

# **An Ecological Approach to Wildlife Stewardship**

**October 7, 2020**





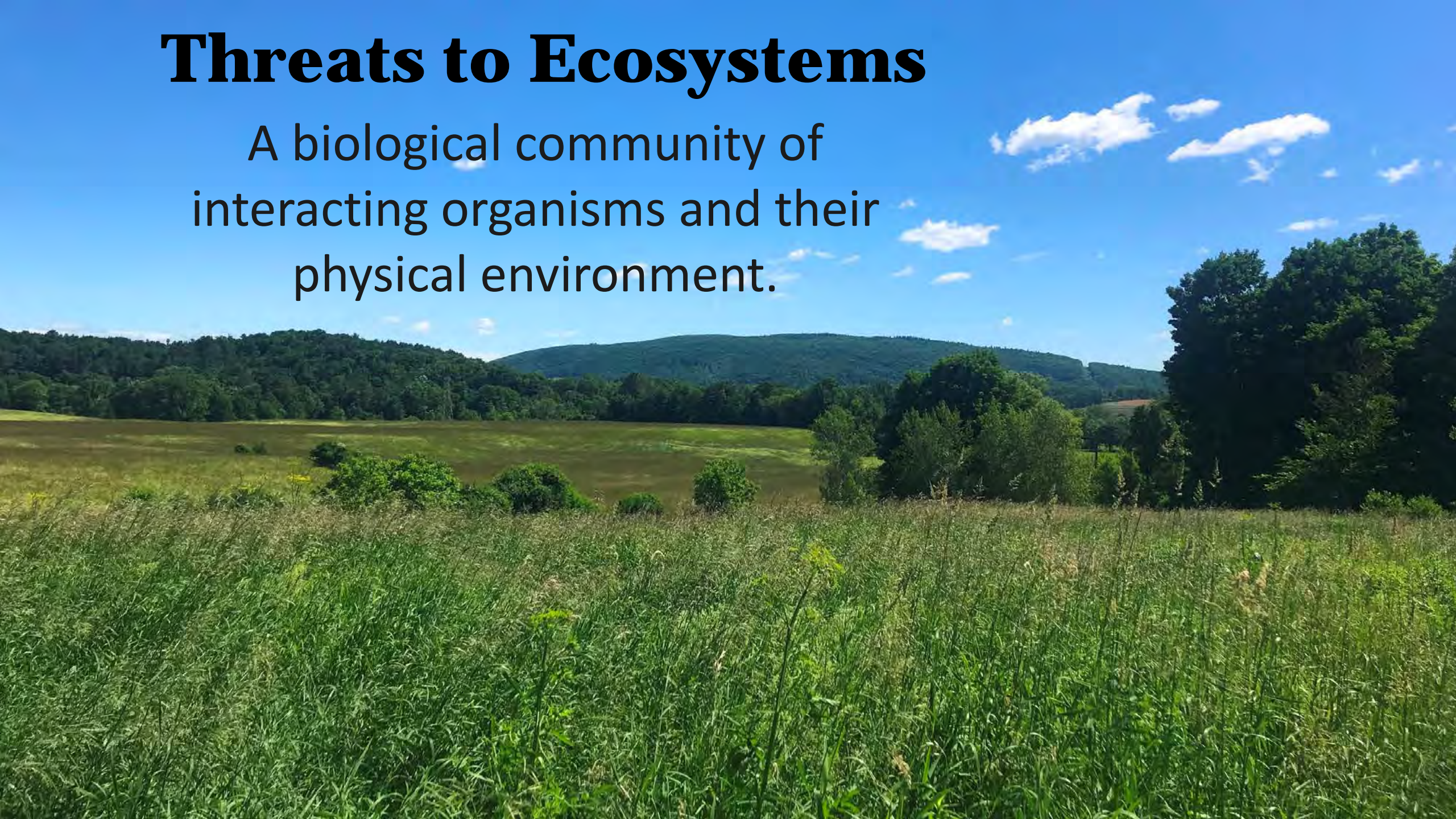
**Julie Hart**  
**Senior Manager of Stewardship and Education**  
**Dutchess Land Conservancy**

