Invasive Plants of Midcoast Maine

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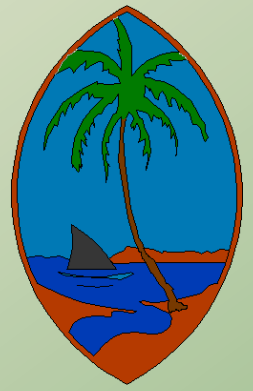
History of plant invasions

- Humans have always moved plants around
- Exponential increase in rate
- Plant introductions to Hawai`i
  - Polynesians: ~18 plants
  - 100 years after European contact: ~175 plants
  - 200+ years since European contact: >869 plants



Rate 1 million times greater than pre-human settlement

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Unintentional

Hemlock wooly adelgid

Japanese stiltgrass

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Intentional:
Hedgerows and wildlife habitat

Multiflora rose (*Rosa multiflora*)

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Aesthetics

85% of 235 invasive shrubs introduced as ornamentals

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Native, Weed, or Invasive?

- **Native plant**
  - Has developed over hundreds or thousands of years in a particular geographic region or ecosystem

- **Non-native plant**
  - Introduced by human action beyond native range

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Native, Weed, or Invasive?

- **Weed**
  - "Plant out of place"
  - Native or non-native
  - Threat to agricultural or natural systems

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Native, Weed, or Invasive?

- **Naturalized**
  - Non-native; established outside of cultivation
  - Usually found in human-dominated landscapes

- **Invasive**
  - Non-native
  - Established in natural or minimally managed plant communities
  - Harmful ecological and/or economic effects

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Characteristics of invasive plants

- **Reproduction**
  - Flower and fruit early in life cycle
  - Many seeds / effective long distance dispersal
  - Soil seed bank
  - Vegetative reproduction
  - Unpalatable

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Characteristics of invasive plants

- **Competitive edge**
  - **Phenology**
    Annual timing of flowering, fruiting, leaf-out/leaf-drop
  - **Physiology**
    shade tolerance
    nutrient use
    photosynthetic efficiency
  - **Enemy release hypothesis**

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Effects of non-native invasive plants

- Reduce native plant and animal biodiversity
  - Crowd/shade native plants
  - Hybridize
  - Alter habitat
  - Compete for pollinators
  - Extinction???
- Alter ecosystem properties
  - Hydrology
  - Soil physical and chemical properties
- Aesthetic or Cultural
- Economic
  - $137 billion annually in US (Pimental et al, 2000)

Kudzu

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Purple loosestrife

Lythrum salicaria

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Purple loosestrife control

- **Small populations**
  - Remove flower heads and destroy to prevent new populations from seed
  - Cover and smother
- **Manage water levels**
- **Biological**
  - Galerucella pusilla/G. calmariensis
  - Hylobius transversovittatus
- **Chemical**

