

Conservation of Biodiversity in the Face of Climate Change

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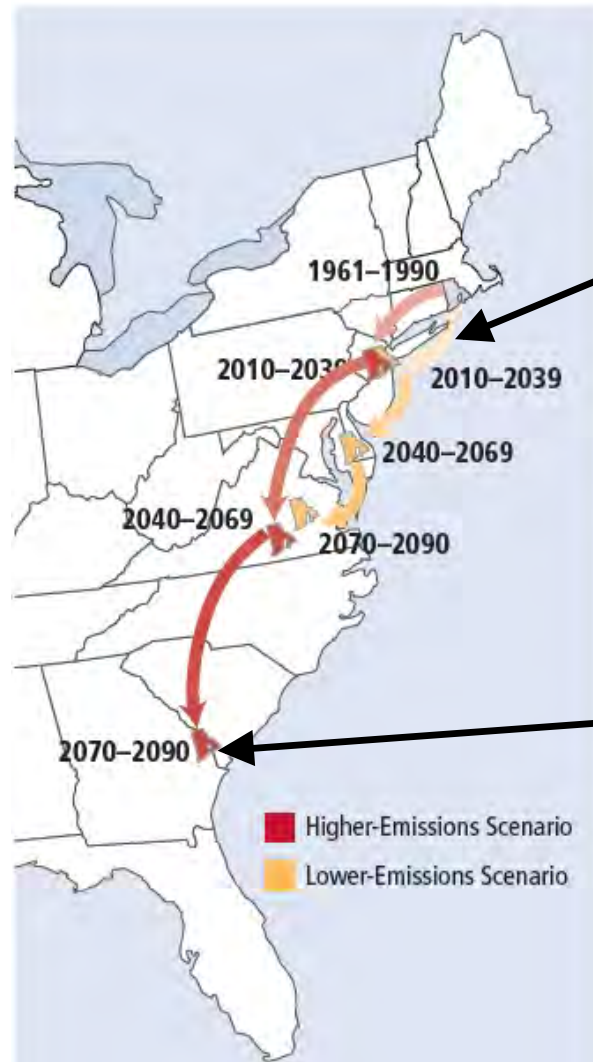
Peter August

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University of Rhode Island

Climate Change in RI

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Summer Weather

Current Condition (*us, now*)

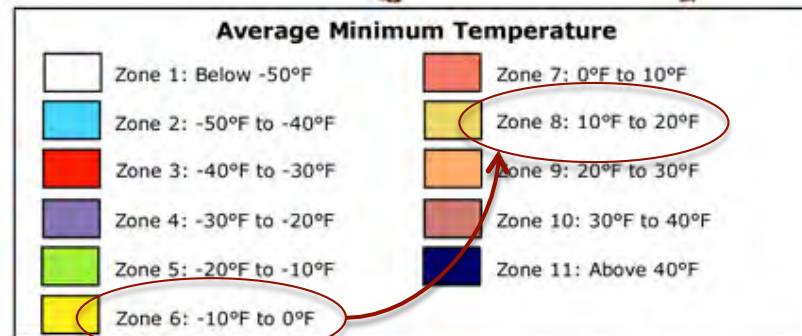
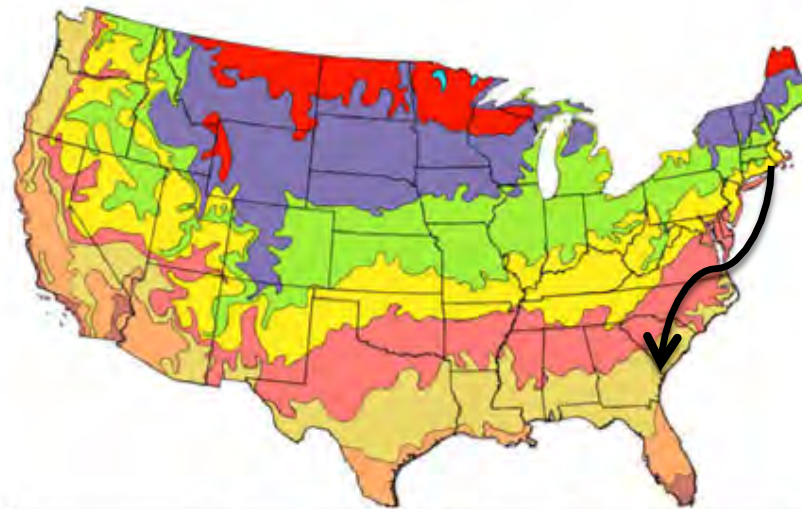
2090 (*our grandchildren*)
High
Emission
Scenario

