Threats to NE Forests

An Ecological Approach to Forest Stewardship

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May 11, 2021

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Today's Forest

Plant type and abundance:

- Different from pre-settlement times.
- Changing constantly,
- Will be a different forest in the future.

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Forests Are Result Of

- Climate and plant dispersal
- Competition and succession
- Disturbance
- Legacy of land use history

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Competition Shapes Communities

- Light
- Nutrients
- Water
- Temperature, wind

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Succession:
Changes in light favor dominance by different species.

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Disturbance

- Wind
- Floods
- Ice
- Fire
- Biological
- Logging
- Agriculture
- Development

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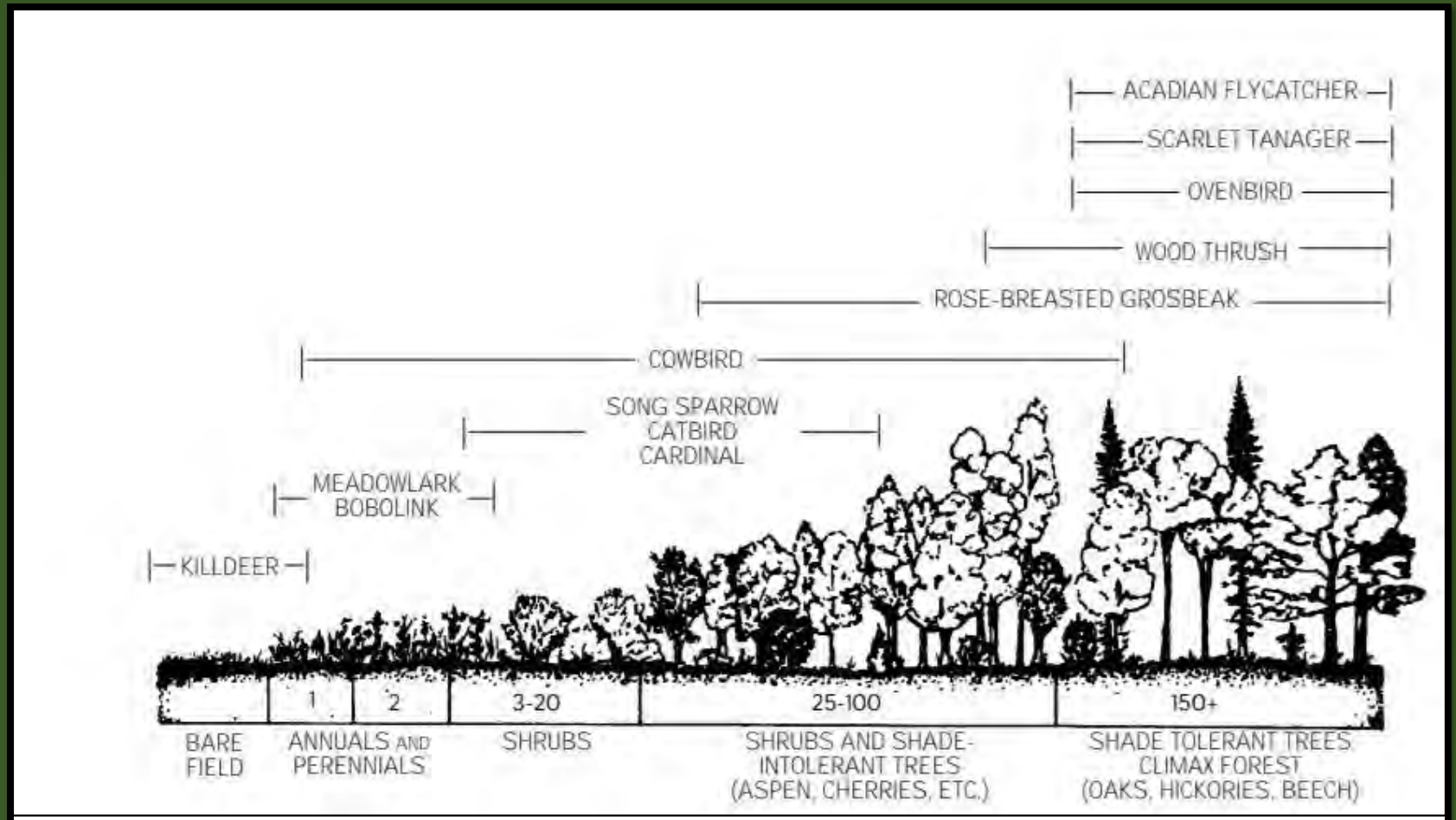
Community Succession

- Shifting dominance of different plants over time.
- Animals change as plant availability changes



https://buffalo.extension.wisc.edu/files/2011/01/A-Landowner-Guide-to-Woodland-Wildlife-Management.pdf

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What Do Wildlife Need?

