

# **Building resiliency for climate change**

**On your land and in your community**



**Angie Hong**

**East Metro Water Resource Education Program**



## Climate change 101

### Observed changes in Minnesota

### Building resiliency & climate adaptation

- State and local planning & action

### What can you do?

- Reducing your carbon footprint
- Building resiliency on your land and in your yard
  - Lawn alternatives
  - Native landscaping
  - Woodland management

### Resources



**Climate change** = Change in global and regional climate patterns, attributed largely to the increased levels of atmospheric carbon dioxide





## CARBON DIOXIDE

↑ **410** parts per million

## CARBON DIOXIDE

Carbon dioxide levels in the air are at their highest in 650,000 years

<https://climate.nasa.gov/>

## GLOBAL TEMPERATURE

↑ **1.9** °F since 1880

## GLOBAL TEMPERATURE

Eighteen of the 19 warmest years on record have occurred since 2001

## ARCTIC ICE MINIMUM

↓ **12.8** percent per decade

## ARCTIC ICE MINIMUM

In 2012, Arctic summer sea ice shrank to the lowest extent on record

## ICE SHEETS

Satellite data show that Earth's polar ice sheets are losing mass

## ICE SHEETS

↓ **413** Gigatonnes per year

## SEA LEVEL

Global average sea level has risen nearly 7" (178 mm) over the past 100 years

## SEA LEVEL

↑ **3.3** millimeters per year





## **Minnesota = Warmer and wetter since 1895**

- Ave. annual temperature  $\uparrow$  2.9F
- Ave. annual precipitation  $\uparrow$  3.4 inches

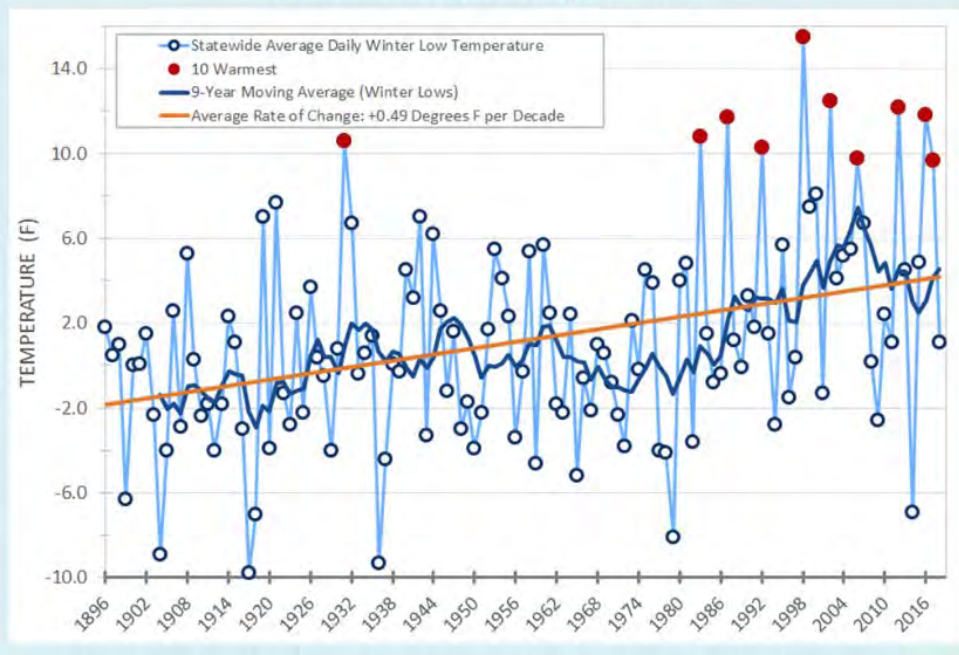
## **Most warming happening in winter and overnight**

- Since 1970, winter has warmed 13 times faster than summer, and nights have warmed 55% faster than days.

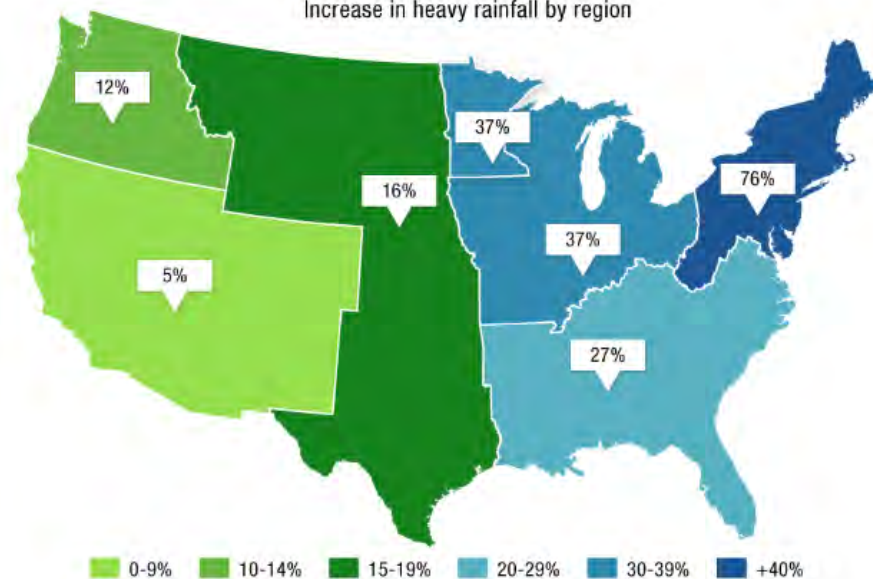
## **More frequent extreme precipitation events**