# Threats to Ecosystems



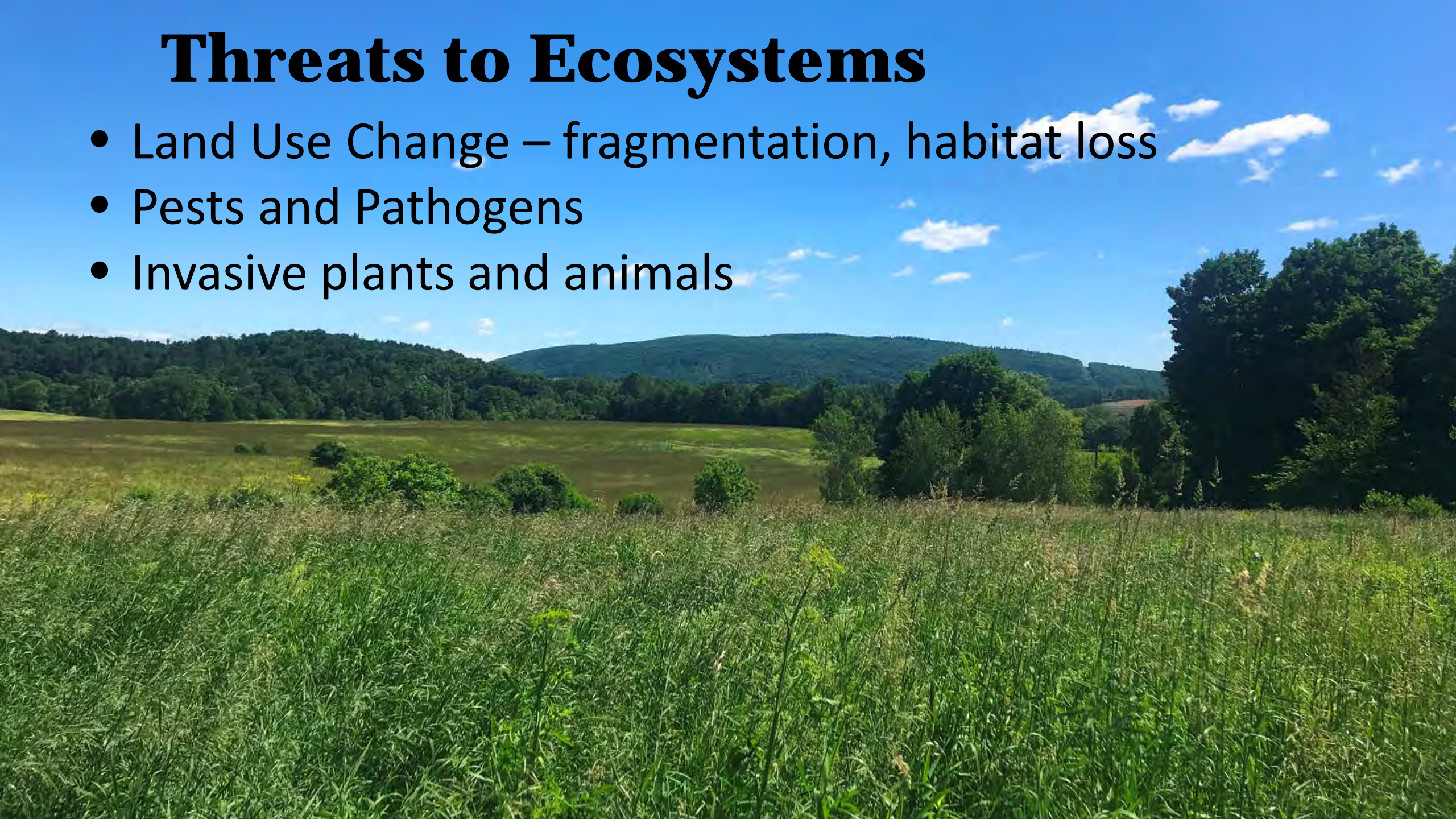
# Threats to Ecosystems

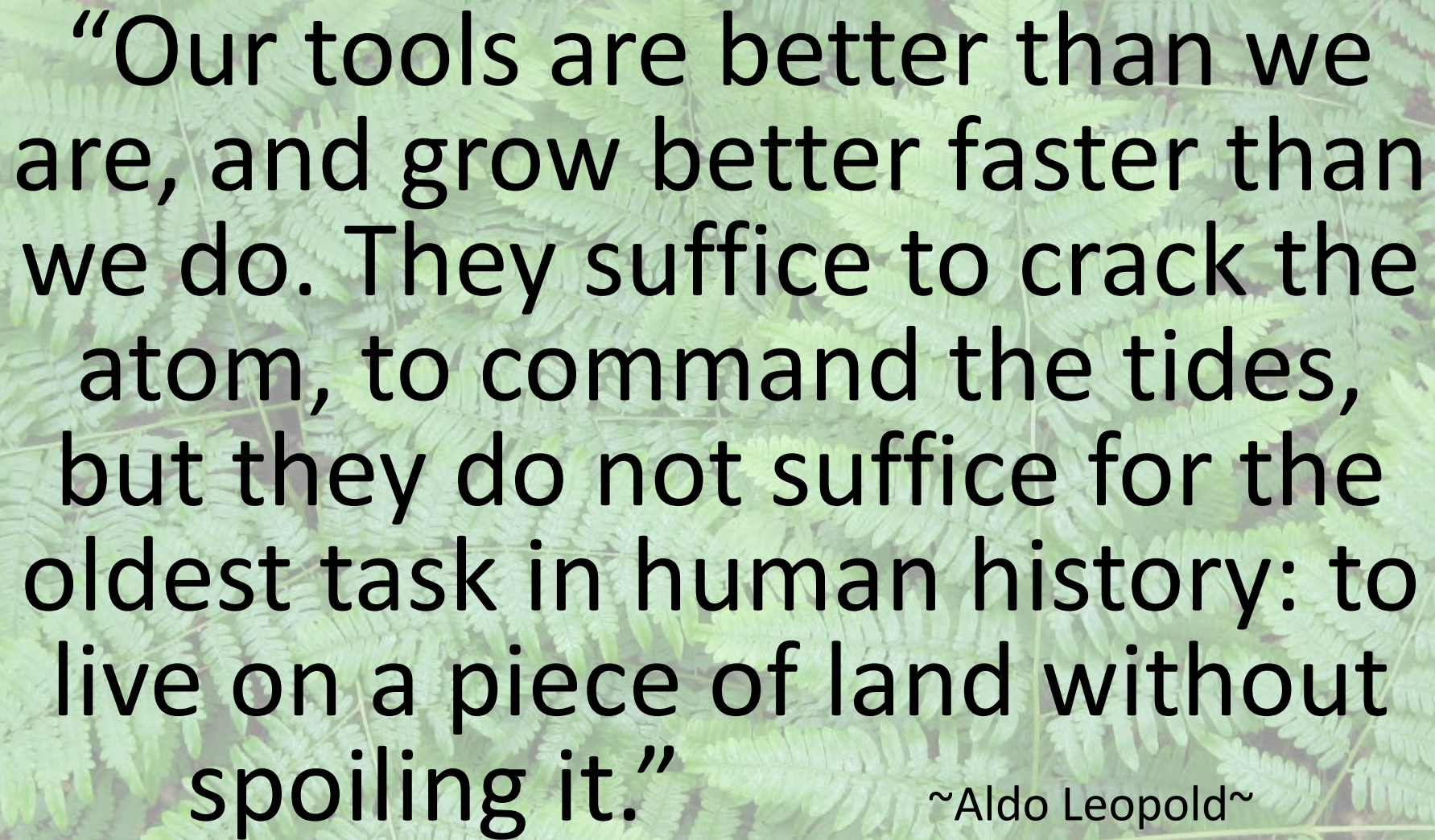
A biological community of interacting organisms and their physical environment.