Source: Union of Concerned Scientists

Growing Conditions Will Change

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Very Different Climate

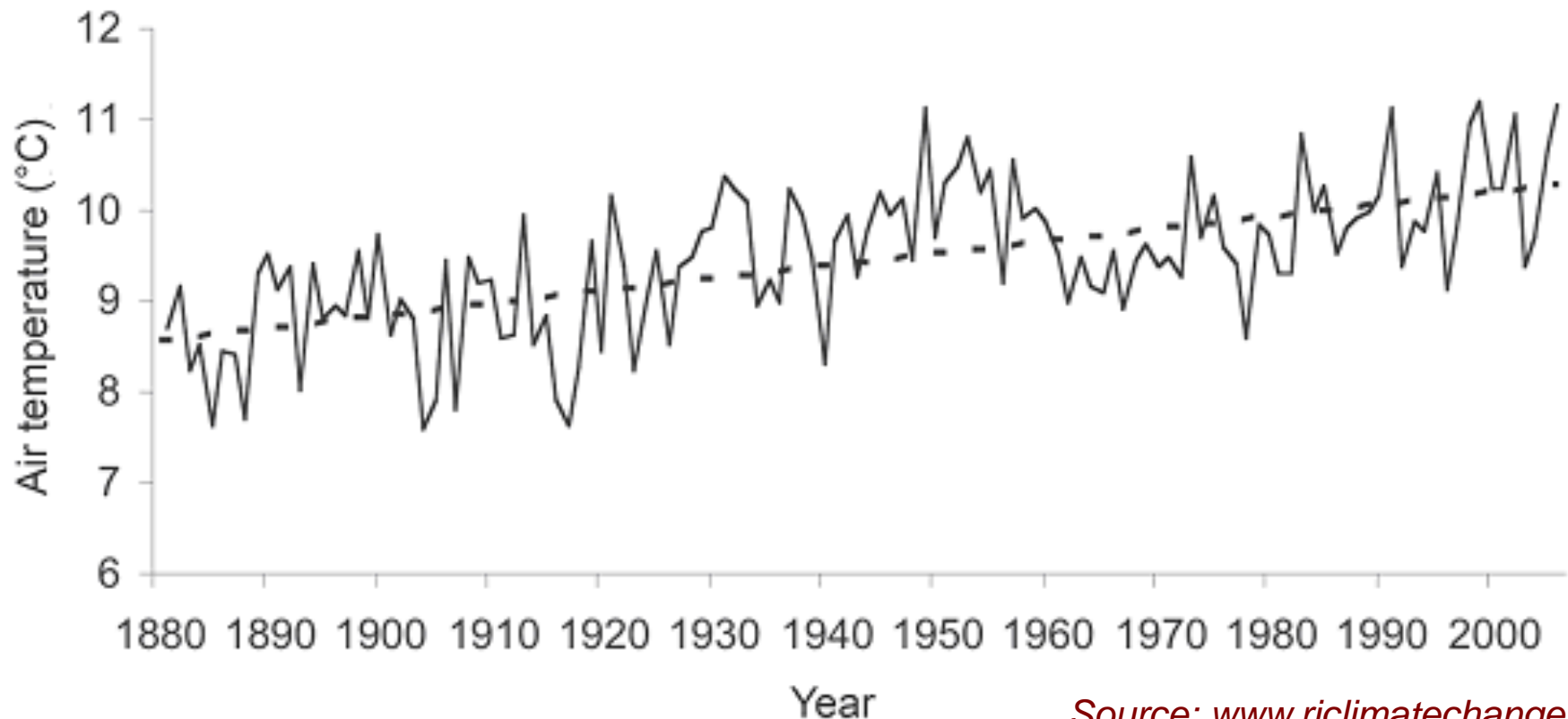


Temperatures Has/Will Increase

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1/2 degree (F) increase per decade since 1970, Providence, RI.

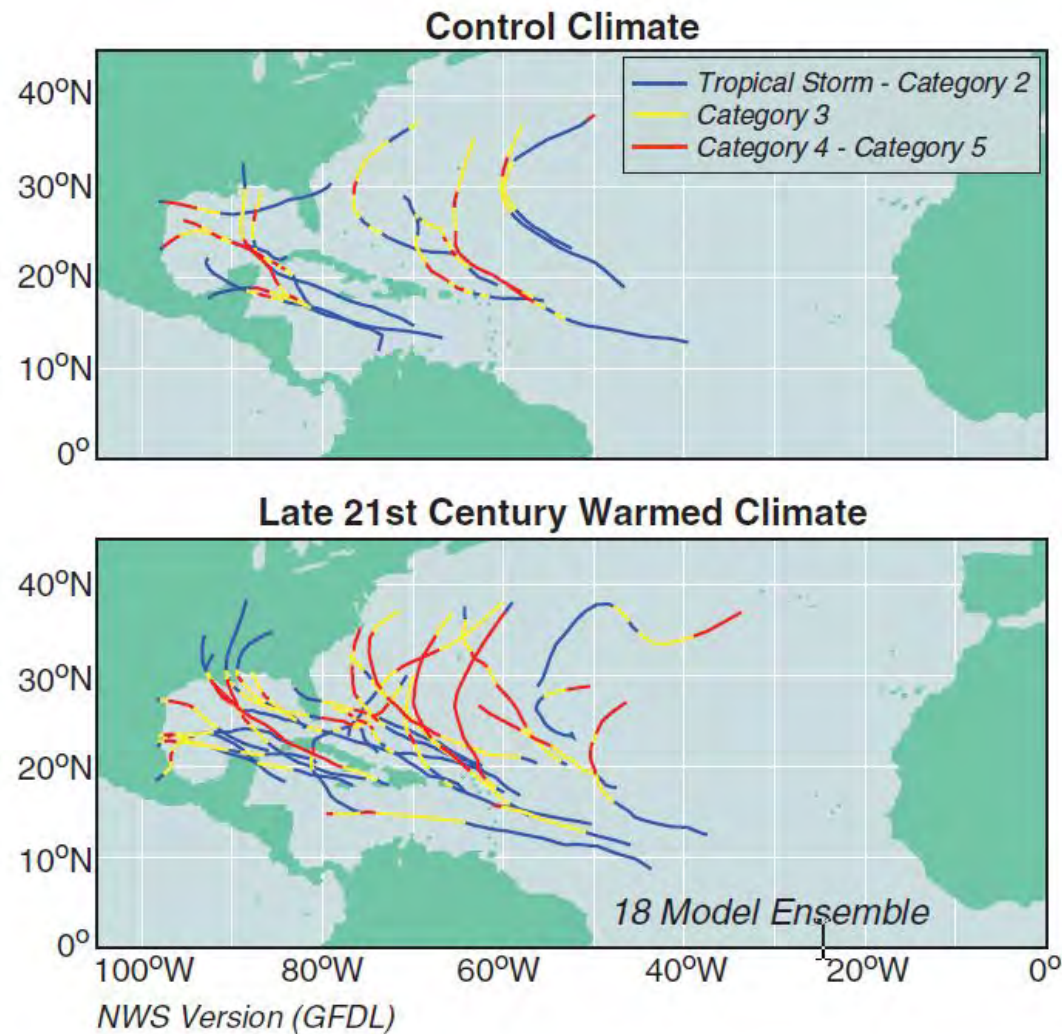
Winter temps rising at 1.3 degrees (F) per decade.