- Food
- Water
- Cover
- Spatial distribution

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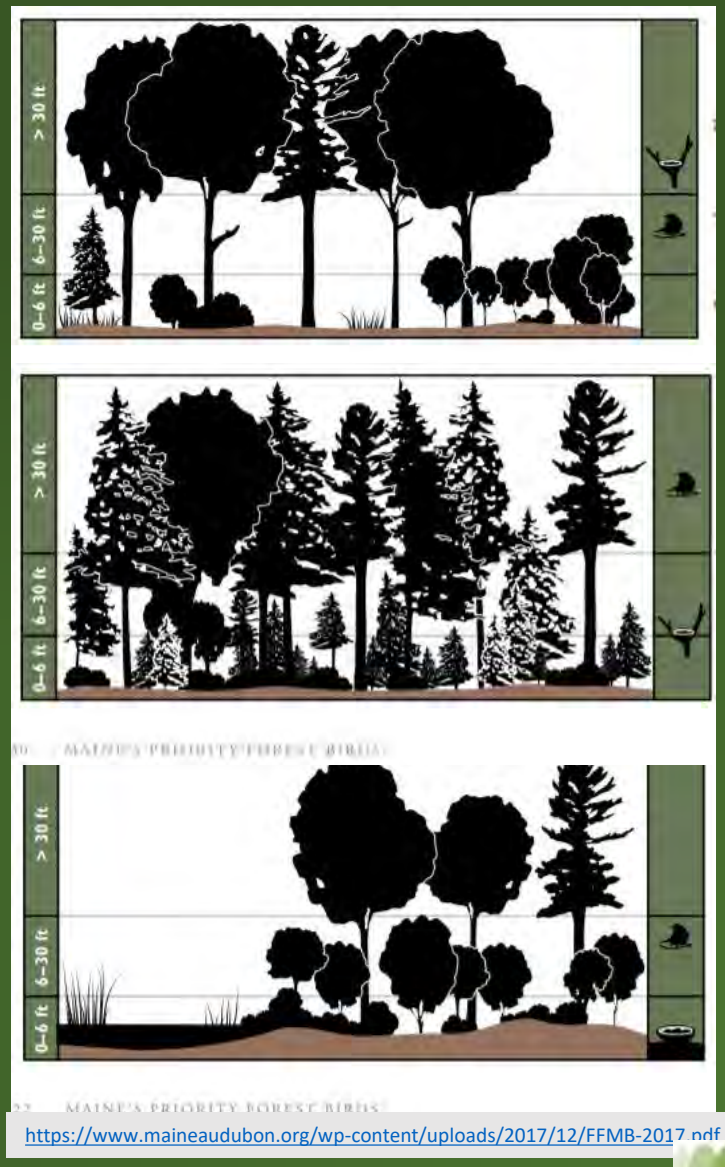
Habitats Within Habitats…..

Eastern Wood Pewee

Black-throated Green

Veery



https://www.maineaudubon.org/wp-content/uploads/2017/12/FFMB-2017.pdf

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Threats to NE Forests: Too Many Deer

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White-tailed Deer

- Long-lived.
- Can reproduce at an young age.
- Polygamous breeding system.
- Thrive in post-agricultural landscapes close to people.
- More deer today than pre-European settlement.

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White-tailed Deer

Populations double in 2.5 years.

George Reserve:

- 1928-34: 6 grew to 222 in seven years.
- 1975-80: 10 grew to 212 in six years.

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White-tailed Deer

- Highly-selective food preferences.
- Impact abundance of preferred plants.

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White-tailed Deer

- Switch to woody browse in winter.
- Widespread damage to seedlings.
- Loss of potential replacement trees if disturbance occurs.

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Forest Understory

- May provide necessary food at critical times.
- Provides important structure for feeding, nesting and hiding.
- Replacement trees after disturbances.

