Threats to NE Forests

An Ecological Approach to Forest Stewardship

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May 11, 2021
Today’s Forest

Plant type and abundance:

• Different from pre-settlement times.

• Changing constantly,

• Will be a different forest in the future.
Forests Are Result Of

• Climate and plant dispersal
• Competition and succession
• Disturbance
• Legacy of land use history
Competition Shapes Communities

- Light
- Nutrients
- Water
- Temperature, wind
Succession: Changes in light favor dominance by different species.
Disturbance

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

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

What Do Wildlife Need?

• Food
• Water
• Cover
• Spatial distribution
Habitats Within Habitats.....

Eastern Wood Pewee

Black-throated Green

Veery

Threats to NE Forests: Too Many Deer
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.
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.
White-tailed Deer

- Highly-selective food preferences.
- Impact abundance of preferred plants.
White-tailed Deer

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

- May provide necessary food at critical times.
- Provides important structure for feeding, nesting and hiding.
- Replacement trees after disturbances.
### Causes of Marginal/Failed Regeneration

<table>
<thead>
<tr>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer browsing</td>
<td>81%</td>
</tr>
<tr>
<td>Interfering vegetation</td>
<td>39%</td>
</tr>
<tr>
<td>Lack of $ investment</td>
<td>40%</td>
</tr>
<tr>
<td>Soil or site limitation</td>
<td>19%</td>
</tr>
<tr>
<td>Forest health</td>
<td>15%</td>
</tr>
</tbody>
</table>

[https://smallfarms.cornell.edu/2013/03/27/regenerating-your-next-forest-keys-to-success/](https://smallfarms.cornell.edu/2013/03/27/regenerating-your-next-forest-keys-to-success/)
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!
Predicted Regeneration of Desirable Timber

Source: The Nature Conservancy, 2010
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.
Deer / Invasive Plant Interactions

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

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.americanforests.org/magazine/article/trees-on-the-move/
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.

Another Threat: Do Nothing

Hesitancy to manage lands:

• Unsure what to do (it's 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!
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
Questions?
References


Connelly, NA, PJ Smallidge, GR Goff and PD Curtis. 2010. Foresters perception of forest regeneration and possible barriers to regeneration in New York State. Cornell University Department of Natural Resources Human Dimensions Research Unit HDRU 10-2. 37 pp. https://smallfarms.cornell.edu/2013/03/regenerating-your-next-forest-keys-to-success/