# Threats to Ecosystems

- Land Use Change – fragmentation, habitat loss
- Pests and Pathogens
- Invasive plants and animals





“Our tools are better than we are, and grow better faster than we do. They suffice to crack the atom, to command the tides, but they do not suffice for the oldest task in human history: to live on a piece of land without spoiling it.”

~Aldo Leopold~

1700



<https://harvardforest.photoshelter.com/galleries/C000068gHIUTc6BY/G0000OR2a2UhZafY/Diorama>

1740



<https://harvardforest.photoshelter.com/galleries/C000068gHIUTc6BY/G0000OR2a2UhZafY/Diorama>



1830



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1850



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1915



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1930

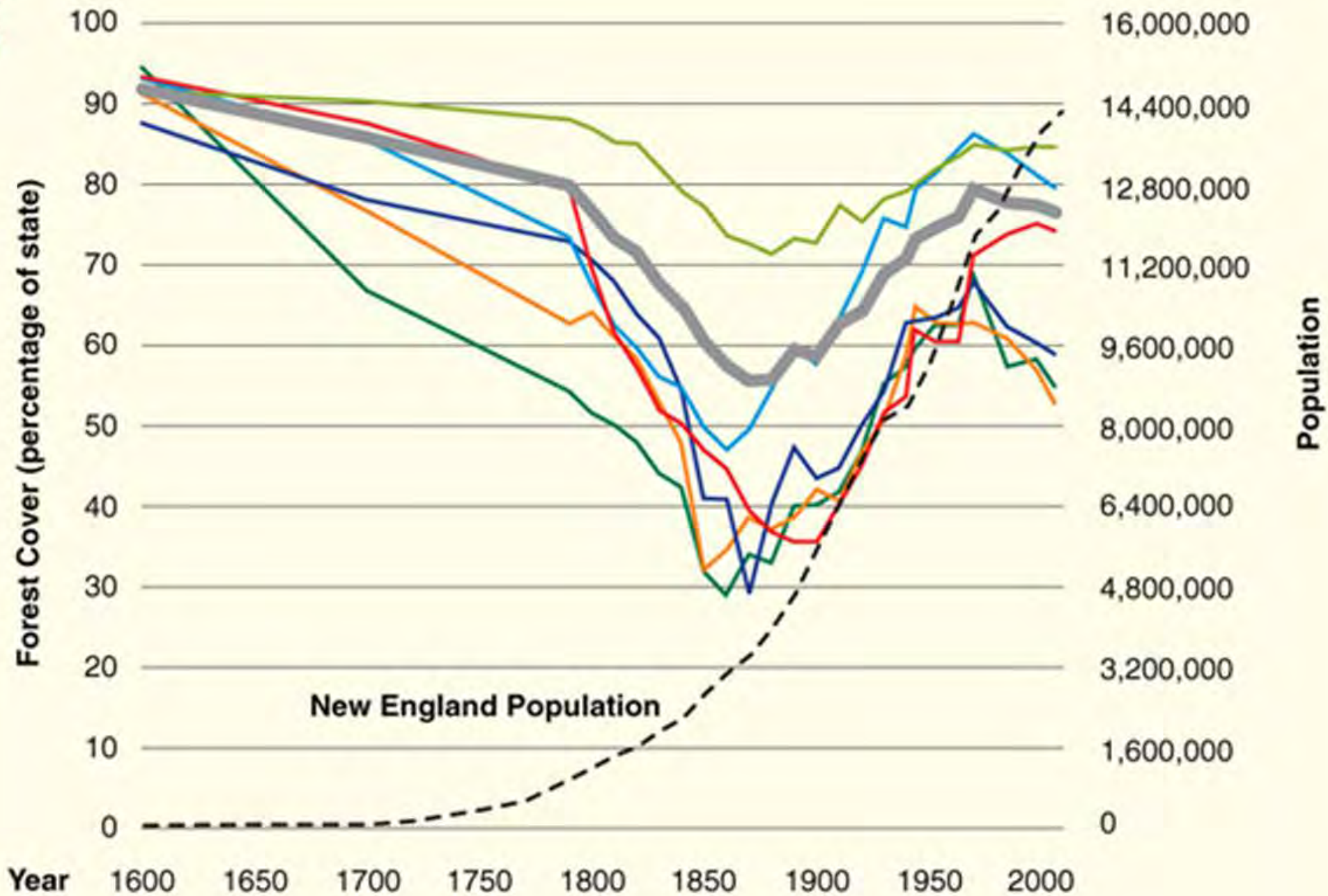


<https://harvardforest.photoshelter.com/galleries/C000068gHIUTc6BY/G0000OR2a2UhZafY/Diorama>

# New England Forest Cover and Human Population

- Connecticut
- Maine
- Massachusetts
- New Hampshire
- Rhode Island
- Vermont
- All New England (% of all six states)

Foster, D.R., B.M. Donahue, D.B. Kittredge, K.F. Lambert, M.L. Hunter, B.R. Hall, L.C. Irland, R.J. Lillieholm, D.A. Orwig, A.W. D'Amato, E.A. Colburn, J.R. Thompson, J.N. Levitt, A.M. Ellison, W.S. Keeton, J.D. Aber, C.V. Cogbill, C.T. Driscoll, T.J. Fahey, and C.M. Hart. 2010. *Wildlands and Woodlands: A Vision for the New England Landscape*. Harvard Forest, dist. by Harvard University Press, Cambridge, Massachusetts. 36pp.





