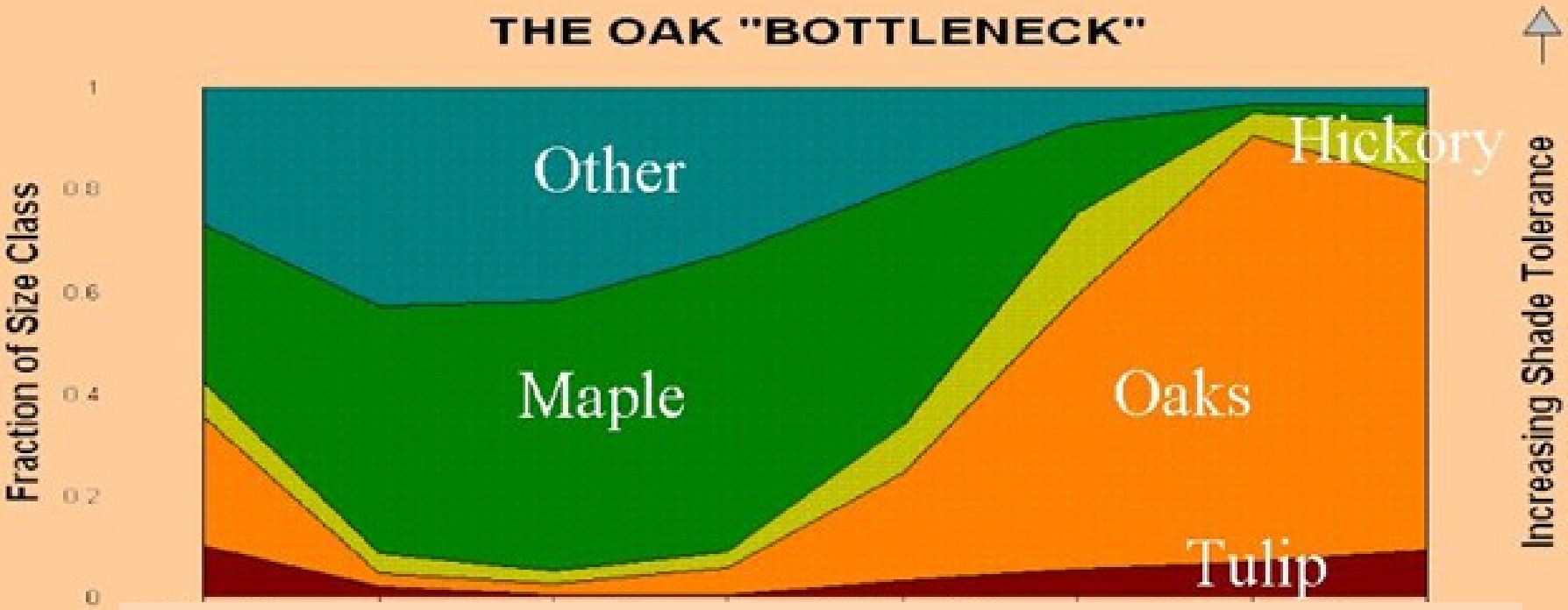


Diversity of Natural Community Types

Growing conditions vary due to:

