

Plants *are* the habitat



Plants are vital to humans

Oxygen
Filter air pollutants
Sequester carbon
Cleanse water
Control erosion
Lessen floods
Fuel
Fiber
90% of food energy
75% of major drugs



Plant blindness prevails



Protect plants, you protect many species



Goals of the report

- Document status of and trends in the New England flora
- Identify threats to plant species in the region
- Articulate research agenda
- Discuss frameworks for conserving and managing species
- Suggest what everyone can do to help



We have the data

About | Go Botany | Garden in the Woods | Take a Course | Garden Shops | Resources | Membership

NEW ENGLAND
**WILD
FLOWER
SOCIETY**

CONSERVE | GROW | LEARN | VISIT | SUPPORT

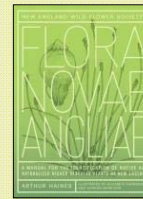
Conserving and promoting the region's native plants to ensure healthy, biologically diverse landscapes

Investigating Your Yard and Woods in the Digital : Important Legal Victory for Conservation : Get Ready for Free Fun Friday! : Sponsor a Seed Help us save our region's

Sources of data – NEPCoP



New England Plant Conservation Program
Plant Conservation Volunteers
Rich botanical history
Herbarium Recovery Project
Flora Novae Angliae
Go Botany and PlantShare
Flora Conservanda
1,000's of published studies
New England experts



Sources of data – Volunteer monitoring

- **250+ Plant Conservation Volunteers active each year**
700+ total trained
- **450+ surveys yearly**
- **60,000 hours of fieldwork since 1998**
- **New discoveries, updates, surveys**
- **Management**



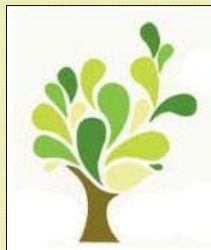
Wikipedia

Sources of data – Witness tree records



Charlie Cogbill, Vermont

Sources of data – Go Botany & PlantShare



Go Botany Discover thousands of New England plants

Home Simple Key PlantShare Full Key Dichotomous Key Teaching Help Search

PlantShare

Your Profile

efarnsworth-admin
180 Hamenway Road,
Frammingham MA, 01024
Sightings 0
Checklists 0

Find People

Enter person's name

Recent Sightings

Sightings Locator

Show recent plant sightings for

Scientific or common name

How to Use

Enter a plant name and we'll show where it's been seen recently.

Don't see a plant you think should be there?

You will see all recent sightings that others have marked for public view or for a PlantShare group that you belong to. Rare and endangered plants will not be displayed.

Ask the Botanist

Our ace botanists are here to help you identify a plant, suggest locations for seeing plants, and provide you with expert scientific guidance on all things in the New England plant kingdom.

Sources of data – *Flora Conservanda*

RHODORA
The Journal of the
New England Botanical Club

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Flora Conservanda: New England. The New England Plant Conservation Program (NEPCoP) list of plants in need of conservation. William E. Bramblett and Leslie A. Melting†, in collaboration with Richard W. Ecker, Susan C. Givler, Robert G. Propp, Paul Sumers, and Daniel B. Sperdian, with assistance from William D. Courtyman and C. Barry Helgason

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Issued: July 7, 1997

RHODORA
Journal of the
New England Botanical Club

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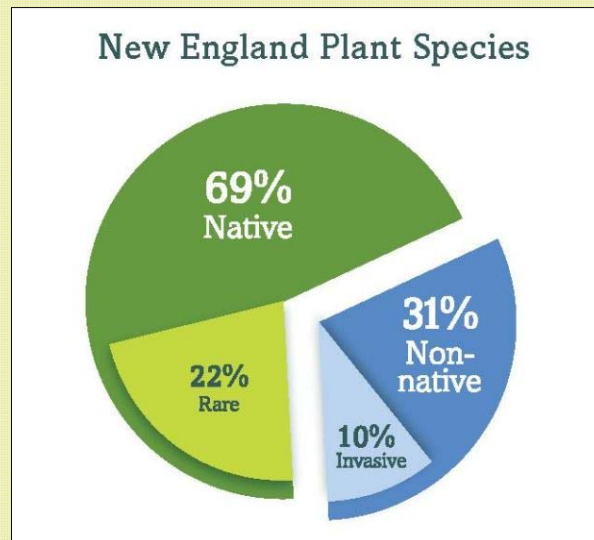
Flora Conservanda: New England 2012. The New England Plant Conservation Program (NEPCoP) list of plants in need of conservation. *New England Flora Committee of NEPCoP*

