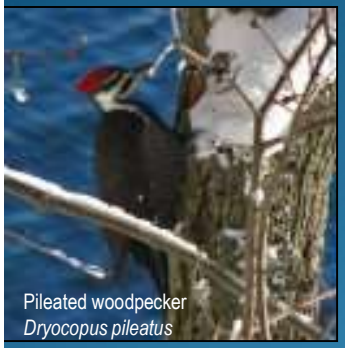
Native plant gardening: tips and resources to help you garden for clean water, wildlife habitat, and beyond

Wisconsin Waters 2020

- April 2nd, 2020



Pileated woodpecker
Dryocopus pileatus

Arctic skipper
Carterocephalus palaemon

Eastern bluebirds
Sialia sialis

Black swallowtail
Papilio polyxenes

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WE SPEAK FOR LAKES!

WISCONSIN DEPT. OF NATURAL RESOURCES

College of Natural Resources

The Wisconsin Lakes Partnership

The Wisconsin Lakes Partnership

- Serves as a national model of conservation partnerships
- Brings the state's resources to lake communities.

- Google UWEX lakes
  - http://www.uwsp.edu./cnr/uwexlakes/
  - http://www.wisconsinlakes.org/
  - http://www.dnr.state.wi.us/
- Lake Tides…

The Lake CONNECTION

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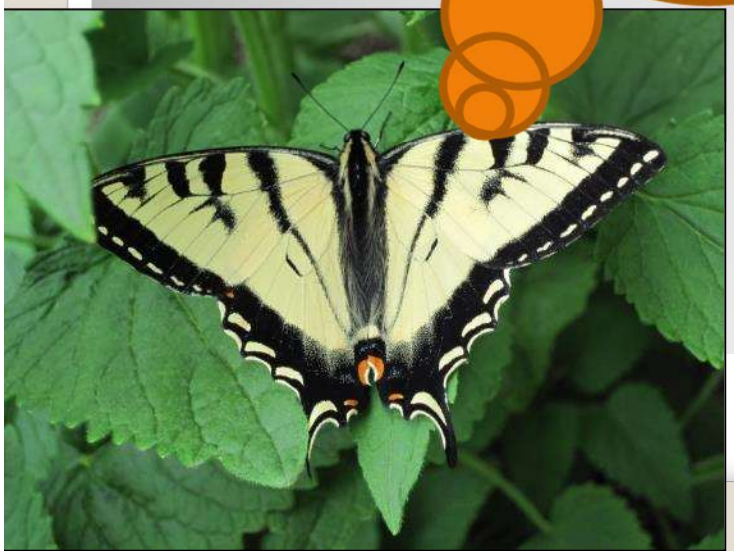
Talk outline

Present tips & resources to help you utilize native plant gardens:

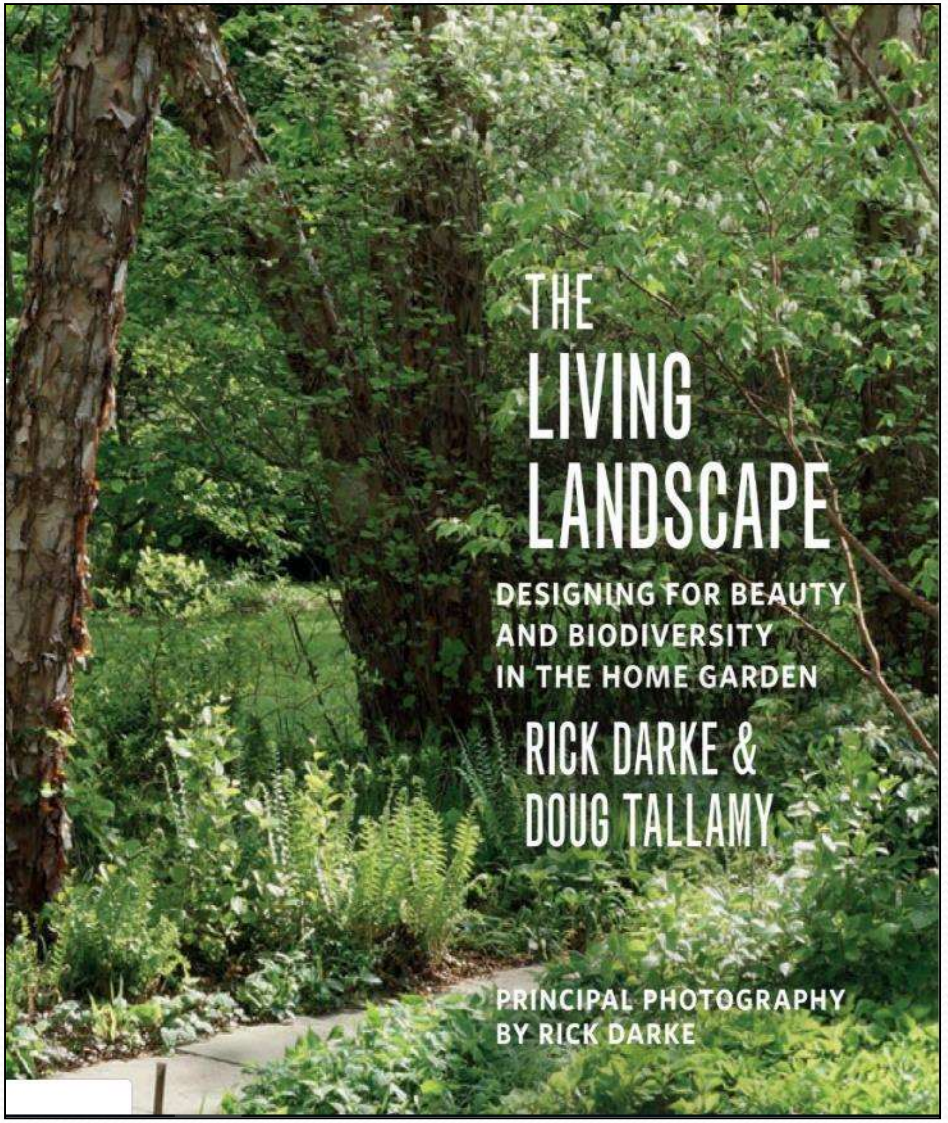
- Define what is a native plant
- Share the gifts native plant gardens offer us
- Give information on why we should use native plants & how to get started with using them
- Provide ideas for planning & designing your native plant garden
- Relay strategies for supporting pollinators through native plant beds
- Field guides & texts for identifying Wisconsin's native flora
- Present maintenance of native plant garden ideas
- Distribute natural plant community restoration tips
- Offer leads on folks writing about a new & growing native plant gardening movement
- Question and answer session

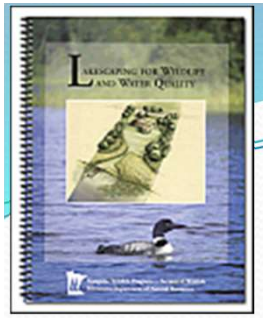


What is a native plant?

Doug Tallamy and Rick Darke define a native plant in their book *"The Living Landscape: Designing for Beauty and Biodiversity in the Home Garden"* as:

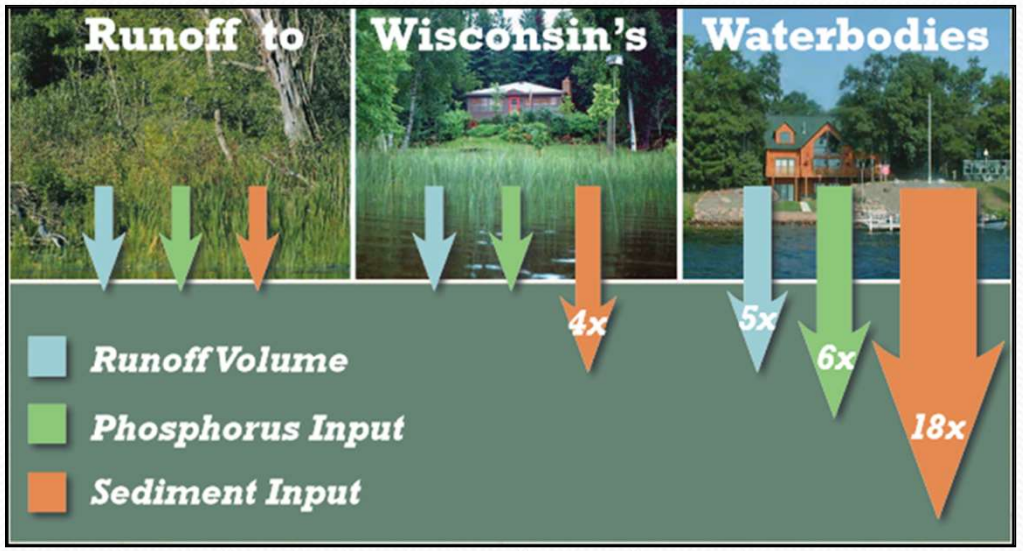
- "a plant or animal that has evolved in a given place over a period of time sufficient to develop complex and essential relationships with the physical environment and other organisms in a given ecological community."