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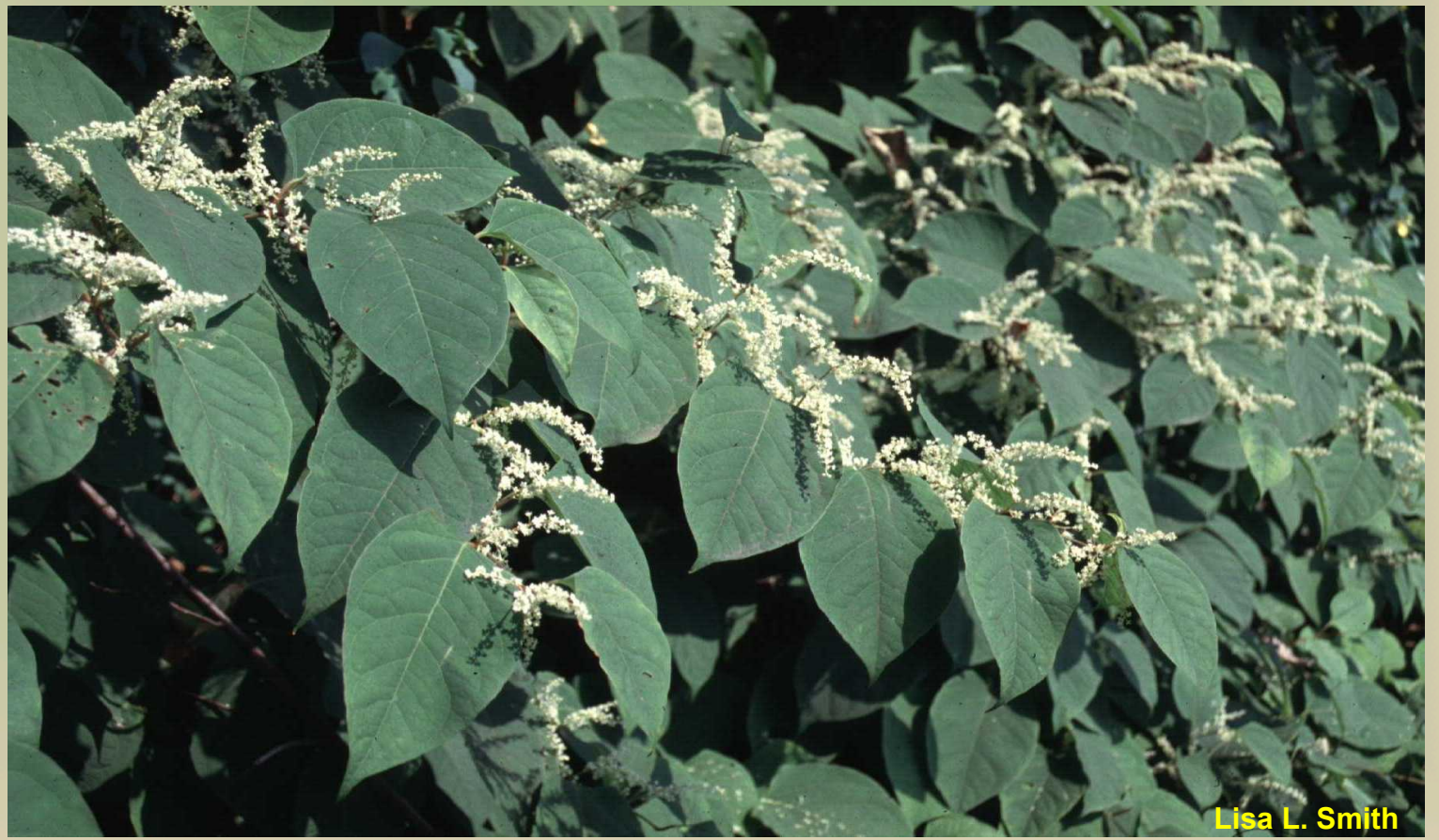
Japanese knotweed

Fallopia japonica



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Japanese barberry

Berberis thunbergii

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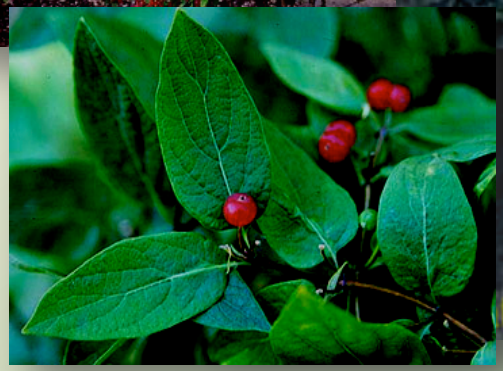
Shrub honeysuckles

