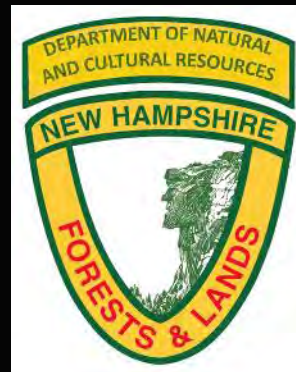


Measuring the Location and Extent of Significant Old Forest Stands in the Northeast


Liz Thompson- Moderator

Northeast Natural Heritage Programs:

- Justin Schlawin -- *Maine*
- Jaci Braund -- *Pennsylvania*
- Max Henschell -- *New York*
- Bob Zaino -- *Vermont*
- Bill Nichols -- *New Hampshire*



Baxter State Park, ME

A large, solid red arrow pointing to the right, located below the text.

Describe your program and its role in the heritage network in the science of understanding significant ecosystems?

What is the NatureServe Network?



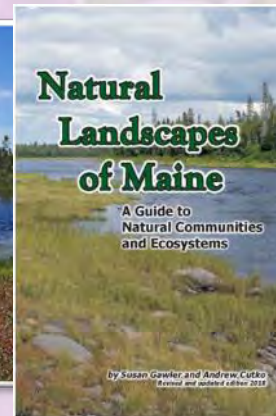
Maine Natural Areas Program

MNAP serves Maine's citizens as a comprehensive source for the State's important natural community and botanical features.

Endangered & Threatened
Plants



Rare or Exemplary Natural
Communities and
Ecosystems



Maps, Data, Technical
Assistance



Ecological Reserves,
Sentinel Site Vegetation
Monitoring



MNAP provides objective and comprehensive information to equip decision-makers. We share data with other state agencies, town planners, land trusts, and other groups interested in natural resource and conservation planning.

NH Natural Heritage Bureau

The NH Natural Heritage Bureau finds, tracks, and facilitates the protection of New Hampshire's rare plants and exemplary natural communities.



Natural Plant Communities



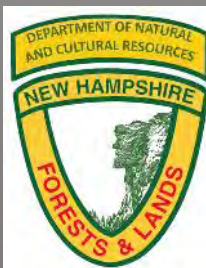
Rare Fauna



Ecological Systems

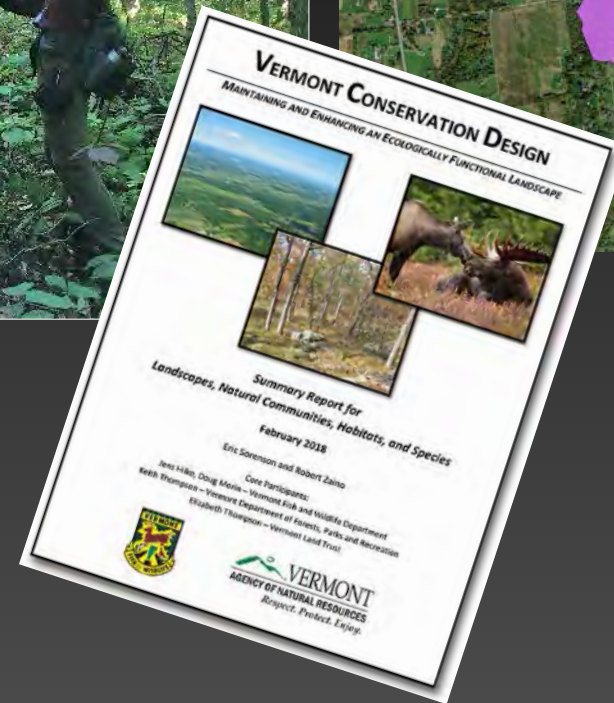
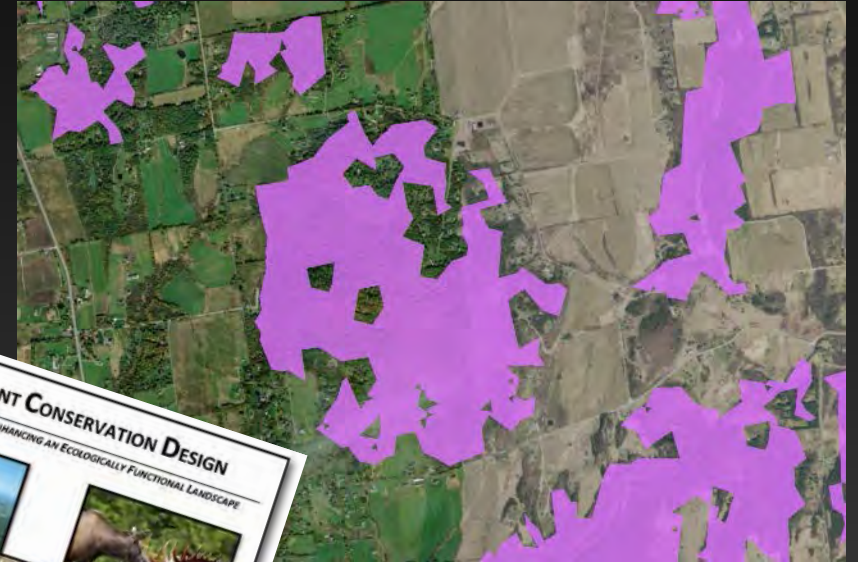


Rare Flora



The mission of the Vermont Fish & Wildlife Department is the conservation of our fish, wildlife, plants and their habitats for the people of Vermont

- Classify, map, and track high-quality natural communities
- Map and track larger ecological units: habitat blocks (forest blocks)
- Conservation science and planning
- Technical assistance, outreach, and education





Pennsylvania Natural Heritage Program

Session 1: Describe your program and its role in the heritage network in the science of understanding significant ecosystems?

- PNHP is a partnership between a few organizations:
 - Western Pennsylvania Conservancy
 - PA DCNR, Game Commission, Fish & Boat
 - USFWS
- Pennsylvania Natural Diversity Inventory (PNDI) is our bread & butter
- Classifying over 200 different community types in PA
 - Mainly grant-funded, project based
 - PA Old Growth Project
 - Plot work, mapping, determining ecological associations
 - Foresters use PNHP plant community types when typing a stand
- Tracking rare types (S1-S3)
 - Involves in-depth understanding from surveys and cause of rarity
 - PNDI Environmental Review – but non-regulatory
- Collaborating with other state heritage programs to understand regional similarities/differences
 - Methods
 - Distribution of community types

New York Natural Heritage Program

“Facilitating conservation of New York State’s biodiversity”

- Program of the State University of New York College Environmental Science and Forestry (SUNY-ESF)
- Funded primarily by the NYS Department of Environmental Conservation and its partners
- Maintain records on significant examples of natural communities, rare plants, animals, exotic species throughout the State
 - No direct stewardship or management