The gifts native plant gardens offer us – stormwater control for clean water

- Infiltration
- Slows water down
- Natural vegetation absorbs, spreads out, and slows down water flow over land

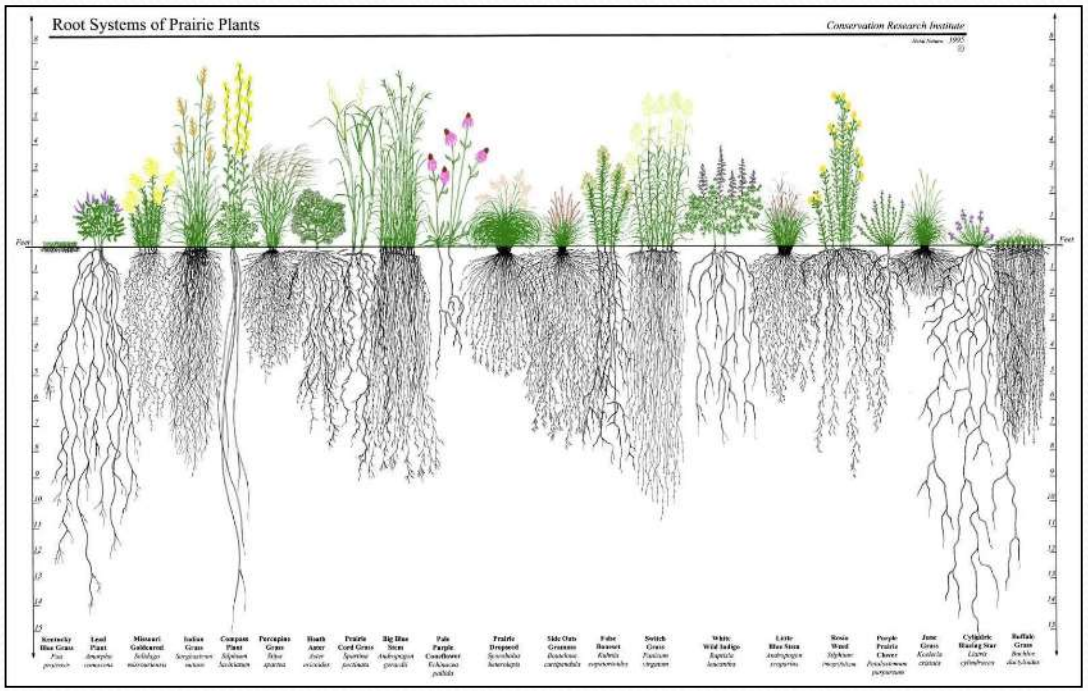


The gifts native plant gardens offer us –
Natural screening and added privacy, goose deterrence

- A low growing native shrub growing at the land / water interface can deter geese traffic

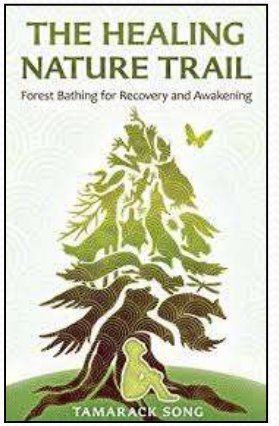
The gifts native plant gardens offer us –
Enriches soil to a healthier state

- Fungi and native plant relationships
- Infiltration through root die off
- Penetrating root structures (aka clay busters)



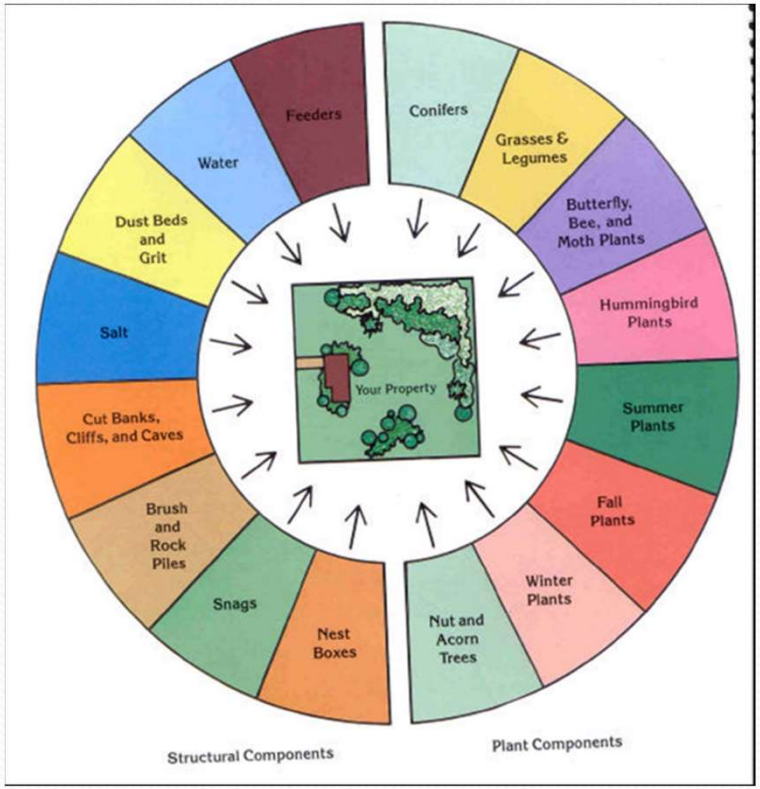
The gifts native plant gardens offer us – Meditation and relaxation benefits

- Place for getting to peace of mind
- Relaxing / hammock time
- Place for reflection / meditation spots
- Forest bathing for recovery and awakening
- Measure heartbeat study b/a



The gifts native plant gardens offer us – Wildlife value

- Food web support
- Nesting habitat for young of the year
- Protective cover from predators



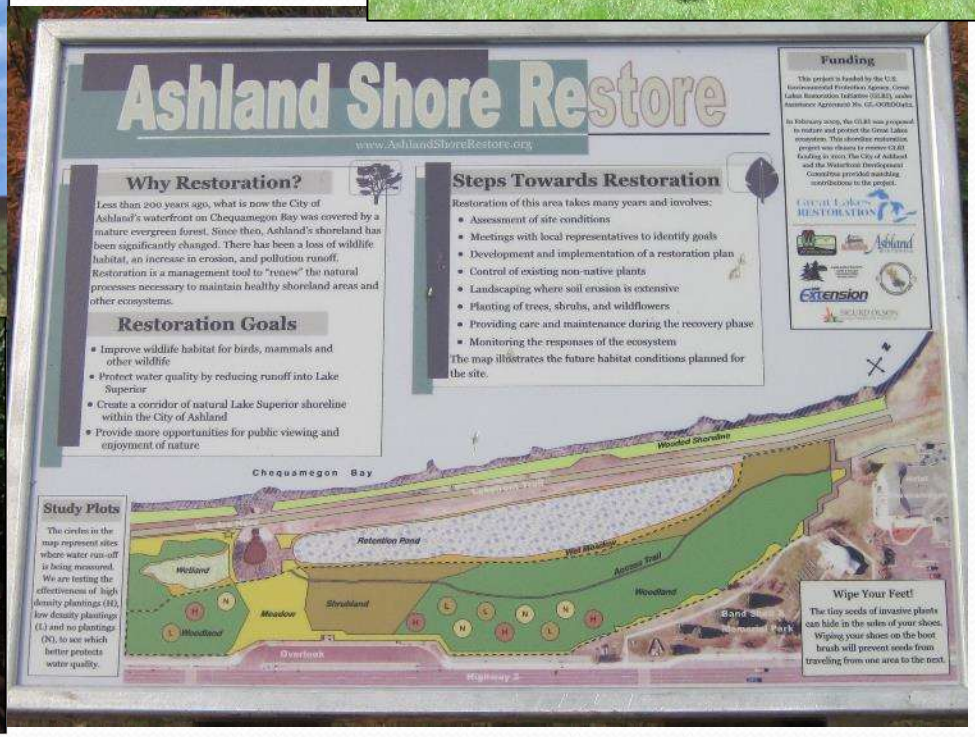
The gifts native plant gardens offer us –
Natural beauty

- Aesthetic beauty
- A place for wonder
- Decorative value
- Seasonal interest
- Focal points

The gifts native plant gardens offer us –

Outdoor classroom

- Exploration for youth
- Study of phenology



The gifts native plant gardens offer us –
Express yourself

- A vehicle for artful expression and creative energy release
- Painting on a landscape scale if you will

The gifts native plant gardens offer us – Food for us

- Sustenance
- Cultural identity (i.e., maple syrup; blueberry picking)

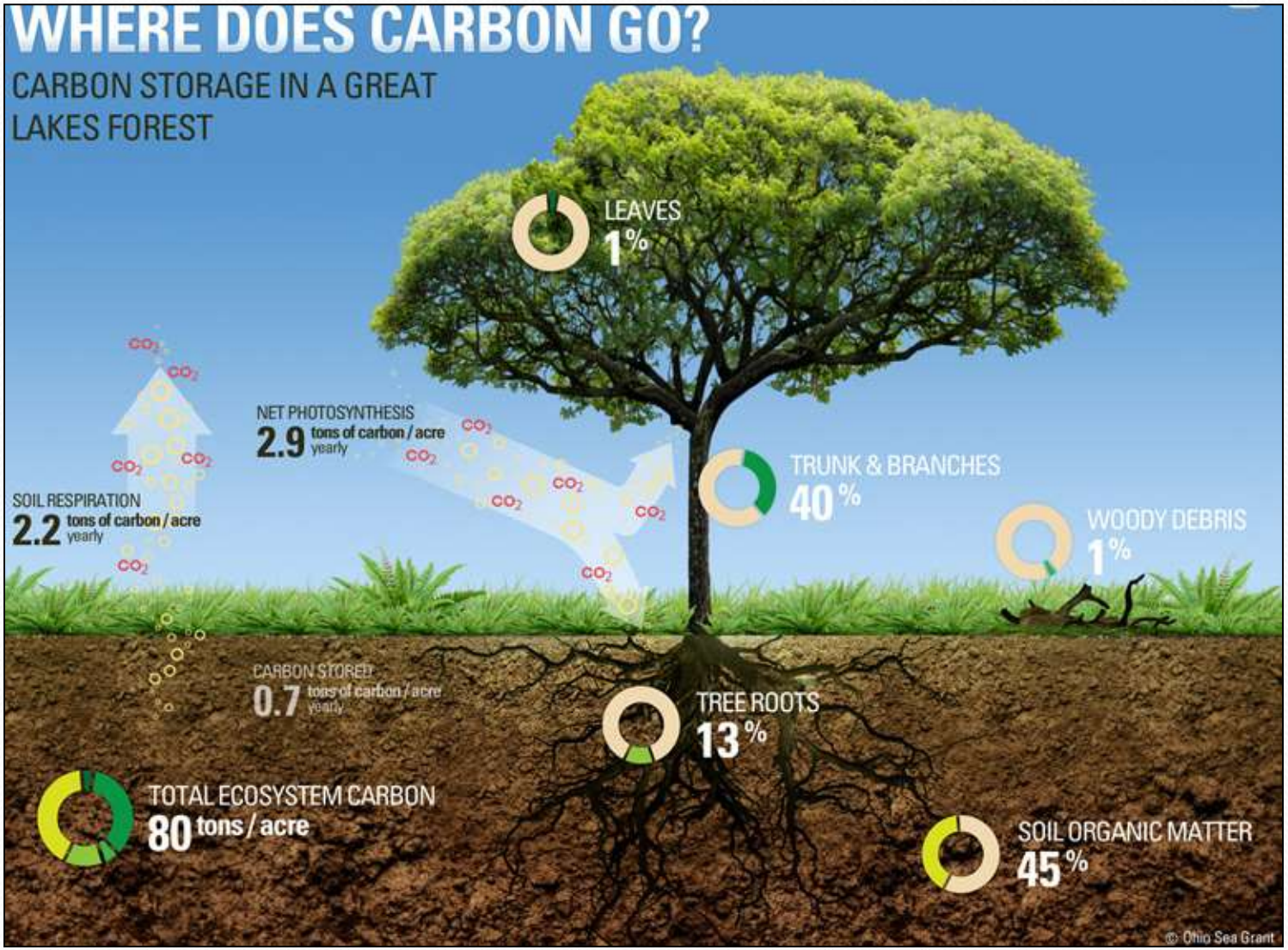
The gifts native plant gardens offer us –
Support for pollinators

