

A low-angle photograph of a large tree trunk, showing its textured bark and the canopy of yellow and orange leaves above. The tree trunk is the central focus, extending from the bottom towards the top of the frame. The background is filled with the branches and leaves of other trees, creating a dense forest scene. The lighting is bright, suggesting a sunny day in autumn.

# Forest Management

**“To exist as a nation, to prosper as a state and to live as a people we must have trees”**

Theodore Roosevelt

# History



- 1930's pine plantations
- 1948 first forest management plan
- 50'-60's Pre commercial timber stand improvement treatments

- 70's& 80's thinning's
- 1994 Second Forest Management plan
- 90's 2000's- regeneration



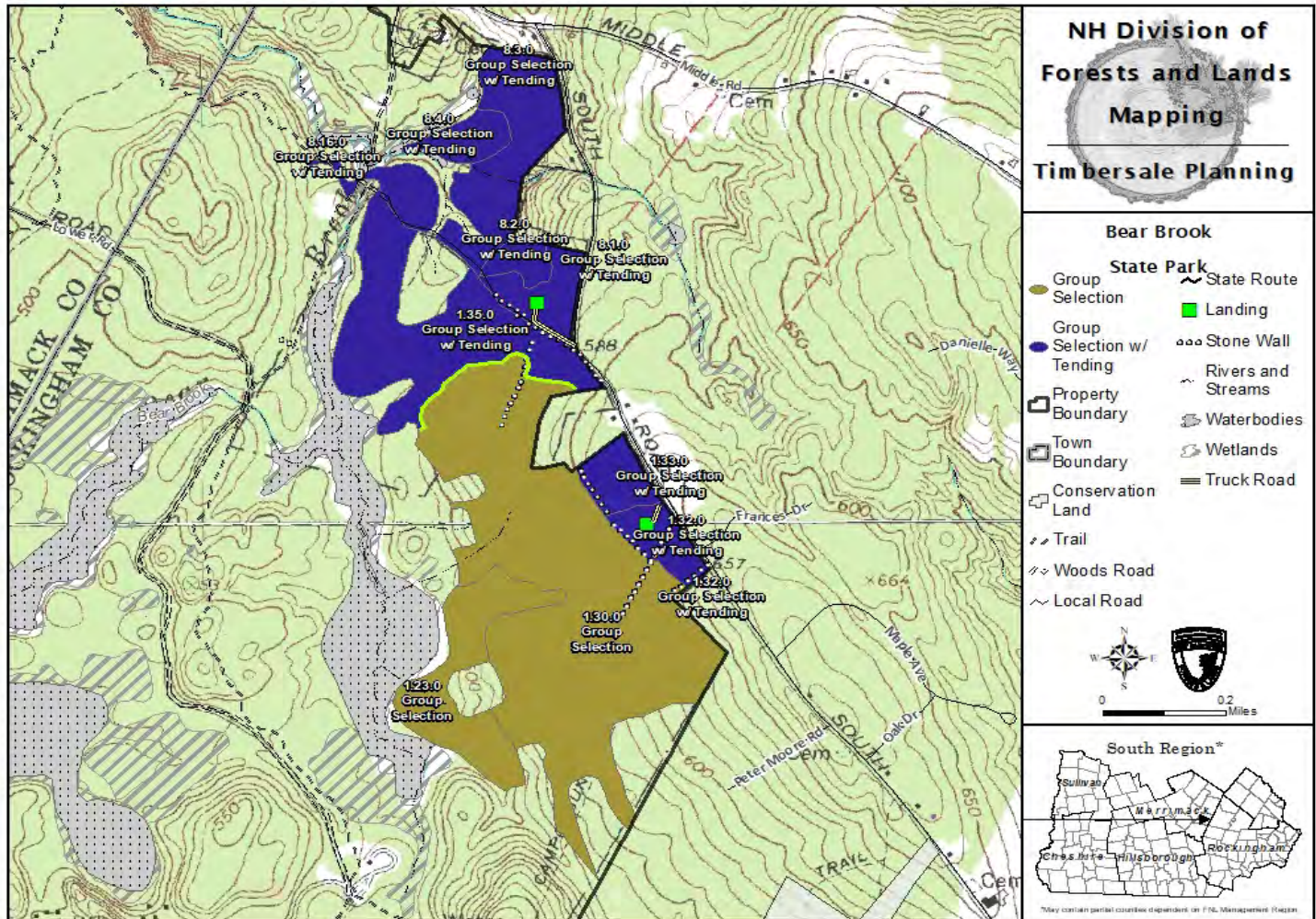
# Economic Impact

Project #	Year	Value
1.358	1995	\$30,161
1.362	1996	\$8,364
1.377	1996	\$17,572
1.380	1996	\$16,382
1.382	1996	\$1,141
1.397	1998	\$90,553
1.415	1998	\$33,173
1.431	2000	\$23,689
1.446	2002	\$63,691
1.458	2004	\$141,491
1.466	2003	\$100,458
1.474	2005	\$78,500
1.477	2006	\$53,193
1.489	2007	\$58,824
1.515	2007	\$25,809
1.522	2008	\$99,237
1.528	2009	\$55,991
1.545	2010	\$70,171
1.549	2011	\$116,413
1.553	2011	\$51,551
1.580	2013	\$279,724
1.587	2014	\$86,240
1.592	2015	\$115,567
1.605	2016	\$44,584
1.613	2017	\$65,424
1.624	2018	\$88,755
1.631	2019	\$121,726
		<b>\$1,938,384</b>

$\$1,938,384 \times 10\% = \$193,838.4$  to local communities through the timber tax alone