NYNHP Home Guides About Search

Acidic Talus Slope Woodland

System
Terrestrial

Subsystem
Barrens And Woodlands

State Protection
Not Listed

Federal Protection
Not Listed

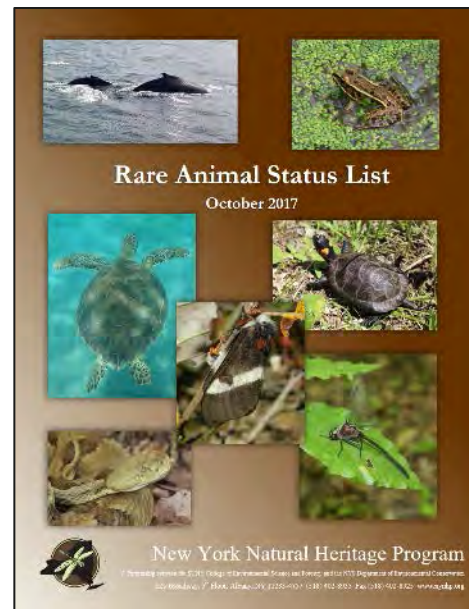
State Conservation Status Rank
S3

Global Conservation Status Rank
G4?

Acidic talus slope woodland in southern Shawangunk Mountains near Phillipsport.
Gregory J. Edinger

Contents

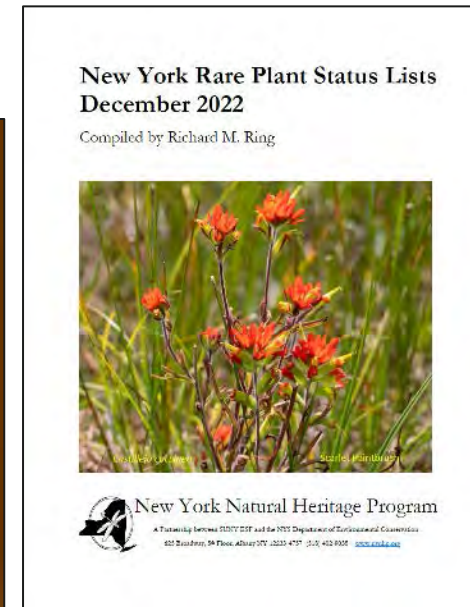
1. [Summary](#)
2. [Conservation and Management](#)
3. [Range](#)
4. [Identification Comments](#)
5. [Classification](#)
6. [Additional Resources](#)
7. [About This Guide](#)



Rare Animal Status List

October 2017

New York Natural Heritage Program
A Partnership between SUNY ESF and the NYS Department of Environmental Conservation
625 Broadway, 9th Floor Albany, NY 12242-4737 (518) 412-6335 www.nynhp.org

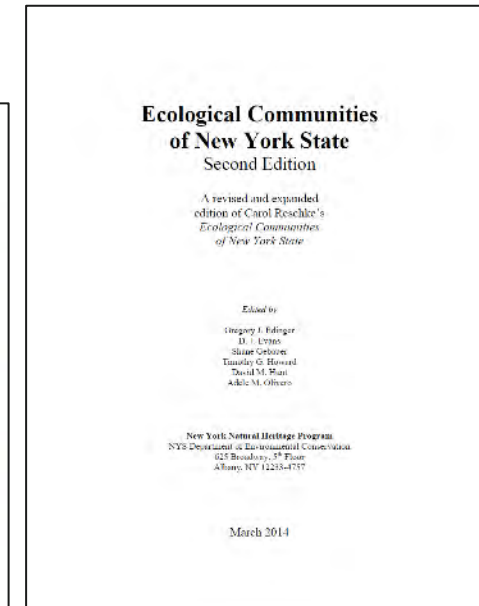


New York Rare Plant Status Lists

December 2022

Compiled by Richard M. Ring

New York Natural Heritage Program
A Partnership between SUNY ESF and the NYS Department of Environmental Conservation
625 Broadway, 9th Floor Albany, NY 12242-4737 (518) 412-6335 www.nynhp.org



Ecological Communities of New York State

Second Edition

A revised and expanded edition of Carol Reschke's *Ecological Communities of New York State*

Edited by
Gregory J. Edinger
D. J. Lynch
Shane Osborne
Timothy G. Howard
David M. Starr
Adelle M. Olivero

New York Natural Heritage Program
NYS Department of Environmental Conservation
625 Broadway, 9th Floor
Albany, NY 12242-4737

March 2014





How does
your program
track old
forest
occurrences?





Tracking Old Forests in NH

- Information from a variety of sources.
- Field surveys on state, federal, and private land.
- Geographic and ecological data entered into Biotics database.
- We actively locate and confirm new sites of old forest.



Old-growth high-elevation spruce - fir forest system
Nancy Brook Research Natural Area
Livermore



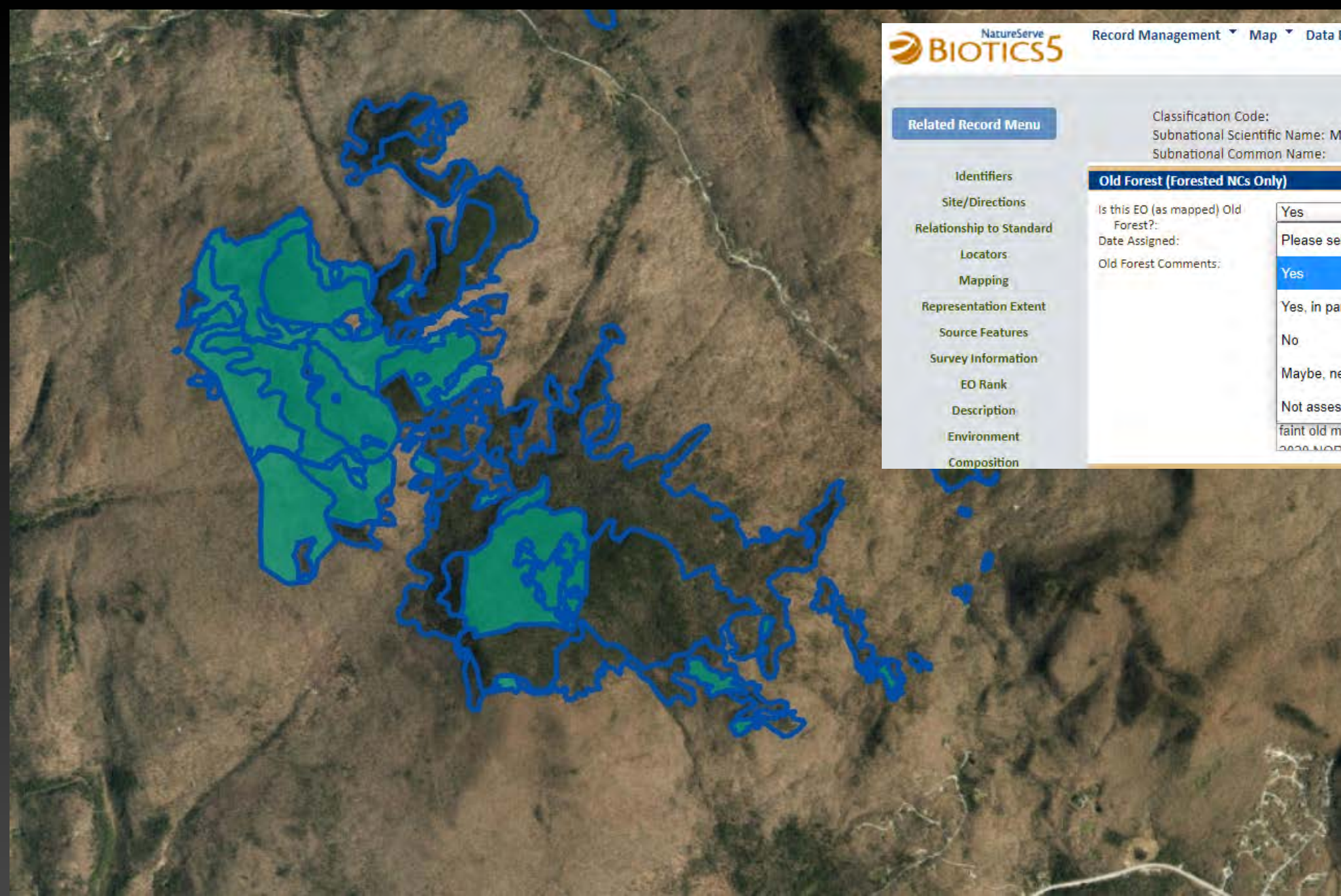
CWD in an old-growth hemlock – beech – oak – pine forest
Pisgah State Park
Winchester