- Host plants
- Nectar plants
- Nesting habitat
- More to come

POLLINATOR PARTNERSHIP
Protect their lives. Preserve ours.

The gifts native plant gardens offer us –
Carbon storage / sequestration

- Carbon storage

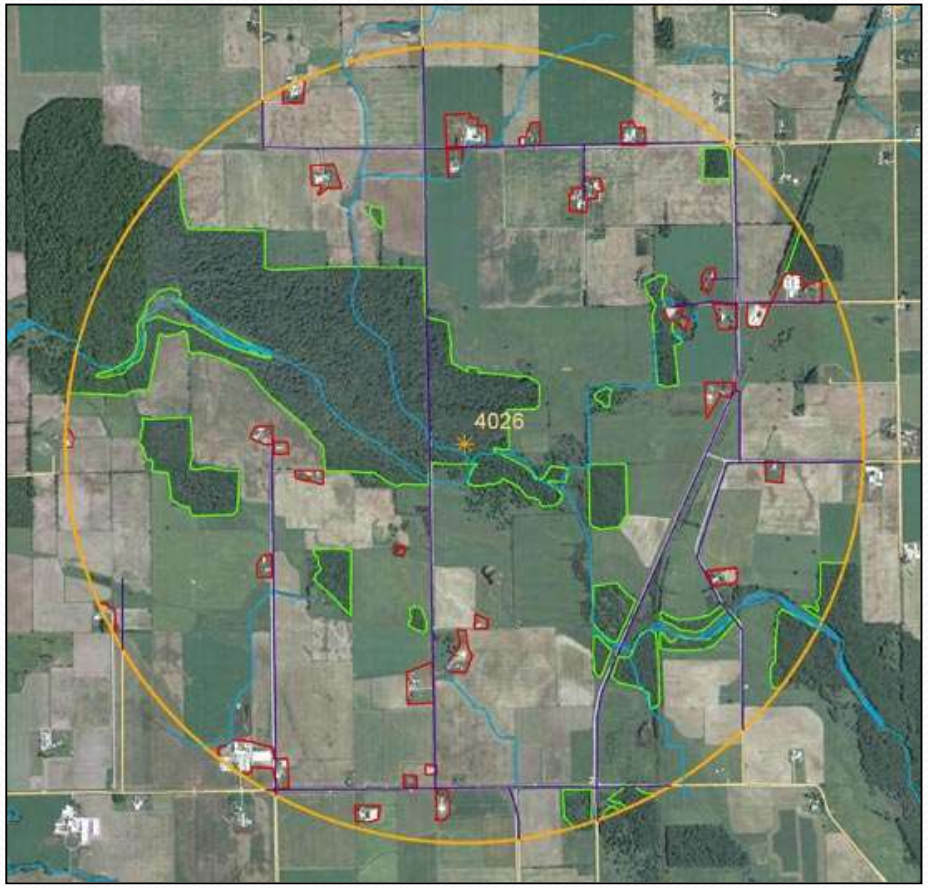


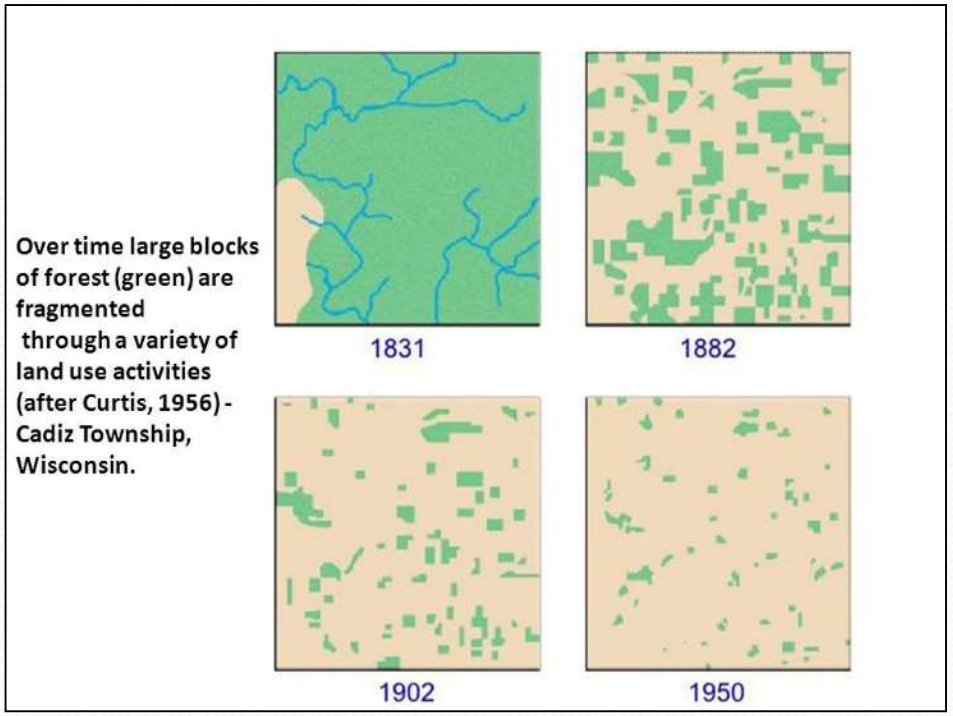
The gifts native plant gardens offer us – Medicine

- Before there was CVS and Walgreens there were native plants
- Get to know your local ethnobotanists / plant geeks

Why should you explore native plant gardening? – To counter habitat loss & the effects of a fragmented landscape

- Habitat fragmentation is reducing the abundance and diversity of native plants in Wisconsin forests, especially in the south





Why should you explore native plant gardening? – Restoring insects [and pollinators], the little things that run the world

The perfect pollinator garden – considerations:

- ✓ Parade of bloomers:
  - Spring: lupine; geraniums, dogwoods, cherries, Virginia bluebells, Jacob's ladder, willows, chokecherries, and bellwort;
  - Early summer: Baptisia, spiderwort, golden Alexanders, viburnums, penstemon, columbine, anemone, and elderberry;
  - Mid-summer: mountain mint, rose, wild quinine, swamp milkweed, butterflyweed, blazing stars, Culver's root, and coreopsis;
  - Late summer/early fall: lavender hyssop, compass plant, vervains, Joe Pye weed, wild Senna, blue sage, cardinal flower, and steeplebush;
  - Fall: asters, goldenrods; sunflowers; American burnet into Nov.

- ✓ Grow woody species: native trees, shrubs, and vines
  - Early season food sources before wildflowers emerge
  - Oak tree story
  - Conifers, nuts, berries

- ✓ Use grasses, sedges, and rushes-provides nesting material and protection
  - Make nesting habitat: leave hollow stemmed plants standing over winter; create brush piles (5 per acre)

- ✓ Water source
  - Keep shallow bird baths too deep); use marbles or stones for landing pads

- ✓ Caterpillar pupation sites under your trees-
  - More than 90% of the caterpillars that develop on plants do not pupate on their host plants; instead, they drop to the ground and do it in the duff or within chambers they form underground—replace the lawn under trees with well-planted native groundcovers

Our pollinators are in trouble?

- Worldwide there is disturbing evidence that pollinating animals have suffered from loss of habitat, chemical misuse, introduced and invasive plant and animal species, and diseases and parasites.

- Many pollinators are federally "listed species," meaning that there is evidence of their disappearance in natural areas.

- The U.S. has lost over 50% of its managed honeybee colonies over the past 10 years.