- Elevation
- Aspect
- Landform
- Slope Position
- Soil Moisture
- Soil Type

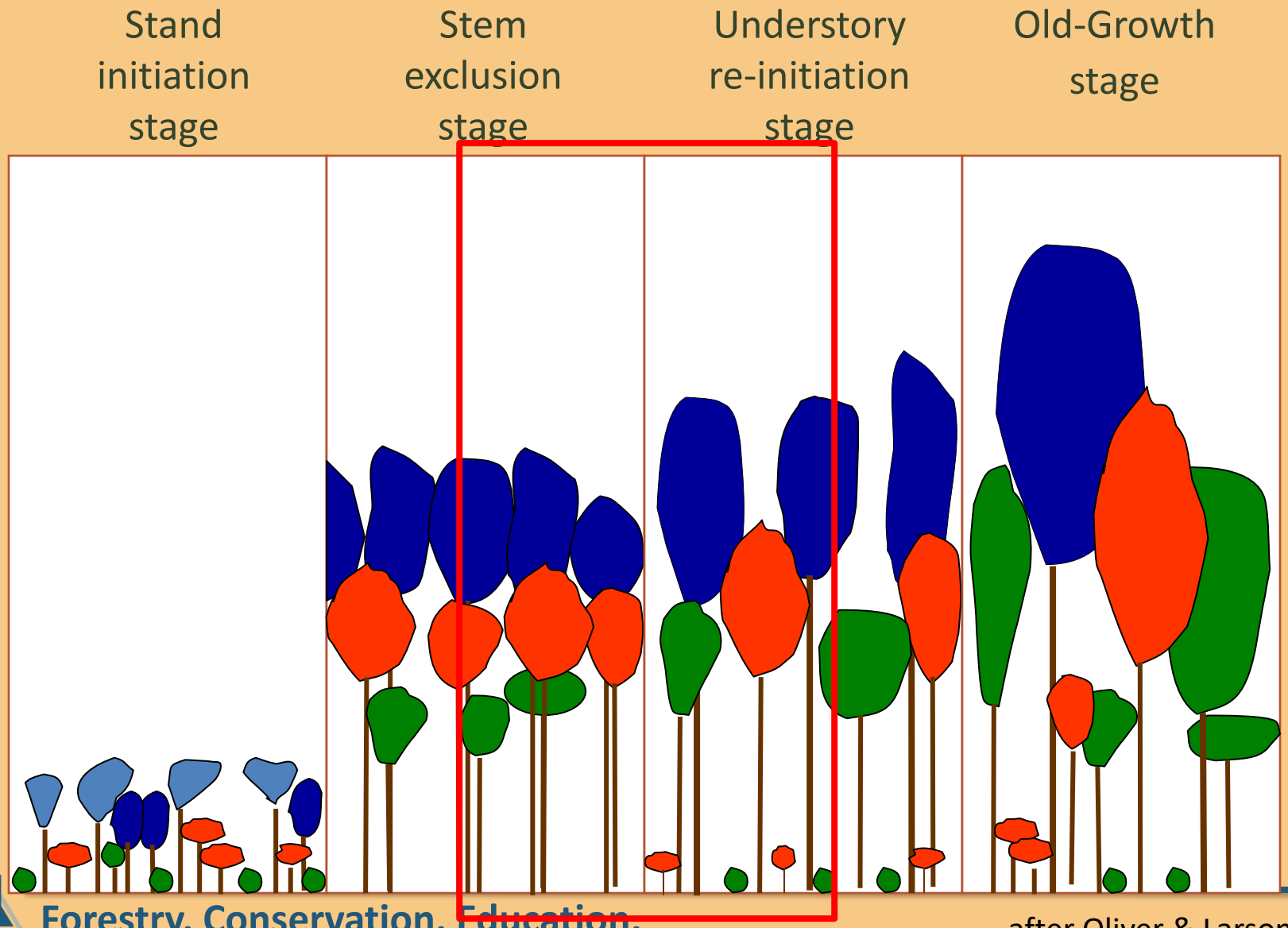




Seedlings--------Saplings----------Mature Trees/Sawtimber

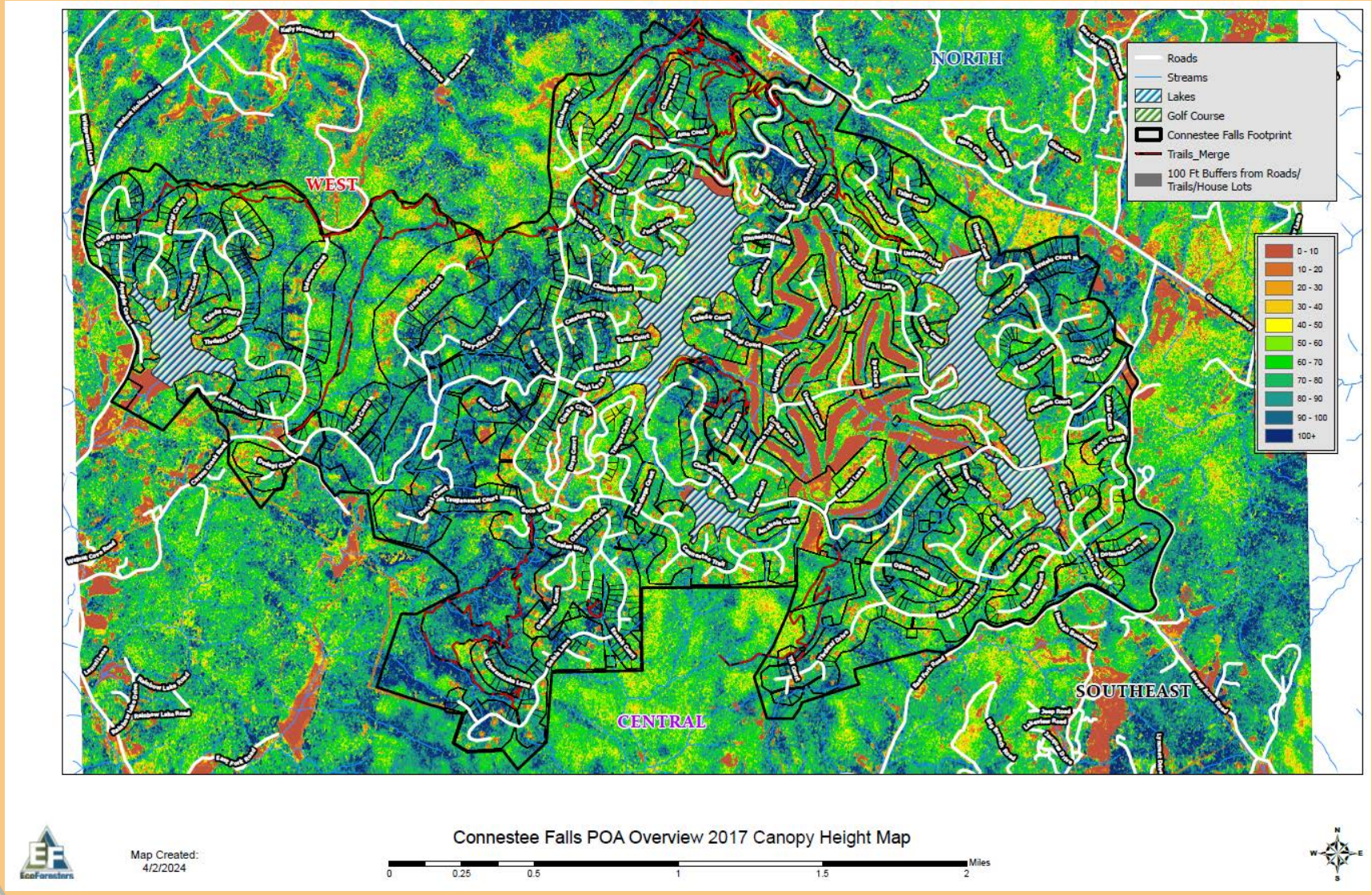
Tree Size: Small ----------Medium----------Large

Stand Successional Stages



after Oliver & Larson 1996

Canopy Height of CF (2017)



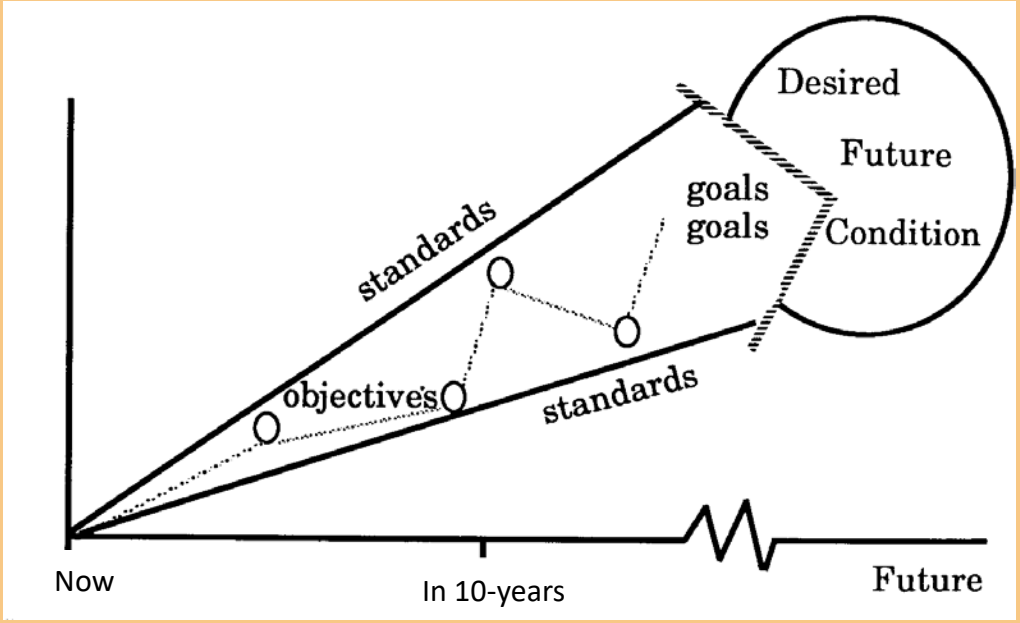
Summary of Forest Planning Process

- Establish a plan
  - **Quantify and Qualify the resource**
  - **Define objectives**
  - **Establish long-term timeline of stewardship actions**
- Implement Plan
  - **Important to be capable of implementing plan**
- Monitor results and adapt as needed