Source: www.riclimatchange.org

Storms Will Increase

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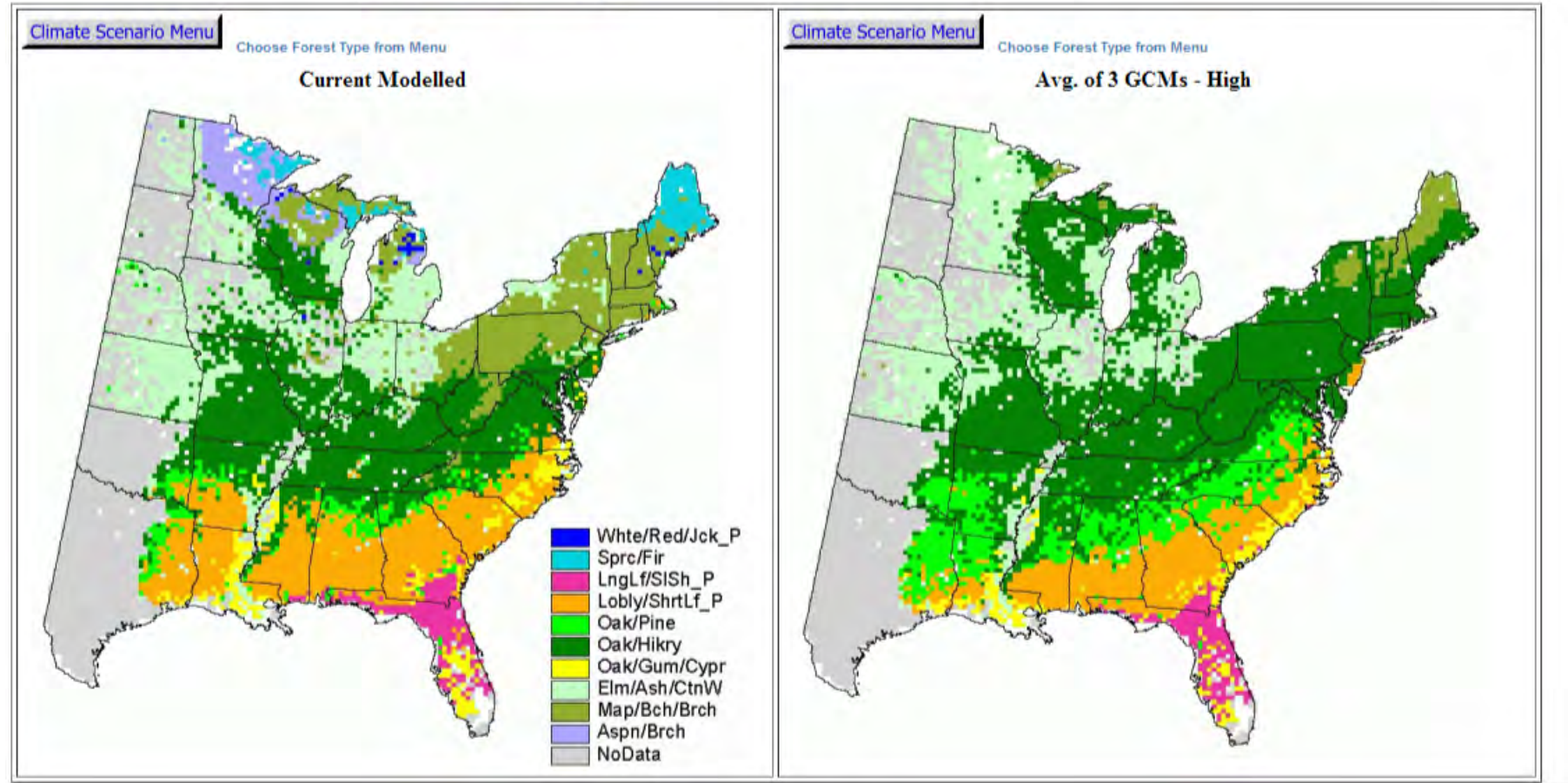


(Source: Bender et al. 2010)

Habitats Will Change - Forest Types

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[view Summary of Changes](#)