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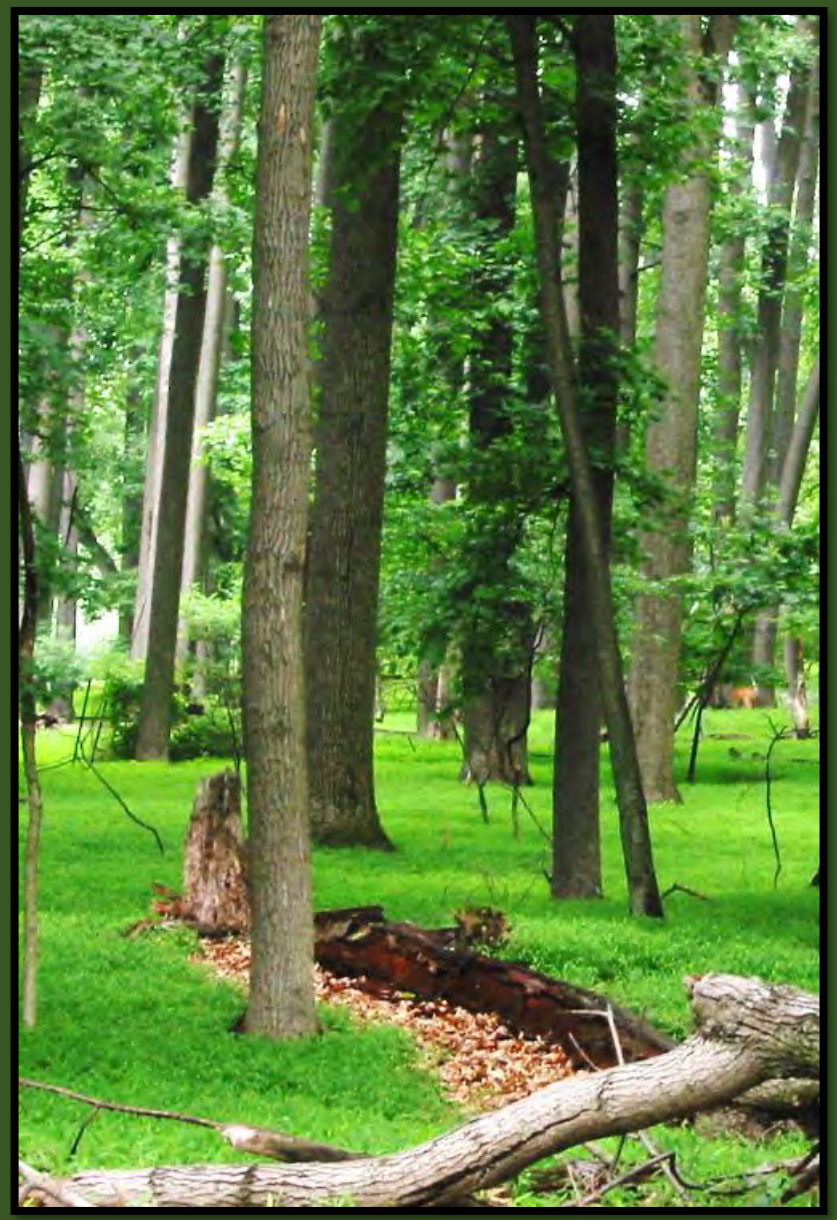

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Causes of Marginal/Failed Regeneration

Deer browsing	81%
Interfering vegetation	39%
Lack of $ investment	40%
Soil or site limitation	19%
Forest health	15%

https://smallfarms.cornell.edu/2013/03/27/regenerating-your-next-forest-keys-to-success/

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Deer Impacts:

Density & Food Dependent

- >10 deer / mi^2 impacts preferred browse species
- > 10-15 / mi^2 impacts regeneration and wildlife.
- Food quality and availability matter!