**1936 Aerial Photograph**

*1936 Aerial Photographic Survey. Photographs cover the entire county. Photos were taken in the Spring of 1936. Original photos are black and white, roughly 2 feet x 3 feet in size and on a fabric medium. The original 50 photos were scanned as tiffs and rectified.*



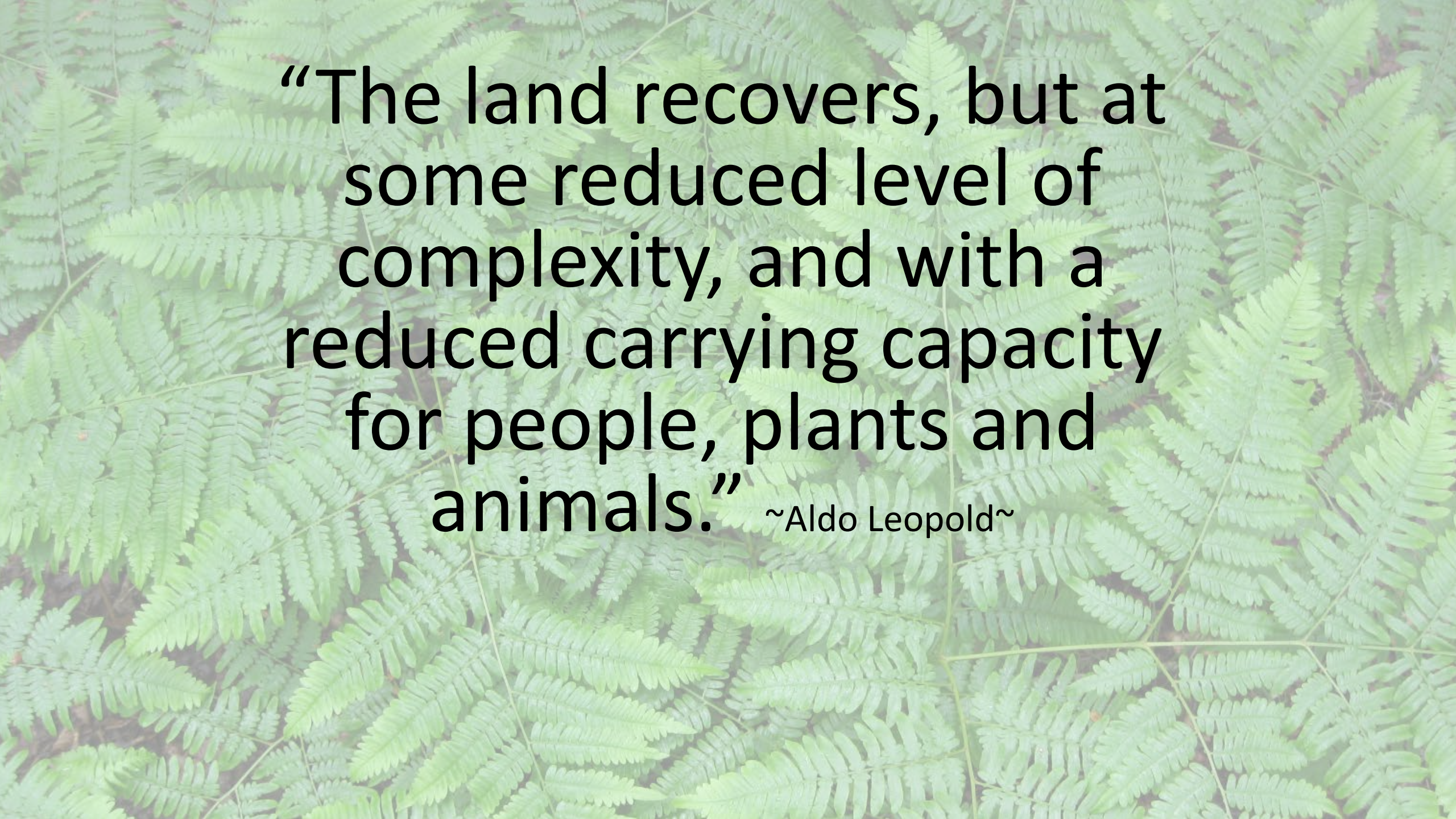
**Southern LaGrange in 1936 and 2013**

Route 55 and Taconic State Parkway  
Town of LaGrange  
Dutchess County, NY



**2013 Aerial Photograph**

*2013 digital Ortho-imagery created by NYS Office of Information Technology Services, GIS Program Office. Image pixel size is 1' or 2' GSD. Image type is 4-band, RGB & NIR. Image horizontal accuracy is within 4' at the 95% confidence level (NSSDA).*