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NEPCoP Officers and Council Members	inside back cover

Vol. 115 Oct-Dec, 2013 No. 964
Issued: Month 09, 2013

1996 and 2012 comparisons

General findings: 3,514 species & counting



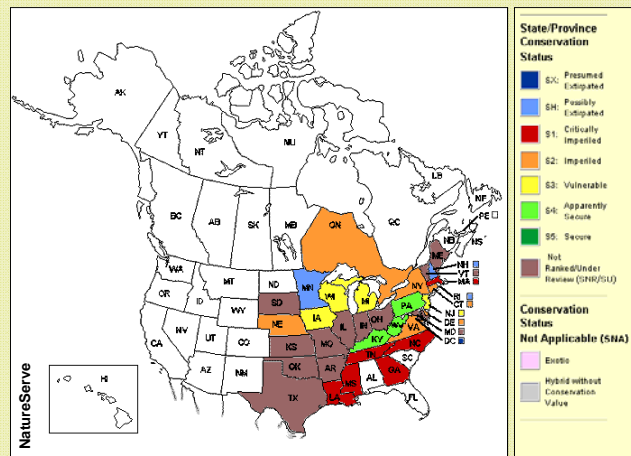
10 rare taxa endemic to New England



3 now extinct
1 removed from U. S. Endangered Species List

It's not *just* about New England

Species on average are listed in 38.5% of their North American range



General findings

593 considered in *Flora Conservanda* 2012

Globally rare:	62 (2.5% of native taxa)
Regionally rare:	325 (13.4%)
Regionally declining:	6 (0.2%)
Disjunct:	51 (2.1%)
Historical:	96 (3.9%)

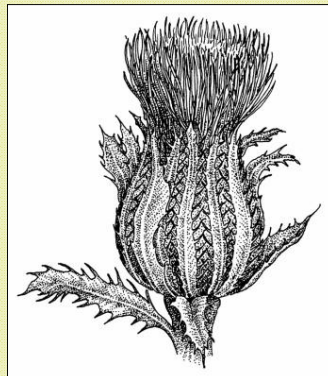
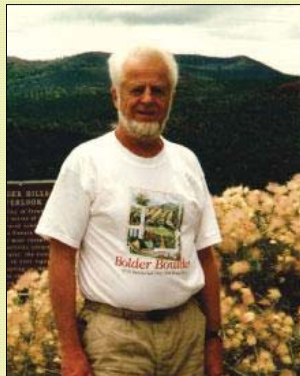
TOTAL: 540 (22.1% of the native flora)

Division IND (Indeterminate): 53 (1.5%)

Most staying the same, but 25 down-listed, 8 up-listed

De-listing of taxa

Previously unrecorded finds
Taxonomic revisions (lumping)
Hybrids
New information on nativity
Actual increases