- 7 catastrophic mega-rain events since 2000  
(6+ inches in 24hrs over an area greater than 100 sq. miles)

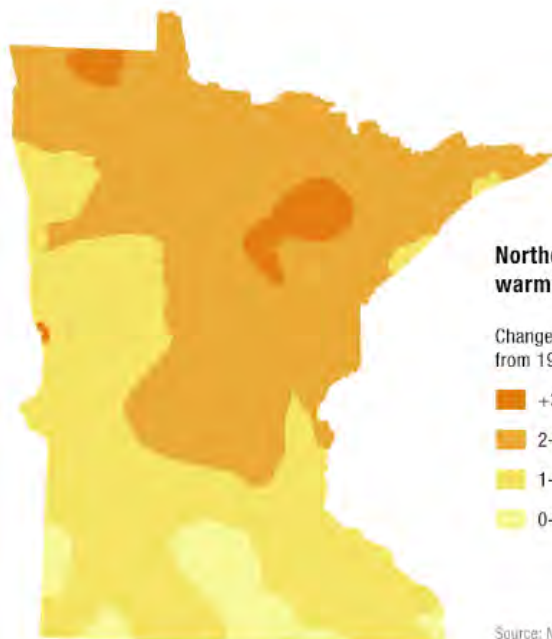
# Minnesota Average Winter Daily Minimum Temperatures (December through February, 1896-2018)