Lonicera morrowii, L. tatarica, L. x. bella, L. maackii



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Winged burning bush

Euonymus alatus

Ovens Mouth Preserve Boothbay, Maine

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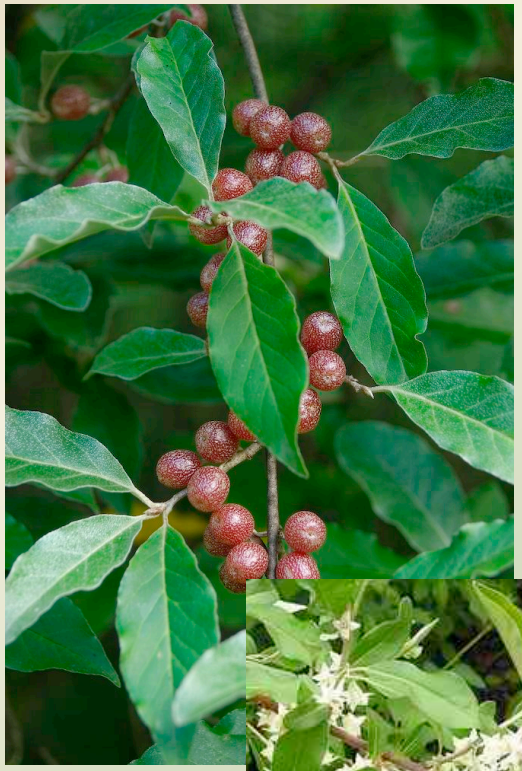
Autumn olive

Eleagnus umbellata



Buckthorn

Rhamnus spp.

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Oriental bittersweet

Celastrus orbiculatus

Daniel Barringer/Natural Lands Trust

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Multiflora rose

Rosa multiflora

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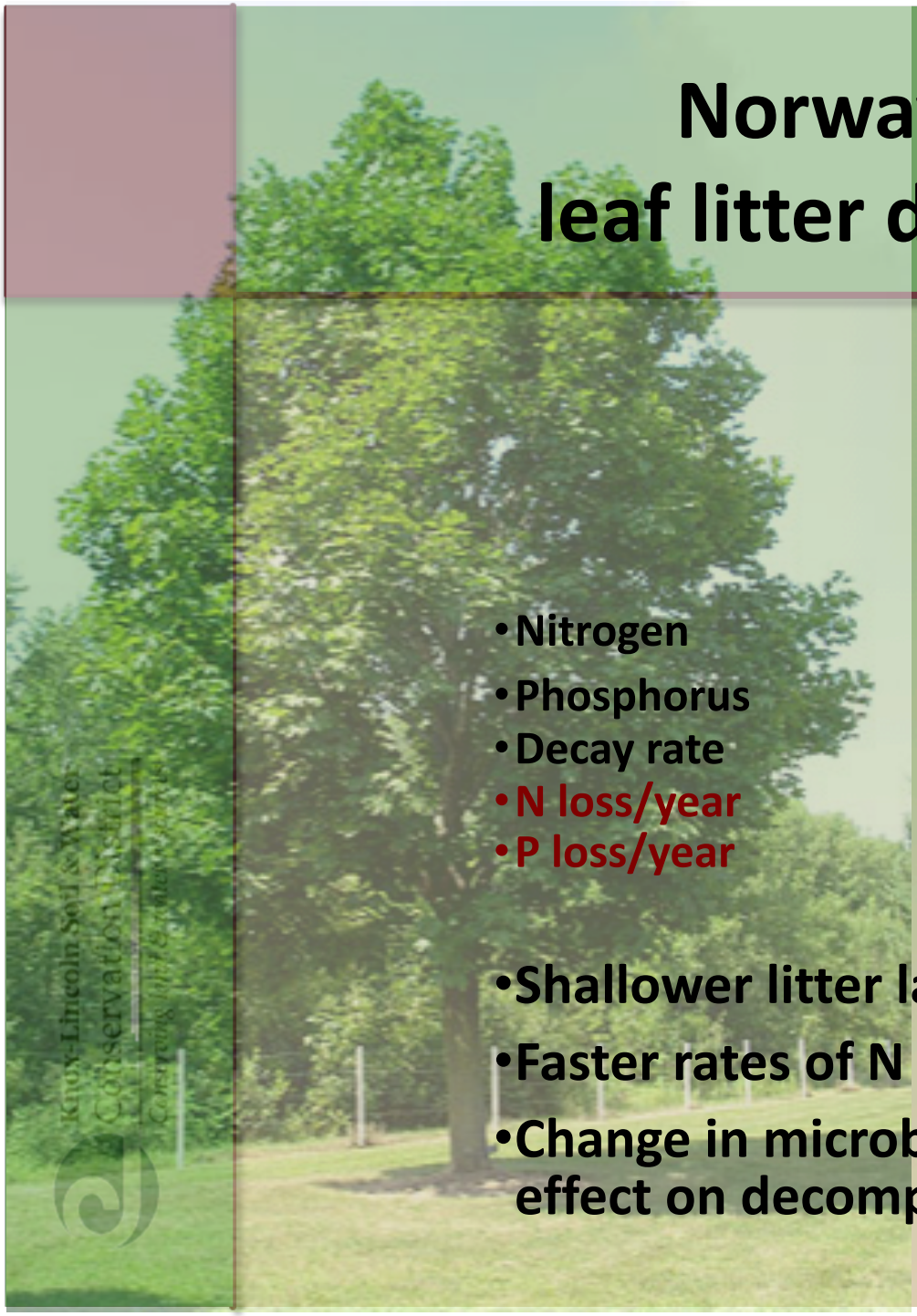
Norway maple & leaf litter decomposition