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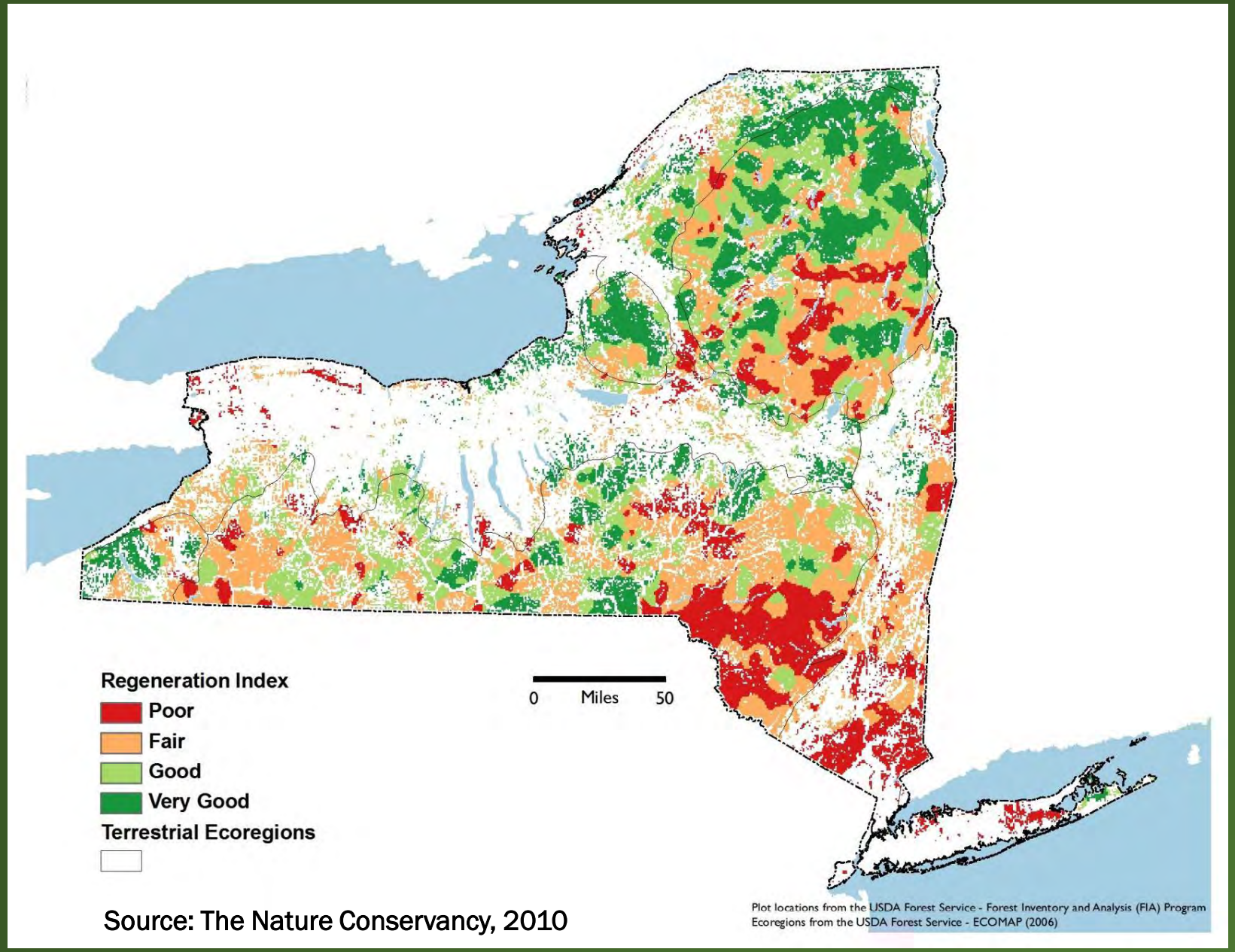
Predicted Regeneration of Desirable Timber