Most imperiled groups

Ophioglossaceae
60%



Saxifragaceae
43%



Orobanchaceae
41%

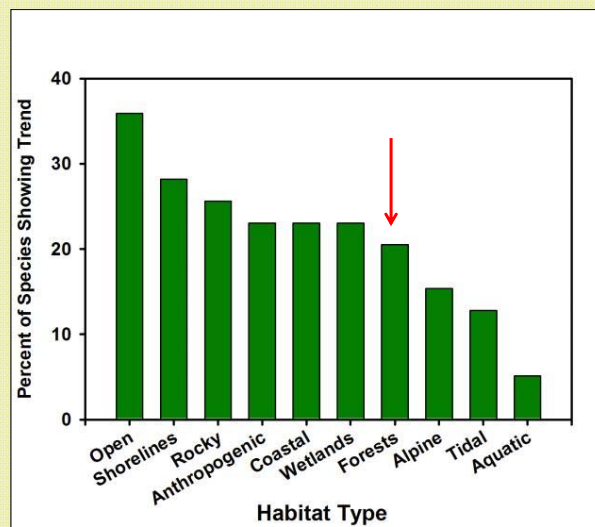


Orchidaceae
36%



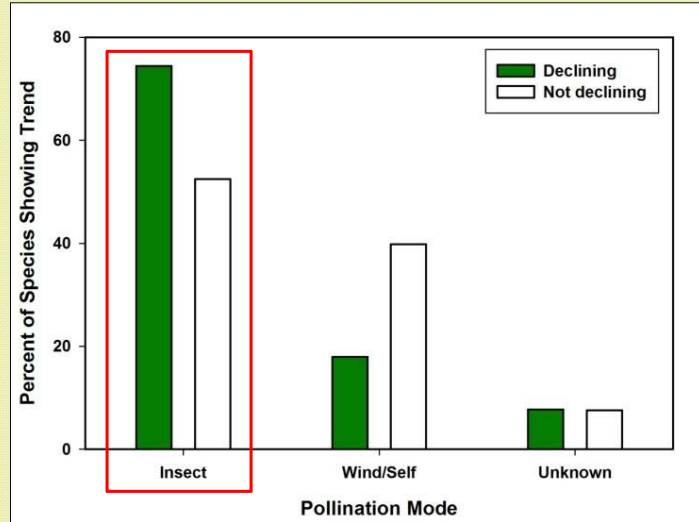
What do declining species have in common?

Habitat affinities

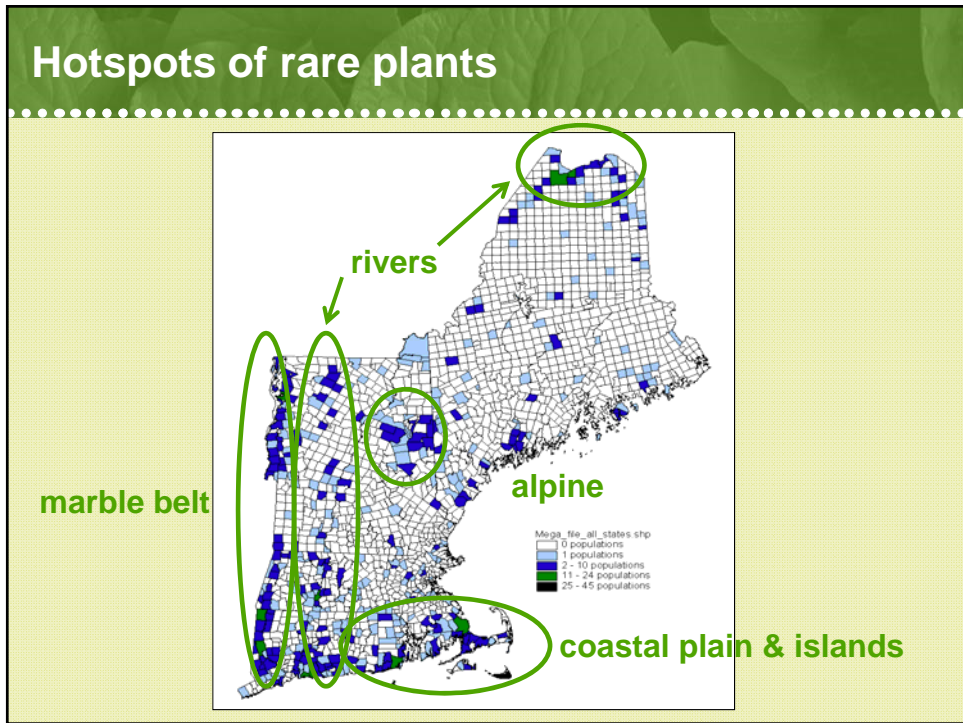


What do declining species have in common?