Vermont's 'Old Forest' Definition

- Minimal human disturbance
- Tree species characteristic of the natural community present in multiple ages
- Complex forest structure (usually)
- Generally with trees older than 150 years
- Not limited to matrix forest types

Intentionally do not have quantitative diagnostic criteria





Related Record Menu

- Identifiers
- Site/Directions
- Relationship to Standard
- Locators
- Mapping
- Representation Extent
- Source Features
- Survey Information
- EO Rank
- Description
- Environment
- Composition

Classification Code:
Subnational Scientific Name: Montane Spruce-Fir Forest
Subnational Common Name:

Old Forest (Forested NCs Only)

Is this EO (as mapped) Old Forest?:
Date Assigned:
Old Forest Comments:

Yes ▾
Please select a value
Yes
Yes, in part
No
Maybe, needs more inventory
Not assessed

determined with Marcus and Sorenson
in the broader record needs to be grou
220 acres has been ground truthed to b
also more young forest. This applies to
forest on the South summit complex that
faint old minor access roads in places on the LIDAR.
2000 NORTH SUMMIT On the south summit complex...





Pennsylvania Natural Heritage Program

Session 1: How does your program track old forest occurrences?

Definition of old growth

- PNHP currently utilizing PA DCNR definition (= FSC) of old growth:
 - “...Includes both virgin stands and those that experienced some level of timbering since European settlement, and are now achieving some old growth characteristics after being protected.”
- Not directly written in my project to update this, but I would like to explore a more in-depth definition for Pennsylvania (or at least BOF)
 - Updating language – old growth vs. old forest
 - Should I explicitly include old growth forest characteristics or leave that vague?
 - Interested in feedback on the pros/cons of outright defining OG



Large Betula allegheniensis log at Ricketts Glen State Park



Pennsylvania Natural Heritage Program

Session 1: How does your program track old forest occurrences?

Role of tracking old forest areas

- Drawing in polygons for old growth based on recent surveys
 - Use my weighted ranking system & field gestalt to determine if the polygon should be an EO

| | |
|------------------------------------|--------------------|
| Should this observation be an EO?* | Yes |
| EO Spec. Comments | old growth example |

- Many older records in Biotics - field biologist deemed mature, or old; or overlap with “well-known OG areas” (mainly within Natural Areas)
 - These are typed, delineated, and just simply noted in the description about the old status
- Currently all the old growth plant community types are not tracked (S4-5); so it is up to the biologist whether it is “elevated” to an EO
 - will go into Biotics but not tracked in ER
- Understand the distribution of old forest habitat in the state
 - Carbon sinks
 - Other EO’s that are associated with old forests (TBD)
 - Enhancing buffer habitat around old forests

New York State Definition

“... A parcel of at least ten acres which includes all of the following: an abundance of late successional tree species, generally at least 180-200 years old in a contiguous forested landscape, that has evolved and reproduced itself naturally and with the capacity for self perpetuation, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring canopy gaps formed by natural disturbances creating an uneven canopy, and a conspicuous absence of multiple stemmed trees and coppices. Typically, old growth forest sites also are characterized by an irregular forest floor containing an abundance of coarse woody materials which are often covered by mosses and lichens, show limited signs of human disturbance since European settlement, have distinct soil horizons that include definite organic, mineral, alluvial accumulation, and unconsolidated layers, and have an understory that displays well-developed and diverse surface herbaceous layers.”
– NY Environmental Conservation Law § 45-0105