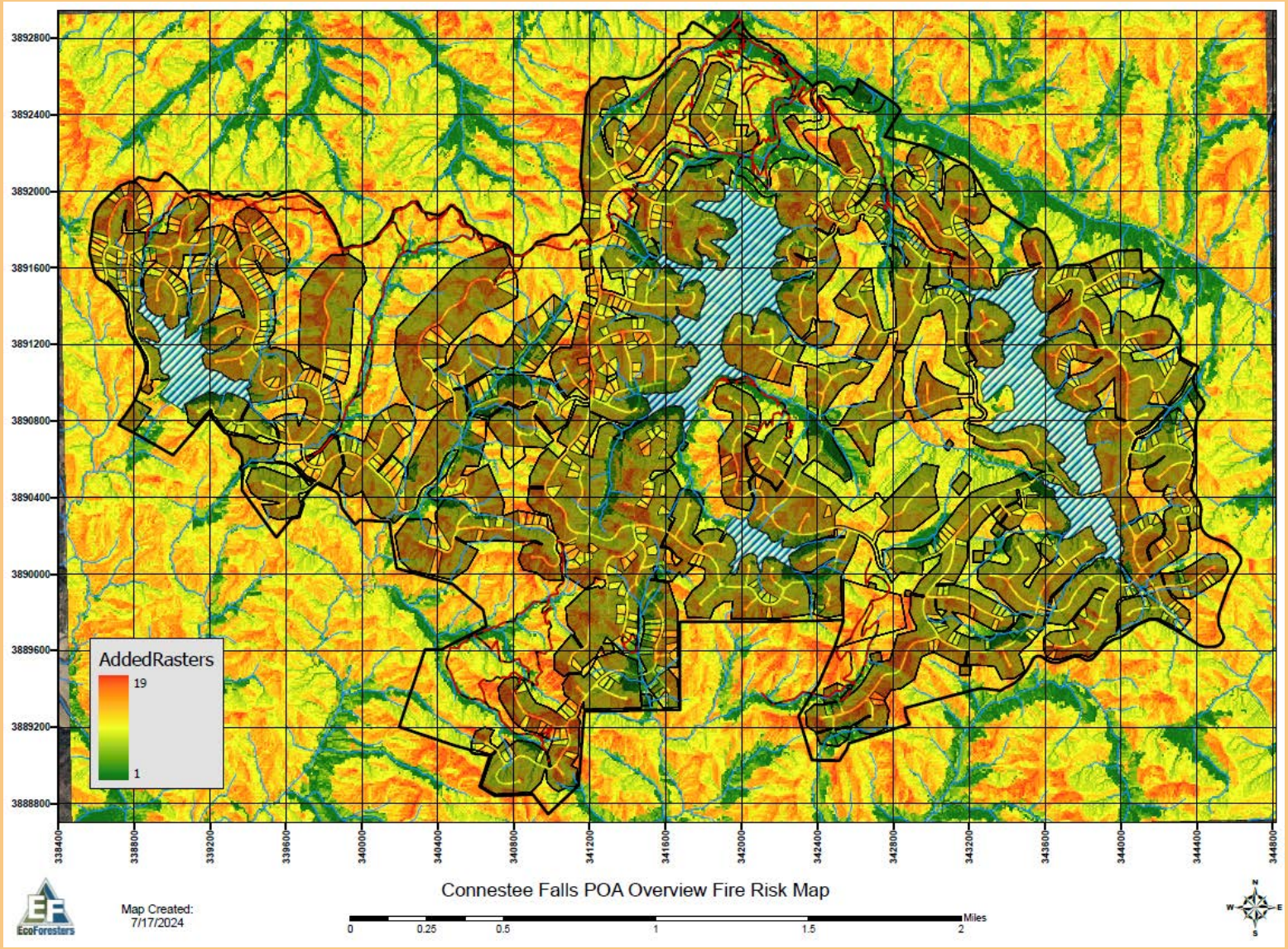
Forest Stewardship Objectives

Ecological Forestry Objectives

- Special Site Conservation
- High Water Quality
- Biodiversity
- Wildlife Habitat
- Carbon Sequestration
- Climate Smart Forestry
- Aesthetic Beauty
- Recreation
- Nontimber Forest Products (mushrooms, ginseng…)
- Wildfire Mitigation



Wildfire Risk Modelling

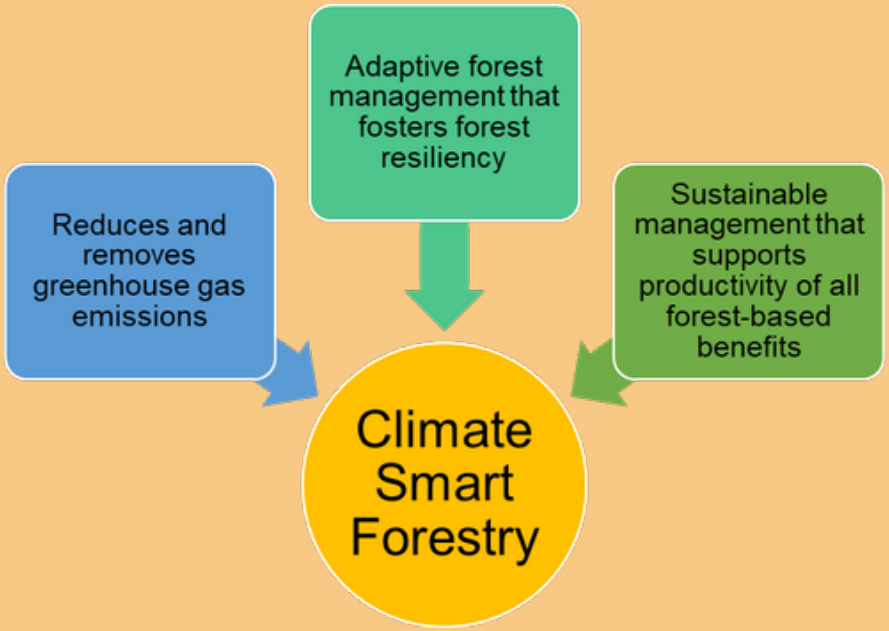


Forest Stand Improvement

- Climate Smart Forestry
- Reduce Wildfire Risk
- Control Non-native invasive species
- Favor more desirable or uncommon trees that need help
- Promote oak, hickory, and yellow-pine that are declining
- Increase growth, vigor, and health
- Improve/Create wildlife habitat

Climate Smart Forestry

- Prepare Forests to be *resilient to and mitigate*:
  - Drier and hotter conditions
  - More droughts
  - Increased wildfire risk – frequency and severity