Maple/Beech/Birch

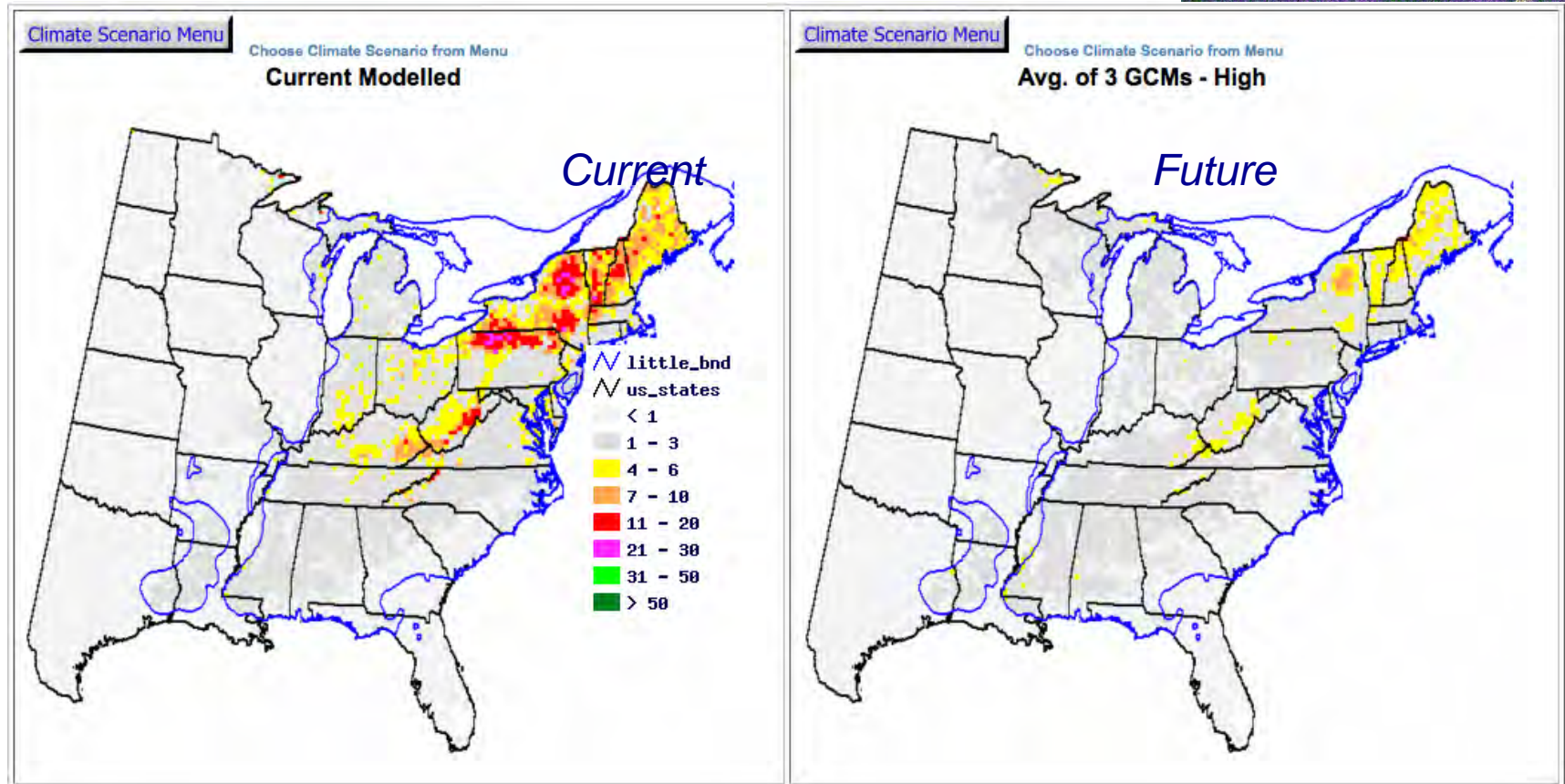
Oak/Hickory

Source: Prasad, A. M., L. R. Iverson., S. Matthews., M. Peters. 2007-ongoing.

Habitats Will Change - Plants

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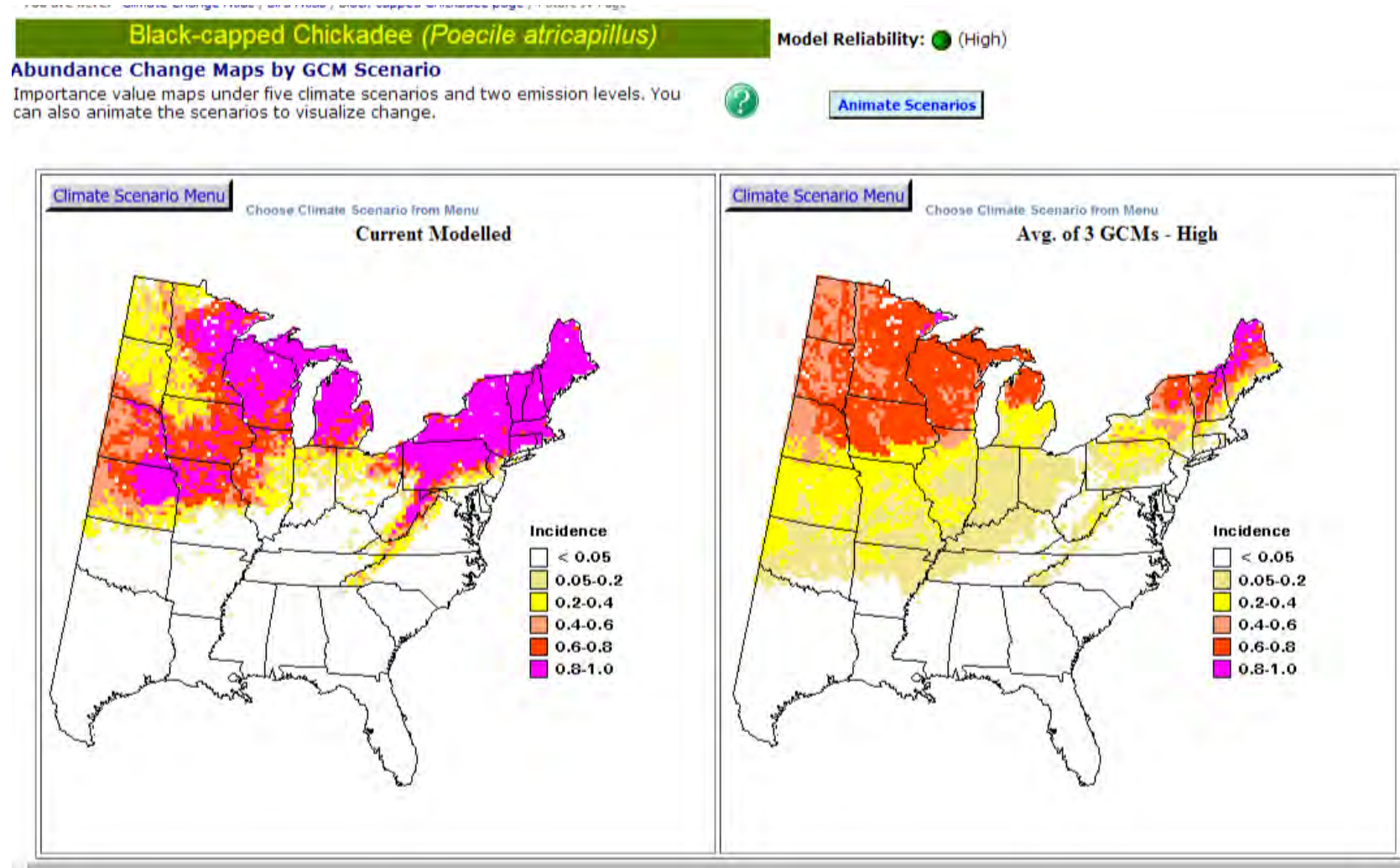
American Beech Tree (*Fagus grandifolia*)



Source: Prasad, A. M., L. R. Iverson., S. Matthews., M. Peters. 2007-ongoing.

Habitats Will Change - Animals (Black-Capped Chickadees)

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Source: Prasad, A. M., L. R. Iverson., S. Matthews., M. Peters. 2007-ongoing.

Is it Hopeless?