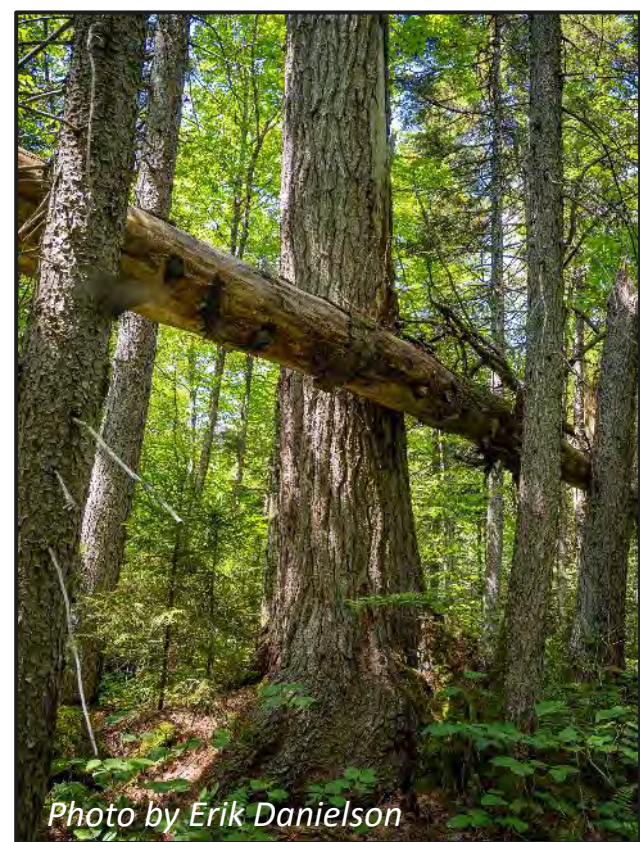
NYNHP definition and tracking

What is old-growth

- “Minimally harvested”
- First-growth

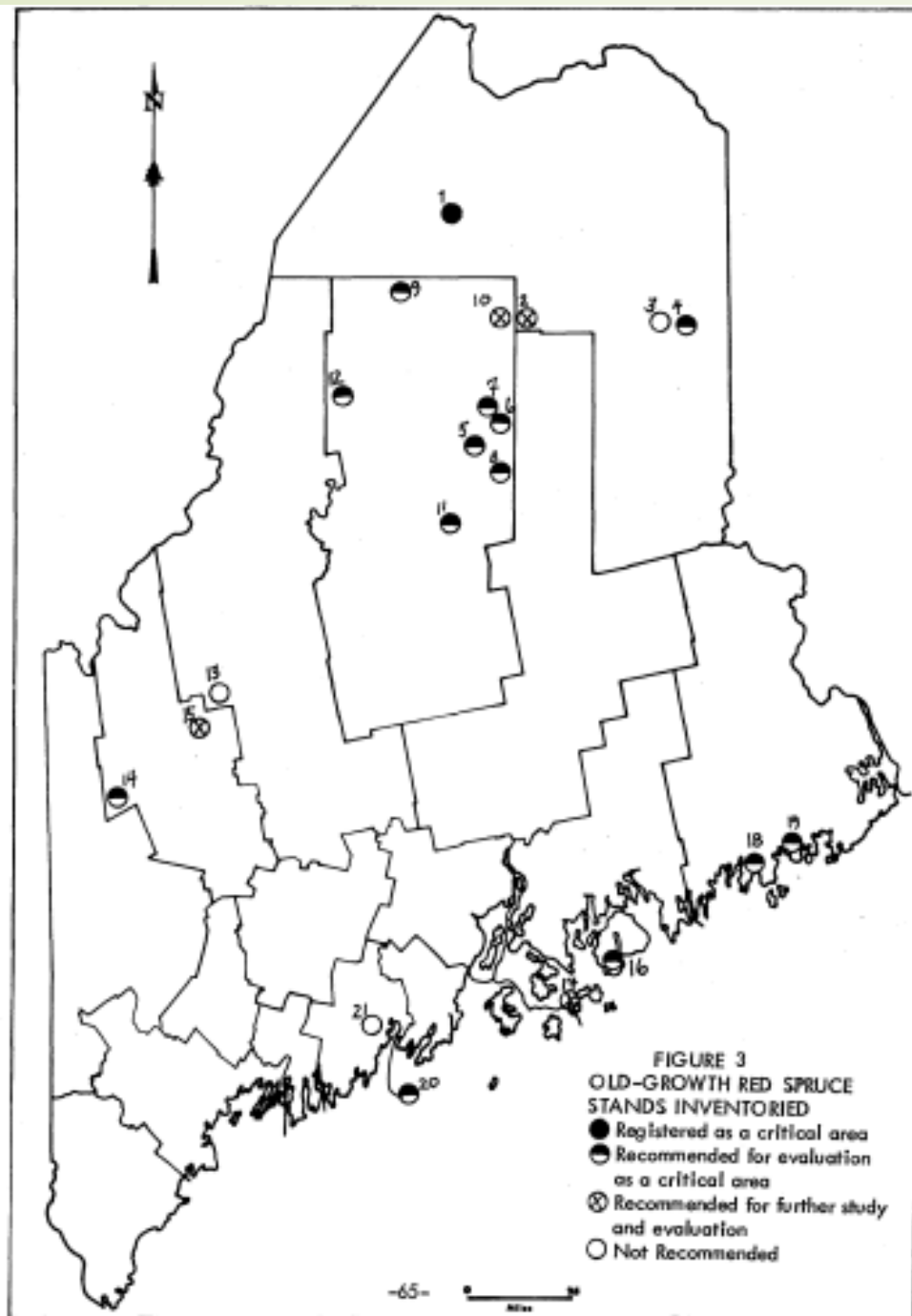
Tracking

- Tracked by natural community type
- Old-growth characteristics considered in condition rank



Critical Areas Inventory

- Critical Areas OG inventory: 1980-87
- 1993 → MNAP
- 41 sites now tracked by Maine Natural Areas Program



Maine terminology: 'old-growth'

- ▶ No formal definition or legal protection in ME
- ▶ Numerous references in Maine forest management frameworks with different definitions
 - ▶ E.G. FSC Forest Management Standard V1.0, BPL IRP
- ▶ MNAP focus: document **reference condition** habitats at the natural community scale, including forests. Crosswalk when necessary to management frameworks.



Little Moose (state record red spruce)



What do you measure to determine what is an old forest?



Gero Island, ME

Confirming and Documenting Old Forests

- Very large, old trees present in mixed-aged forest.
- Dominant tree species late successional.
- Large snags and CWD.
- Canopy gaps.
- Absence of cut stumps, roads, stonewalls, cellar holes, or other evidence of human land use.
- Other features (e.g., tip-up mounds).



Measuring old forest

- No standardized methods – relies on professional judgement
- Tree ages
- Observations of structure
- Evidence of stumps and roads
- Manomet LS Index





Pennsylvania Natural Heritage Program

Session 1: What do you measure to determine what is an old forest?

- Developing an Old Growth Rapid Assessment
 - Weighted ranking system
 - 4 points along a 200 m transect
 - Collect some forestry data – tree DBH, basal area, percent cover of CWD
 - Record presence or absence of old forest characteristics (on a scale)
 - Numerous large trees (at least 60 cm, more commonly 80-over 100 cm)
 - No evidence of cut stumps or haul roads
 - Pit and mound topography
 - Nursery logs
 - Tree features: large lateral branches, low stem taper, unique bark patterns
 - Run the transect within old growth
 - Continuing to evolve but it is working so far
 - Minimum score of 7 (out of 12) to be considered late successional
- Qualitative measurements...
 - Historical records of areas not being cut
 - Big trees

OGRE (Old-Growth Rapid Evaluation)

- 9 old-growth characteristics
 - Pit and mound
 - “large” coarse woody debris
- Basal area
- CWD size class & decay class
- Presence of 3 epiphytes

Old-growth project

- Relevé plot (vegetation)
- 12 epiphytes
- Tree diameter
- Tree age
- Coarse woody debris



Maine indicators for old forest conservation significance

- 11 forest types tracked on basis of old forest conditions
- Condition
 - Land use history
 - Old trees > 150 years
 - Large trees
 - Large snags
 - Coarse woody debris
 - Canopy gaps and tree age diversity
 - Tree epiphytes
- Landscape context
- Size

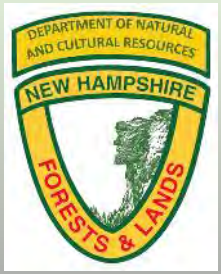




How much old forest is in your state/ region and what are some of the most notable sites in your state?