Climate Smart Forestry

Allows forests and society to transform, *adapt to, and mitigate* climate-induced changes

- Thinning overly dense stands for sustainable growth & climate resilience
- Controlled/Prescribed fire to reduce fuel loads/wildfire risk
- Forest stand improvement work to address coming threats such as pests and competing vegetation
- Planting or fostering climate adapted species or traits to increase climate resilience
- Produce renewable carbon friendly building materials

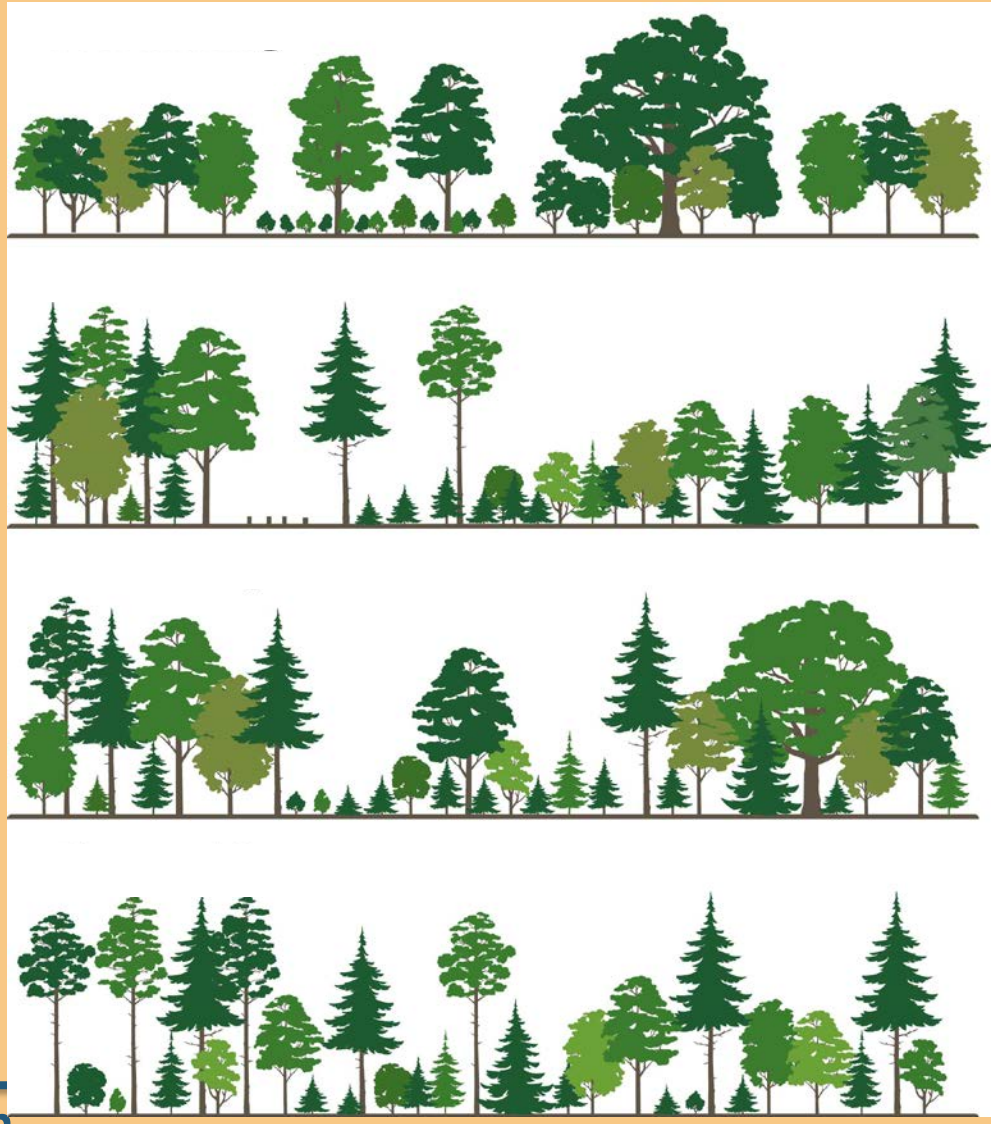
Invasive Plant Control & FSI Methods

- Chemical (Herbicides) – kills roots
- Manual
  - hand-pulling, digging, cutting with hand tools
- Mechanical
  - Chainsaws, brushcutters, mowers, heavy machinery
- Cultural
  - Livestock grazing, controlled burns, thermal weed control, soil solarization

Ecological Forest Management

To Benefit Plants and Animals

- Increase Forest Structural Diversity
- Increase Tree Species Diversity
- Encourage Large Legacy Trees
- Minimize Ground Disturbance



Implementation Methods: Restoration Treatments

Forest Type: Pine-Oak Heath

Objective: Reduce Fire Hazard, Restore Forest Health and Diversity through prescribed burning

Silvicultural Methods: Prescribed Fire on a 3-5 year interval

Midstory Reduction for Wildfire Mitigation and Oak Regeneration

Source: Dr. Jeff Stringer, University of Kentucky

Implementation Methods: Pre-commercial Crop Tree Release Treatment

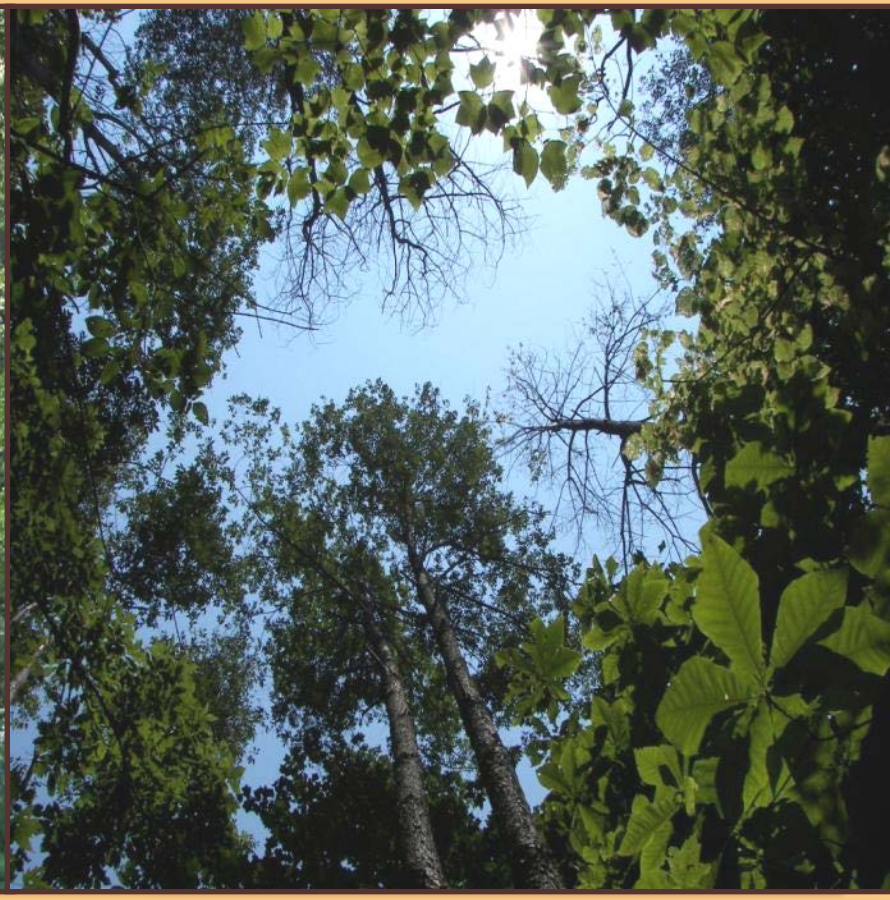
Forest Type: Younger Cove Forest, lacking diversity.