	Norway maple ↑	Sugar maple ↓
• Nitrogen	1.2%	0.8%
• Phosphorus	0.071%	0.043%
• Decay rate	0.43%/day	0.28%/day
• N loss/year	56%	24%
• P loss/year	42%	18%

- Shallower litter layer
- Faster rates of N & P return to soil
- Change in microbial growth dynamics → effect on decomposer food web

(Carreiro et al 2000)

Native phytophagous insects and Norway maple

- Food preferences of native insects for >24 plants/trees

Species	*Leaf area consumed*
Black oak	239 cm^2
Norway maple	12 cm^2

- Effect on insect/bird food supply

(Tallamy 2001)

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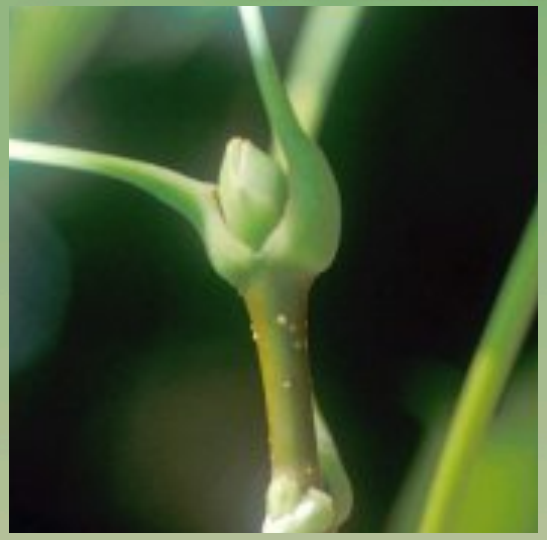
Sugar maple

Norway maple



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Sugar maple

Norway maple

Sugar maple

Norway maple

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Rugosa rose

Rosa rugosa

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Himalayan balsam

Impatiens glandulifera

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Himalayan balsam

Impatiens glandulifera

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Common reed

Phragmites australis

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“Now what?”