Tionesta Research and Scenic Area, Allegheny National Forest, PA



Old Forest in New Hampshire

1,886 acres of old forest on record.

1,940 acres of high-elevation spruce fir forest generally never cut.

Informal knowledge of another 500–1,000 acres needing confirmation.

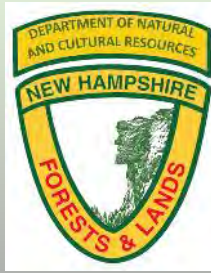
If confirmed, total estimated at 0.03–0.05% of the forest cover in NH.



The Bowl Research Natural Area

731 acres

Northern hardwood - conifer forest system
High-elevation spruce - fir forest system
Waterville Valley



Mt. Sunapee State Park

484 acres (so far)

Northern hardwood - conifer forest system
Newbury



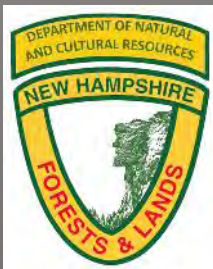
Sugar maple



Large yellow birch



Coring red spruce



Lafayette Brook

227 acres

Ecological study plots



Northern hardwood - conifer forest system, Franconia



Mt. Kearsarge State Forest 300+ acres

Northern hardwood - conifer forest system
Warner



Yellow birch



Red spruce



Red oak dominated slope



Other Old Wooded Communities

Circumneutral red cedar rocky outcrop

RHODORA, Vol. 120, No. 982, pp. 154-171, 2018
© Copyright 2018 by the New England Botanical Club
doi: 10.3119/17-28; first published on-line June 18, 2018.

AN OLD CIRCUMNEUTRAL RED CEDAR ROCKY OUTCROP COMMUNITY IN THE PAWTUCKAWAY MOUNTAINS, NEW HAMPSHIRE

WILLIAM F. NICHOLS

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Natural and Cultural Resources, 172 Pembroke Road, Concord, NH 03301
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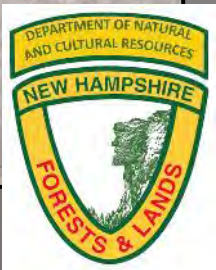
ABSTRACT: Red cedar woodlands on circumneutral outcrops are a rare type of natural community in New Hampshire (S1—Critically Imperiled) and across its global range (G3—Vulnerable). The most studied example in the state, first observed by New Hampshire Natural Heritage Bureau ecologists over 15 years ago, was surveyed and formally documented in 2016 and 2017 from three adjacent slopes of the ring-dike complex known as the Pawtuckaway Mountains in Nottingham and Deerfield, NH. Stand-age studies suggest the red cedar woodland may have existed as a stable community at this site for many centuries. Since examining this site in the Pawtuckaway Mountains, one other circumneutral red cedar rocky outcrop community with similar plant species composition and cover in a comparable physical setting has been documented in southern New Hampshire. Here, we newly describe the circumneutral red cedar rocky outcrop community in New Hampshire.

Key Words: circumneutral red cedar rocky outcrop community, globally rare, old growth, ring-dike complex, Pawtuckaway Mountains, Nottingham and Deerfield, New Hampshire

Red cedar woodlands on circumneutral outcrops are a rare type of natural community in New Hampshire (S1—Critically Imperiled) and across its global range (G3—Vulnerable). Across eastern North