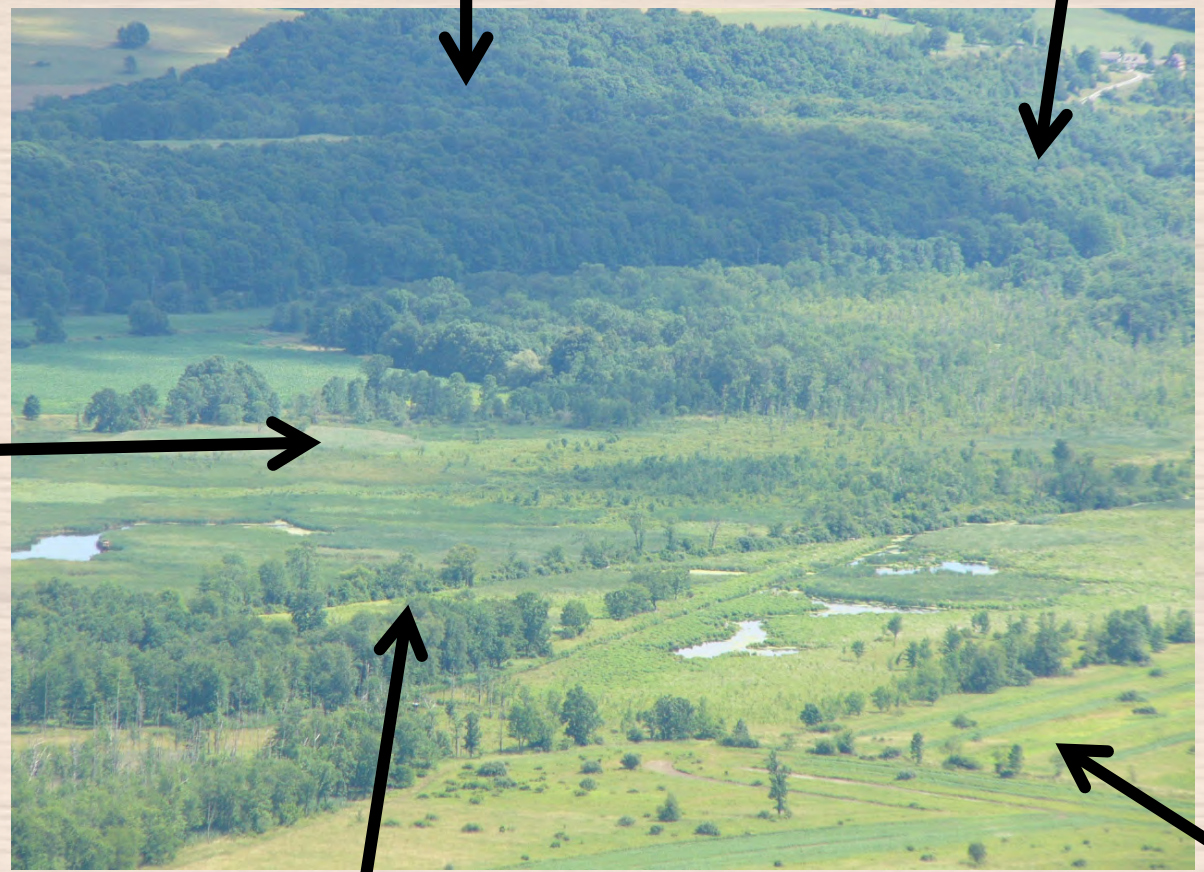


“The land recovers, but at some reduced level of complexity, and with a reduced carrying capacity for people, plants and animals.” ~Aldo Leopold~

Winds, insects and other animals pollinate crops and disperse seeds

Forests clean the air, and mitigate droughts and floods

Forests and fields generate and preserve soils, and renew their fertility



Farmlands produce our food

Nutrient cycling moves carbon, nitrogen and other nutrients from the soil into living organisms, and then back into the soil

Biodiversity is maintained by intact ecosystems

Vegetation buffers protect streams from erosion

Microbes detoxify and decompose wastes

Wetlands clean the water, and mitigate droughts and floods



# Fragmentation and Loss of Connectivity



# Habitat Loss



**Shelter**

Where does it live?

**Food**

What does it eat?

**Safety**

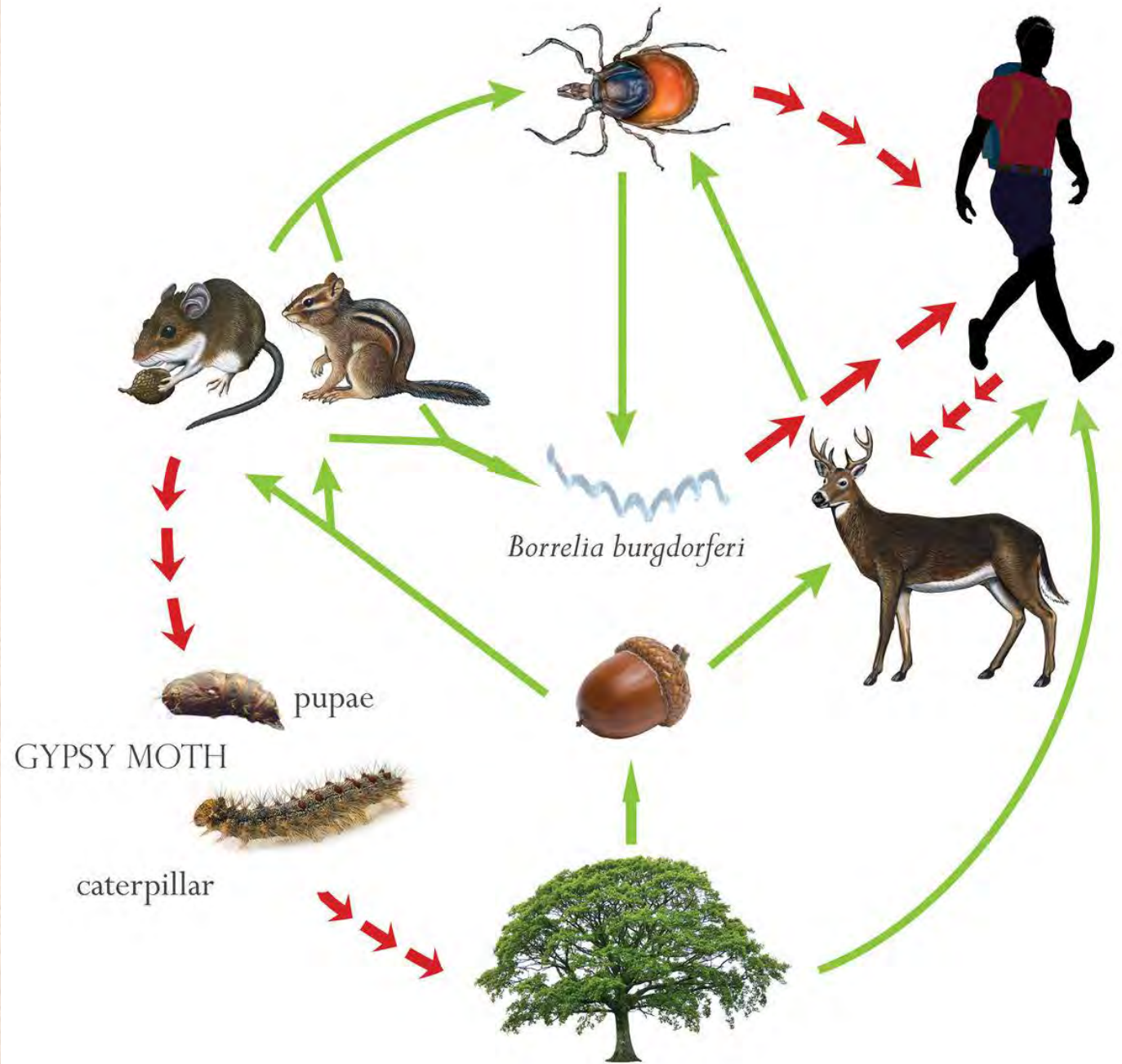
What eats it?