There's more than one way…

- Manual removal
- Carbohydrate starvation
- Herbicide

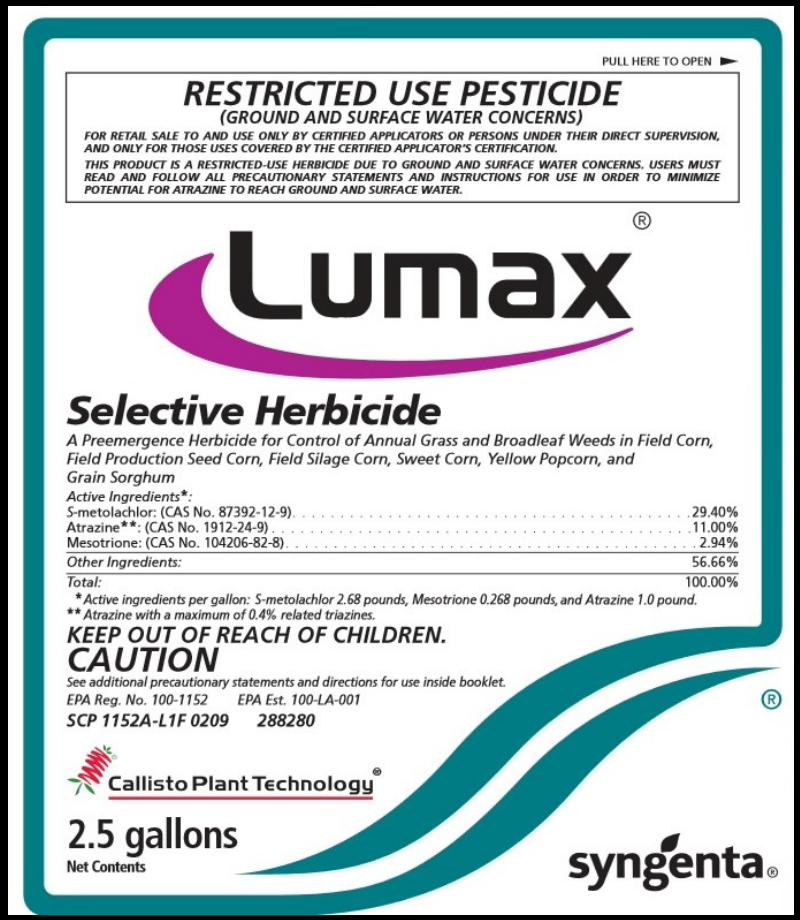
MUSTANG
MTL25

Safety first!

- Long sleeves
- Long pants
- Close toed-shoes
- Nitrile gloves
- Eye protection (for certain herbicides)
- Follow re-entry interval
- Wash hands before eating/drinking

READ THE (fact-filled) LABEL.

- Is the product labeled for the use you intend for it?
- What PPE is required?
- What is the re-entry interval?
- What is the rate per acreage?



PULL HERE TO OPEN

RESTRICTED USE PESTICIDE
(GROUND AND SURFACE WATER CONCERNS)

FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

THIS PRODUCT IS A RESTRICTED-USE HERBICIDE DUE TO GROUND AND SURFACE WATER CONCERNS. USERS MUST READ AND FOLLOW ALL PRECAUTIONARY STATEMENTS AND INSTRUCTIONS FOR USE IN ORDER TO MINIMIZE POTENTIAL FOR ATRAZINE TO REACH GROUND AND SURFACE WATER.

Lumax®

Selective Herbicide

A Preemergence Herbicide for Control of Annual Grass and Broadleaf Weeds in Field Corn, Field Production Seed Corn, Field Silage Corn, Sweet Corn, Yellow Popcorn, and Grain Sorghum

Active Ingredients*:	
S-metolachlor: (CAS No. 87392-12-9)	29.40%
Atrazine**: (CAS No. 1912-24-9)	11.00%
Mesotrione: (CAS No. 104206-82-8)	2.94%
Other Ingredients:	56.66%
Total:	100.00%

* Active ingredients per gallon: S-metolachlor 2.68 pounds, Mesotrione 0.268 pounds, and Atrazine 1.0 pound.
** Atrazine with a maximum of 0.4% related triazines.

KEEP OUT OF REACH OF CHILDREN.
CAUTION
See additional precautionary statements and directions for use inside booklet.
EPA Reg. No. 100-1152 EPA Est. 100-LA-001
SCP 1152A-L1F 0209 288280