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Image: Splatter.com.

Is it Hopeless?

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NO!

Solutions:

**Conservation
Stewardship
Restoration**

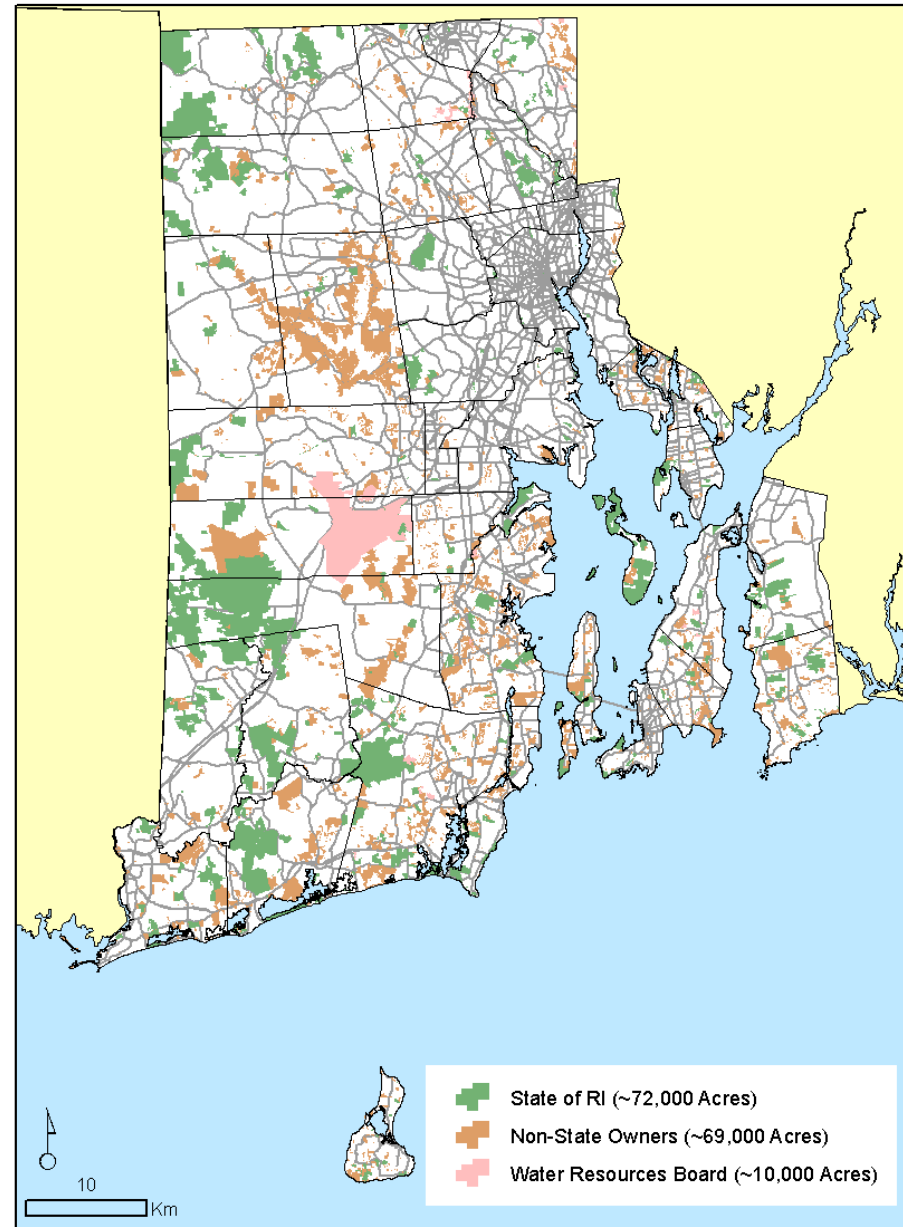
One Solution

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Conserve Land!

Protect habitats that can support populations of plants and animal

Conservation Lands in RI



GIS Data provided by Paul Jordan, RIDEM. July 2006

Climate Change Impacts are on Top of Other Challenges to Our Biodiversity.

Habitat Changes in RI – 1972-1999

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↓ **4.5% RI Forest Cover** (=30 Sq Mi [or one Cranston or Smithfield])

↑ # of **Forest Patches** by 78%

↓ **Forest Patch Area** 17 Acres to 9 Acres

↑ Forest **Patch Density** 21 Forest Patches / Sq Mi to 39



Source: Alyssa Novak, YQ Wang. 2003

Selecting Land to Protect: Fundamental Rules

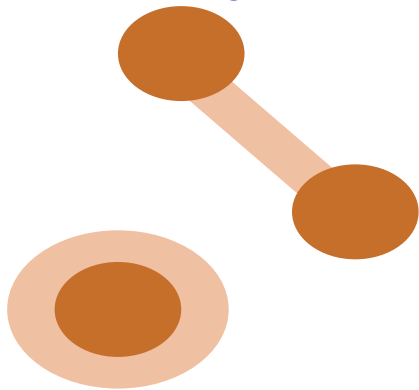
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Protect Rare Species