## Increase in heavy rainfall by region

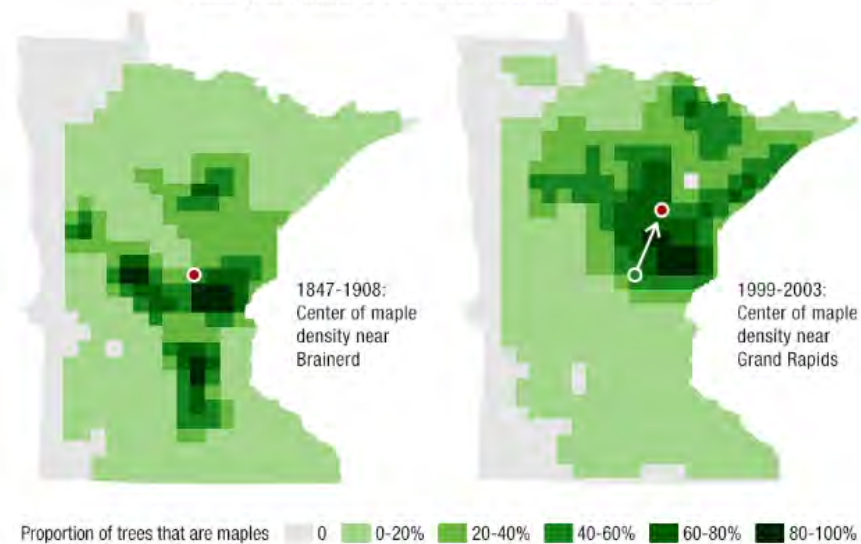


Source: National Climate Assessment, National Climatic Data Center



Source: National Climate Assessment

## Density of Minnesota's maples moving north and east

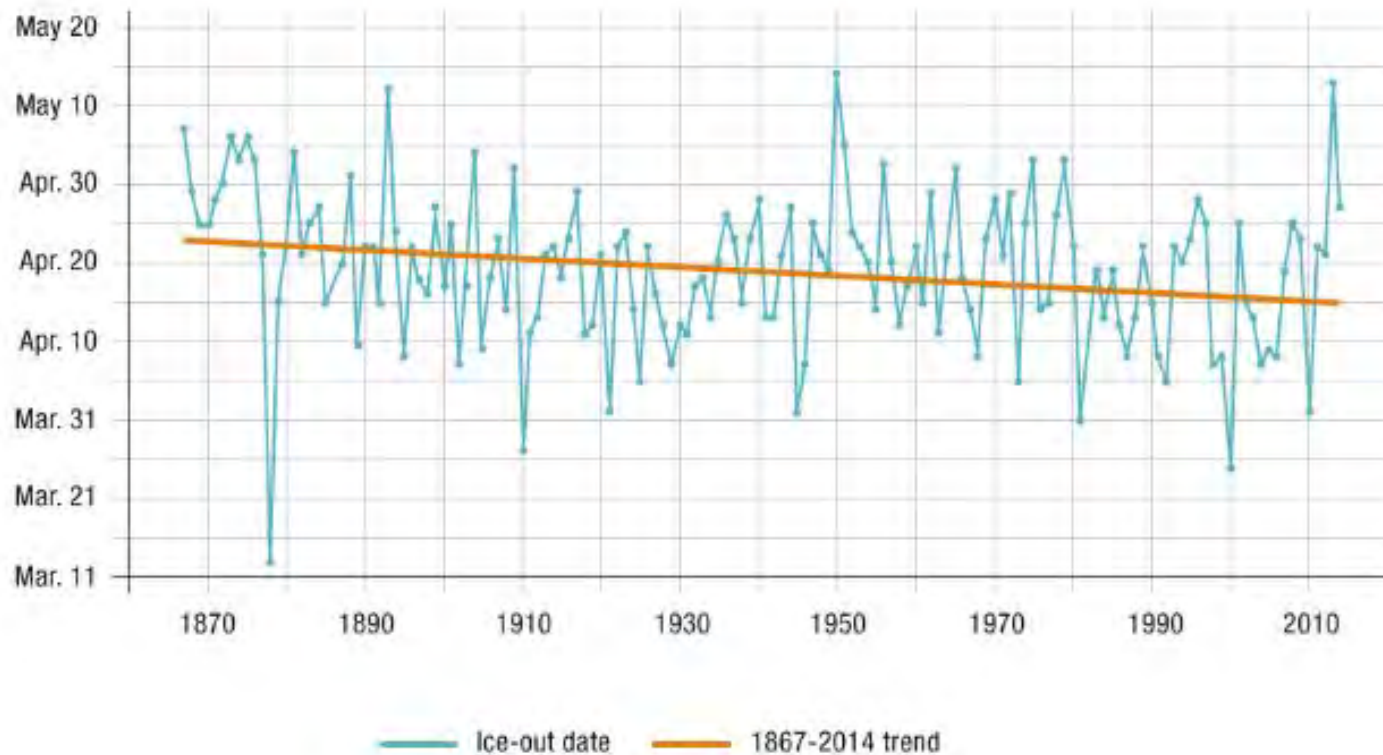


Source: Nick Dantz, Ph.D. thesis. University of Minnesota



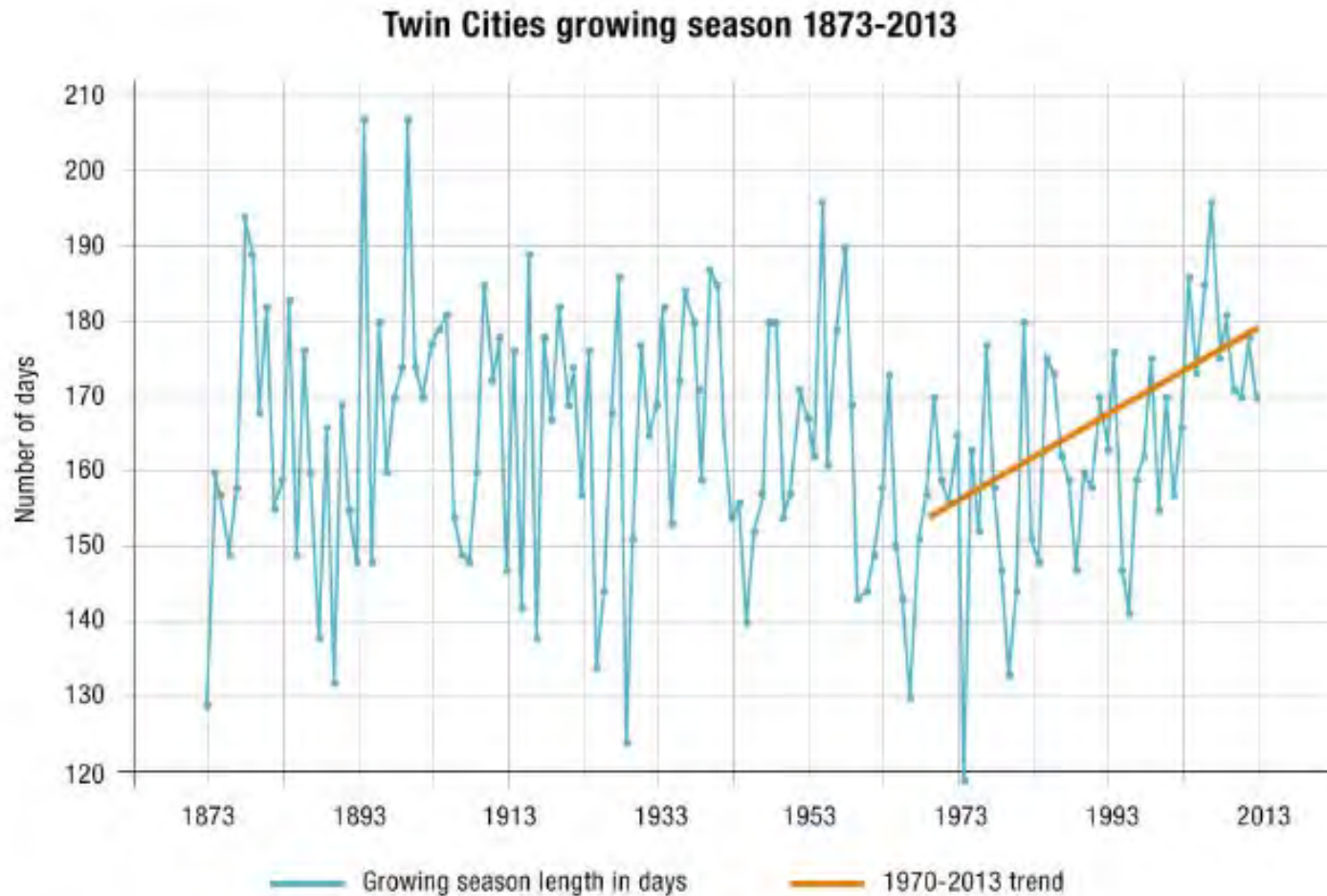
# Impact = Ice melts earlier

**Ice out on Lake Osakis 1867-2014**



Source: Minn. Department of Natural Resources, State Climatology

# Impact = Longer growing season

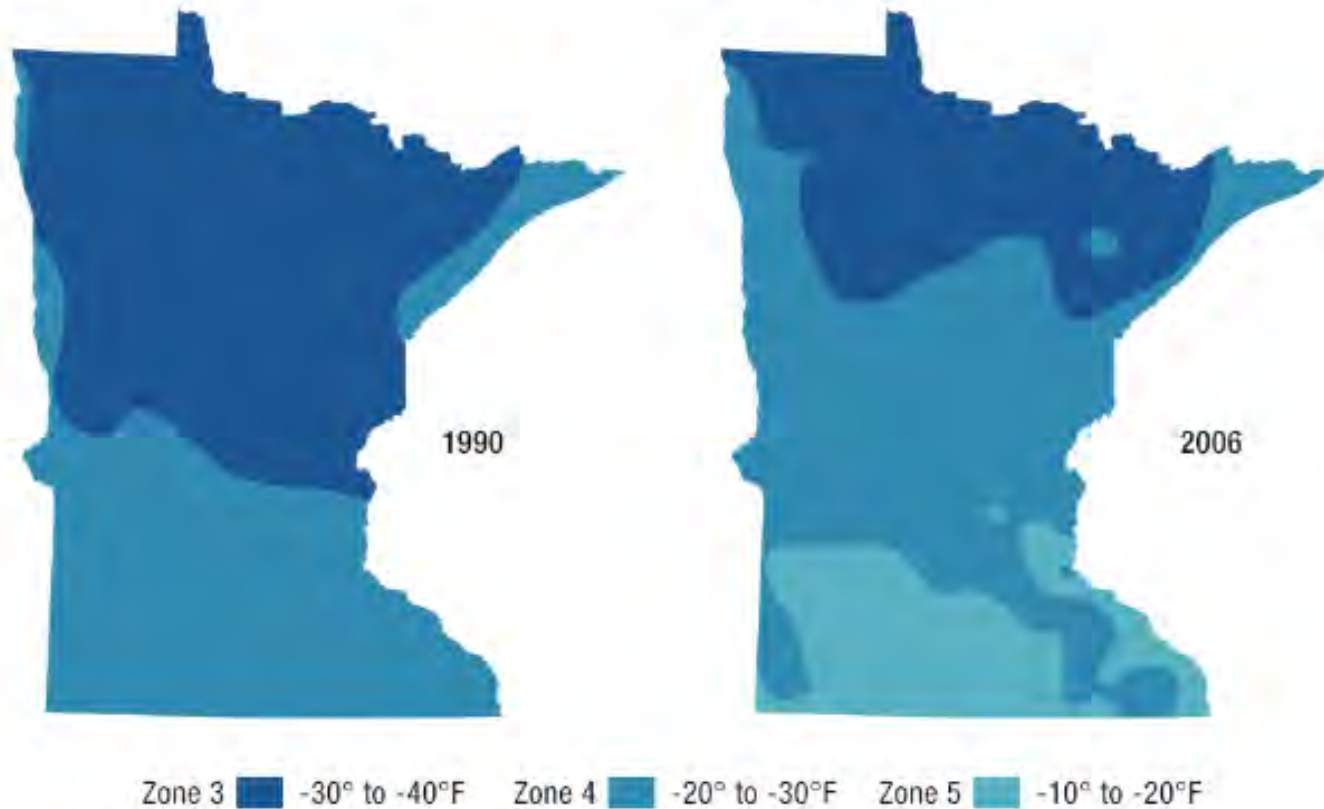


Source: Midwestern Regional Climate Center



# Impact = Hardiness zones move north

Hardiness zone changes in Minnesota



Source: U.S. Department of Agriculture

# Building resiliency & climate adaptation

## State and local planning & action

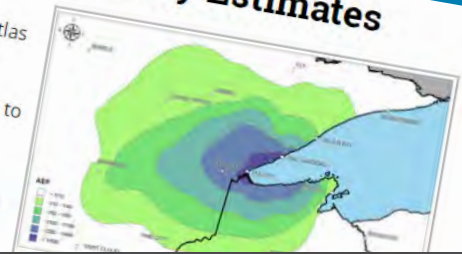
### Adapting to Climate Change in Minnesota

2013 Report of the Interagency Climate Adaptation Team

### NOAA Atlas 14 - Precipitation Frequency Estimates

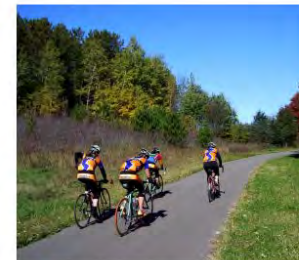
National Weather Service Hydrometeorological Design Center has released NOAA Atlas 14, Volume 8. The Atlas provides precipitation frequency estimates for many of the states, including Minnesota. Analyses of the frequency of heavy rainfall events are of importance to engineers and others involved in designing and operating infrastructure such as culverts and stormwater runoff ponds.