Objective: Enhance Diversity and Forest Health.

Silvicultural Methods: Utilize Crop Tree Release (stem injection method) to increase growing space and health of vigorous trees and desirable species.

Before:

After:



Forest Stewardship Incentives/Funding

Possible Funding Options for CFPOA:

- USDA NRCS EQIP cost share funding for forest stand improvement work
- NCFS Forest Development and Community Protection Programs

An Update on Connestee Falls' Forest Stewardship Plan

Andrew Danner

Forester

NC Registered Forester #1957

Forest Sampling

- Over 50 plots
  - Spaced across 4 forest types
  - Randomly placed
- **Variable Radius Sampling**
  - 10 BAF
  - “Prism Cruising”

Basal Area (BA)

- Determine stand density
- Delineate Even / Un-even Aged Forests
- Basis for making forest management decisions
- Incl. forest regeneration needs and wildlife habitat mgt.

Forest Types

- Confirmed Equinox's – NRI Report
- 4 Types Evaluated; Acidic Cove, Montane Oak-Hickory, Chestnut Oak Forest, Pine-Oak Heath

Data Collected

Overstory species
- Diameter class (4” groups), overall quality
- (Co-)Dominant Trees +16” dia.

Midstory (overtopped and under*)
- Stems counted from 4”-16”
- *POH & COF – 8” and lower
  - site conditions

Advanced Regeneration
- Min. 4.5’ tall

Other Understory
- Shrub Layer
- Vines
- Invasives
- Herbaceous, etc.

General Notes &
“In-Situ” Mgt. Recommendations

Acidic Cove Forest

- Total BA – 144 ft^2/ac

Overstory – BA 90 ft^2/ac (60%)

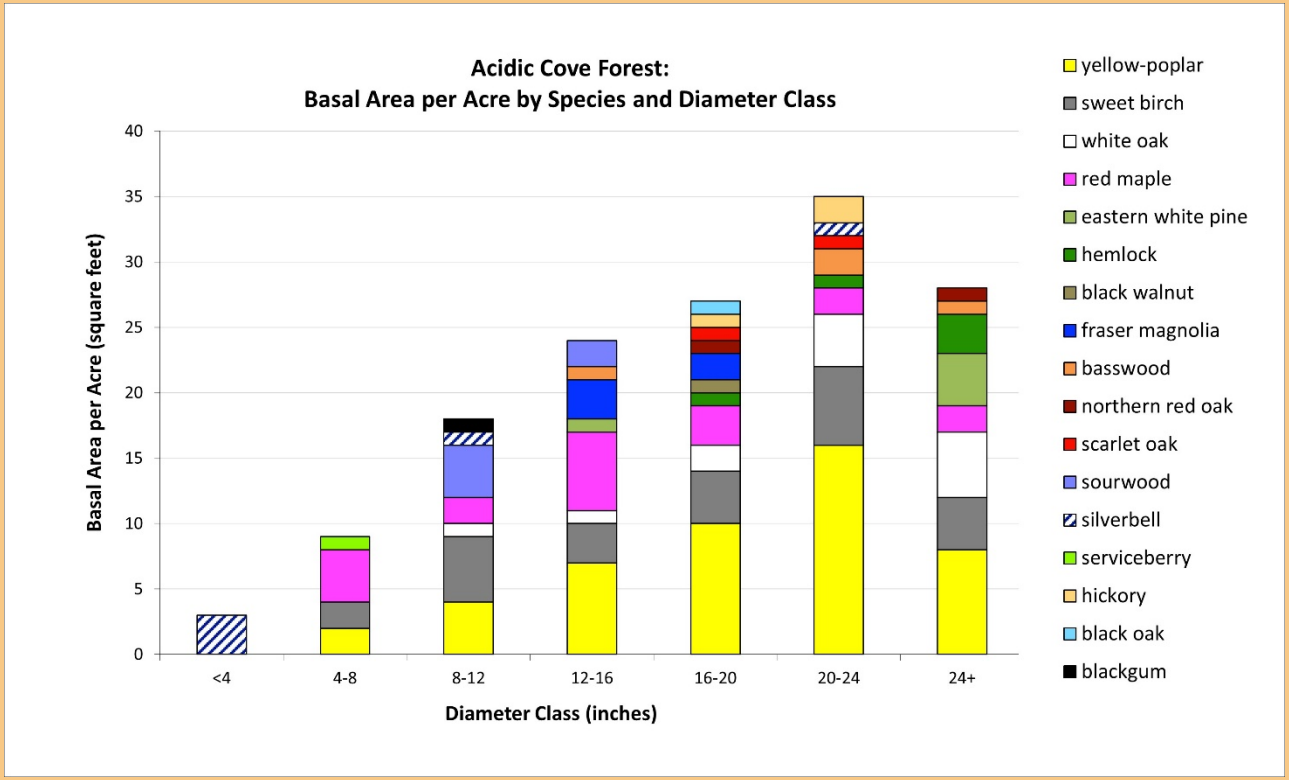
  - Yellow-poplar, sweet birch, red maple, white pine, hemlock, oak sp.

Midstory – BA 51 ft^2/ac (35%)

  - Similar to overstory, plus
  - Silverbell, sourwood, serviceberry

Regen – under 2” dia.