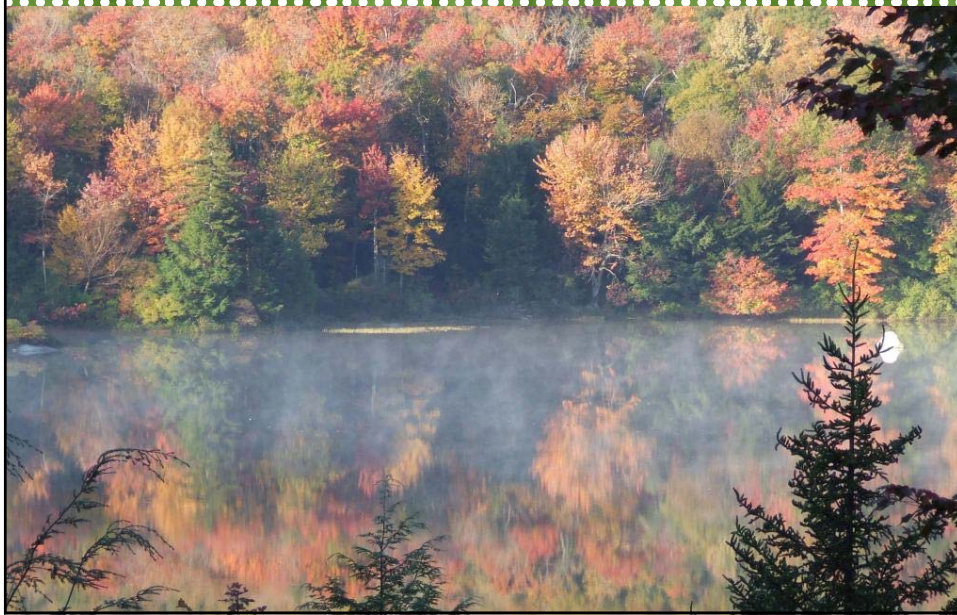
Insect-pollinated species declining



Hotspots of rare plants



Case studies – A habitat-based approach



Case studies – A habitat-based approach

5 major habitat types
Mountains to the sea
Captures 213 rare plant species
Many common species
Animal species supported
Services to humans

Threats to each habitat – shared threats
Identify most threatened habitats

Steps needed to protect and restore

Alpine and Subalpine Habitats

Plants: 48 rare species, 4 globally rare



Geum peckii



Kent McFarland

Riparian Habitats

Plants: 44 rare species, 9 globally rare



Lisa Mattei

Astragalus robbinsii var. *jesupii*



A. M. Ellison



William Hull

Sandplain Grasslands and Heathlands

Plants: 52 rare species, 12 globally rare



Ed Sambolin



Majle Neel

Agalinis acuta



USFWS

Estuarine Marshes

Plants: 21 rare species, 6 globally rare



PlantRescue.com

Sagittaria subulata



Derek Stoner

Mixed Northern Hardwoods Forest

Plants: 48 rare species, 5 globally rare



Dorothy Long

Hydrastis canadensis

Mixed Northern Hardwoods Forest

Other species: Forest-interior nesting birds, bear, moose, rare salamanders, early hairstreak butterfly



Danny Bates



Naba.org

Mixed Northern Hardwoods Forest

Threats: Clearing
Invasive invertebrates, pathogens, plants
Deer
Climate change forcing species north