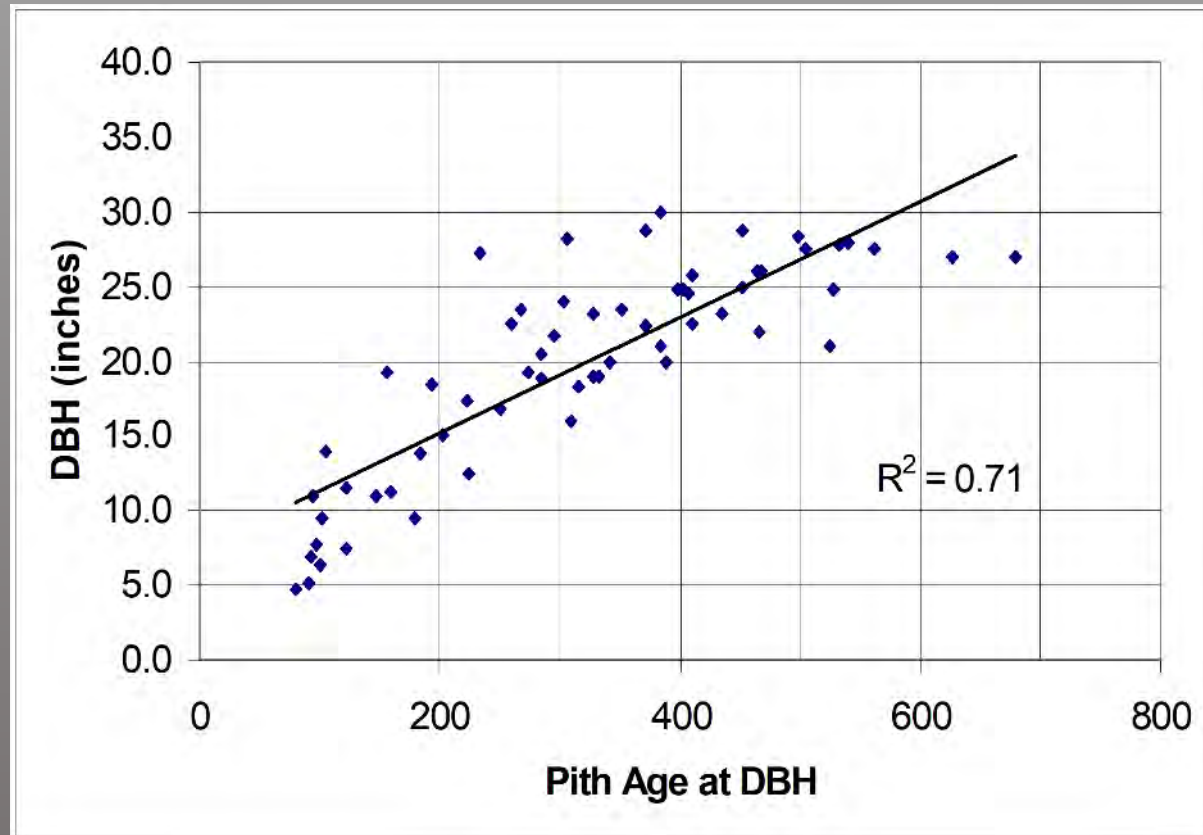








Black gum - red maple basin swamp



Diameter / age
correlation

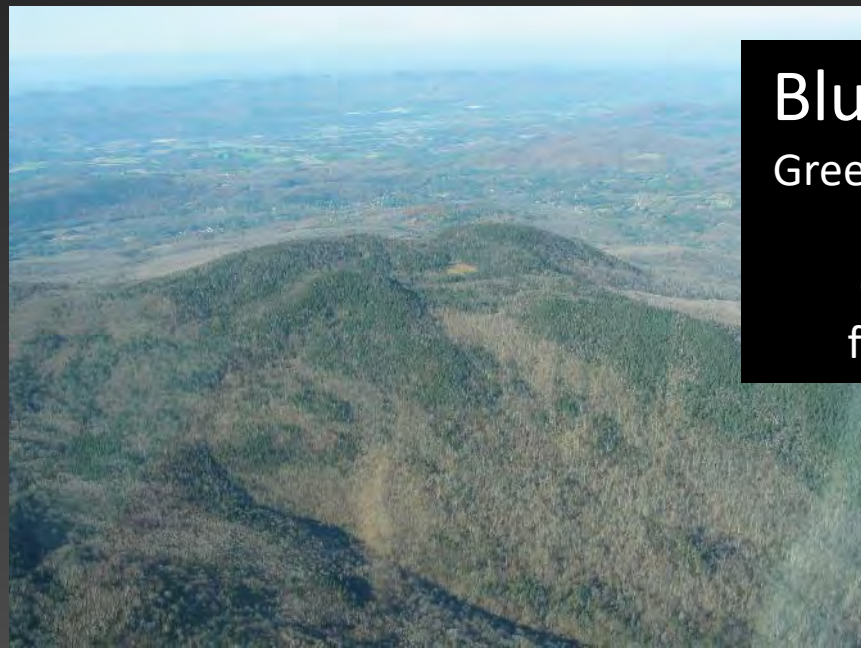


700 year-old black gum



Silver Lake Old Forest
70 acres of Hemlock-Northern Hardwood Forest

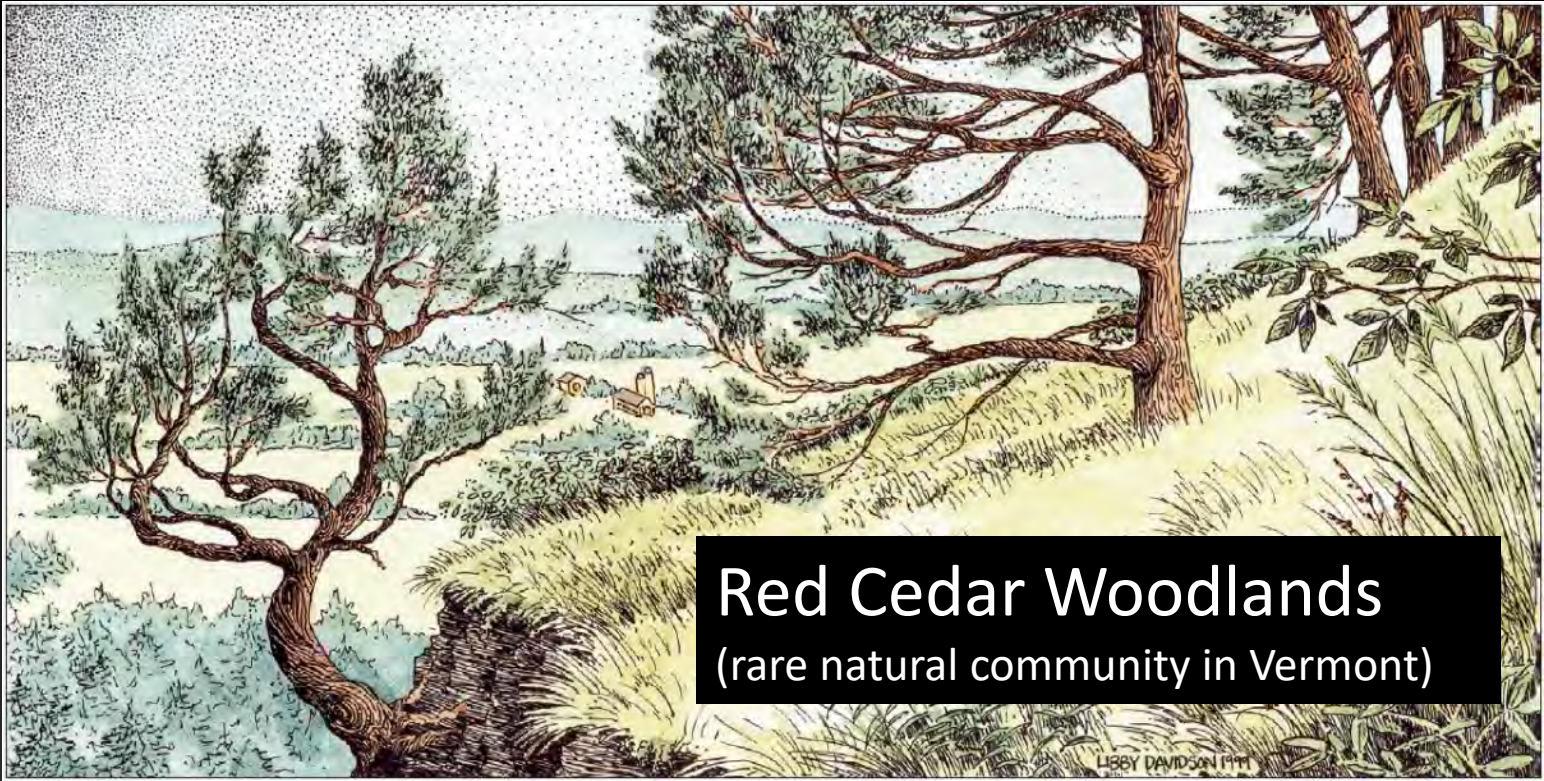




Blue Ridge Mountain Green Mountain National Forest

600+ acres of old forest
found during inventories





Red Cedar Woodlands
(rare natural community in Vermont)