[4 Precipitation Frequency Estimates for Minnesota](#)



in NOAA Atlas 14, Volume 8 superseded frequency estimates contained in the

er No. elements in the al frequency es for spatia a, and proje A Atlas 14 web site.



2040 Washington County



### 2040 Comprehensive Plan

A Policy Guide to 2040



December 4, 2018

### South Washington Watershed District Climate Resiliency Plan







## NOAA Atlas 14, Volume 8

- Provides precipitation frequency estimates based on actual data collected over the past 100 years
- Previous guidance developed in 1961
  - More data, better technology, and more weather tracking locations
- MN rainfall ↑ 20-25% for 50 and 100-year storms
- Example: Minneapolis–St. Paul International Airport
  - 50-year rain event: 5.3 inches → 6.4 inches
  - 100-year rain event: 6 inches → 7.5 inches



## Interagency Climate Adaptation Team

- Agriculture
- Commerce (Division of Energy Resources)
- Health
- Natural Resources
- Pollution Control
- Public Safety (Division of Homeland Security and Emergency Management)
- Transportation
- Board of Water and Soil Resources
- Metropolitan Council

### Climate Change Adaptation Workgroup

- MN DNR
- MDH
- MN DOT
- MN Pollution Control Agency
- Metropolitan Mosquito Control District
- NOAA
- U.S. Geological Survey
- U.S. Army Corps of Engineers
- Cities, Counties, Watershed Management Orgs.
- University of Minnesota
- Nonprofits
- Private sector



## Building resiliency to Extreme Precipitation in MN

- State Policy
- Local planning and regulations
- Structure and infrastructure projects
- Natural systems protection
- Education and awareness







# South Washington Watershed District **Climate Resiliency Plan**



[https://www.swwdmn.org/wp-content/uploads/2017/10/FINAL\\_SWWD-Climate-Resiliency-Plan\\_3.7.pdf](https://www.swwdmn.org/wp-content/uploads/2017/10/FINAL_SWWD-Climate-Resiliency-Plan_3.7.pdf)



## Community Resiliency Workshops

Communities  
developed plans  
to mitigate



- 2 workshops in September at Cottage Grove
- About 60 attendees
- Co-sponsored by SWWD and RWMWD
- Mix of education and planning exercises



# Cottage Grove Priorities

- Infrastructure
  - Coordinate emergency response plans
  - Provide backup power
  - **Improve stormwater infrastructure**
- Societal
  - Communicate with at-risk populations
  - **Promote groundwater protection**
  - Develop pet emergency response plans
- Natural Resources
  - **Promote stormwater treatment and protect wetlands**
  - **Protect and expand urban forest**
  - **Improve parks and open spaces**