Mixed Northern Hardwoods Forest

Clearing: Legacy effects



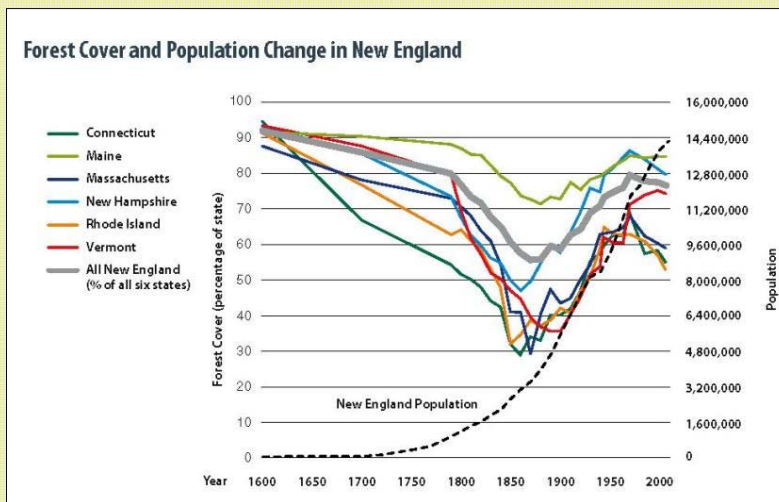
Mixed Northern Hardwoods Forest

Forest understory species few and declining



Mixed Northern Hardwoods Forest

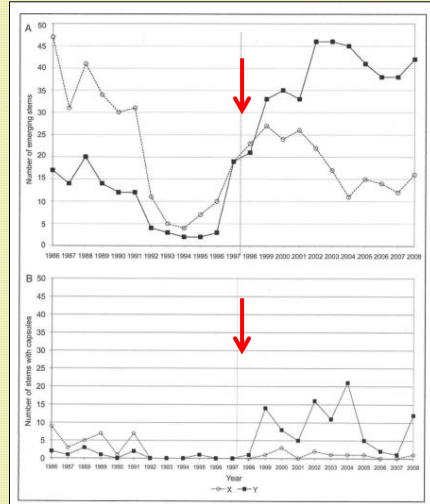
Clearing: Forests now declining again



Source: Harvard Forest

Mixed Northern Hardwoods Forest

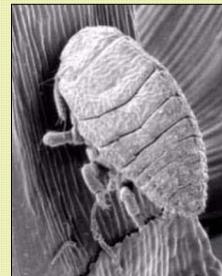
Restoring rare forest plants: Small whorled pogonia



Source: Brumback et al. *Northeastern Naturalist* 18:185-196. 2011

Mixed Northern Hardwoods Forest

Forest insects



Adelges tsugae

Mixed Northern Hardwoods Forest

Forest insects



Anoplophora glabripennis

Mixed Northern Hardwoods Forest

Forest insects



Agrilus planipennis

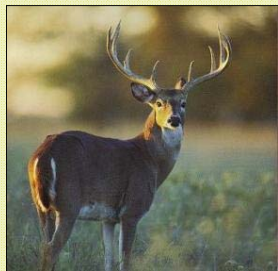
Mixed Northern Hardwoods Forest

Already being done: Restrict transport of infested wood products
Investigate resistant provenances of trees