LIBBY DAVIDSON 1991



287 y/o (est. 1734)
Austin Hill - TNC



445 rings
Private land

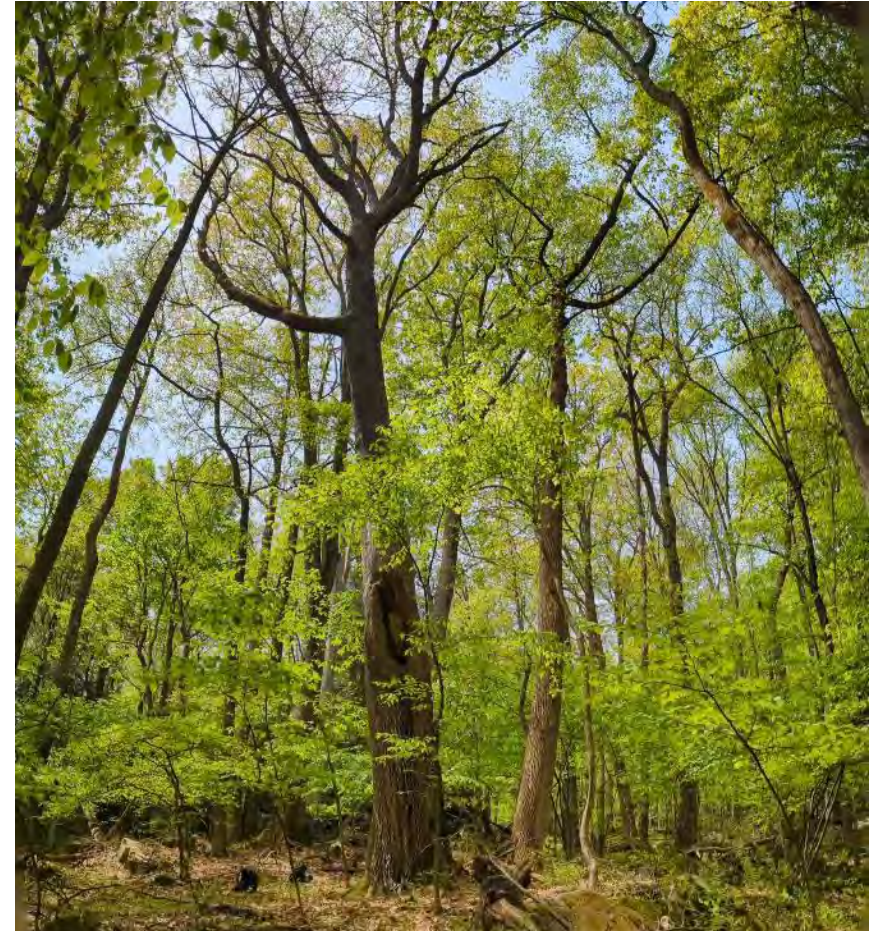




Pennsylvania Natural Heritage Program

Session 1: How much old forest is in your state/ region and what are some of the most notable sites in your state?

- Tough question to answer because there hasn't been a dedicated mapping effort yet in PA
- Most are protected in Natural Areas
 - entire Natural Area may not be old growth
- State Forest, State Parks, Allegheny National Forest, some assorted other properties
- Running list in Arc of potential OG sites in PA – ~100 sites (possibly up to 200*)
 - Assorted published papers/books/public land: 85
 - Informal websites or blog posts: 10
 - Biotics query (“mature” or “old growth” or “old-growth”): 87*
 - OG associate species locations: 5



Remnant OG patch in Fayette County



Pennsylvania Natural Heritage Program

Session 1: How much old forest is in your state/ region and what are some of the most notable sites in your state?

17 mil acres of forest in PA... 1 half of 1 percent = 85,000 acres old growth? Not quite.

| | Estimated Acres |
|-------------------------------------|-----------------|
| Cook Forest State Park | 2,300 |
| Tionesta | 4,000 |
| My surveys | 1,600 |
| Other misc. OG within Natural Areas | 2,500 (?) |
| | = 10,400 acres |

Late-successional management areas on state lands (upcoming old forests):

- *Not* included in statistics above
- State Forest ~500,000 acres (about 25% of 2 million)
- Game Lands – “significant amount” (unknown although 25% would be over 300,000 acres of 1.5 million)
- State parks – 300,000 acres total; unknown how much is late-successional forest
 - 25% = 75,000



Pennsylvania Natural Heritage Program

Session 1: How much old forest is in your state/ region and what are some of the most notable sites in your state?

Most notable sites in PA:

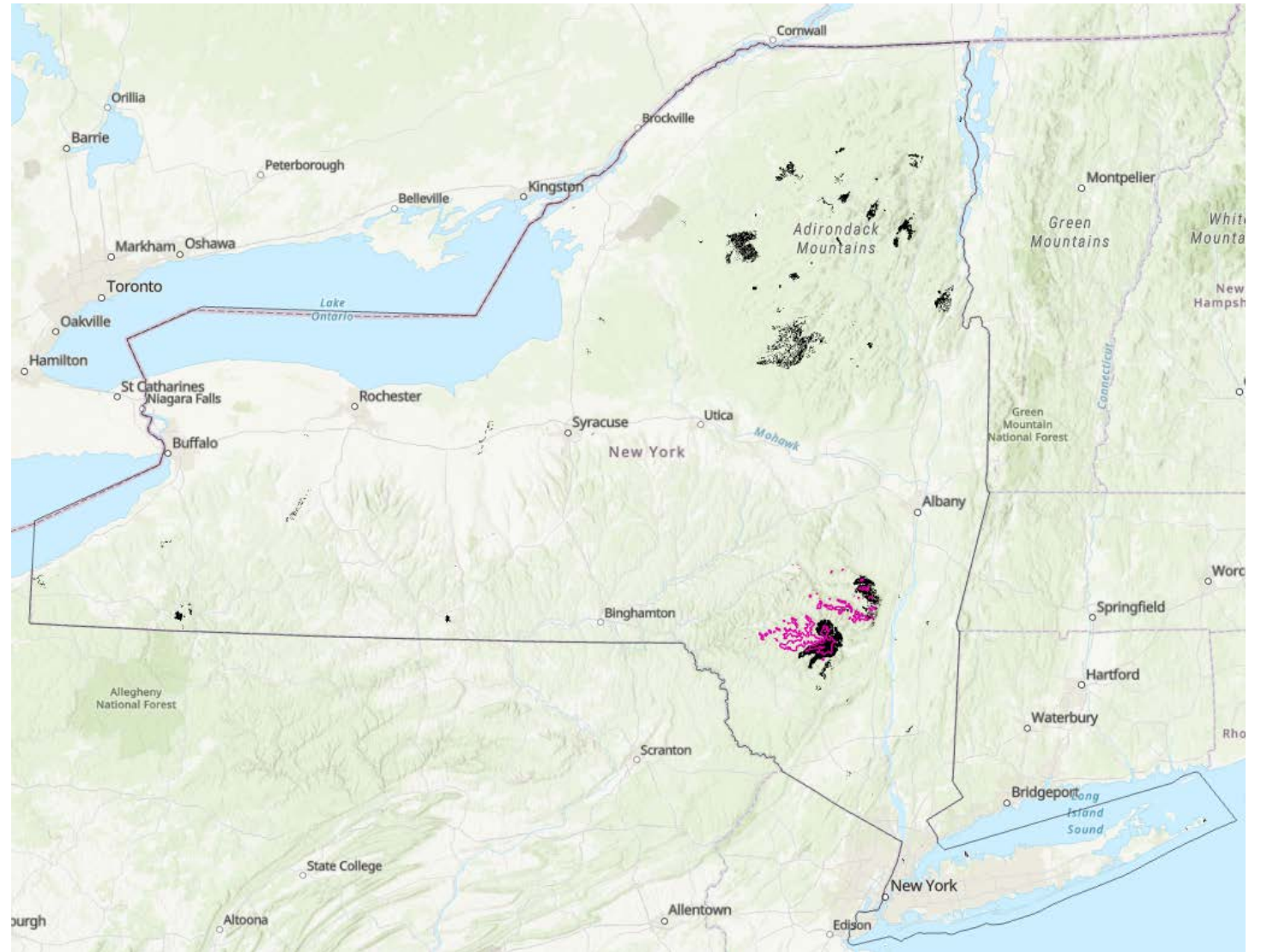
- Tionesta Scenic and Research Natural Area (ANF – 4,000 acres)
- Hearts Content (ANF – 100 acres)
- Cook Forest State Park (2,300 acres)



