Preserving Biodiversity using local ecotypes in Maryland

Propagating Local Ecotype Native Species (LENS) from local native seed

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Maryland Experiences with Local Ecotype Native Species (LENS)

1. Is preserving local biodiversity a lost cause?
2. Mixing it up!
   Are we loosing the LENS?
3. Finding, storing, germinating and propagating MDs LENS
4. A Maryland LENS growers’ perspective
Where have all the flowers gone?
from Maryland
Long time ..... passing
Why Maryland perennials are declining?

- Farms, fairways, freeways
- Built environments
- Introduced species
- Fire prevention
- Weed and animal control, or not
Native species refugia

- Powerline corridors
- Forest/meadows in State Parks
- Natural preserves: barrens, dunes and tidal swamps
- Roadsides and byways
- Graveyards and gardens

Mostly refugia are managed, mowed and manipulated
When will they ever learn?
Preserving the “hard to find” MD perennials

- ~80% of MD native biodiversity need meadows, the remainder are in the forests – the meadows are almost gone – so are the meadow species

- RIP 21 species of MD Butterflies

- Mixing it up with seed; dilution; recognizing what we are doing!

Eutrochium fistulosum
For gardens east of the Rocky Mountains kits contain the following species:

- **MILKWEED HOST**
  - butterfly milkweed (*Asclepias tuberosa*)
  - common milkweed (*Asclepias syriaca*)
  - swamp milkweed (*Asclepias incarnata*)

- **GENERAL NECTAR PLANTS**
  - Indian blanket (*Gaillardia pulchella*)
  - purple coneflower (*Echinacea purpurea*)
  - joepyeweed (*Eupatorium purpureum*)
  - scarlet sage (*Salvia coccinea*)
  - Mexican sunflower (*Tithonia rotundifolia*)
  - zinnia, dahlia mix (*Zinnia elegans*)
Example: Monarch Way Station’s Seed Kits

For gardens east of the Rocky Mountains kits contain the following species:

- **MILKWEED HOST** (Maryland/CBW provenance unlikely)
  - butterfly milkweed (*Asclepias tuberosa*)
  - common milkweed (*Asclepias syriaca*)
  - swamp milkweed (*Asclepias incarnata*)

- **GENERAL NECTAR PLANTS** (not native in MD)
  - Indian blanket (*Gaillardia pulchella*)
  - purple coneflower (*Echinacea purpurea*)
  - joepyeweed (*Eupatorium purpureum*)
  - scarlet sage (*Salvia coccinea*)
  - Mexican sunflower (*Tithonia rotundifolia*)
  - zinnia, dahlia mix (*Zinnia elegans*)
Seed kits and other seeds supplies for wildflowers

Most native seed comes from several large commercial suppliers (Burpee, Ernst, others)

2 million of these NRCS packets go nationwide

1000s of these Florida tropical milkweed packets go nationwide! MDs next invasive species

Please save & plant these Butterfly Garden seeds. They include Milkweed which is the only food source for Monarch Caterpillars and a mixture of the best nectarine plants for all butterflies.
Seed kits and other seeds supplies for wildflowers

Most native seed comes from several large commercial suppliers (Burpee, Ernst, others)

× Not MD native

What about widespread native species?
Can local ecotypes be recognized?

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1000s of these Florida tropical milkweed packets go nationwide!
MDs next invasive species
Can local ecotypes be recognized?

Example: LENS diversity in the thicket bean *Phaseolus polystachios* assessed from 120 AFLPs

Kisha & Egan, *in Prep.*
Most landscapes have been modified or are secondary regrowth

Most species require considerable researching and searching

Historical personal knowledge is largely lost
  - Use of herbarium records
  - Little use yet of searching for remnant habitats from aerial photography

Experiences with declining species

Easy: Matrix species are mostly still common

Tricky: Many MD species are thought to be more common than they really are

Difficult: Most MD species that are S3 have fewer viable sites remaining than anticipated
Seed sorting
- Handling: let dry or not
  - seed lacking endosperm
  - seed with much endosperm
- Cold long-term storage 4C (40F)

Some species are easier to propagate by: bulbs, corms, rhizomes, cuttings

Experiences with declining species
Easy: natural cycle; viability upward of 5 years
Tricky: few species do not like dry cold; endospermic ephemeral seed short-lived
Phacelia, Hydrophyllum
Difficult: Sarracenia, Aralia, Panax
Germinating perennial seed

Imitating nature’s way:
- Stratification warm, cold, alternating
- Immediate sow endospermic seed
- Scarification legumes
- Simulated burning, smoke infusion?
- Surface or covered sow

Experiences with declining species
Easy: most are surprisingly easy - *Liatris*, *Coreopsis*, *Asclepias*, *Lupinus*, *Sabatia*, *Lobelia purberula*, *Chrysopsis*
Tricky: some *Helianthus* spp., *Hypoxis*
Difficult: *Sarracenia*, *Gentiana*
Once past seedling stages problems

- Micro-nutrients, soil biota deficiencies
- Moisture and drainage
- Propagation in specialized beds
- Mites, aphids, larvae

Experiences with declining species

Easy: not many e.g. Scrophularia, Sedum

Tricky: Asclepias spp., Liatris, Coreopsis, Ionactis, Chelone

Difficult: particularly deep sand and ultramafic species Lupinus, Sabatia, Gentiana
Experience: Growers of LENS from seed

Labor intensive and limited production requires volunteers to make the plants

- **Commercial for-profit businesses** - not viable unless supplemented by large restoration projects; need several years ramp-up time for large quantities

- **County-supported programs using volunteers** – needs Directors to value of local native biodiversity over introductions from easily accessible distant seed sources

- **Nonprofit organizations using volunteers** – tend to be smaller operations with volunteer-hours limiting production
Chesapeake Natives, Inc.
501(c)(3) nonprofit since 2006

at Pope Farm MPP Native Plant Nursery, Gaithersburg since 2012
at Mt. Airy Mansion Greenhouse, Rosaryville State Park since 2013

provide local ecotype species for CBW
• Gather and store seed
• Stratify and germinate seed
• Dibbling to plugs
• Grow on to quarts and gallons
• 200 spp. c.50,000q, c.5000g in 2017

Provenance 100% from CBW, 90% from the Patuxent and lower Potomac
Montgomery, Anne Arundel and Prince George’s Counties

Projected annual CNI increase ~20 spp.
requires considerable research and search for reliable ecotype material
LENS growers in Maryland

- Chesapeake Natives, Inc. (c.200 perennial species)
  - 100% strictly from within CBW
- Pope Farm, Montgomery County Parks (c.150 perennial LENS)
  - All species other than ferns and woody plants
- Herring Run – Blue Water Baltimore
  - Mostly MD, also wider mid-Atlantic
- Wicklein’s Water Gardens (few spp.)
  - Mostly MD, also wider mid-Atlantic
- Environmental Concern (lowland perennials, MD eastern shore)
  - Mostly eastern shore, also wider mid-Atlantic
Conclusions

1. Is preserving local biodiversity a lost cause?
   Not entirely. Resilience, recognition and restoration

2. Mixing it up!
   Species from outside the local region ARE ‘alien’ introductions

3. Finding, storing, germinating, propagating LENS
   Without help by promoting, protecting and propagating, MDs declining perennial species are on the road to extirpation

4. A Maryland LENS growers’ perspective
   Commercial viability for species grown from seed is limited by the importance placed by the statewide marketplace
questions

The historic 1935 Lutton Solar V-Bar greenhouse at Mount Airy Mansion, Rosaryville State Park
The preceding presentation was delivered at the

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This and additional presentations available at  http://nativeseed.info