Mixed Northern Hardwoods Forest

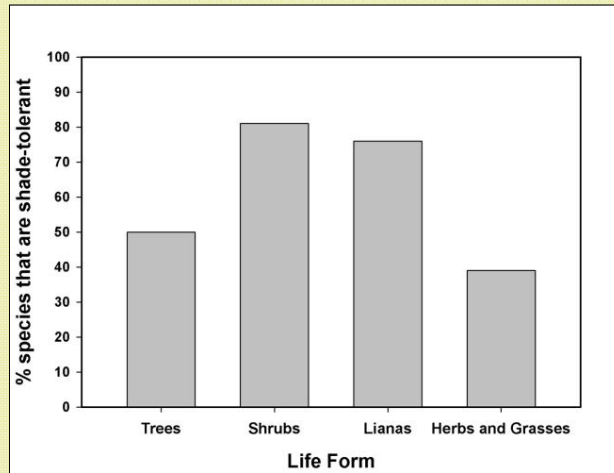
Threats: Deer



Andrew Moe

Mixed Northern Hardwoods Forest

Invasive plants



Source: Martin et al. 2009

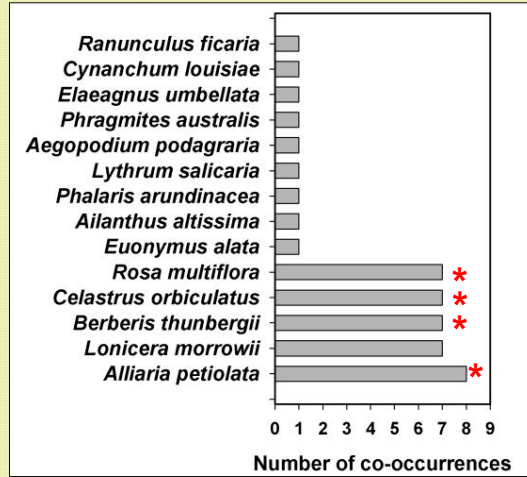
Mixed Northern Hardwoods Forest

Early leaf-out



Mixed Northern Hardwoods Forest

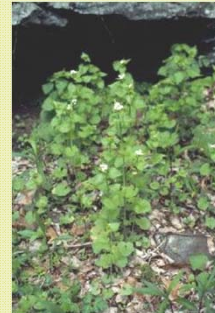
Major invasives



* Species occurring in 3 or more forest sites in Luken (2003) analysis of 144 surveys

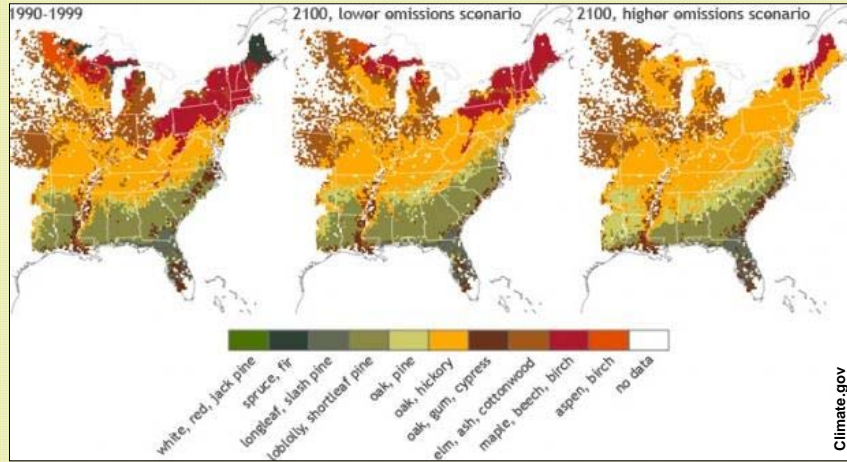
Mixed Northern Hardwoods Forest

Learn to recognize major invasives



Mixed Northern Hardwoods Forest

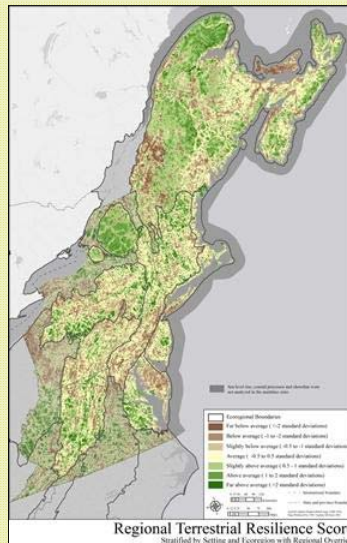
Threats: Climate change forcing species north



Climate.gov

Mixed Northern Hardwoods Forest

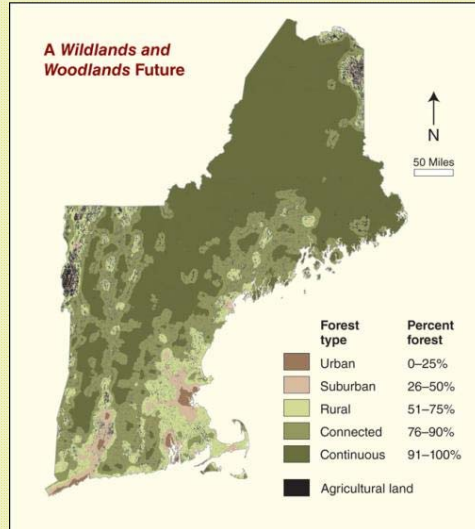
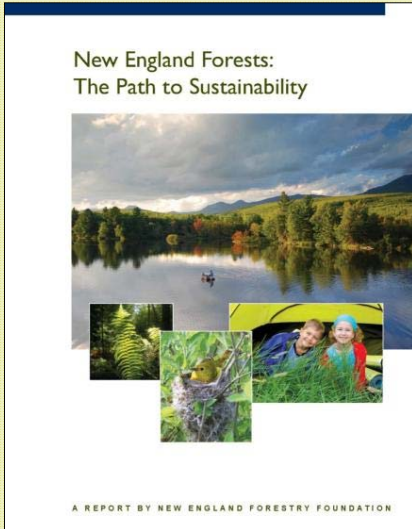
Conservation Needs: Protect large corridors of matrix forest