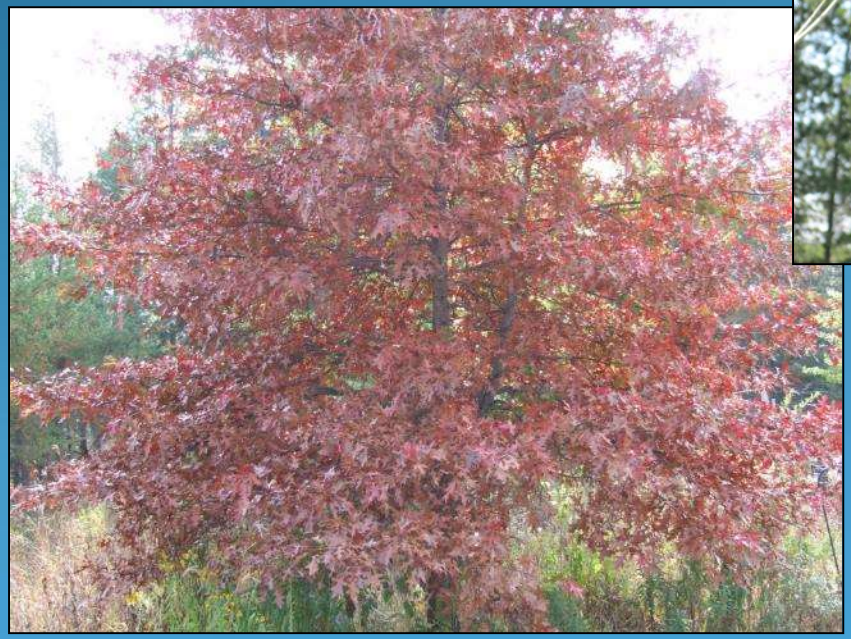
- 90 % decline seen in monarch population in recent years; California population > 99% gone

- A lack of research has hindered our knowledge about the status of pollinators. The E.U. has been so concerned that they have invested over $20 million investigating the status of pollinators in Europe.

Native plants and butterflies – example combos

- Oak trees support over 550 species of moths and butterflies
- Cherry trees support over 400+ species of moths and butterflies
- Blueberry bushes (*Vaccinium* sp.) support 294 species of moths and butterflies.

(Source: Tallamy 2012 handout)



What do butterflies, moths and skippers need?

Host plants: the specific food of a caterpillar

Nectar plants: plants with sugary fluid secreted by flowers—the principal food for adult butterflies

Common North Woods butterflies and their habitats

Bogs:

- Pink-edged sulphur
- Bronze copper
- Bog copper
- Dorcas copper
- Spring azure
- Silvery blue
- Aphrodite fritillary
- Atlantis fritillary
- Bog fritillary
- Silver-bordered fritillary
- Meadow fritillary
- Harris' checkerspot
- Baltimore checkerspot
- Common ringlet
- Jutta arctic
- Arctic skipper
- Dreamy duskywing
- Black dash

Deciduous forests:

- Canadian tiger swallowtail
- Mustard white
- Spring azure
- Aphrodite fritillary
- Atlantis fritillary
- Gray comma
- Compton tortoiseshell
- Northern pearly-eye
- Little wood-satyr
- Silver-spotted skipper
- Dreamy duskywing
- Sleepy duskywing
- Juvenal's duskywing

Swamps:

- Spring azure
- Eastern comma
- Gray comma
- Milbert's tortoiseshell
- Mourning cloak
- Viceroy
- Northern pearly-eye
- Eyed brown
- Arctic skipper
- Pepper & salt skipper

Oak woodlands:

- Pink-edged sulphur
- Edwards' hairstreak
- Banded hairstreak
- Aphrodite fritillary
- Baltimore checkerspot
- Sleepy duskywing
- Juvenal's duskywing
- Arctic skipper

Coniferous forests:

- White admiral
- Green comma
- Arctic skipper

Sandy areas:

- Silvery blue
- Silvery checkerspot
- Sleepy duskywing

Burned areas:

- Pink-edged sulphur (wherever blueberry plants are found.)
- Silvery blue
- Silvery checkerspot

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Bog examples –

Jutta arctic:

- Caterpillar plant(s): cotton grass, sedges, and rushes.
- Adult food(s): Labrador tea.

Spring azure:

- Caterpillar plant(s): dogwoods, cherries, viburnums, blueberries, staghorn sumac, red-berried elder, and meadowsweet.
- Adult food(s): wild plum and minerals on the ground..

Photo by: Robert W. Freckmann

Photo by: Merel R. Black

Photo by: Emmet J. Judziewicz

Photo by: Merel R. Black

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Deciduous forest examples –

Pepper and salt skipper:

- Caterpillar plant(s): grasses: Indian grass, *Poa* species.
- Adult food(s): blackberries, blueberries, honeysuckles, viburnum, Virginia waterleaf, self-heal, and spreading dogbane.

Compton tortoiseshell:

- Caterpillar plant(s): birch, willow, and aspen leaves.
- Adult food(s): tree sap (especially maples) and rotting fruit.

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Oak woodland examples –

Baltimore checkerspot:

- Caterpillar plant(s): turtlehead and beardstongue; willows and arrowheads.
- Adult food(s): shrubby cinquefoil, wild roses, viburnums, spreading dogbane, common milkweed, swamp milkweed, and black-eyed Susans.

Aphrodite fritillary:

- Caterpillar plant(s): violets.
- Adult food(s): common milkweed, blazing-stars, and thistles.

Photo by: Robert W. Freckmann

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Sandy area examples -


Sleepy duskywing
Erynnis brizo


Silvery checkerspot
Chlosyne nycteis

Sleepy duskywing:

- Caterpillar plant(s): willows and aspens.
- Adult food(s): blackberries, blueberries, cherries, wild strawberries, Labrador tea, New Jersey tea, bog laurel, hoary puccoon, lupines, spreading dogbane, and ox-eye daisy.

Silvery checkerspot:

- Caterpillar plant(s): asters, black-eyed Susans, and sunflowers.
- Adult food(s): common milkweed, staghorn sumac, spreading dogbane, and fleabanes.

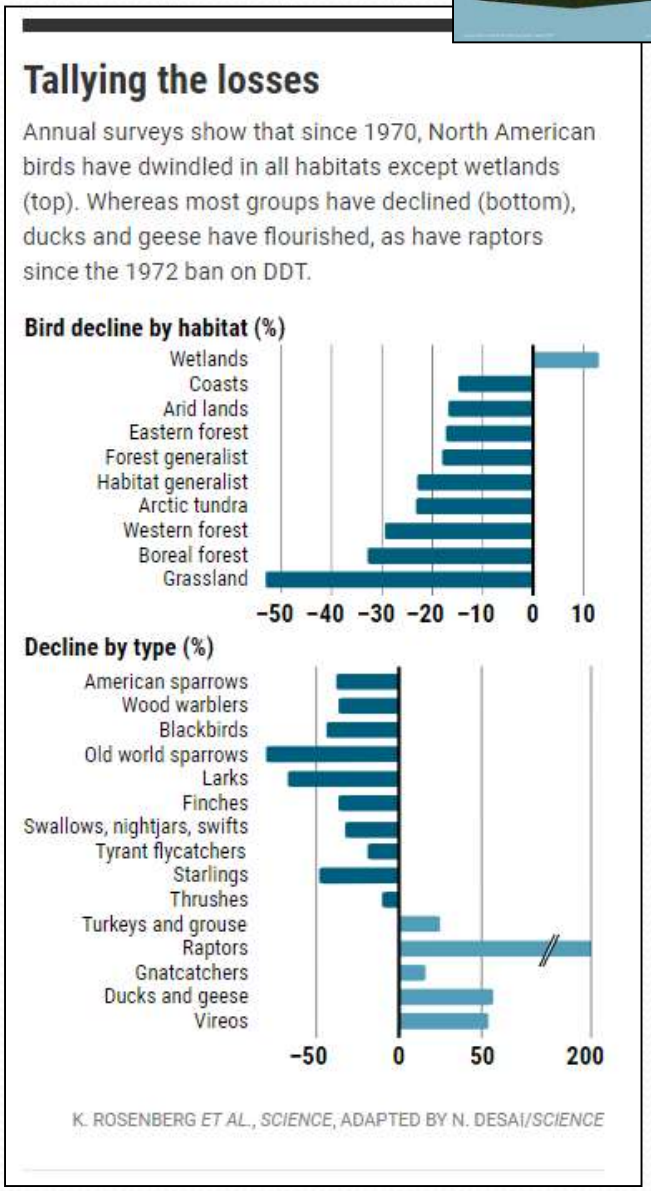
Different flower shapes and tongue lengths

- The inclusion of a variety of floral shapes attracts a more diverse array of pollinators.
- Some bees are generalists, flitting among flowers to drink nectar and collect pollen from many plant species.
- Flat or shallow blossoms, such as asters or coreopsis, attract a wide variety of bee species.
- But long-tongued pollinators (such as butterflies and bumble bees) are attracted to flowers that have tube-shaped nectaries, such as *Monarda* or *Liatris*

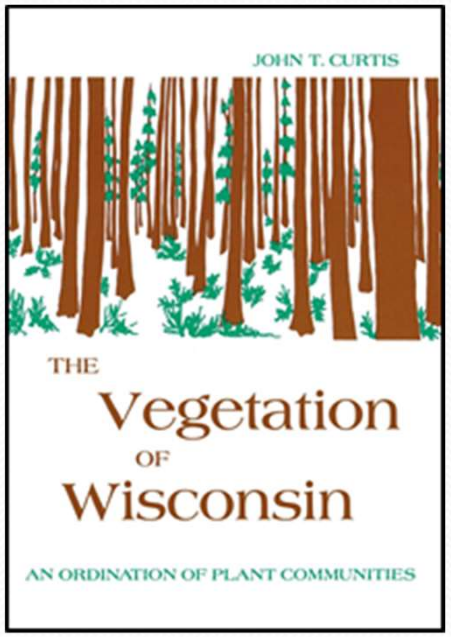
Why should you explore native plant gardening?