  - Sparse -Silverbell, birch, red maple, white pine, yellow-poplar



Dense rhododendron and doghobble,
limits understory growth
Treated hemlocks – where accessible

Montane Oak-Hickory Forest

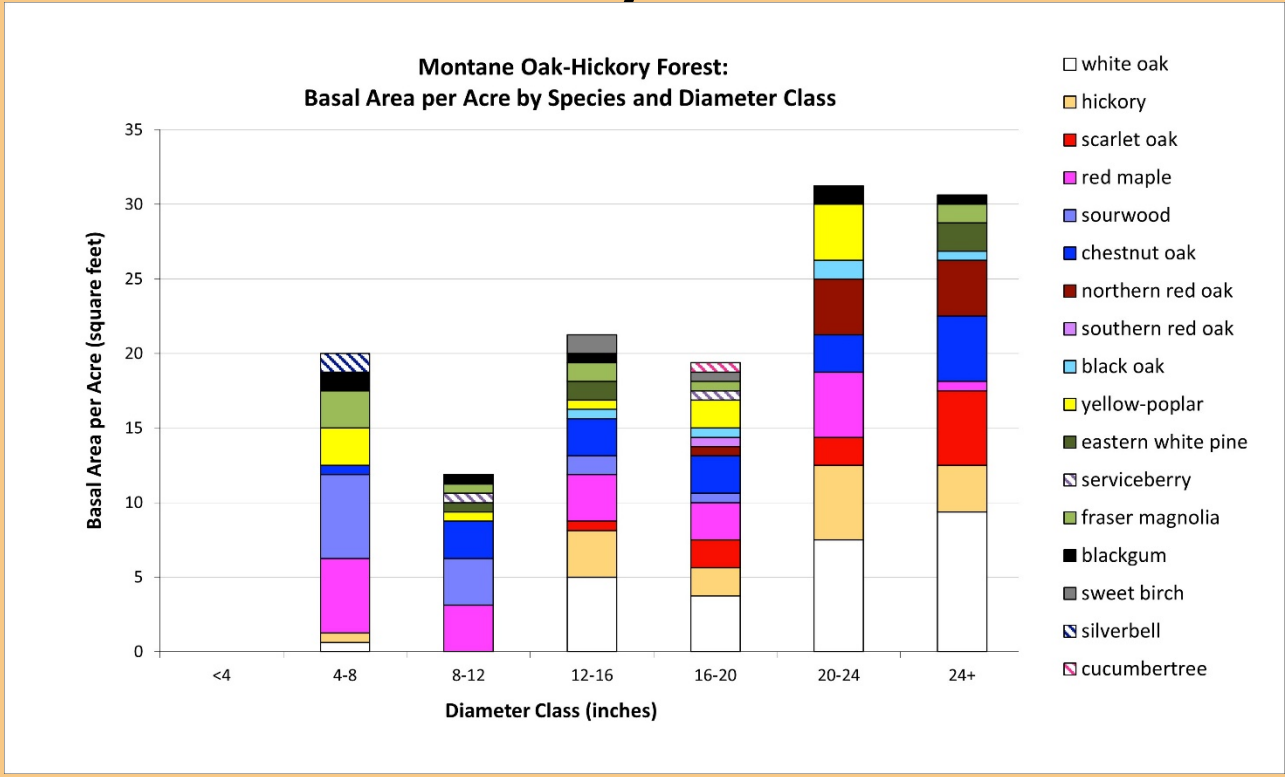
- Total BA – 134 ft^2/ac

Overstory – BA 81 ft^2/ac (60%)

- White oak, hickory, oak red maple, other oak sp.

Midstory – BA 51 ft^2/ac (30%)

- Reduced oak component
- Somewhat similar to overstory
- Red maple, sourwood dominant, other mesophytic sp.



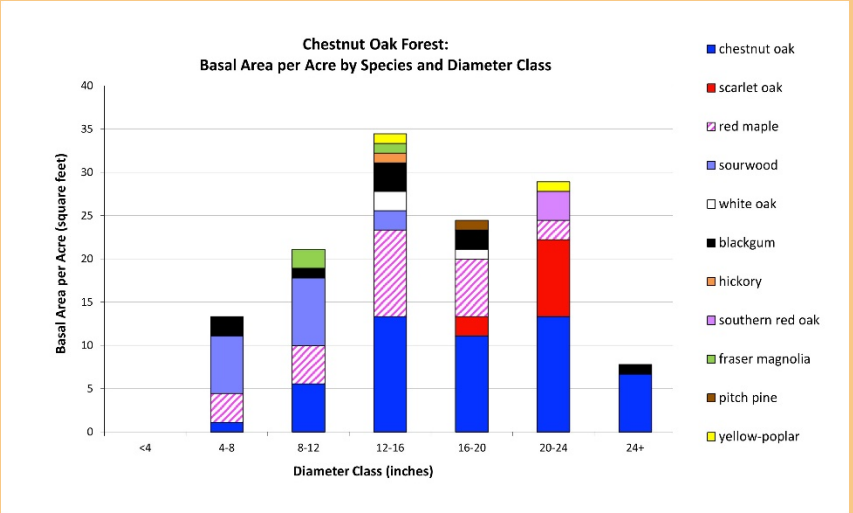
Montane Oak-Hickory

Regen – under 2” dia.

- Sparse – dense understory
- Occasional – open understory
  - Red maple, sourwood, sweet birch, white pine, Fraser mag, silverbell
  - Oak and hickory species seldom
- Often large groves mtn. laurel and/or rhododendron, occ. grapevines

Chestnut Oak Forest

- Total BA – 130 ft2/ac
- Overstory – BA 61 ft2/ac (45%)
  - Chestnut oak, red maple, other oak sp.
- Midstory – BA 69 ft2/ac (50%)
  - Somewhat similar to overstory
  - Red maple, sourwood dominant, blackgum, other mesophytic sp.