Protect Unique Ecosystems

Expand or Connect Existing Reserves



Public Access



Benefits of Conserving Natural Habitats

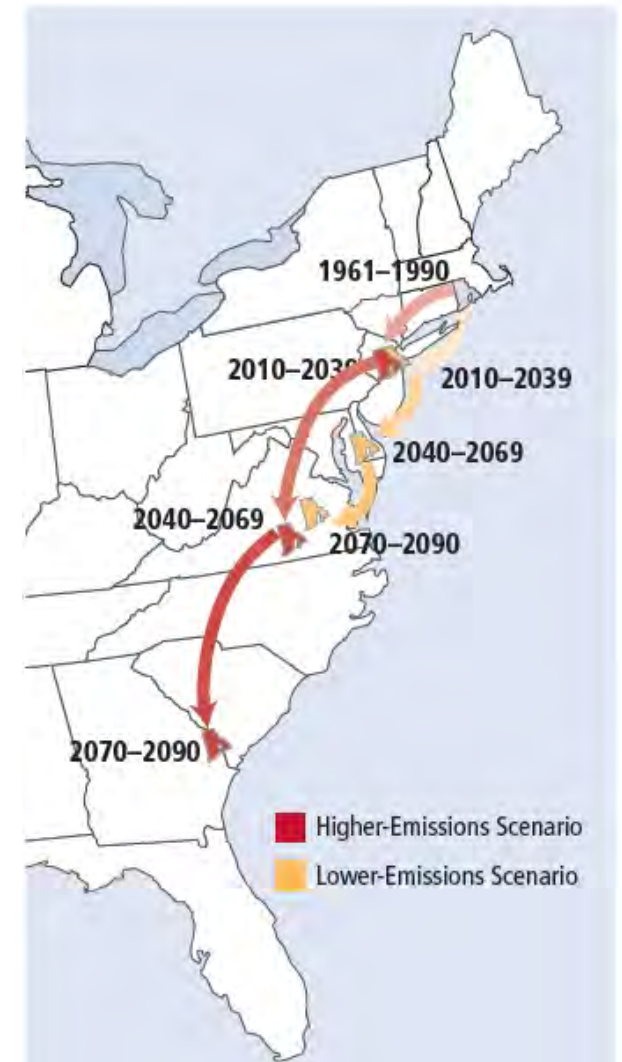
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- Ensures large populations of native plants and animals
- Ensures a diversity of habitats
- Creates resilient ecosystems
- Provides aesthetic and recreational services (hikers, hunters, fishers, bird watchers)

Conundrum

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- Where are critical locations to protect when we do not know what will be here?



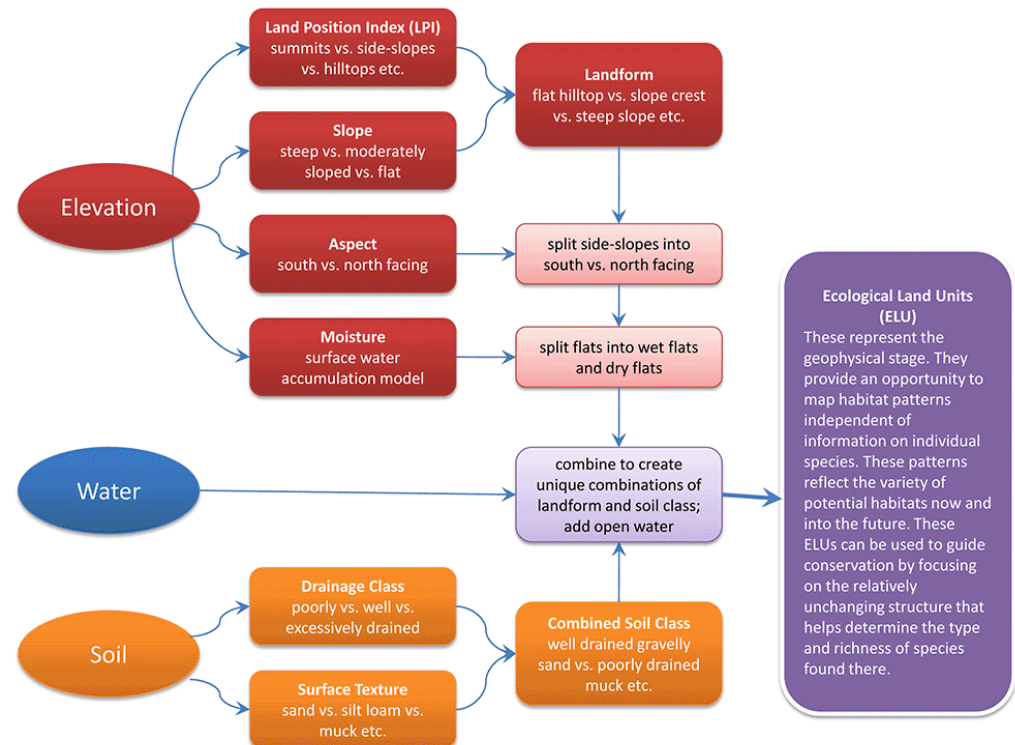
ELUs

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ELU – Ecological Land Unit

*Areas of unique soil
drainage, soil texture, &
landform*

ELU Code	Description
1121	Excessively drained gravelly sand on flat hilltop
1122	Excessively drained gravelly sand on gentle slope
1123	Excessively drained gravelly sand on upper sideslope/rounded ridge
1130	Excessively drained gravelly sand on dry flat

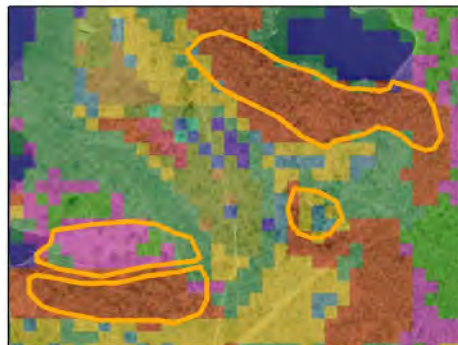


ELUs and Plant Community Types

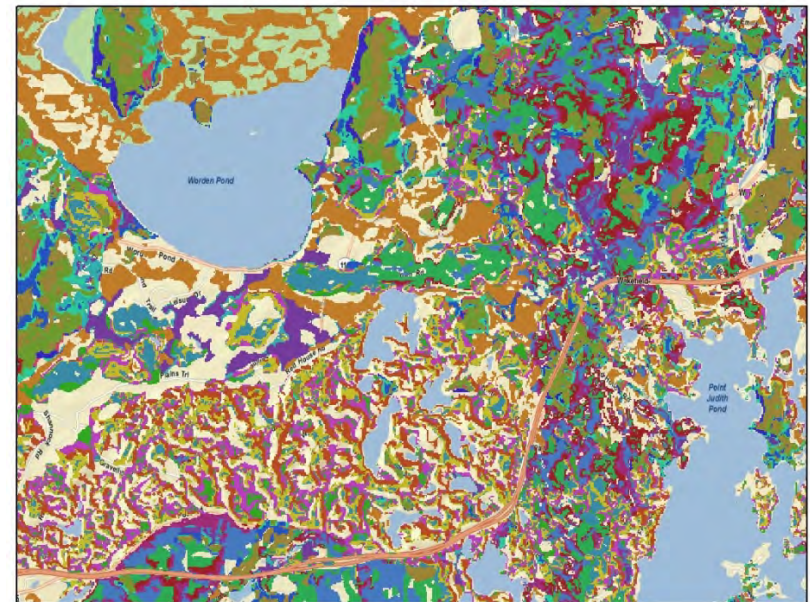
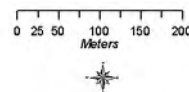
17