Regional Terrestrial Resilience Score
Stratified by Setting and Interaction with Regional Drivers

Mixed Northern Hardwoods Forest

Already underway: Encourage sustainable forestry



Mixed Northern Hardwoods Forest

Already being done:

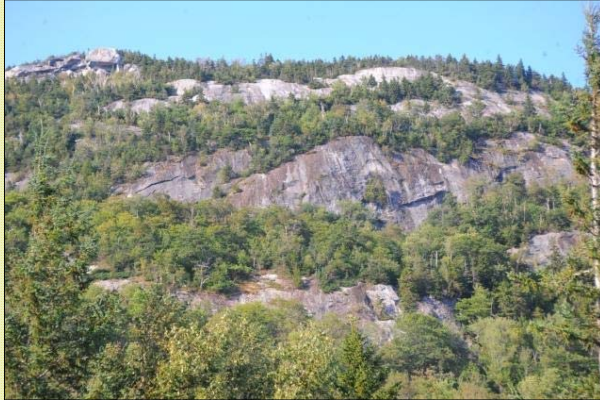
- Protect large corridors of matrix forest
- Encourage sustainable forestry
- Restrict transport of infested wood products
- Cull or reduce fecundity of deer
- Detect and remove early invasions
- Actively restore sensitive species



Recommendations

Overall Goal:

Functioning ecosystems with species continuing to evolve in the wild in response to evolutionary pressures, with little intervention and input.



Recommendations

Overall Strategies:

1. **Protect as much intact, diverse, complex habitat as possible.**
2. **Monitor plant populations for health and threats.**
3. **Collect and bank seeds to preserve the genetic variation of plants.**
4. **Manage habitats for rare and common plants where necessary and feasible.**
5. **Augment, reintroduce and introduce plant populations within the historic range.**
6. **Perform managed relocation as necessary.**
7. **Spearhead a national strategy.**

Recommendations

Fully fund efforts to conserve plant diversity

Endangered plants receive < 5% of funding for recovery
Cost to downlist 1 animal = cost to downlist 9 plant species
Cost to protect global biodiversity is 1/3,500th of the US GDP



Recommendations

What individuals can do

Plant native plants
Reduce herbicide and pesticide use
Educate yourself and your kids to appreciate plants (Go Botany!)
Remove invasives and prevent new ones
Support land trusts



Recommendations

At the community level

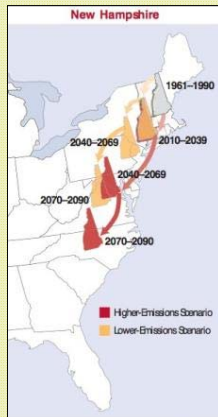
- Work with municipal officials
- Advocate for more plant education in schools
- Encourage local outlets to promote native plants
- Support local, sustainable agriculture and forestry



Recommendations

At the national level

- Reduce greenhouse gas emissions
- Funding for land protection and management
- Strengthen laws for wetlands and other sensitive habitats
- Eliminate loopholes in rare species laws



Acknowledgments

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NEPCoP Task Force Members
Plant Conservation Volunteers
Members of New England Wild Flower Society



NEW ENGLAND
WILD
FLOWER
SOCIETY



*Conserving and promoting the region's native plants
to ensure healthy, biologically diverse landscapes*

www.newenglandwild.org