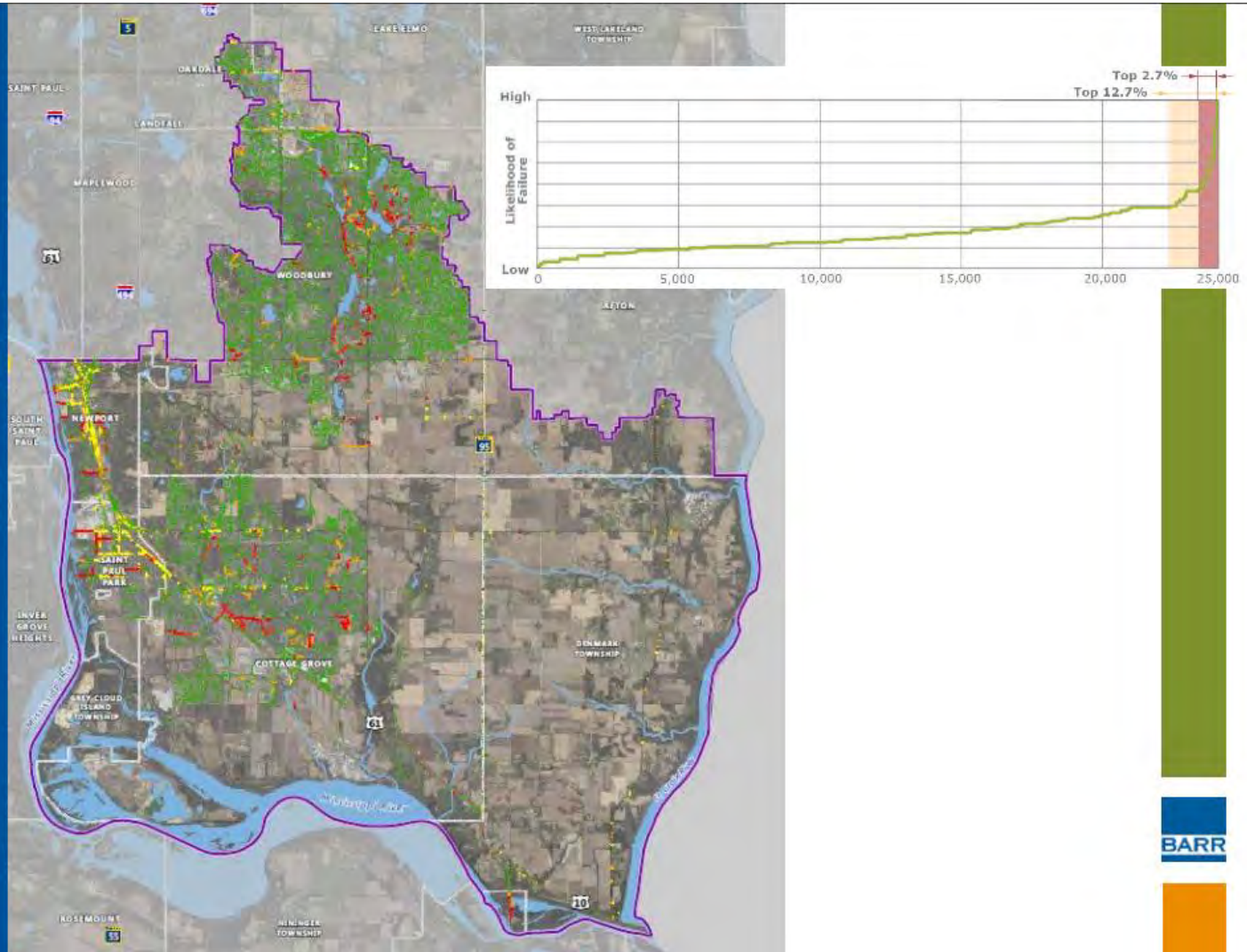
# SWWD Priorities



- Infrastructure
  - Develop emergency flood response plans
  - Build resilient stormwater infrastructure
  - Mitigate flood impacts
  - Promote infiltration
- Societal
  - Communicate with at-risk populations
  - Promote groundwater protection
  - Educate public about vector borne diseases
- Natural Resources
  - Reduce chloride loading
  - Identify and stabilize eroding ravines
  - Use resilient plant palette
  - Manage invasives