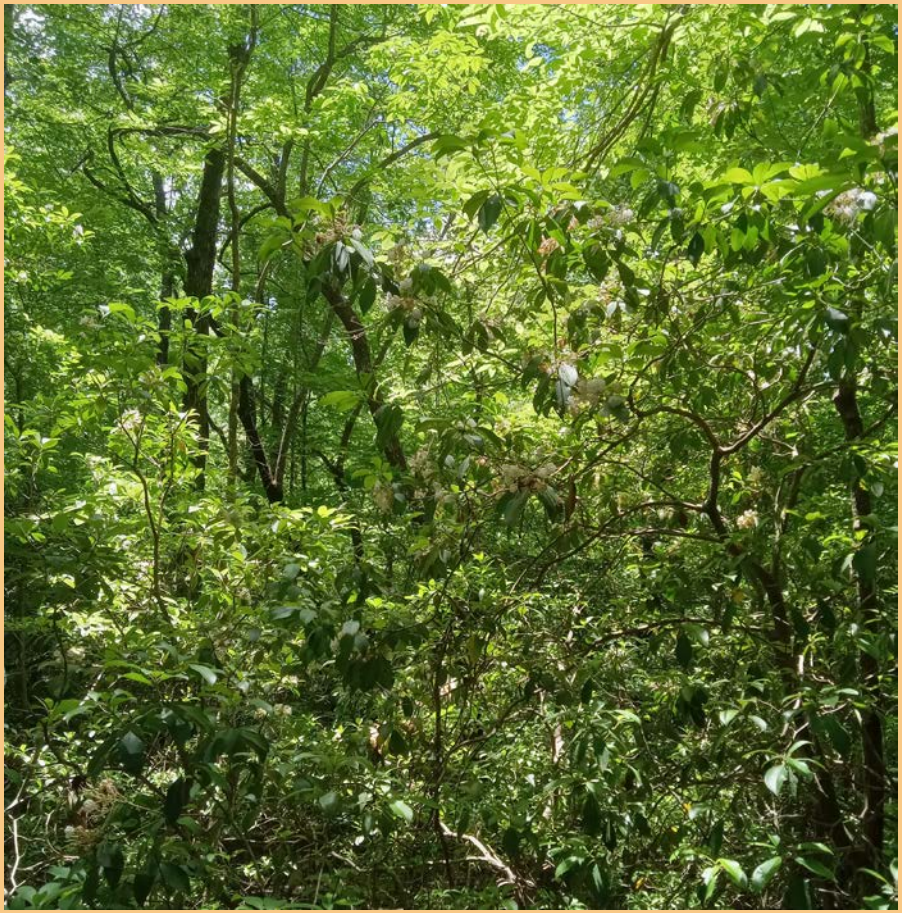


Chestnut Oak Forest

Regen – under 2” dia.

- Sourwood and blackgum dominant, also red maple, white pine, sparse
- Occ. Chestnut oak in canopy gaps

- Often buckberry OR thick groves of rhodo & mtn. laurel
- Taylor Tract – possible “Forest Restoration” project area

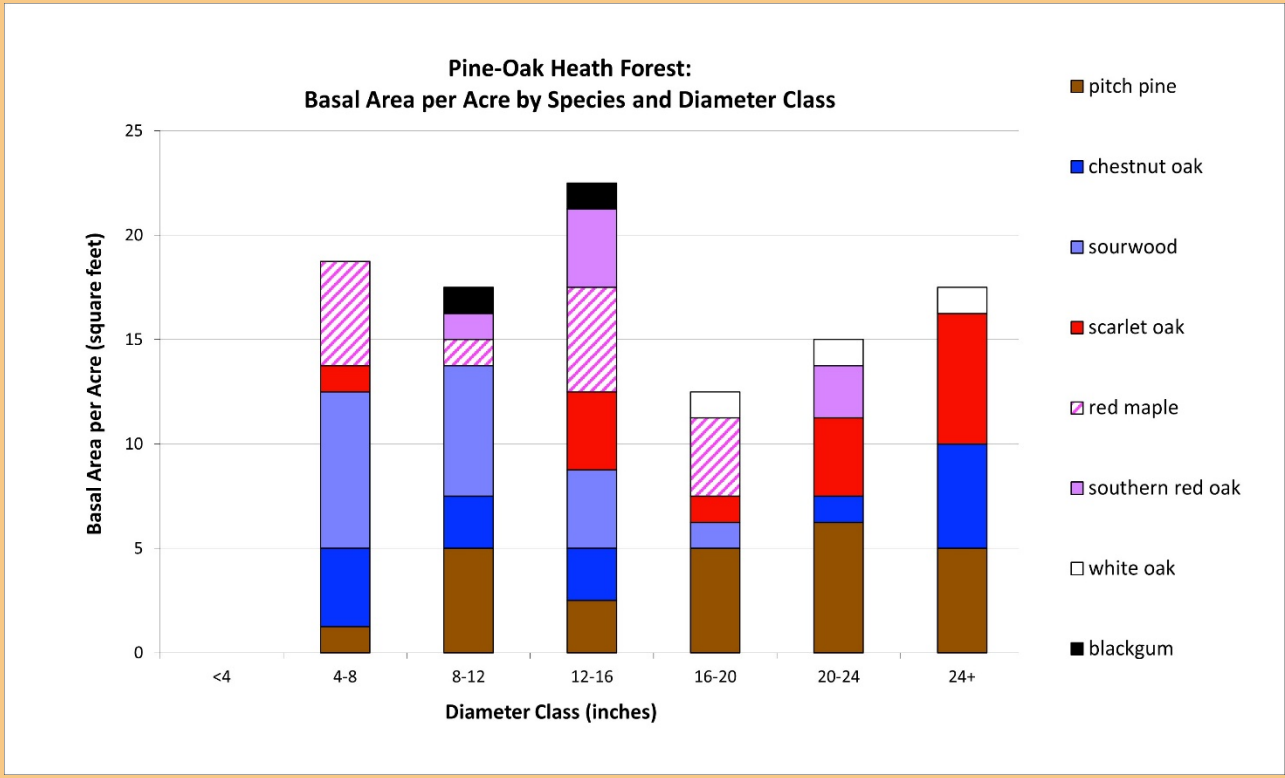


Pine-Oak Heath

- Total BA – 104 ft^2/ac

  Overstory – BA 45 ft^2/ac (appx 40%)
  - Pitch pine, scarlet oak, red maple, other oak sp.

  Midstory – BA 59 ft^2/ac (appx 55%)
  - Reduced pine component
  - Sourwood dominant, blackgum, red maple, chestnut oak



Pine-Oak Heath

- Regen – under 2” dia.
  - Extremely sparse
  - Sourwood, red maple
- Thick & dense rhodo (un-natural) mountain laurel (overly dense)
- Fire suppressed / fire dependent community
- Xeric (dry / lo-nutrients) & slow growing

Forest Management Recommendations

Wildfire Mitigation / Fuel Reduction
Wildlife Habitat – incl Deer
Forest Stand Improvement

Heath Shrub Reduction / Removal

- **Forestry Mulching**
- **Cut and Chip / Haul / Pile**

Forest Management Recommendations

Wildfire Mitigation / Fuel Reduction
Wildlife Habitat – incl Deer
Forest Stand Improvement

Firewise Practices (Homeowner)
Prescribed Fires

Forest Management Recommendations

Wildfire Mitigation / Fuel Reduction
Wildlife Habitat – incl Deer
Forest Stand Improvement

Thinning

-Shape future forest / remove
-midstory & understory
-evergreen shrub layer
- Chemical/Mechanical/Combo
- create snags / reduce fire risk

Small Canopy Gaps
Promotes Desired Midstory and Understory Species

Treat Hemlocks (continual)

Forest Management Recommendations

Wildfire Mitigation / Fuel Reduction
Wildlife Habitat – incl Deer
Forest Stand Improvement

Create Early Successional Habitat
Native Grassland / Wildflower Meadows

Promote Cover/Food Source/ etc. in Natural Environment

Invasive Plant Control – Landscape Changeouts

Promote Native Species

Forest Management

Invasive Species

11 species identified by Equinox- NRI (escaped from landscaping)