# Some species thrive in fragmented ecosystems



- Increased habitat
- Increased food availability
- Lack of predators

# The Acorn Connection



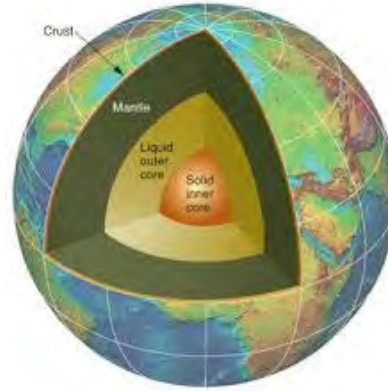
# Key Species Decline or Are Lost



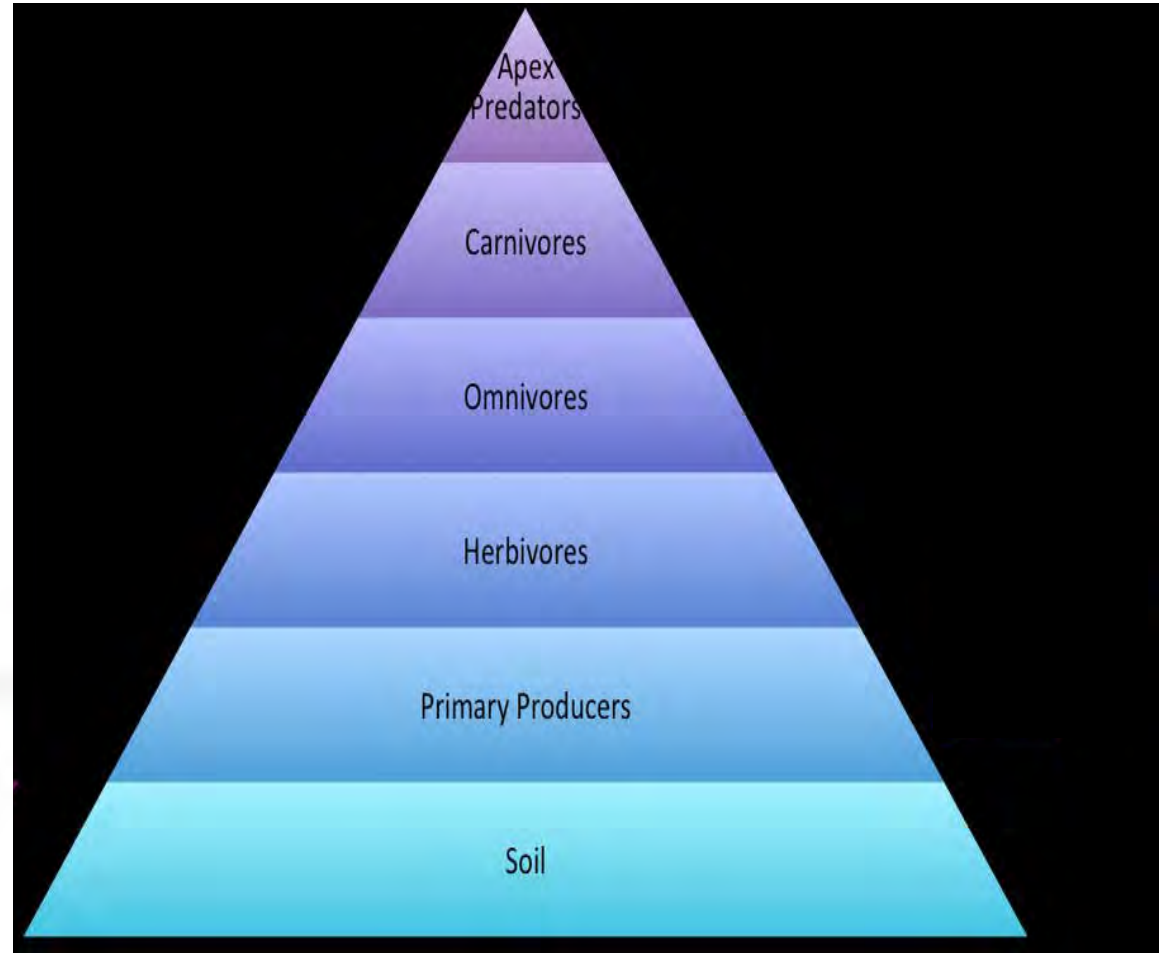
- Predators
- Native pollinators



# What do all these things have in common?



# The Biotic Pyramid





# Invasive Species



# Forest Pests and Pathogens

- Reduce habitat
- Decreased food availability
- Less cover to avoid predators



**Hemlock  
Woolly  
Adelgid**

**Beech  
Bark  
Disease**



**Oak  
Wilt**

**Chestnut  
Blight**



**Emerald  
Ash Borer**

**Asian  
Longhorned  
Beetle**

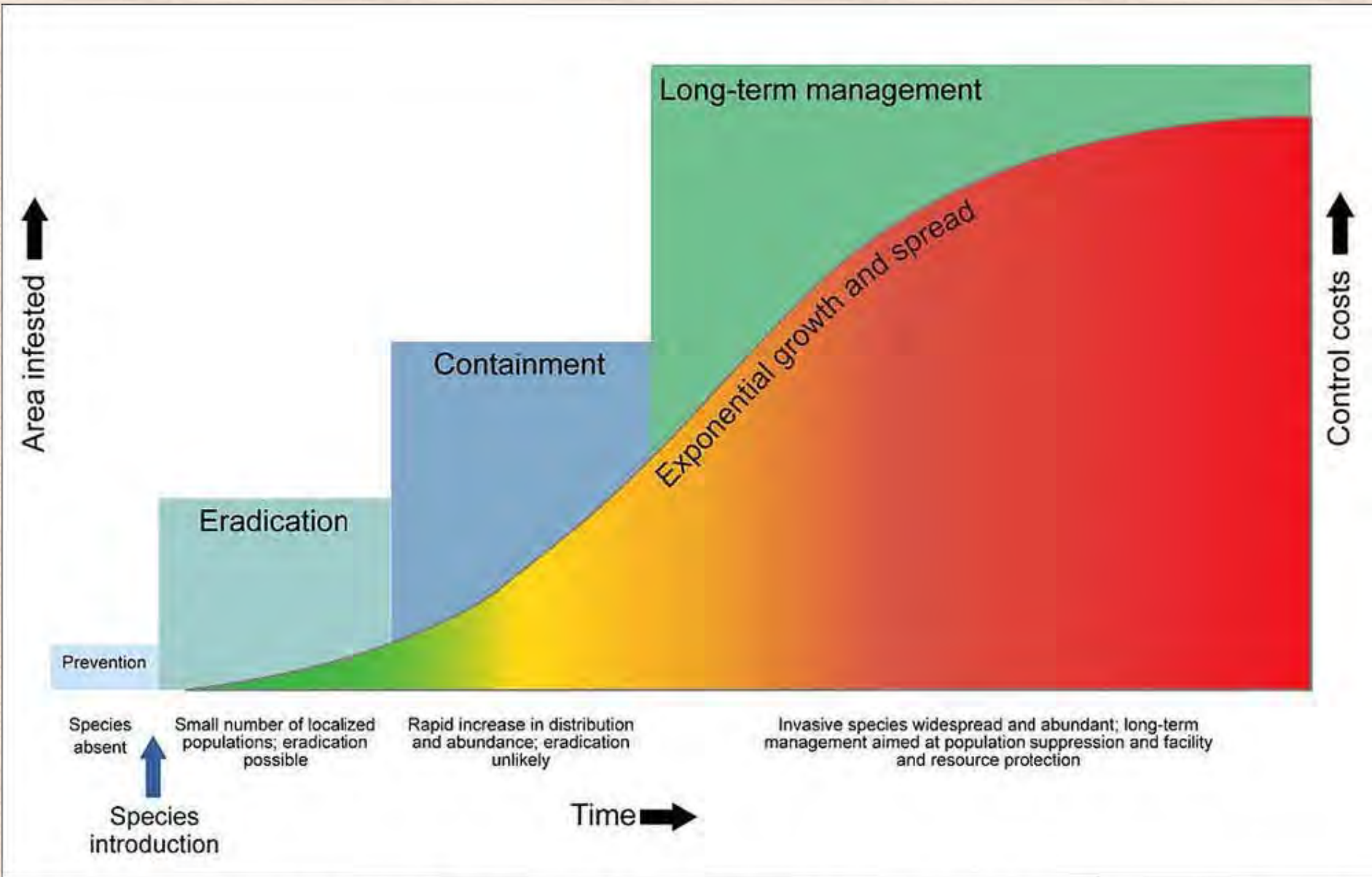


# Invasive Plants

- Change in habitat quality
- Change in food availability and quality
- Competition with native plants
- Impacts cascade through food web



# Invasion Curve



Sources: National Invasive Species Council; U.S. Department of Agriculture; National Park Service; U.S. Fish and Wildlife Service; Rodgers, L. South Florida Water Management District; Department of Primary Industries, State of Victoria, Australia; and GAO. | GAO-16-49

# Invasives Management

- Identify what you have

# Invasives Management

- Identify what you have

A promotional graphic for the 'seek by iNaturalist' app. The background is green with a pattern of leaves. The text reads "seek by iNaturalist" and "Get outside, explore, and learn about the nature all around you!". Below this are logos for Google Play and the App Store. Social media handles for @seekbyinat are shown. At the bottom are logos for the California Academy of Sciences and National Geographic. Three smartphone screens are displayed, showing app features: "SPECIES NEARBY" with a Monarch butterfly, "ACHIEVEMENTS" with a "SURVEYOR" badge, and "CHALLENGES" with a "CONNECTIVITY CHALLENGE".