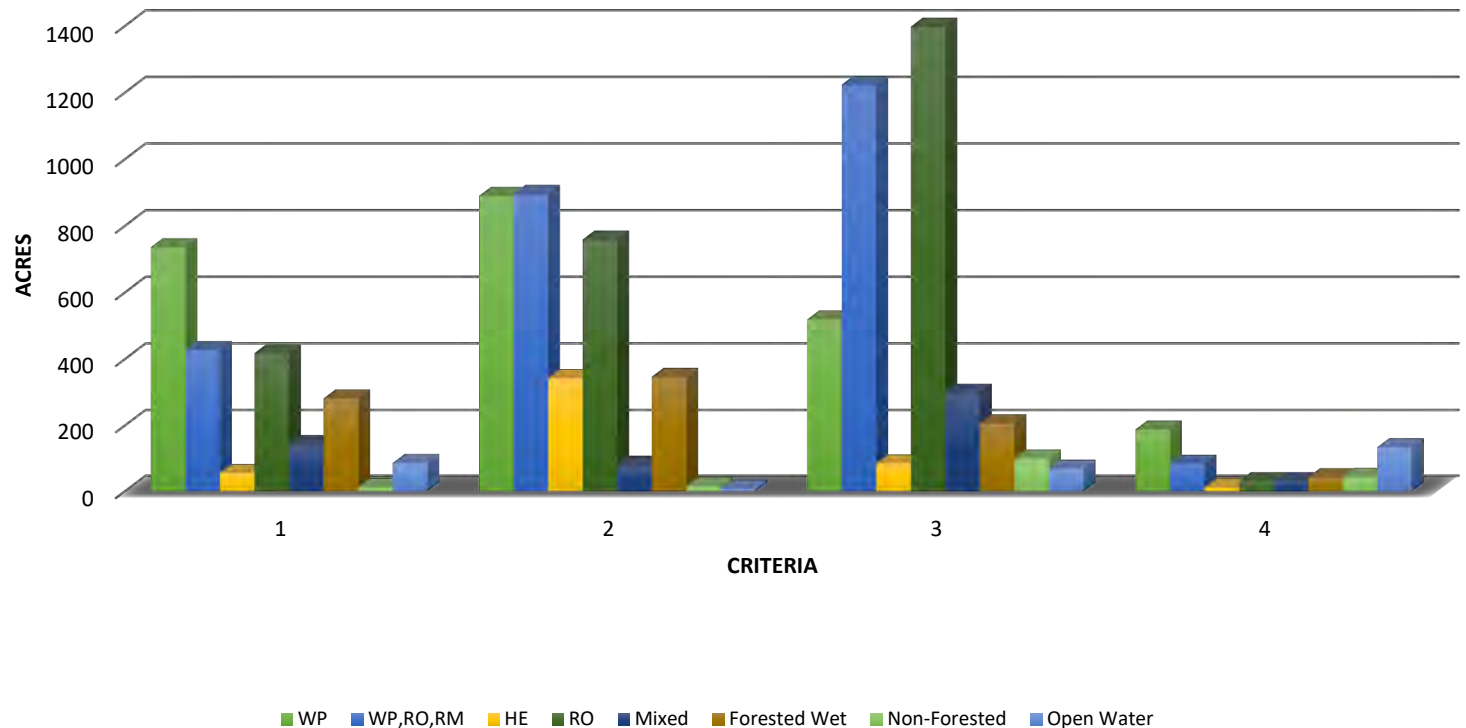


# Natural Resource Inventory



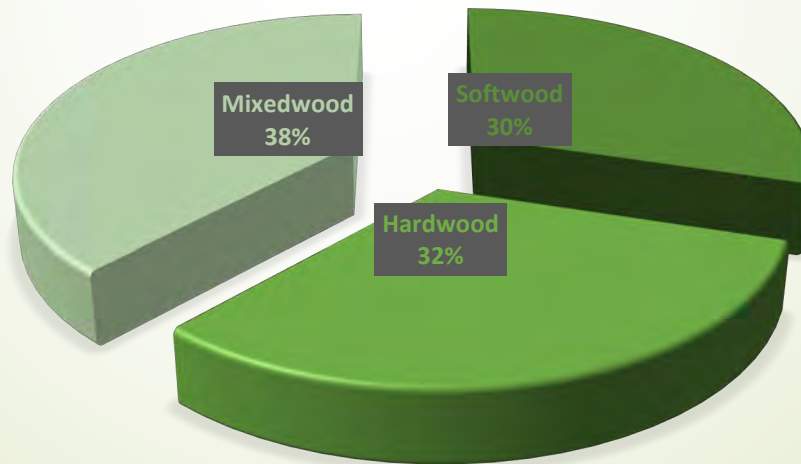
# Forest Composition

## Forest Composition per Criteria Zone



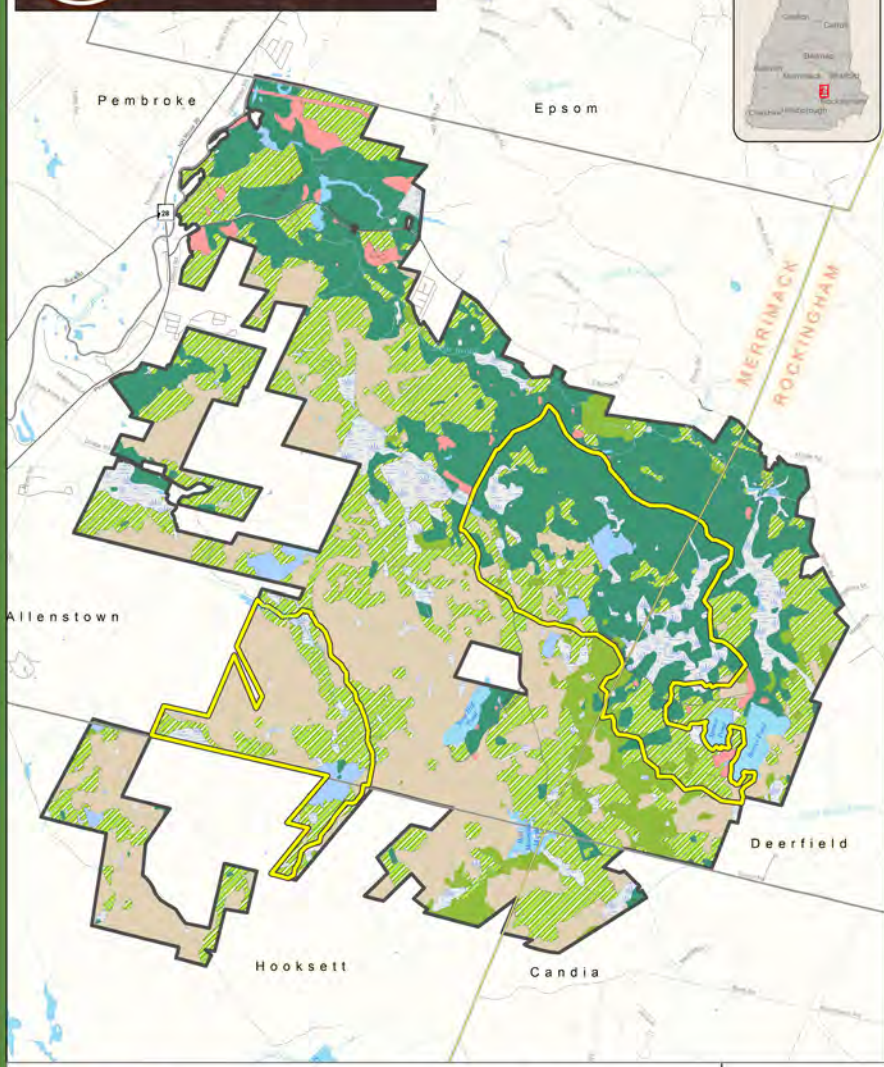
# Cover Type

## FOREST COMPOSITION OF CRITERIA 2,3&4

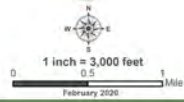




# MANAGEMENT PLAN



### Map 12 Cover Type



- Management Criteria 1
  - Property Boundary
- #### Cover Types
- White pine/Red oak/Red maple (3,080 ac)
  - White Pine (2,456 ac)
  - Hemlock (496 ac)
  - Red Oak (2,606 ac)
  - Forested Wetland (879 ac)
  - Non-Forested (156 ac)
  - Open Water (303 ac)

Data Sources:  
 NH GRANIT Digital Data (1:24,000)  
 DNR Division of Forests & Lands

DNR makes no representations or guarantees to the accuracy of the features and designations of this map.

Map prepared by the  
 DNR Division of Forests & Lands,  
 112 Pembroke Rd,  
 Concord, NH 03301

This map is for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.

# Forest Structure

Table XX Comparison of 1990 forest structure, present forest structure, and desired forest structure (Degraaf et al) for the area available for timber management (4,969 acres) at Bear Brook State Park.

Forest Size Class	1990 Forest Structure	Current Forest Structure	Desired Forest Structure
Seedling/Sapling	3%	8%	5-15%
Poles	20%	22%	30-40%
Small Sawtimber	69%	64%	40-50%
Large Sawtimber	8%	6%	<10%

- Seedling up to 2.5"
- Sapling 2.6" – 4.5"
- Poletimber 4.6" -9.5"
- Sawtimber 9.6"-16"
- Large Sawtimber < 16"