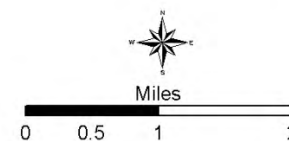
Distinct vegetation communities in upland areas in the Matunuck Hills Kettle Ponds landscape



ELU's show approximate demarcation of the different vegetation communities



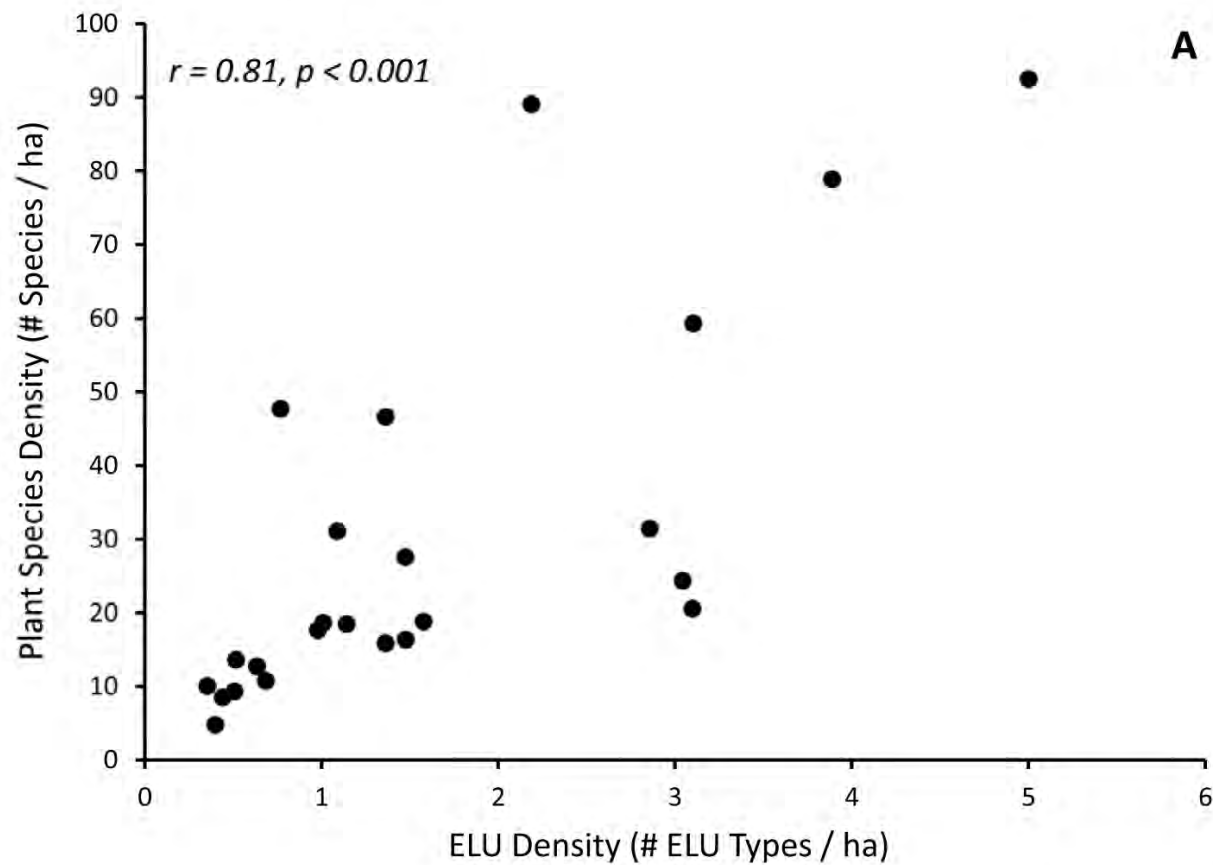
ELUs of the Matunuck Hills
South Kingstown



ELU Type	Code	1132	2432	3422
	1121	2421	2521	3521
	1122	2422	2522	3621
	1123	2423	2530	
	1130	2430	2532	3421