Source: The Nature Conservancy, 2010

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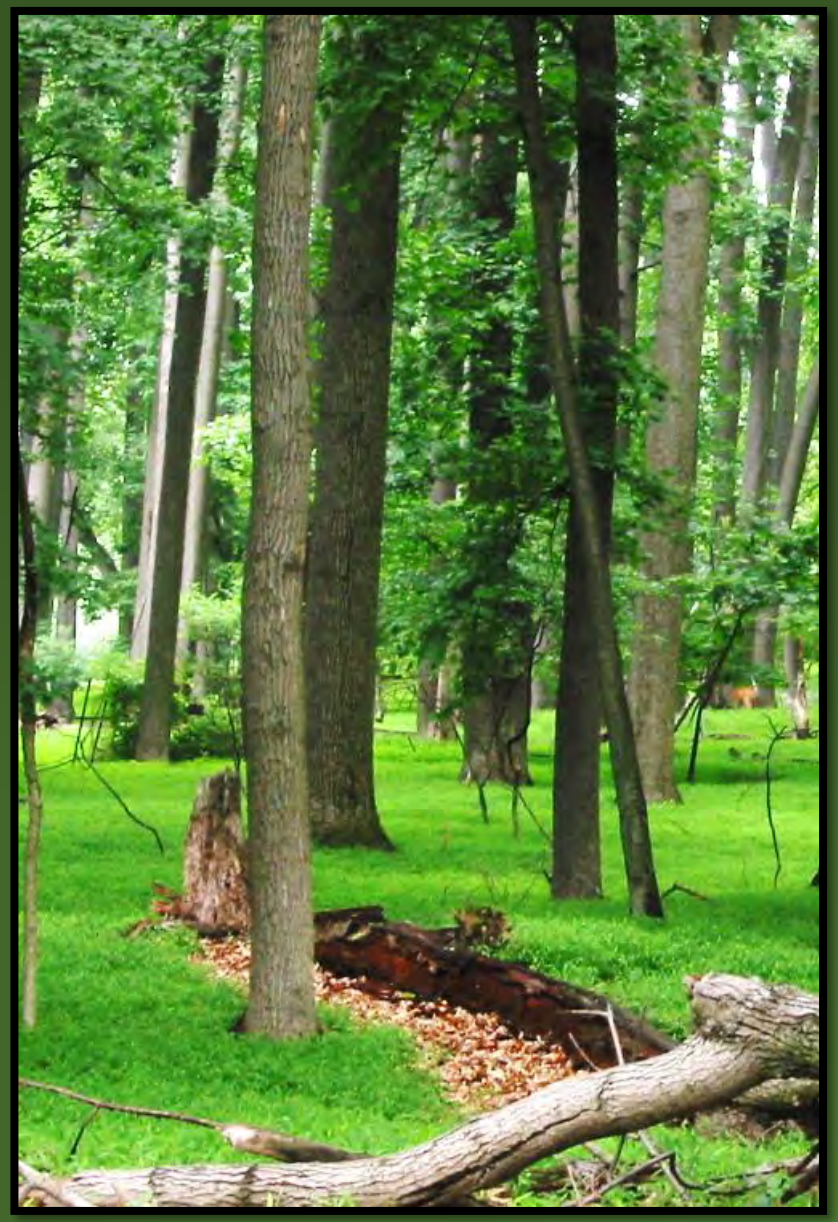
Community Impacts of Overabundant Deer

- Reduction in # insects and insect species.
- Fewer mid-story nesting birds.
- Fewer birds that fed or nest near the ground compared with canopy species.
- Greater impact on birds using mature forests than those using early successional stages.
- Greater chipmunk and mouse populations inside fences where deer were excluded.



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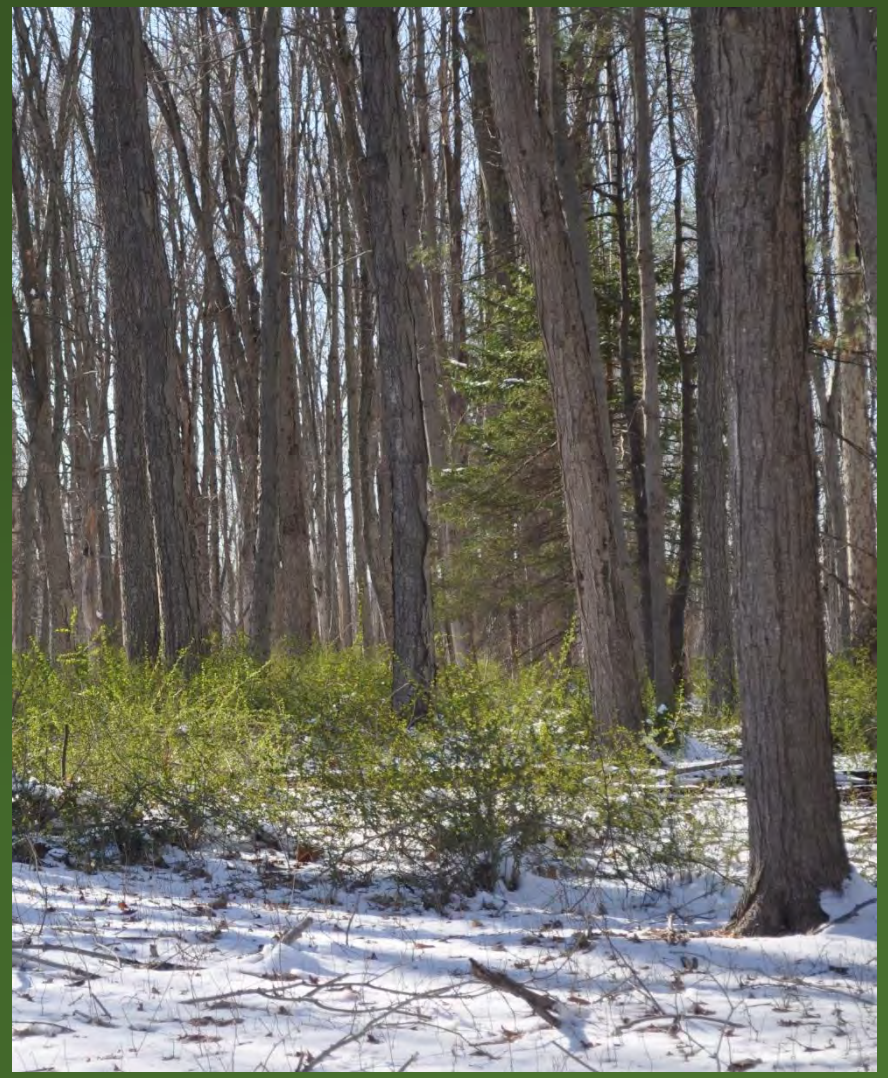
Deer / Invasive Plant Interactions