# Storm Sewer Infrastructure Combined Risk

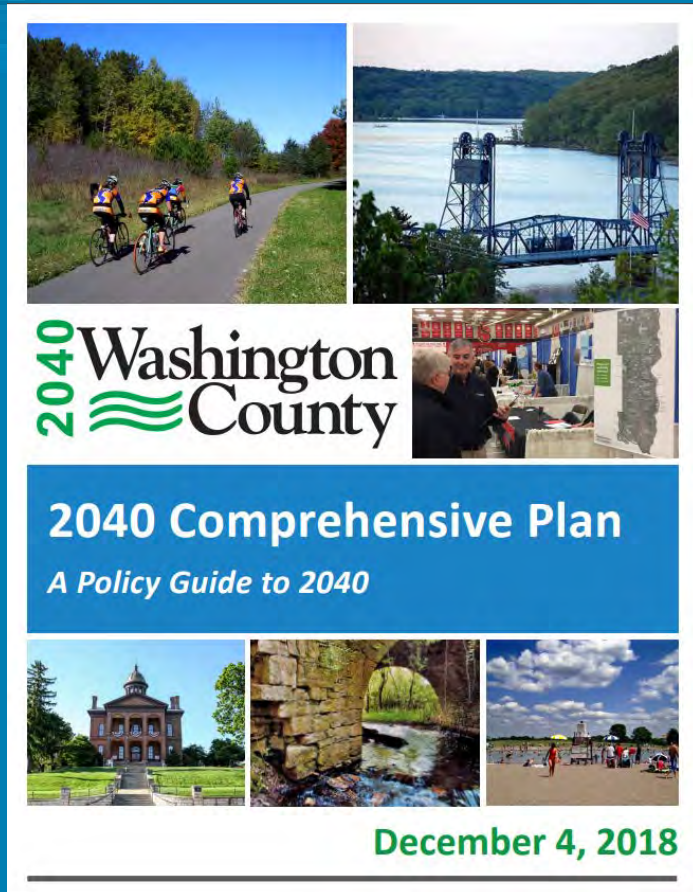


- Older pipes more likely to fail
- Greater risk of consequences along highways and in low-lying areas



# Washington County 2040 Comprehensive Plan

- Submitted to Met Council in December 2018
- Expected to be adopted by the county in June 2019



## Chapter 9: Resilience and Sustainability

- Hazard Mitigation/Community Vulnerability
- Healthy Communities
- Energy
- Solid Waste Management