Callisto Plant Technology®

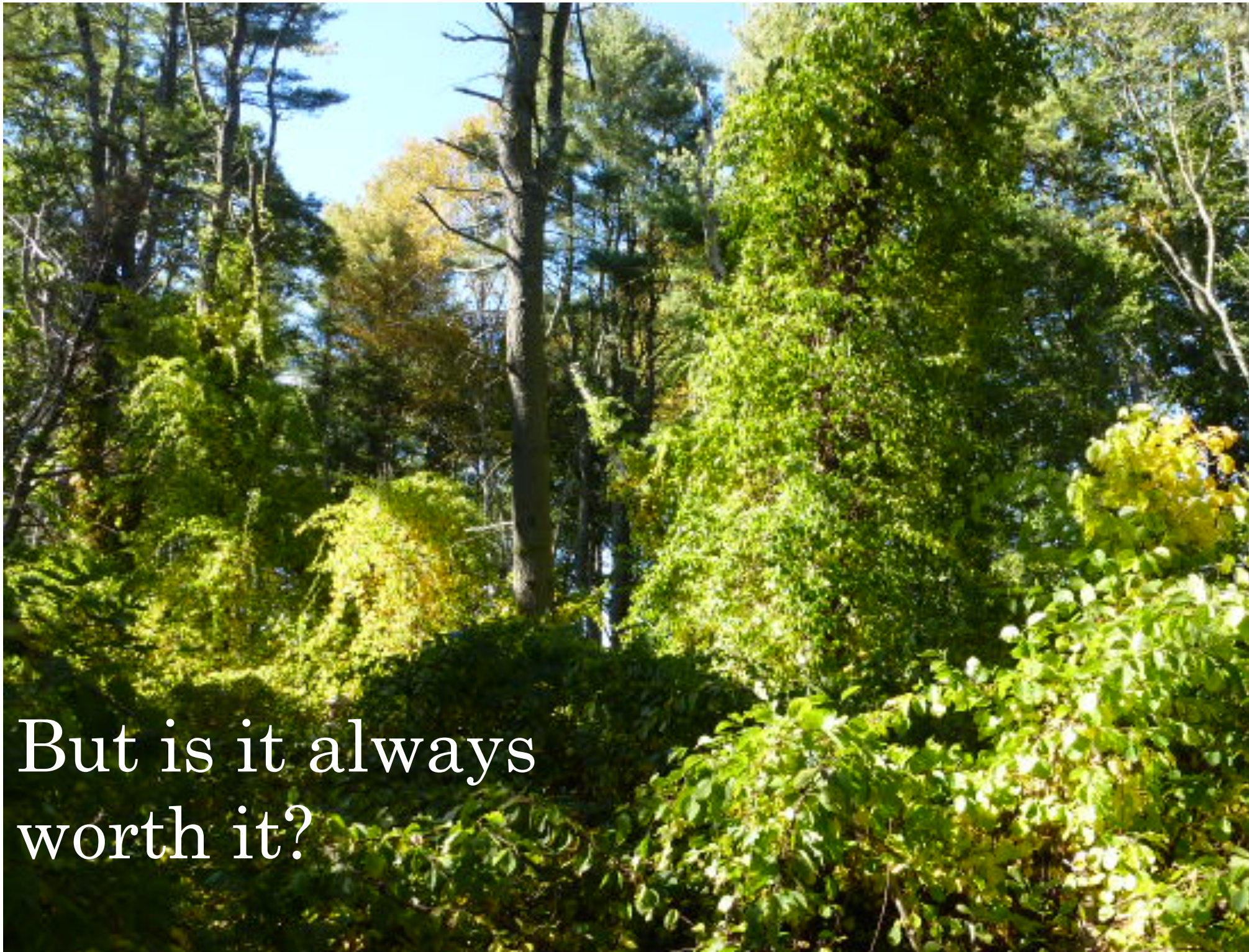
2.5 gallons
Net Contents

syngenta®

Who needs a commercial license?

- Anyone who applies <u>any</u> pesticide…
  - For any type of compensation
  - In areas open to the public, such as town parks
  - As a government employee
  - For application of restricted or limited use pesticides for other than agricultural purposes (e.g., termite control)

Invasive plant management is a long term, multi-year commitment.


But is it always
worth it?

Questions to ask before you begin:

What are your goals?