"Deer are key drivers of community change, while invasive plants are likely passengers opportunistically taking advantage of ecosystem alterations"

Averill et al. 2018. A regional assessment of white-tailed deer effects on plant invasions. AoB Plants, https://doi.org/10.1093/aobpla/plx047



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Climate Change and Tree Migration

Changing moisture conditions alter trees that are adapted to NE and result in range migration.

US Forest service Northern Research Review, 11, 2010

https://www.fs.fed.us/nrs/news/review/review-vol11.pdf

https://www.americanforests.org/magazine/article/trees-on-the-move/

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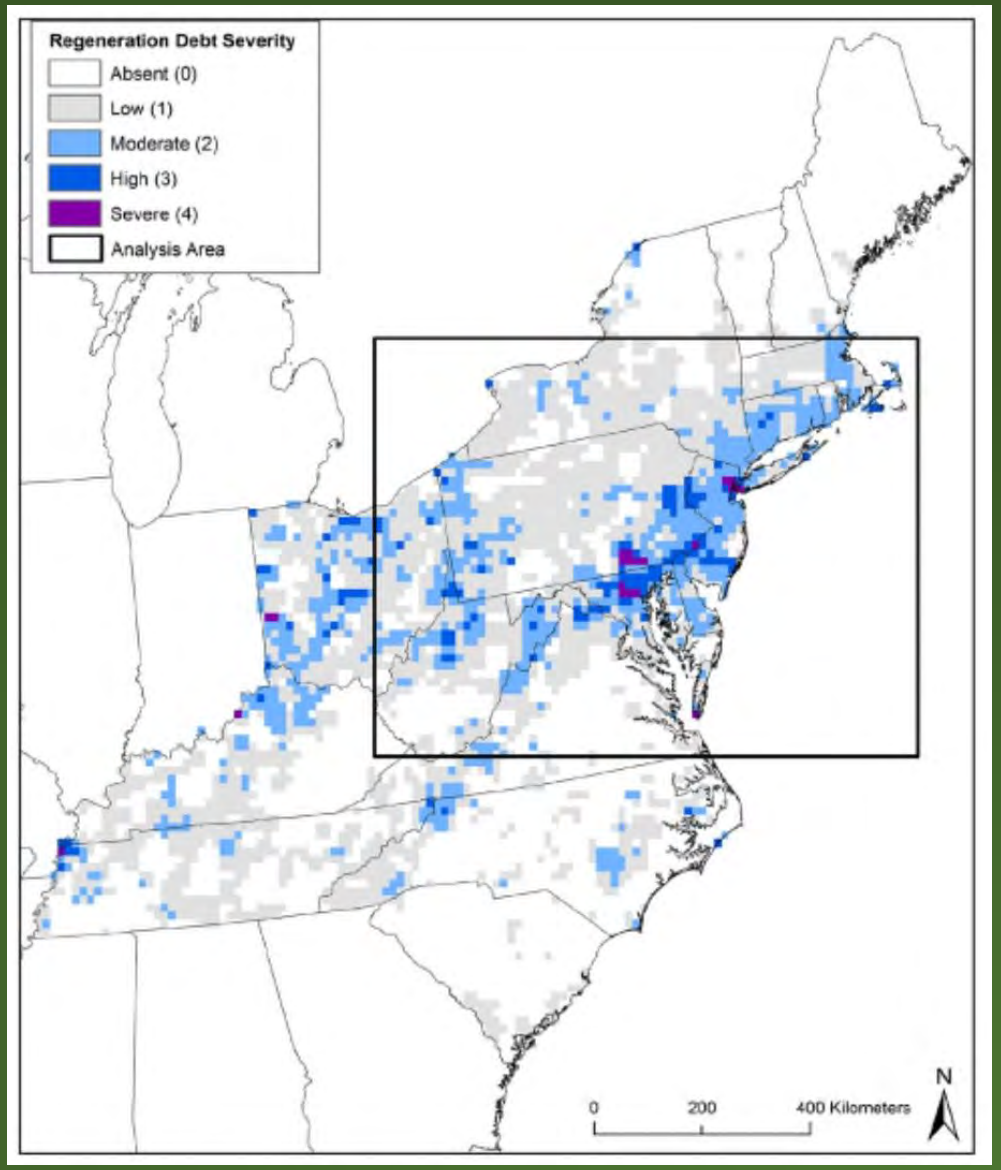
Regeneration Debt in Mid-Atlantic