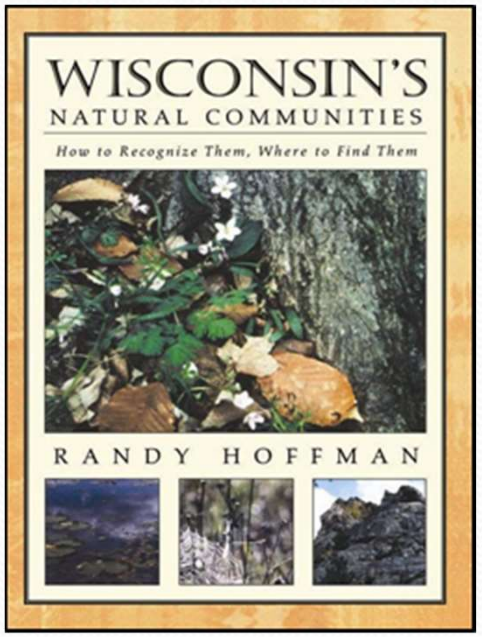
Decline of the North American birds – (Rosenberg et al. – Science > Oct. 2019: Vol. 366, Issue 6461, pp. 120-124.

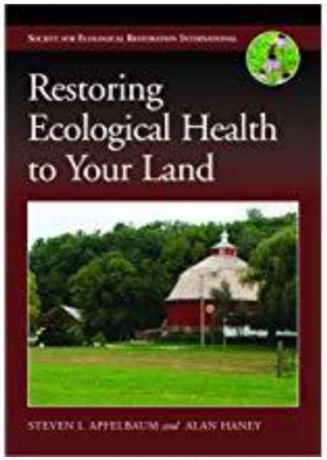
- Indications are of a net loss approaching 3 billion birds, or 29% of 1970 abundance



Using site assessment information to restore a natural community target –







Using site assessment information to restore a natural community target – northern dry forest (jack & red pine)

- Soil type -
  - Sandy, well drained
- Aspect -
  - Bed location specific – south facing
- Sun Exposure -
  - Shade / part shade & some sun
- Gradient -
  - Level area and 1:5 slope
- Mature canopy trees -
  - Red & jack pine dominated stand with scattered white pine, paper birch, quaking aspen, balsam fir, and white spruce
- "Microsite" assessments -
  - Variations in the landscape: seeps; boulder piles
  - Moist / cool pockets
- Goals – finding suitable shrubs and ground cover:
  - Shrub and ground layer plant ideas

If you know your plants….

- ID. Groundcover, Shrubs, and Trees
- What's growing where?
- List which species are growing in the Shade/Dappled Shade/Full Sun
- What's growing on slopes/in depressions/on ridges?
- What species are naturally grouped together?
- TAKE PHOTOS to complement notes

If you don't know your plants…

- TAKE PHOTOS to complement notes
- Many plant professionals and amateurs can assist with plant identification.
  - Botany Departments UWSP/UWGB/Madison
  - Land Conservation Depts.
  - UW Extension/DNR
  - Nurseries/Garden Centers
  - Outdoor Education/Interpretive Centers
  - Weird neighbor you never talk to that loves plants

Natural community restoration tips for native plant gardening – Curtis et al. – *The vegetation of Wisconsin* resource

Table XI-2

Structure of two typical stands of northern xeric forests

Species	Less than 1″ d.b.h.: Less than 1′ tall	Less than 1″ d.b.h.: More than 1′ tall	More than 1″ d.b.h.: 1–4″	More than 1″ d.b.h.: 4–10″	More than 1″ d.b.h.: 10–20″	More than 1″ d.b.h.: 20–30″
Dry jack pine forest in Burnett County						
Acer rubrum	312	62	14	6	2	0
Betula papyrifera	0	0	0	9	0	0
Pinus banksiana	0	144	71	59	33	0
P. strobus	164	20	0	0	2	0
Populus tremuloides	0	0	0	7	0	0
Quercus ellipsoidalis	1568	865	68	43	11	0
Dry-mesic red pine forest in Oneida County (Finnerud Forest of the University of Wisconsin)						
Acer rubrum	3400	1000	80	25	0	0
Betula papyrifera	0	0	35	31	2	0
Pinus resinosa	0	0	5	7	67	0
P. strobus	2800	1400	27	5	3	4
Populus grandidentata	0	0	3	5	1	0
P. tremuloides	0	0	1	3	1	0
Quercus borealis	400	0	23	24	1	0

Table XI-3

Prevalent groundlayer species of northern dry forest

Species	Pres.	Av. freq.	Species	Pres.	Av. freq.
Anemone quinquefolia	74%	16.3%	Lysimachia quadrifolia	37%	4.3%
Apocynum androsaemifolium*	74	3.6	Maianthemum canadense	89	48.8
Aquilegia canadensis	34	1.9	Melampyrum lineare*	37	3.9
Aralia nudicaulis	76	14.1	Oryzopsis asperifolia	47	21.2
Aster ciliolatus	45	5.4	Polygala paucifolia*	47	3.8
A. macrophyllus	68	36.6	Pteridium aquilinum	87	52.4
Carex pensylvanica	55	26.8	Pyrola elliptica	39	3.4
Chimaphila umbellata*	68	8.4	P. rotundifolia	42	3.2
Clintonia borealis	47	5.2	P. secunda	55	5.1
Convolvulus spithamaeus	45	3.6	Rhus radicans	39	4.0
Cornus canadensis	47	7.6	Rosa sp.	42	4.9
Corylus americana	66	15.0	Rubus allegheniensis	50	7.9
C. cornuta	55	21.4	R. pubescens	82	16.8
Diervilla lonicera	76	21.9	R. strigosus	34	5.1
Epigaea repens*	47	4.4	Smilacina racemosa	79	8.9
Fragaria virginiana*	55	11.5	Streptopus roseus	34	3.5
Gaultheria procumbens*	66	19.8	Trientalis borealis	76	17.5
Linnaea borealis	34	5.7	Uvularia sessilifolia	53	10.3
Lycopodium obscurum	55	5.7	Vaccinium angustifolium*	92	37.1
			Waldsteinia fragarioides*	53	30.8

Table XI-4

Community summary—northern dry forest

Major dominants (*I. V.*): Pinus banksiana (65), P. resinosa (48), P. strobus (43), Quercus ellipsoidalis (37), Populus tremuloides (21).

Most prevalent groundlayer species (*P%*): Vaccinium angustifolium (92), Maianthemum canadense (89), Pteridium aquilinum (87), Rubus pubescens (82), Smilacina racemosa (79).

Leading families (*% of total species*): Compositae (11.3%), Liliaceae (6.3), Ranunculaceae (5.9), Rosaceae (5.9), Ericaceae (5.0).

Related communities (*Index of similarity*): Northern Dry Mesic Forest (70), Boreal Forest (56), Pine Barrens (49), Northern Mesic Forest (48), Southern Dry Forest (42).

Species density: 39.

Index of Homogeneity: 54.8.

No. of stands studied: 38.

Number of species: Trees 25, Shrubs 57, Herbs 182, Total 264.

Stability: Low—a one-generation forest in absence of fire. Succeeded by Dry-Mesic or Mesic Northern Forest.

Climate: Total ppt. 30.0″ (76 cm), Snowfall 49.6″ (126 cm), Jan. Temp. 10.8°F. (−11.8°C.), July Temp. 68.3°F. (20.2°C.), Growing season 123 days. Typical weather stations: Hatfield, Long Lake, St. Germain.

Catena position: Top, usually on sandy soils.

Soil group: Podzol and Gray-Brown Podzolic.

Major soil series: Vilas, Omega, Boone, Plainfield, and Coloma.

Soil analyses: w.r.c. 120%, *p*H 4.9, Ca 1255 p.p.m., K 95 p.p.m.

Approximate original area: Uncertain. Possibly 15% of Northern Xeric Forest or 340,000 acres, but not clearly differentiated from Pine Barren Savanna.

Typical examples: Castle Mound S. A., Cox Hollow S. A. (a southern relic), Necedah S. A.

Major publications: Kittredge (1938), Brown and Curtis (1952).

Geographical distribution: S. Manitoba, N. Minnesota, S. Ontario, N. New York and New England.

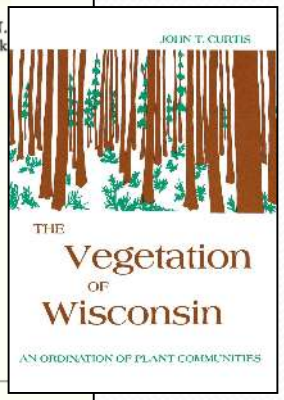
(Notes for Table XI-3)

* Species are also modal, since their presence values are higher here than in any other Wisconsin community.

Additional modal species, with their presence (%) values: Alnus crispa (3), Cynoglossum boreale (21), Gerardia gattingeri (3), Habenaria hookeri (3), Lycopodium complanatum (29), Lycopodium tristachyum (3), Monotropa hypopithys (13), Rubus hispidus (8).

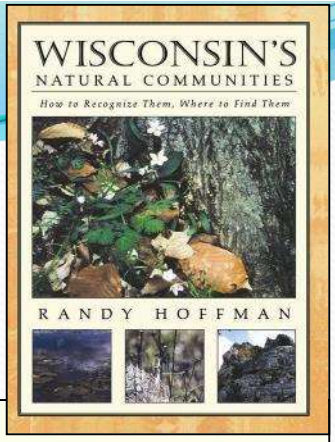
No. of modal species 17.

No. of prevalent modal species as % of total prevalents 23.1%.



Natural community restoration tips for native plant gardening – Randy Hoffman >

"Wisconsin's natural communities: how to recognize them, where to find them" resource



Dry Pine Forest

Indicators: Red Pine, Jack Pine, Hill's Oak, Large-Toothed Aspen, White Pine

Ecology

Although soils and climate determine where dry pine forests can potentially grow, fire determines where the forests actually develop. To develop as forests, red and white pines need protection from intense fires long enough to develop thick bark (40 to 50 years). The east and north sides of lakes and larger streams provide protection from frequent conflagrations. Other areas, such as steep north-facing slopes or islands and peninsulas in bogs and wetlands, offer enough protection for development of dry pine forest.