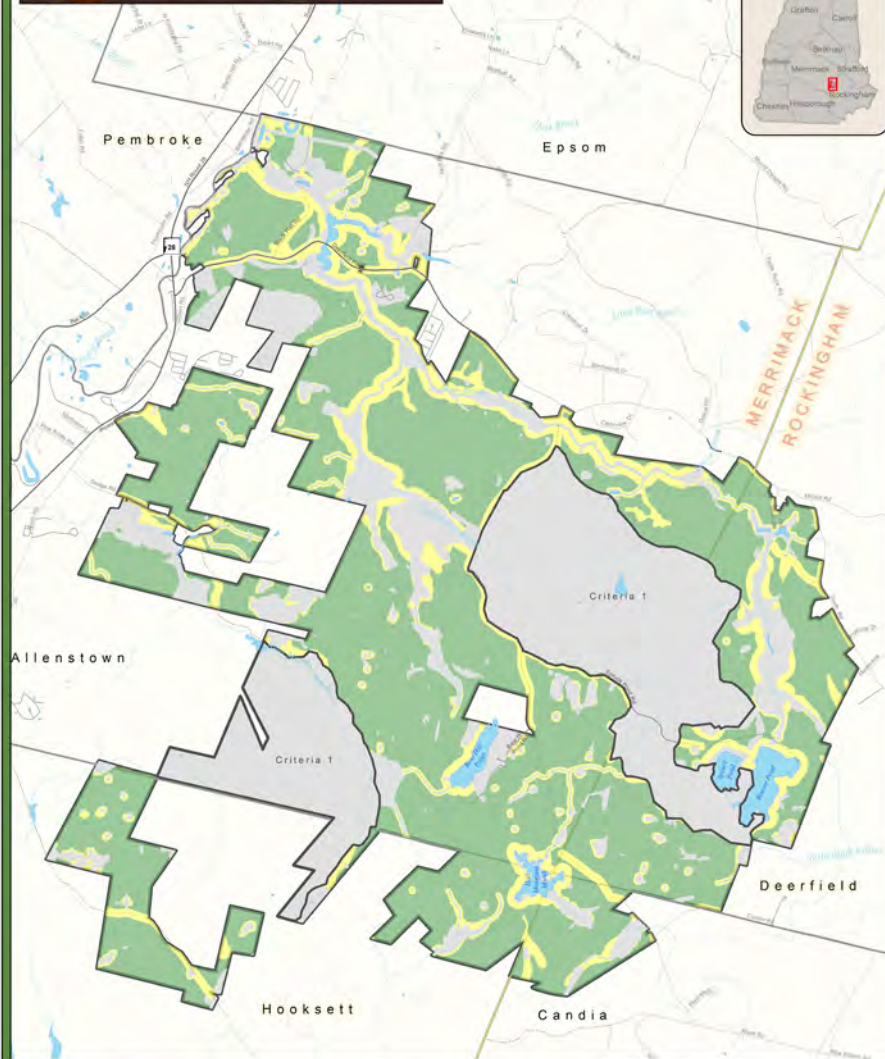


# Area Suitable for Timber Management (ASTM)

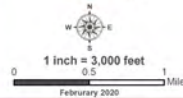
Table 10.5	Criteria				
Management Condition	1	2	3	4	Total
Manageable/Unrestricted	0.0	2,188.5	2,612.5	168.0	4,969.0
Restricted	0.0	544.0	526.0	132.0	1,202.0
No Harvest	2,167.0	610.0	765.0	263.0	3,805.0
<b>Total</b>	<b>2,167.0</b>	<b>3,342.5</b>	<b>3,903.5</b>	<b>563.0</b>	<b>9,976.0</b>






# MANAGEMENT PLAN



Map 14  
Area Suitable for  
Timber Management



-  Areas Suitable for Timber Management (4,969 ac)
-  Restricted Harvest Areas (1,202 ac)
-  No Harvest Areas (3,805 ac)

Data Sources:  
NH GRANIT Digital Data (1:24,000)  
DNCR Division of Forests & Lands  
DNCR makes no representations or guarantees to the accuracy of the features and designations of this map.  
Map prepared by the  
DNCR Division of Forests & Lands,  
172 Pembroke Rd  
Concord, NH 03301  
This map is for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.