Human-caused stresses (invasive plants, deer overabundance and land use) result in:

- Inadequate seedlings
- More disease-prone and suboptimal tree species

Lead to long-term declines in forest cover and act as barrier to northward tree migration.

Miller and McGill, 2018.
https://besjournals.onlinelibrary.wiley.com/doi/epdf/10.1111/1365-2664.13375



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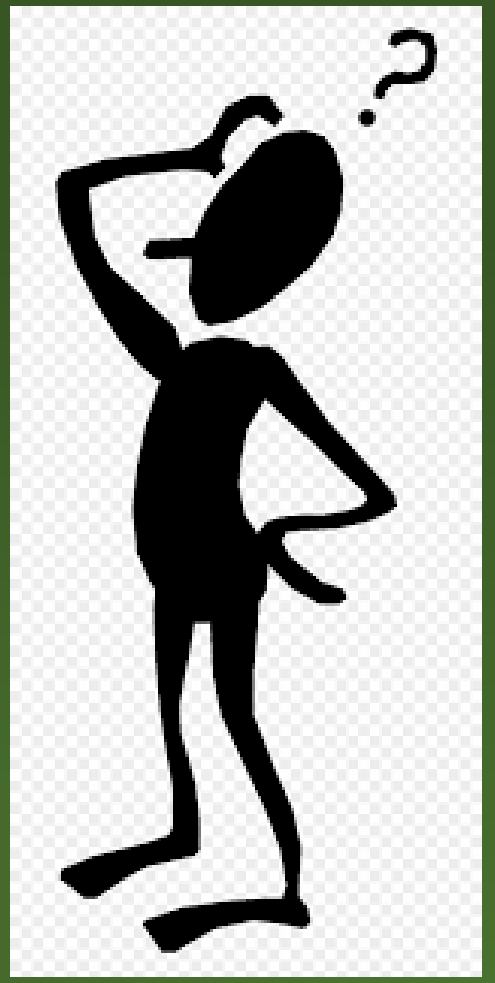
Another Threat: Do Nothing

Hesitancy to manage lands:

- Unsure what to do (its complicated).
- Don't want to make mistake.
- Can't afford to do all you want.
- Better to "Let nature take its course".



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Why “Do Something” Should Be Considered

- These are not “pristine” forest communities, nor are they transitioning toward some pre-colonial natural condition.
- Today’s natural disturbances are not equivalent to what produced pre-colonial forests.
- Change is happening – regardless if you take action or not. Do you like it’s current direction?
- Forests moving toward more homogeneous, simpler and less diverse states. These are less able to support wildlife and withstand catastrophic disturbances.

“Letting nature take its course” is a management decision!

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What To Do?

Develop a Management Plan:

- Interests and Goals
- Resource inventory
- Assess potential and constraints / risks
- Find suitable best management practices
- Work schedule
- Monitoring

That's our next session!

6 PM, May 18, 2020

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