Jack pine needs fire to replace itself naturally because its cones usually open after being heated by fire. Also, a fire-scorched landscape is ideal for germinating the light wind-borne seeds of red and white pine. Because the seedbed is no longer prepared by fire, naturally regenerated pine forests have become very rare.

Exploitation of red and white pine was intensive in the early days of logging. After harvest, immense slash accumulated, and massive fires scoured the area. The removal of most white

Burnt Wood Community

Fire prevention is a crucial activity in Wisconsin. Countless lives, structures, and income-producing trees have been spared due to our fire prevention and control efforts. Control and prevention of fire has tremendous societal benefits, but in some areas we may need to consider the adverse effects of fire suppression on fire-influenced ecosystems.

In nature, no one act is simple and complexity rules. For example, fire benefits many species in a pine forest, in addition to the pines which rely on fire for regeneration. After a burn, species like crows, ravens, jays, foxes, and weasels scavenge the area for food. Olive-sided flycatchers often perch on the dead snags and sally for flying insects. Black-backed woodpeckers inhabit burned conifer areas, sometimes in dense numbers, for several years after a fire to feed on insects found under the bark and in the wood. They forage for grubs and larvae, which feed on the dead trees, by scaling off large pieces of bark and lapping up the exposed insects. Even humans will search recently burned sites for mushrooms, such as pink burn cup.

Some insect species breed and lay eggs only on the bark of recently burned conifers. About 40 species of insects, mostly beetles, fly to recently fire-killed conifers to lay their eggs. One group of these insects in the metallic wood-boring beetle family have antennae that sense infrared radiation emitted by the fires (Hart 1998). They then fly to the fire to beat their competition for this resource. It isn't known how far away they can sense this radiation, but individuals have shown up at a burn site more than 60 miles from the nearest conifers.

40

Characteristic Species

Plants

- American hazelnut
- barren strawberry
- beaked hazelnut
- big-leaved aster
- bracken fern
- bush honeysuckle
- Canada mayflower
- dwarf raspberry
- early low blueberry
- false Solomon's seal
- pipsissewa
- spreading dogbane
- starflower
- wild sarsaparilla
- wintergreen
- wood anemone

Mosses and Lichens

- antler lichen
- British soldiers
- common feather moss
- cornucopia cladonia
- curd lichen
- empty-cup lichen
- flabby lichen
- ladder lichen
- many-fruited dog lichen
- matted byrum
- mealy goblet lichen
- pitted cetraria
- puffed shield lichen
- reindeer lichen
- water measuring cord moss
- yellow pine lichen
- yellow wall lichen

Mushrooms

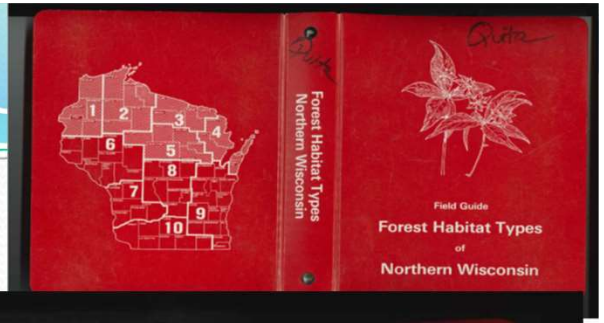
- conifer false morel
- crustlike cup
- deadly cort
- dirty milky
- dusky waxy cap
- elegant polypore
- false chanterelle
- family collybia
- fetid armillaria
- irregular earth tongue
- orange jelly
- peppery bolete
- rooting cauliflower mushroom
- rosy polypore
- slippery jack
- yellow pholiota
- yellow rabbit ears
- yellow tuning fork

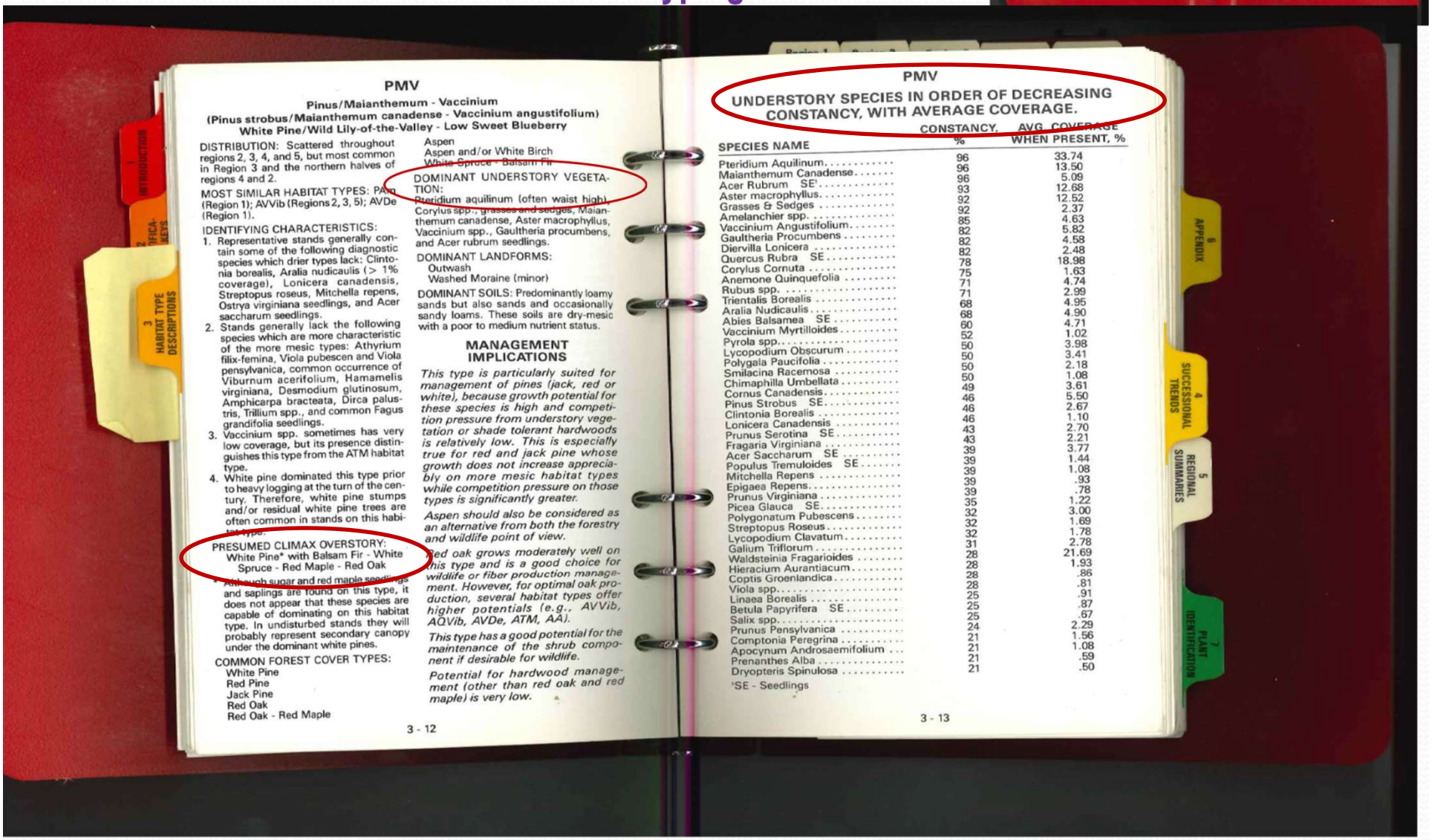
Butterflies and Moths

- bicolored moth
- big poplar sphinx
- black zigzag
- brown collared dart
- Canadian sphinx

Natural community restoration tips for native plant gardening –

Kotar et al. resources > Forest Habitat Type guidebooks





PMV

Pinus/Maianthemum - Vaccinium
(Pinus strobus/Maianthemum canadense - Vaccinium angustifolium)
White Pine/Wild Lily-of-the-Valley - Low Sweet Blueberry

DISTRIBUTION: Scattered throughout regions 2, 3, 4, and 5, but most common in Region 3 and the northern halves of regions 4 and 2.

MOST SIMILAR HABITAT TYPES: PAm (Region 1); AVVib (Regions 2, 3, 5); AVDe (Region 1).

IDENTIFYING CHARACTERISTICS:

1. Representative stands generally contain some of the following diagnostic species which drier types lack: Clintonia borealis, Aralia nudicaulis (> 1% coverage), Lonicera canadensis, Streptopus roseus, Mitchella repens, Ostrya virginiana seedlings, and Acer saccharum seedlings.
2. Stands generally lack the following species which are more characteristic of the more mesic types: Athyrium filix-femina, Viola pubescen and Viola pensylvanica, common occurrence of Viburnum acerifolium, Hamamelis virginiana, Desmodium glutinosum, Amphicarpa bracteata, Dirca palustris, Trillium spp., and common Fagus grandifolia seedlings.
3. Vaccinium spp. sometimes has very low coverage, but its presence distinguishes this type from the ATM habitat type.
4. White pine dominated this type prior to heavy logging at the turn of the century. Therefore, white pine stumps and/or residual white pine trees are often common in stands on this habitat type.

PRESUMED CLIMAX OVERSTORY:
White Pine* with Balsam Fir - White Spruce - Red Maple - Red Oak

* Although sugar and red maple seedlings and saplings are found on this type, it does not appear that these species are capable of dominating on this habitat type. In undisturbed stands they will probably represent secondary canopy under the dominant white pines.

COMMON FOREST COVER TYPES:
White Pine
Red Pine
Jack Pine
Red Oak
Red Oak - Red Maple
Aspen
Aspen and/or White Birch
White Spruce - Balsam Fir

DOMINANT UNDERSTORY VEGETATION:
Pteridium aquilinum (often waist high), Corylus spp., grasses and sedges, Maianthemum canadense, Aster macrophyllus, Vaccinium spp., Gaultheria procumbens, and Acer rubrum seedlings.