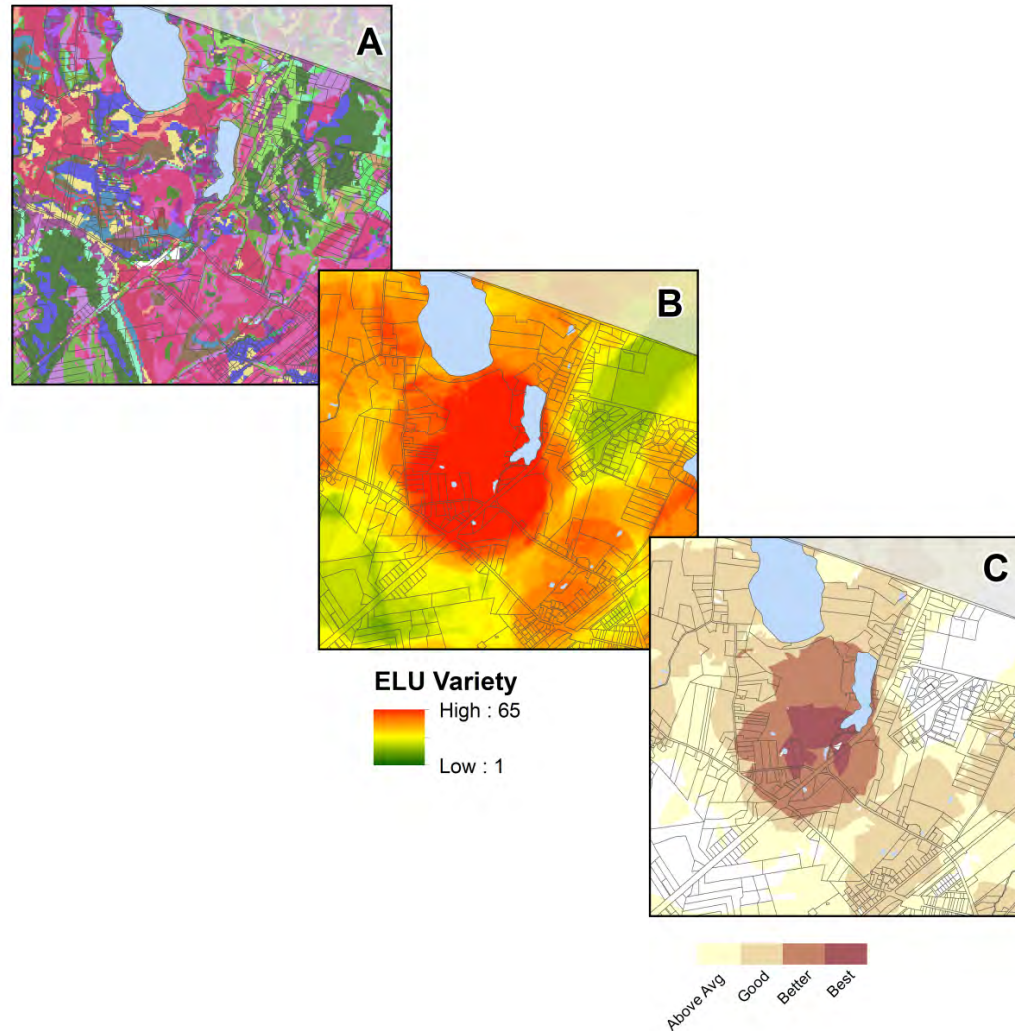
Does ELU Variety = High Biodiversity?

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Ecological Land Units – A Planning Tool

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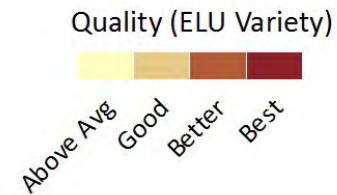
Ecological Land Units – A Planning Tool

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Conserving the Stage

Land Protection for Biodiversity
in the Context of Climate Change



For more information please contact
Kevin Ruddock at kruddock@tnc.org

THE
UNIVERSITY
OF RHODE ISLAND

Sea Grant
Rhode Island

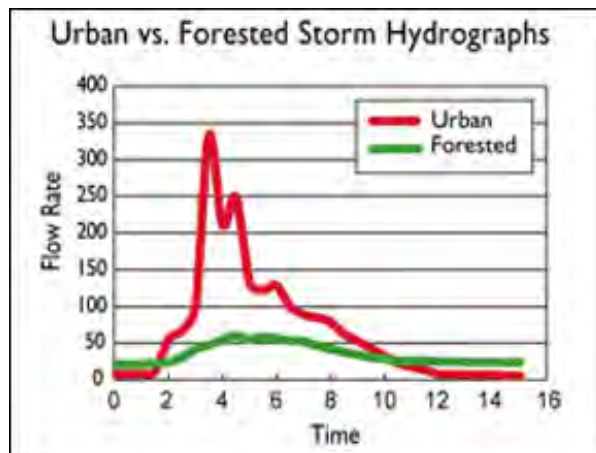
The Nature
Conservancy
Protecting nature. Preserving life.

RIGIS

Benefits of Conserving Natural Habitats

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- Slows the flow of runoff
- Recharges groundwater reservoirs
- Reduces groundwater withdrawal
- Keeps rivers cold
- Reduces flood hazards



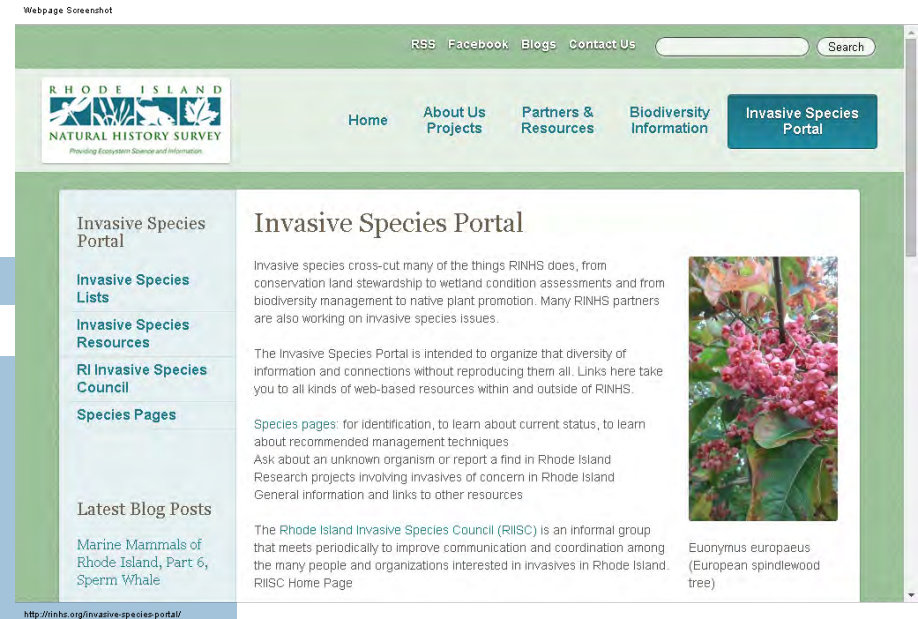
Other Actions

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Stewardship

Protecting our investment

Vigilant to pests, pathogens, invasives



Restoration - The New Frontier

Fixing broken systems

Dam removal, habitat management

What You Can Do ... Now

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- Join your town's **land trust, conservation commission or Planning Board**
- Support town and state **bond issues** for open space protection
- **Become a member** of conservation organization (WPWA, RINHS, TNC, ASRI)
- Attend the **Land and Water Summit** conference
- Build an **outdoor ethic** in the next generation by doing outdoor activities with kids
- **Vote** for conservation-minded candidates