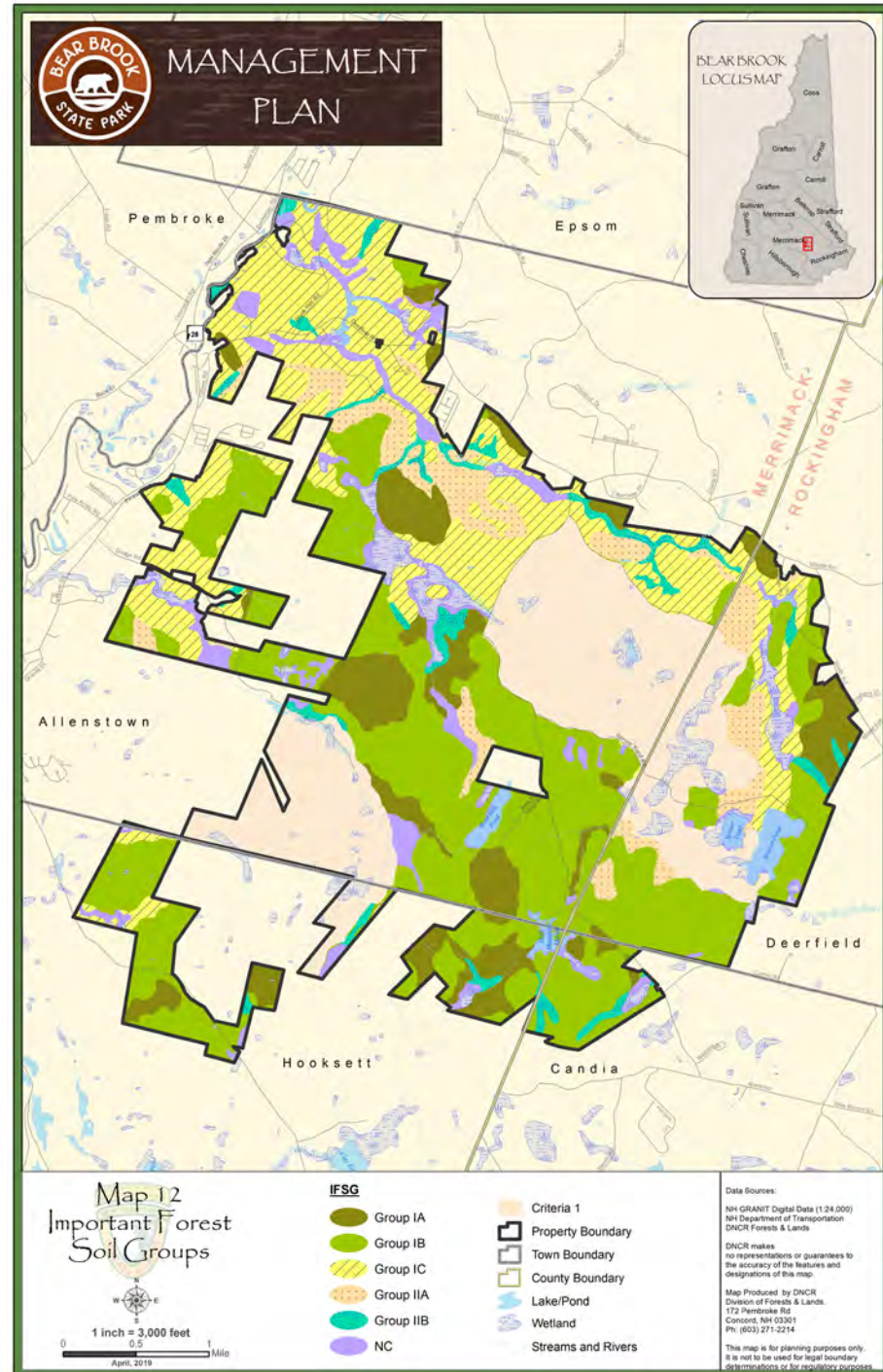
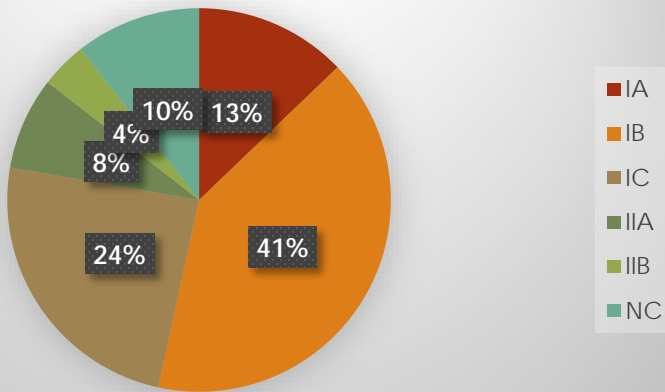
# Important Forest Soils Groups



- ▶ IA soil – deep loamy, fertile soil suited to northern hardwoods
- ▶ IB - Sandy moderately well drained suited to mixed species
- ▶ IC- Outwash sand and gravel suited to softwood species
- ▶ IIA – both IA and IIB soils with physical limitations steep, rocky, shallow to bedrock
- ▶ IIB – poorly drained, management limited
- ▶ NC - muck and peat, borofibrists, dumps, organic material, gravel pits (existing), rock outcrops