DOMINANT LANDFORMS:
Outwash
Washed Moraine (minor)

DOMINANT SOILS: Predominantly loamy sands but also sands and occasionally sandy loams. These soils are dry-mesic with a poor to medium nutrient status.

MANAGEMENT IMPLICATIONS

This type is particularly suited for management of pines (jack, red or white), because growth potential for these species is high and competition pressure from understory vegetation or shade tolerant hardwoods is relatively low. This is especially true for red and jack pine whose growth does not increase appreciably on more mesic habitat types while competition pressure on those types is significantly greater.

Aspen should also be considered as an alternative from both the forestry and wildlife point of view.

Red oak grows moderately well on this type and is a good choice for wildlife or fiber production management. However, for optimal oak production, several habitat types offer higher potentials (e.g., AVVib, AQVib, AVDe, ATM, AA).

This type has a good potential for the maintenance of the shrub component if desirable for wildlife.

Potential for hardwood management (other than red oak and red maple) is very low.

3 - 12

PMV

UNDERSTORY SPECIES IN ORDER OF DECREASING CONSTANCY, WITH AVERAGE COVERAGE.

SPECIES NAME	CONSTANCY, %	AVG. COVERAGE WHEN PRESENT, %
Pteridium Aquilinum	96	33.74
Maianthemum Canadense	96	13.50
Acer Rubrum SE¹	96	5.09
Aster macrophyllus	93	12.68
Grasses & Sedges	92	12.52
Amelanchier spp.	92	2.37
Vaccinium Angustifolium	85	4.63
Gaultheria Procumbens	82	5.82
Diervilla Lonicera	82	4.58
Quercus Rubra SE	82	2.48
Corylus Cornuta	78	18.98
Anemone Quinquefolia	75	1.63
Rubus spp.	71	4.74
Trientalis Borealis	71	2.99
Aralia Nudicaulis	68	4.95
Abies Balsamea SE	68	4.90
Vaccinium Myrtilloides	60	4.71
Pyrola spp.	52	1.02
Lycopodium Obscurum	50	3.98
Polygala Paucifolia	50	3.41
Smilacina Racemosa	50	2.18
Chimaphila Umbellata	50	1.08
Cornus Canadensis	49	3.61
Pinus Strobus SE	46	5.50
Clintonia Borealis	46	2.67
Lonicera Canadensis	46	1.10
Prunus Serotina SE	43	2.70
Fragaria Virginiana	43	2.21
Acer Saccharum SE	39	3.77
Populus Tremuloides SE	39	1.44
Mitchella Repens	39	1.08
Epigaea Repens	39	.93
Prunus Virginiana	39	.78
Picea Glauca SE	35	1.22
Polygonatum Pubescens	32	3.00
Streptopus Roseus	32	1.69
Lycopodium Clavatum	32	1.78
Galium Triflorum	31	2.78
Waldsteinia Fragarioides	28	21.69
Hieracium Aurantiacum	28	1.93
Coptis Groenlandica	28	.86
Viola spp.	28	.81
Linaea Borealis	25	.91
Betula Papyrifera SE	25	.87
Salix spp.	25	.67
Prunus Pensylvanica	24	2.29
Comptonia Peregrina	21	1.56
Apocynum Androsaemifolium	21	1.08
Prenanthes Alba	21	.59
Dryopteris Spinulosa	21	.50

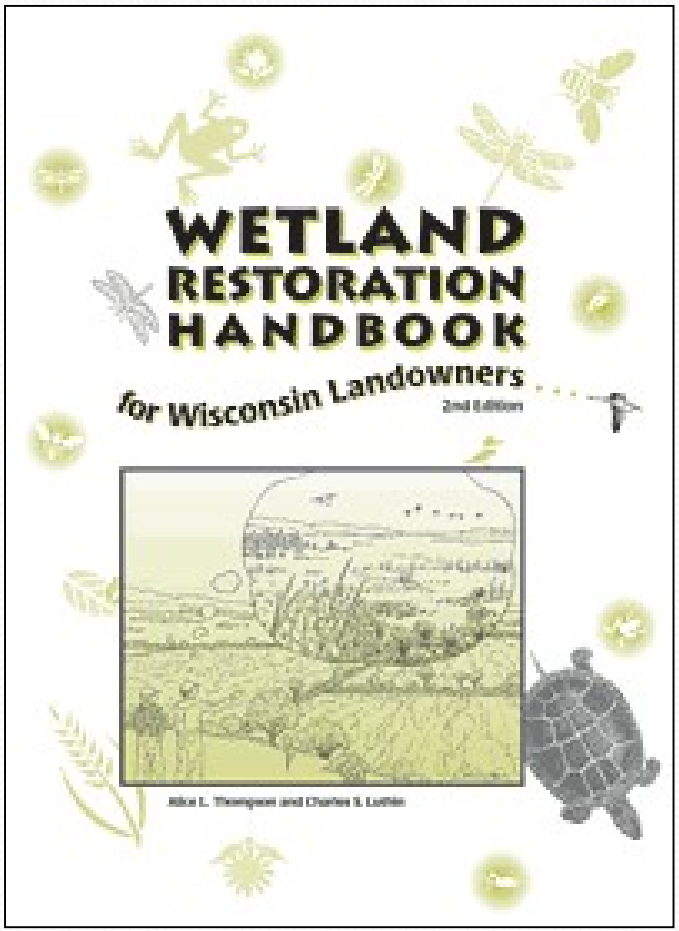
¹SE - Seedlings

3 - 13

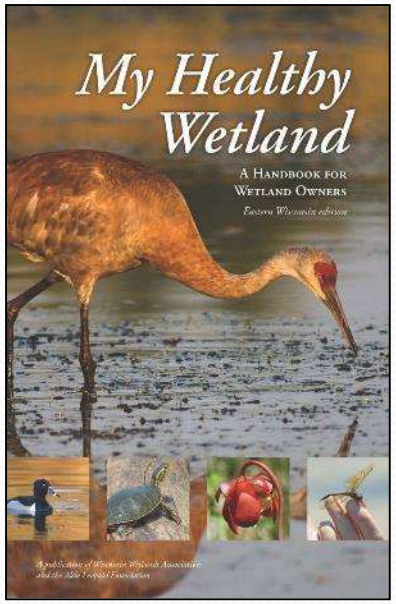
Natural community restoration tips for native plant gardening – Wetland restoration resources

Landowner handbooks:

< https://dnr.wi.gov/topic/wetlands/handbook.html >



< https://wisconsinwetlands.org/for-landowners/handbook/ >



Types of Wisconsin wetlands:

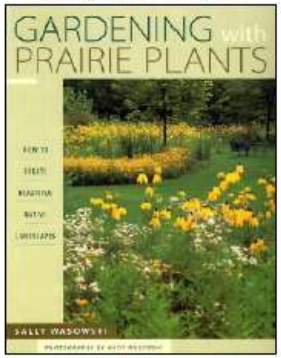
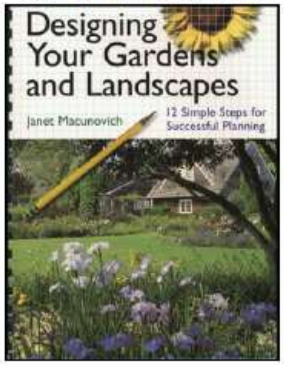
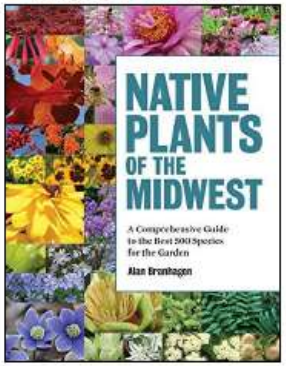
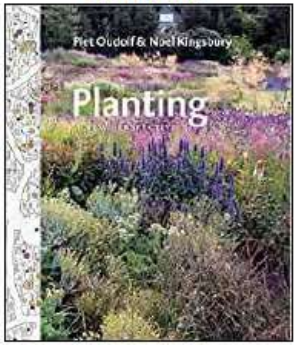
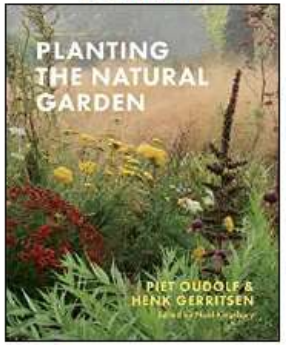
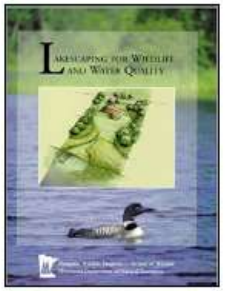
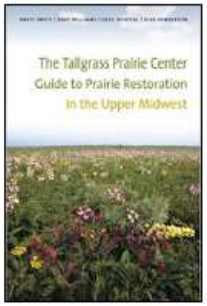
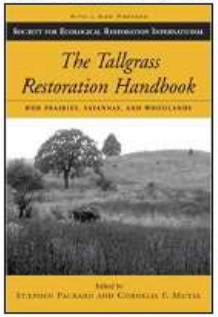
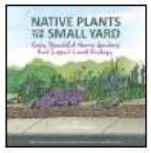
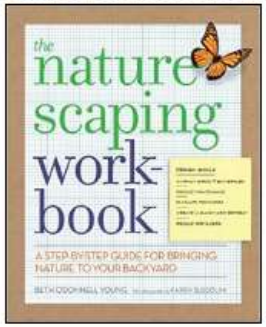
< https://wisconsinwetlands.org/wp-content/uploads/2016/10/GuidetoWisconsinWetlandTypes.pdf >