Cook Forest State Park (left) and Hearts Content Recreation Area (right)

How much old-growth is in New York?

- Adirondack Park
 - 250,000+ acres (estimated)
 - ~50,000 identified
- Catskill Park
 - 73,000 acres first-growth
 - 25,000 acres identified
- Other areas
 - Allegheny State Park
 - Green Lake State Park



Ampersand Mountain



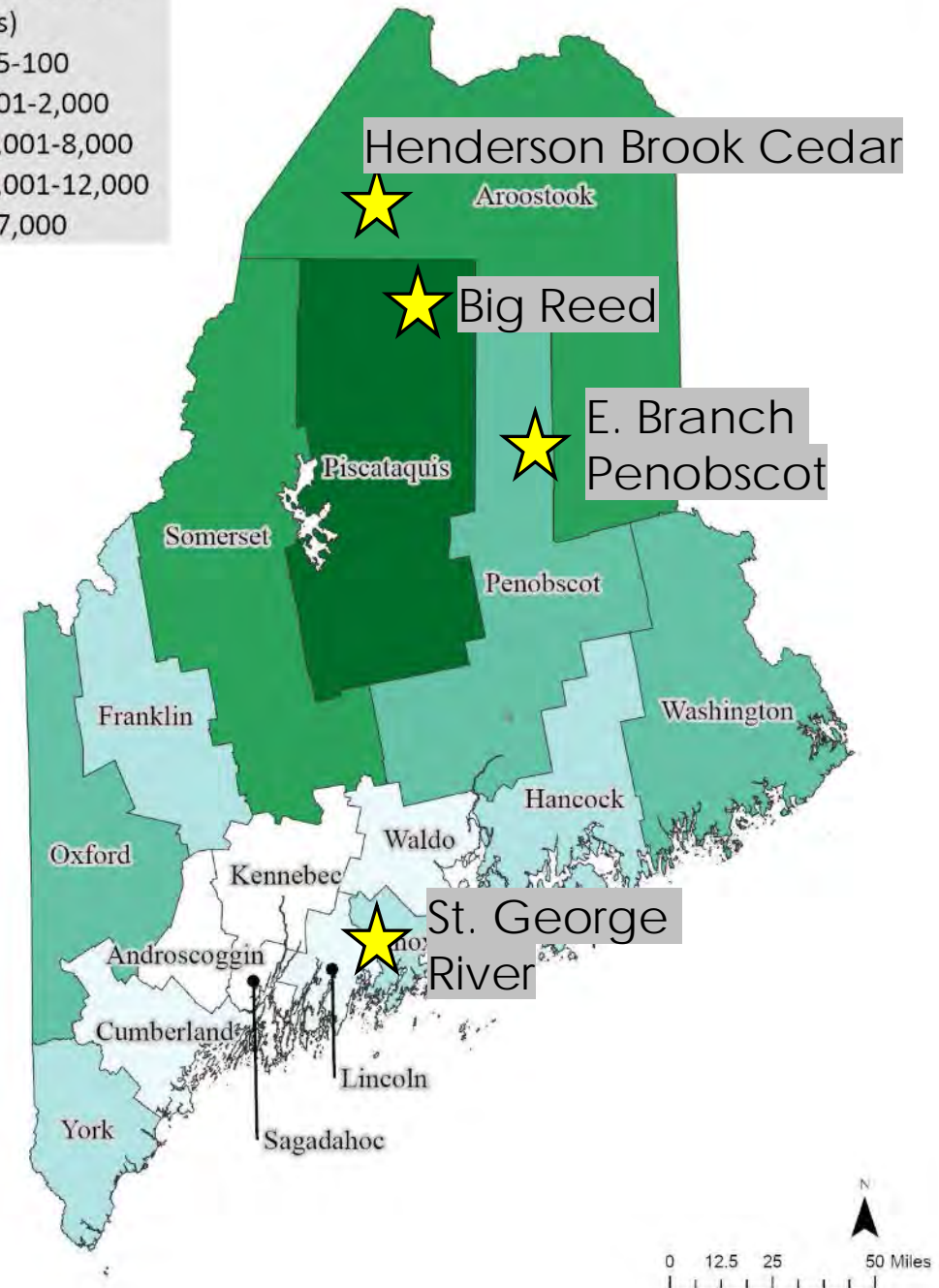
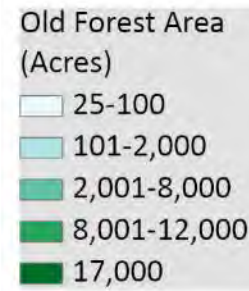
Benedict Tract

- 550-acre Pine-Northern Hardwood Forest
- World's largest Eastern White Pine
 - “Bigfoot”



Maine Old Forest Area

- ▶ FIA plot data estimates <1% of forest area with a stand age >150 years
- ▶ 215 known old forest occurrences, mostly in the northern portion of the state
- ▶ ~50,000 ac old forest identified by MNAP





Big Reed



Photos: Shawn Fraver



East
Branch
Penobscot





Henderson Brook
Cedar



St. George River Floodplain

Take home messages:



NATURAL HERITAGE PROGRAMS
PROVIDE KEY EXPERTISE IN
UNDERSTANDING THE EXTENT AND
CONDITION OF INTACT ECOSYSTEMS,
INCLUDING OLD FOREST SITES.



NATURAL HERITAGE PROGRAMS
COORDINATE AND USE CONSISTENT
METHODOLOGY TO TRACK IMPORTANT
ECOSYSTEMS.



OLD (GROWTH) FOREST IS RARE IN
EACH STATE, AND EXISTING SITES
CONTINUE TO BE MONITORED FOR
CONSERVATION VALUE..