Only 2 species found in forest

Multiflora rose – at Connestee Falls

Asiatic bittersweet – along fence/tree line against Walnut Hollow Rd

Erosion

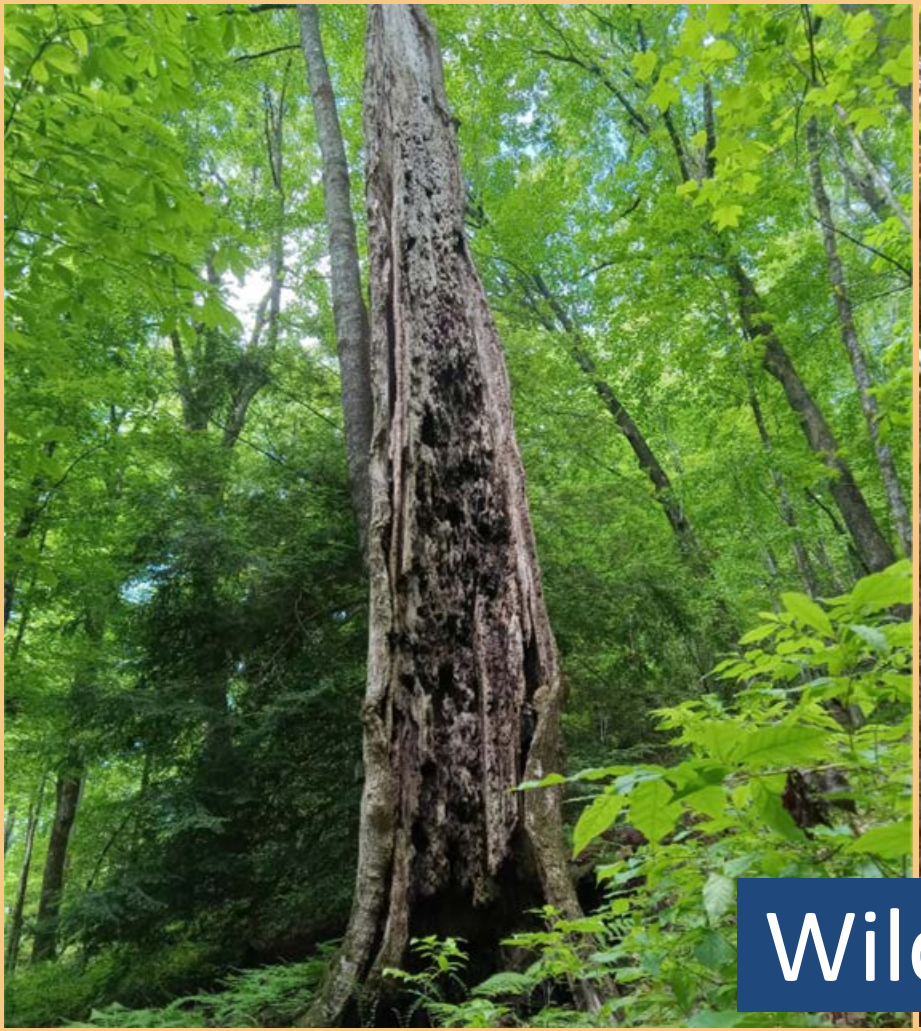
Trails well maintained

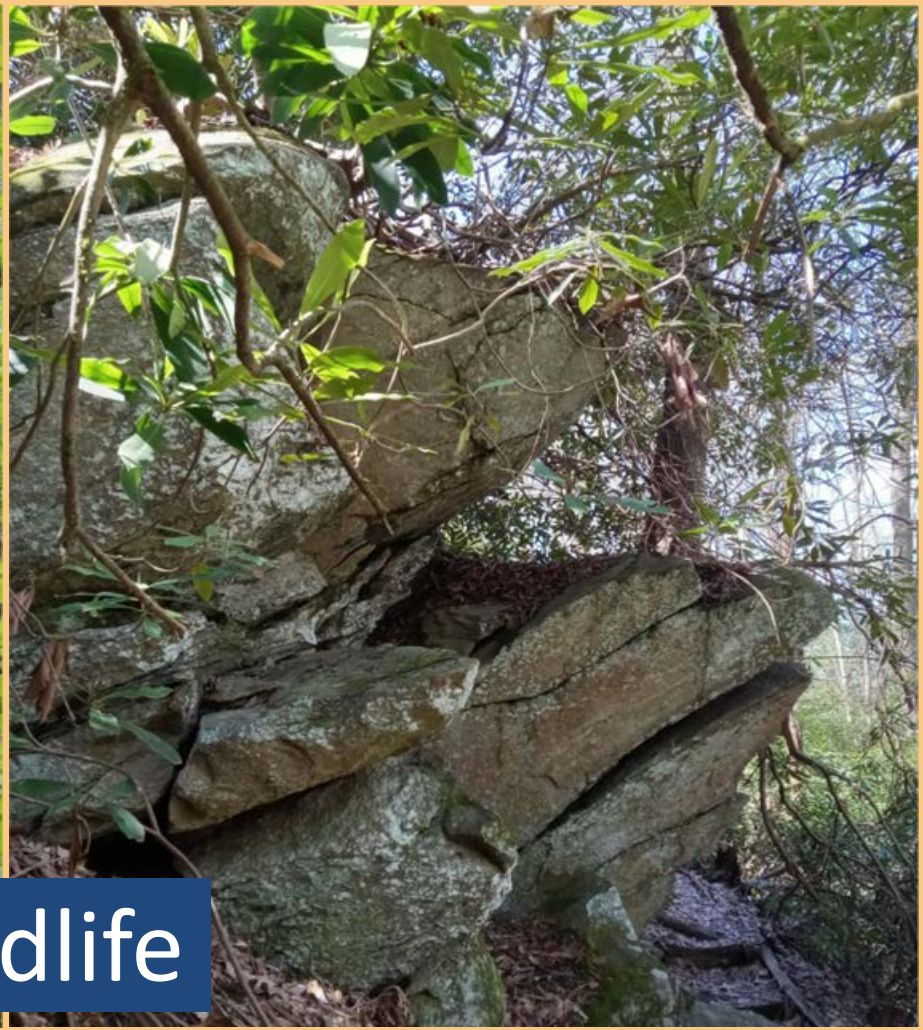
-N. connector Salola Trail Loop


DEFYING
MOTHER NATURE
SINCE 1916
Rite in the Rain
Item No. 373
Made in the USA

Wildlife

Wildlife





Wildlife

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Questions?

atait@ecoforesters.org

adanner@ecoforesters.org

Asheville Office (828)484-6842

www.ecoforesters.org