Planting tips

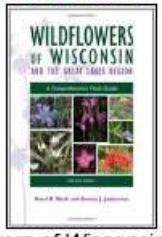
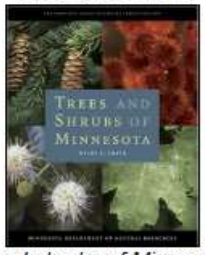
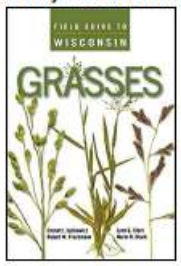
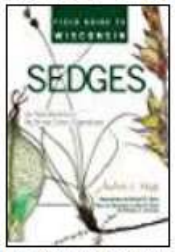
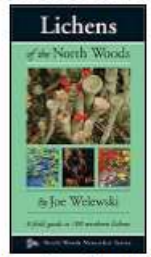
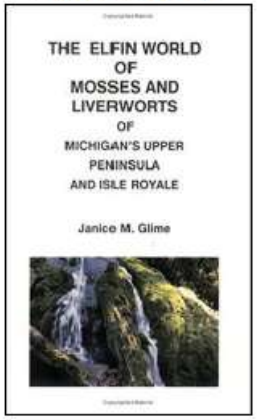
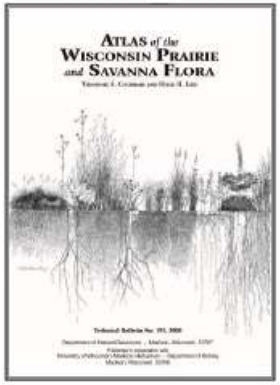
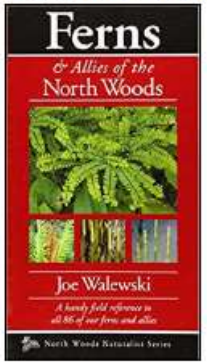
- Groups of three or more of a single species will attract bees because the cluster allows them to forage more efficiently
- Small space – use low growing choices
- Plants that tolerate broader environmental conditions (wet and dry; full and part sun; etc.) will be more resilient
- Other tips: using an auger; browsing deterrence: Liquid Fence (garlic based), Plantskydd (blood meal based), fencing, cues to care ideas, etc.

Installation tip – killing off turf grass / weed control

Guidebooks for getting started with native plant gardening

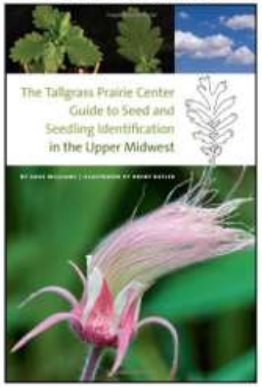
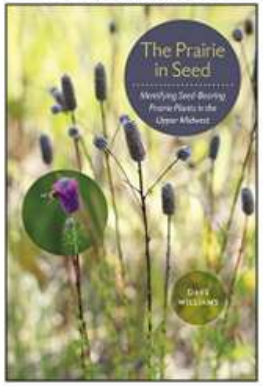
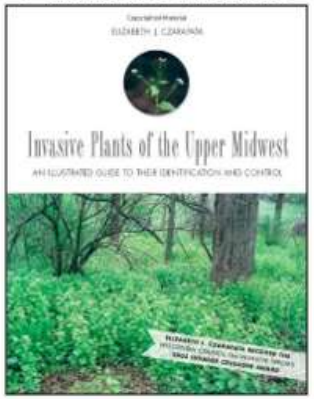
Sally Wasowski  *Gardening with prairie plants: how to create beautiful native landscapes*	**Janet Maconovich**  *Designing your gardens and landscapes: 12 simple steps for successful planning*	**Alan Branhagen**  *Native plants of the Midwest: a comprehensive guide to the best 500 species for the garden*	**Piet Oudolf and Noel Kingbury**  *Planting: a new perspective*	**Piet Oudolf and Henk Gerritsen**  *Planting the natural garden*
C. Henderson, C. Dindorf, and F. Rozumalski  *Lakescaping for wildlife and water quality*	**D. Smith, D. Williams, G. Houseal, and K. Henderson**  *The Tallgrass Prairie Center Guide to Prairie Restoration in the Upper Midwest*	**Stephen Packard and Cornelia Mutel (editors)**  *The tallgrass restoration handbook: for prairies, savannas, and woodlands* *[The Science and Practice of Ecological Restoration Series - Second Edition, Revised Edition]*	**Healthy Lakes**  *350 ft² native planting companion guide* **Kate Brandis**  *Native plants for the small yard: easy, beautiful home gardens that support local ecology*	**Beth O'Donnell Young**  *The Naturescaping workbook: a step-by-step guide for bringing nature to your backyard*

Resources for Wisconsin's native flora including identification & ranges

Merel Black and Emmet Judziewicz  *Wildflowers of Wisconsin and the Great Lakes region: a comprehensive field guide* [2nd Edition]	**Welby Smith**  *Trees and shrubs of Minnesota: the complete guide to species identification* [1st Edition]	**Judziewicz, Freckmann, Clark, and Black**  *Field guide to Wisconsin grasses*	**Andrew Hipp**  *Field guide to Wisconsin sedges: an introduction to the Genus Carex (Cyperaceae)*	**Joe Walewski**  *Lichens of the North Woods* [Naturalist Series]
Janice Glime  *The elfin world of mosses and liverworts of Michigan's upper peninsula and Isle Royale*	**Aquatic plants**  *Aquatic plants of the upper Midwest: a photographic field guide to our underwater forests* [4th Edition] - **Paul Skawinski**  *Through the looking glass: a field guide to aquatic plants* [second edition]	**University of Wisconsin-Madison Arboretum**  *Plant communities*	**Theodore Cochrane and Hugh Iltis**  *Atlas of the Wisconsin prairie and savanna flora*	**Ferns and fern allies**  Ferns and allies of the north woods: a handy field reference to all 86 of our ferns and allies [Naturalist Series]

Maintenance tips and other resources in pdf -

Maintenance of native plant gardens

Dave Williams  *The Tallgrass Prairie Center guide to seed and seedling identification in the upper Midwest* *[Bur Oak Guide]*	**Dave Williams**  *The prairie in seed: identifying seed-bearing prairie plants in the upper Midwest* *[Bur Oak Guide]*	**Roy Diblik**  *The know maintenance perennial garden*	***Cardno***  *Native plant nursery installation and maintenance guideline*	**Elizabeth Czarapata**  *Invasive plants of the upper Midwest: an illustrated guide to their identification and control*
Jane Cummings Carlson, Jeff Martin, and Kyoko Scanlon  *Oak wilt management: what are the options?* *[UW-Extension G3590]*	**Prairie Moon Nursery**  *Growing your prairie: eight steps toward achieving a natural landscape in three to five years*	**Prairie Nursery** Prairie Nursery NATIVE PLANTS & SEEDS *Quick guide: preparing and planting your native plant garden* **National Wildlife Federation** Native Plant Finder [BETA] *Native plant finder online tool*	***Taylor Creek Restoration Nurseries***  *The native planting handbook*	**Natural Heritage Conservation Program, Wisconsin Department of Natural Resources**  *Wisconsin restoration contractors - ER0699* *[Last updated: January 2020]*

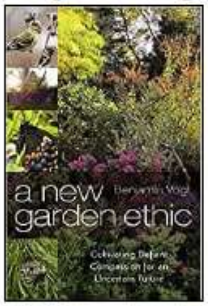
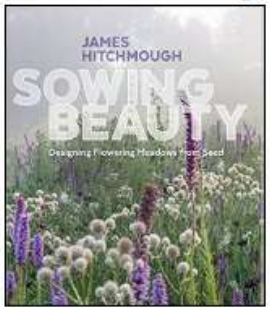
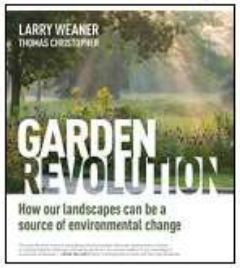
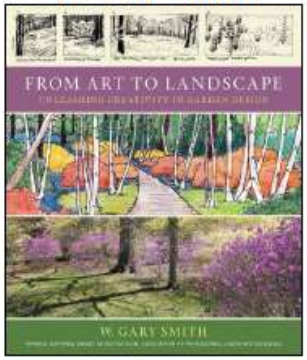
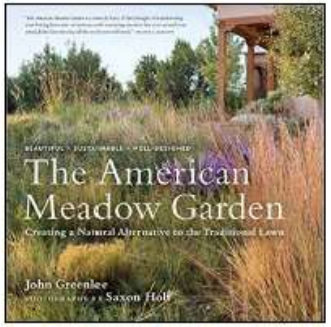
Opportunities for native gardens and plantings

- Homeowners / property owners – much of Wisconsin land in in private ownership
- Healthy Lakes and Rivers grant – WDNR Surface Water Grants funding
- DATCP funding with county land and water conservation departments
- Wild Ones and Prairie Enthusiasts grants
- Beyond just homeowners:

✓ To schools, campuses, churches, businesses, etc.

✓ Refer to pdf to get started

The growing native plant gardening movement

Benjamin Vogt  *A new garden ethic: cultivating defiant compassion for an uncertain future*	**James Hitchmough**  *Sowing beauty: designing flowering meadows from seed*	**Larry Weaner and Thomas Christopher**  *Garden revolution: how our landscapes can be a source of environmental change*	**Piet Oudolf and Rick Darke**  *Gardens of the High Line: elevating the nature of modern landscapes*	**2020 Wisconsin Lakes and Rivers Convention**  Focusing on resilient lakes and rivers
W. Gary Smith  *From art to landscape: unleashing creativity in garden design*	**Thomas Rainer and Claudia West**  *Planting in a post-wild world: designing plant communities for resilient landscapes*	**John Greenlee and Saxon Holt**  *The American meadow garden: creating a natural alternative to the traditional lawn*	**Joel Sternfeld**  *Joel Sternfeld: walking the High Line*	**Missouri Botanical Garden**  Chapter four: landscaping with native plants - a gardener's guide for Missouri < www.grownative.org >

Questions / Handouts / Discussion