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# Invasives Management

- Identify what you have
- Learn about management methods

# Invasives Management

- Identify what you have
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The screenshot shows the website for the Lower Hudson Partnership for Regional Invasive Species Management (PRISM). The header includes a search bar, navigation links for PARTNERS, VOLUNTEERS, and COMMUNITY, and a secondary navigation bar with ABOUT, WHAT WE DO, and GET INVOLVED. The main content area features a large banner image of a forest with a body of water in the background, overlaid with the text: "It is our responsibility to protect our environment from invasive species." Below the banner are three green boxes with white text:

- The Lower Hudson Partnership for Regional Invasive Species Management**  
is a collection of environmental organizations and individuals concerned about invasive species in the region.
- Invasive species are a serious threat**  
to the rich biodiversity and ecosystems of the Lower Hudson Valley. Once established in our region, they have the potential to spread to other areas too.
- We use every tool**  
at our disposal to control the introduction, spread, and harmful impact of invasive species.

# Invasives Management

- Identify what you have
- Learn about management methods
- Make a plan and set realistic goals

# Invasives Management

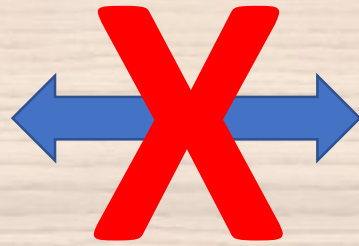
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- Prioritize - pick your battles

# Invasives Management

- Identify what you have
- Learn about management methods
- Make a plan and set realistic goals
- Prioritize - pick your battles
- Commit to making progress, not “winning”

**Why Not “Let Nature Take Its Course”??**

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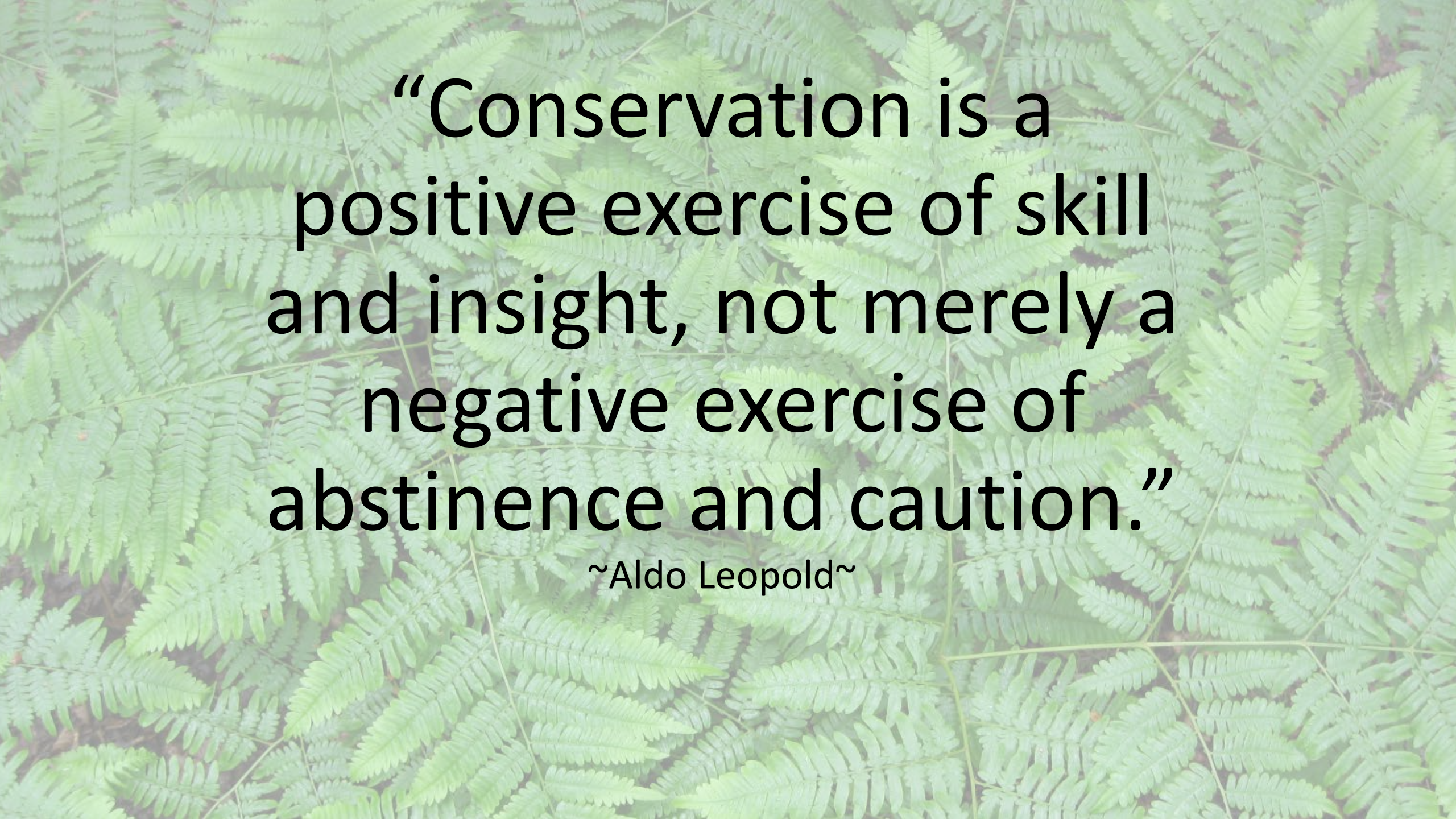


# **Why Not “Let Nature Take Its Course”??**

**The choice not to manage is itself a management decision.**

# Why Not “Let Nature Take Its Course”??





“Conservation is a positive exercise of skill and insight, not merely a negative exercise of abstinence and caution.”

~Aldo Leopold~