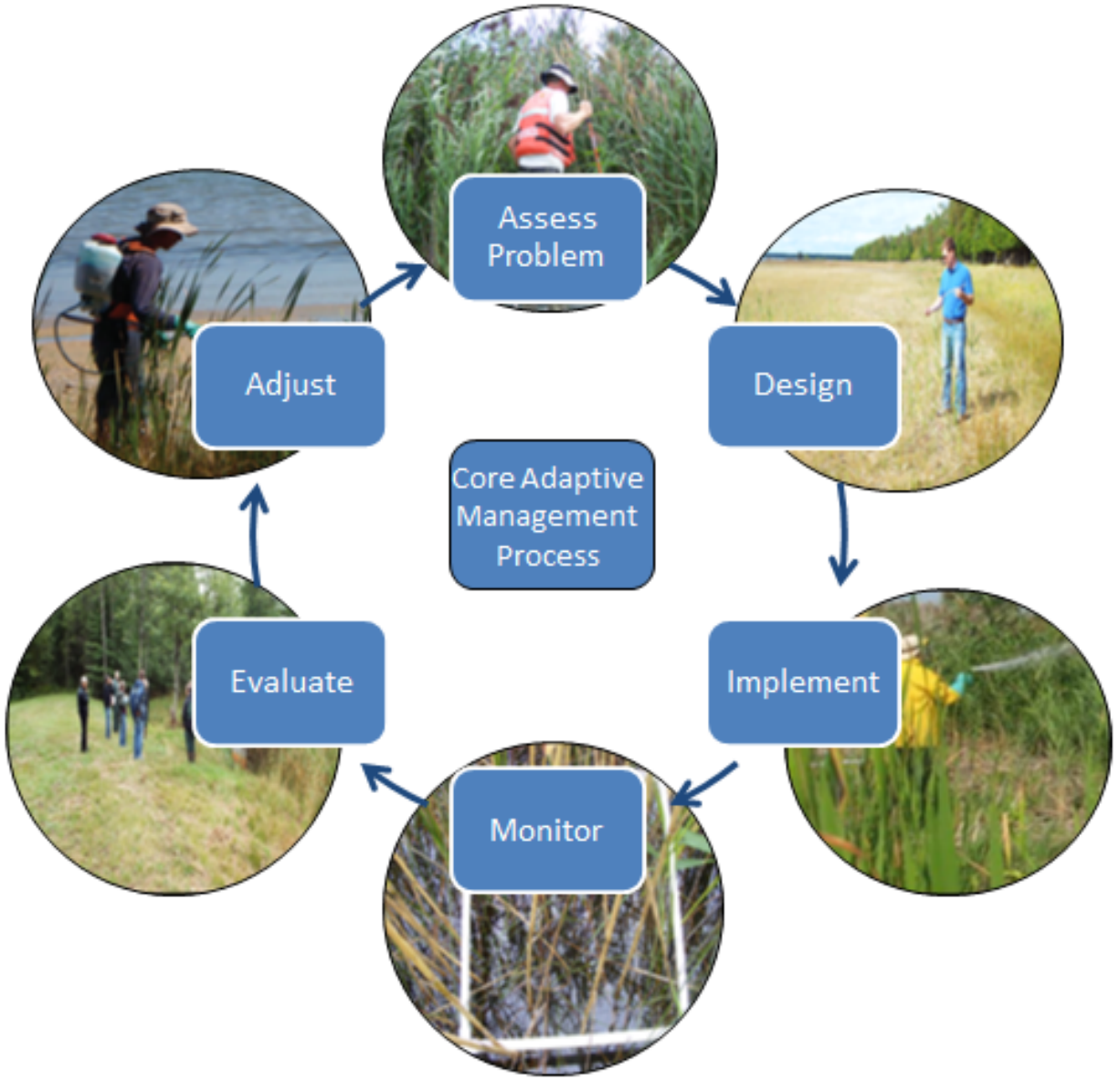
Eradication vs. control/management

What are your priorities?

What are your resources?

- Time
- Equipment
- Labor
- Money

Do you need to revegetate?



(Lousy low-res graphic shamelessly stolen from Great Lakes Phragmites Collaborative)

Native alternatives to invasive plants

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Native Plants = Native Wildlife Birds

- *Juniperus virginiana,* Eastern red cedar
  - *Attracts up to 80 species of birds*
- *Vaccinium corymbosum,* High bush blueberry
  - *Attracts 30 species of birds*

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Place-based Plants
Shorefronts and Wetlands

- Blue flag iris
- Red-osier dogwood
- Carolina rose
- Low- or highbush blueberries
- River birch
- Red maple

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Place-based Plants
Woodlands

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Place-based Plants
Woodlands

- Snowberry
- Doghobble
- Columbine
- Woodland phlox
- Dogwood
  - Pagoda or Alternate Leaf
  - Bunchberry