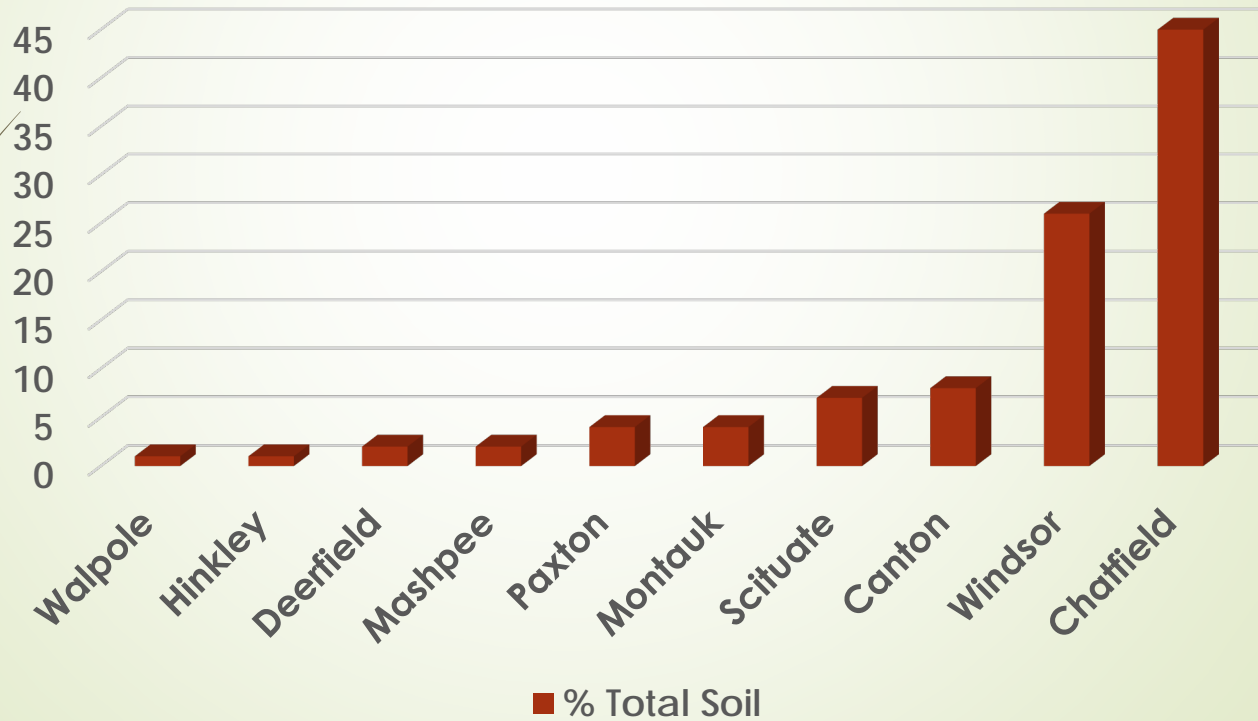
# Soils

## Acres



# Soil Type

% of Major Soils Groups Within Operable Acres





# Uneven-Aged Silviculture

- ▶ **Criteria 2 – Uneven aged Silviculture**
- ▶ rotation age of 100 to 140 years for Criteria 2, with an average of 120 years
  - ▶ **Silviculture**
    - ▶ Single Tree Selection: Single tree selection is the periodic removal (every 15-20 years) of individual stems that results in an intact forest canopy with a uniform, *vertical* distribution of at least three size classes in the stand.
    - ▶ Group Selection: Group selection is the periodic removal (every 15-20 years) of groups of stems that have reached the desired rotation age to create small openings in the forest canopy that results in a *horizontal* distribution of at least three size classes in the stand. Maximum size of 2 acre groups in Bear Brook.