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Place-based Plants
Meadows

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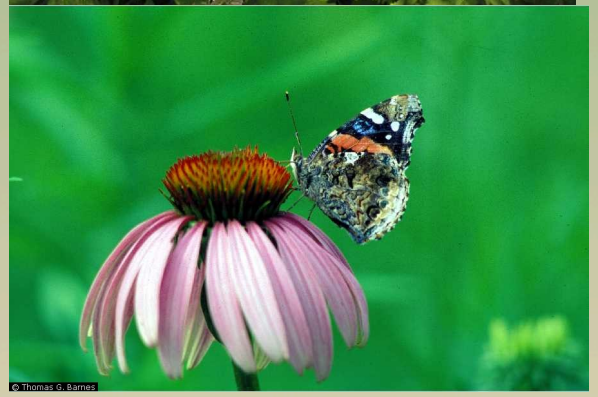
Place-based Plants
Meadows

- *Asclepias tuberosa,* Butterfly weed
- *Comptonia peregrina,* Sweet fern
- *Gailardia aristata,* Blanket flower
- *Echinacea* species
- *Filipendula rubra venusta,*
  Queen of the Prairie
- *Panicum virgatum,* Switchgrass
- *Rudbeckia species,* Black-eyed susans



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Place-based Plants
Seaside or Brackish River Banks

- Buttonbush
- Red-osier dogwood
- Rosa carolina

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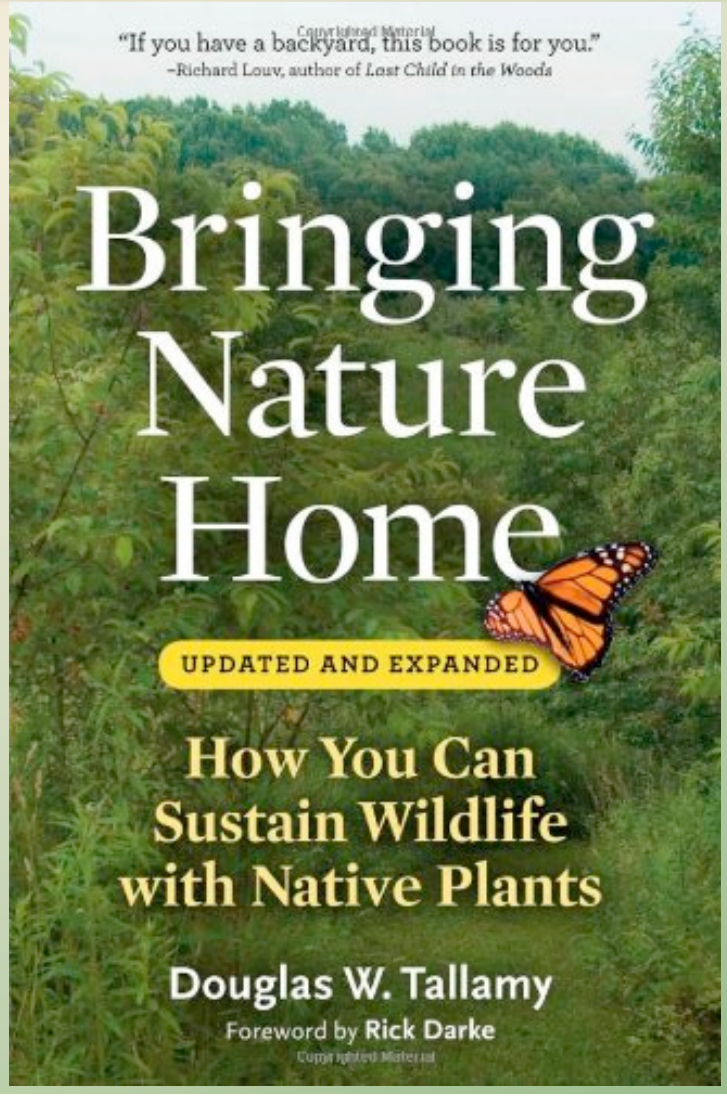
Public Presentation with Doug Tallamy
July 5, 2018 7pm
Rockport Opera House; $10 admission