# Single Tree



# Group Selection







# Even Aged Silviculture

- ▶ Criteria 3 rotation age of 80 to 120 years with an average of 100 years
- ▶ Silviculture –
  - ▶ Timber Stand Improvement
  - ▶ Improvement Cutting
  - ▶ Thinning
  - ▶ Crop Tree Release
  - ▶ Shelterwood

# Timber Stand Improvement



# Improvement Cutting



# Thinning



# Crop Tree



# Shelterwood



# Overstory Removal



# Deferment





# Seed Tree



# Clear Cutting



# Sustained Yield

<b>Criteria</b>	<b>ASTM Acres</b>	<b>Rotation (Target Age)</b>	<b>Tending Entries per Rotation</b>	<b>Tending Acres per Year</b>	<b>Regeneration Acres per Year</b>
2	2,188	120	3	54	18
3	2,612	100	2	52	26

$2,188 \text{ ac.} / 120 \text{ yr} = 18 \text{ acres of regeneration per year}$

$18 \times 3 \text{ tending entries} = 54 \text{ acres of intermediate treatment}$

$1/2 \text{ cord} \times (2,188 \text{ acres} + 2,612 \text{ acres}) = 2,400 \text{ cords of growth per year.}$

# 25 Years of Harvesting Data

Table XX Timber Sale Completed at Bear Brook in the past 25 Years

Project #	Year	Criteria	Acres Regenerated	Acres Tended	Total Acres Treated	Board Feet	Tons	Total as Cords
1.358	1995	2	0	120	120	152,540	1,926	1,108
1.362	1996	3	0	78	78	315,000	1,935	1,436
1.377	1996	2	6.3	31.7	38	191,270	224	476
1.380	1996	2	13	0	13	165,775	460	523
1.382	1996	3	0	15	15	0	300	125
1.397	1998	3	36	9	45	461,555	1,815	1,679
1.415	1998	3	0	82	82	683,345	2,103	2,243
1.431	2000	2	5	41	46	177,293	339	496
1.446	2002	2	10.5	109.5	120	382,800	2,127	1,652
1.458	2004	2	20	138	158	632,575	1,640	1,948
1.466	2003	2&3	6	145	151	469,892	5,169	3,094
1.474	2005	3	35	145	180	302,700	3,798	2,188
1.477	2006	3	2	98	100	244,180	1,963	1,306
1.489	2007	3	35	108	143	234,198	3,694	2,008
1.515	2007	3	2	33	35	172,475	1,268	873
1.522	2008	3	30	70	100	341,650	2,530	1,737
1.528	2009	3	0	80	80	445,470	1,088	1,344
1.545	2010	2	20	52	72	158,160	1,753	1,047
1.549	2011	2	2	153	155	638,158	6,028	3,788
1.553	2011	3	0	115	115	217,395	4,235	2,199
1.580*	2013	3&4	118	0	118	1,663,147	2,757	4,475
1.587*	2014	1&2	11	84	95	596,655	3,616	2,700
1.592	2015	3	45	176	221	270,280	5,113	2,671
1.605	2016	2	17	63	80	229,245	2,720	1,592
1.613	2017	3	28	122	150	340,900	6,780	3,507
1.624	2018	3	51	0	51	212,073	4,382	2,250
1.631	2019	3	0	160	160	635,745	6,202	3,856
<b>Total</b>			493	2,228	2,721	10,334,476	75,964	52,321
<b>25-Year Average</b>			20	89	109	413,379	3,039	2,093



# Timber Sale Process



- ▶ 40 step process from planning to implementation
- ▶ Reviewed by all interdisciplinary resource managers
- ▶ Public comment solicited
- ▶ Timber is marketed and open to bidding by any logging contractor meeting the state requirements
- ▶ Foresters work with road agents, public works directors and DOT district engineers
- ▶ Foresters monitor active timber sales two to three days a week for contract compliance and forestry standards

# Interpretation



# White Pine Research





# Recommendations



- Continue forest management activities with other multiple uses in the park
- Update the natural resource inventory
- Continue striving to reach forest structure goals for wildlife habitat, forest health and climate resiliency
- Continue to provide local, sustainable forest products
- Work with partners to identify research needs and opportunities for collaboration.