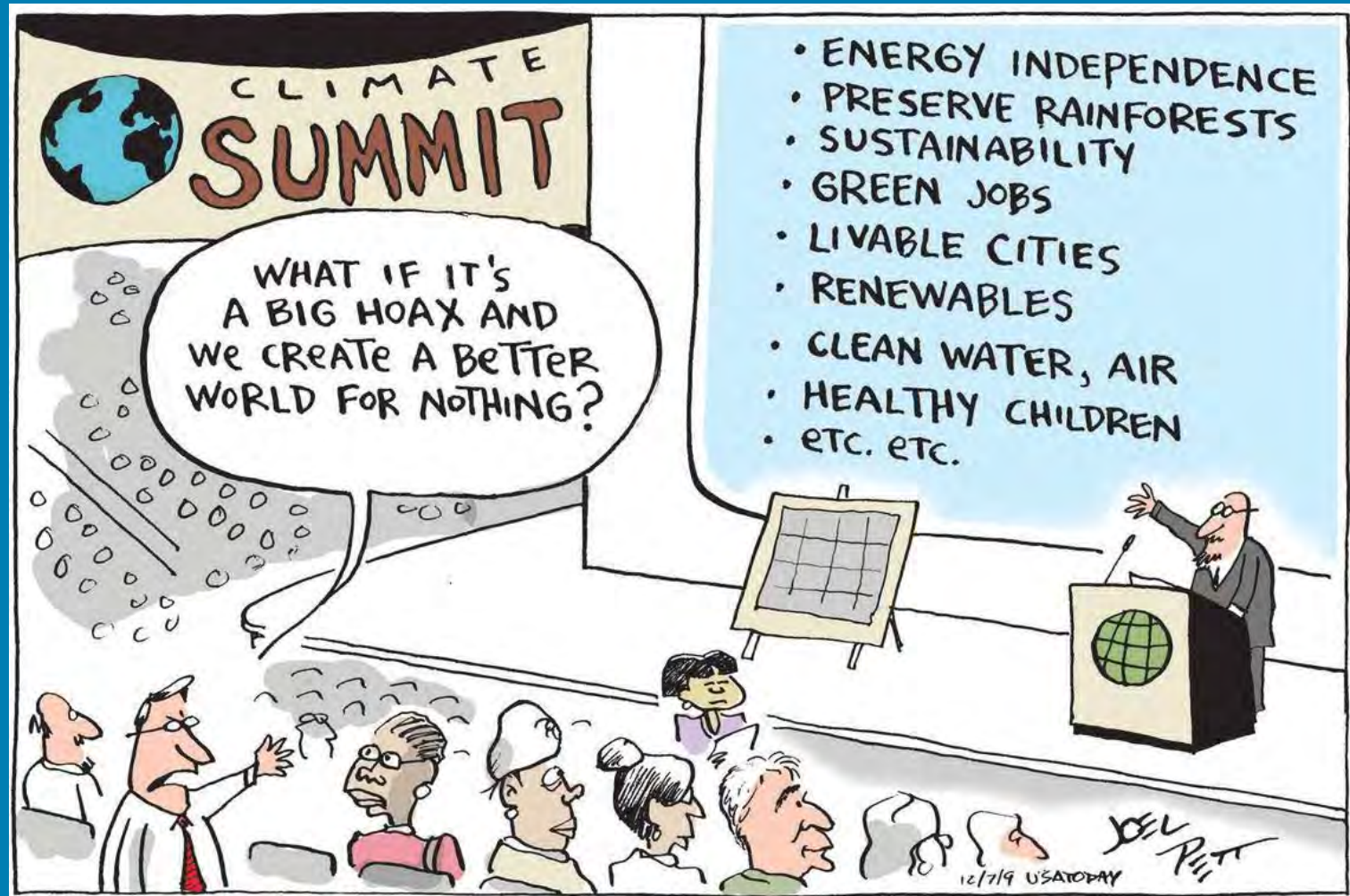


**But...what can I do?**





## Reduce your climate footprint





★ Support renewable energy ★ Use less electricity ★

Minnesota jobs ★ Less coal ★ More wind & solar



Protect our fishing industry ★ Clean air and water

★ Go renewable ★ Keep mercury out of lakes ★



★ Support renewable energy ★ Wind and solar ★

★ Go renewable ★ New jobs for Americans ★



Support clean energy ★ Clean air and water

★ High wage jobs ★ Rural employment ★





★ Support renewable energy ★ Use less electricity ★

Minnesota jobs ★ Less coal ★ More wind & solar



No mountain top removal ★ Clean air and water

★ Less mining pollution ★ Reduce clean-up costs ★



## **Building resiliency on your land and in your yard**

- **Lawn alternatives**
- **Native landscaping**
- **Woodland management**



# Alternatives to traditional lawn: Low-mow & Bee-friendly









# 40.5 MILLION ACRES OF LAWN IN THE U.S.

32 million acres is irrigated

**\*\*More irrigated lawn than irrigated corn**

Lawns use:

- 9 billion gallons of water per day
- 3 million tons of fertilizer per year
- 30,000 tons of pesticides per year
- 800 million gallons of gasoline per year

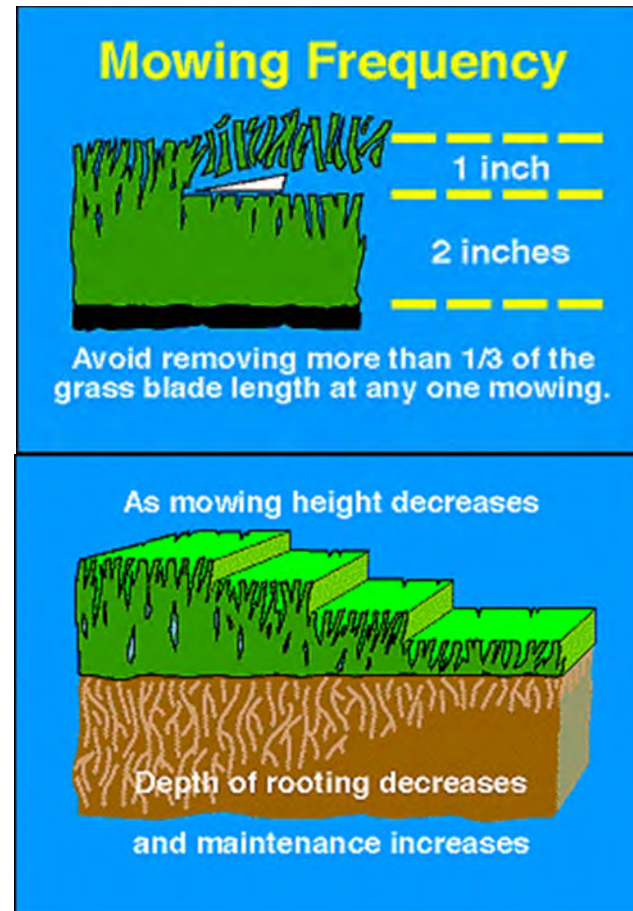
**\*\*17 million gallons of gas spilt each year refilling lawn mowers**



# Simple, Free Changes

## Mow Better

- Mow high – 3"
  - To promote deep roots
- Leave your clippings on the lawn
  - FREE fertilizer!
- Mow less frequently or not at all during dry spells
  - Grass has a natural dormancy in winter cold & summer heat
  - More time to play!





# Simple, Free Changes

## Smart Sprinkling

- Turn off your automatic irrigation system & only turn it on when you need it
- Or invest in an irrigation system with a rain and/or soil sensor.
- Inspect your sprinkler heads to see if they are misting or leaking. Replace them with pressure regulated heads!
- Lawns only need 1" of water per week – Including rain
- We use groundwater for irrigation AND drinking water





# UMN Low Maintenance Turf Examples



Fine Fescue mix planted in 2012. No maintenance or irrigation.



No Mow in high traffic area and dense shade.



# UMN Research Drought Research



Hard Fescue (top), Fine Fescue  
(bottom). Mowed to approx  
3"



Fine Fescue Drought test.



# Fescue Mix with No Spring Mowing



Hard Fescue with seedheads.



Fine Fescue with seedheads



# Maintenance Comparison



- Left side was the research plot. Mowed to a 1/2 inch. Seeded in 2016.
- Right is fine fescue mix receiving mowing twice a year, no herbicide. Approx 3". Had almost no weeds!

# Why go Low-Mow?

- Negative perceptions of turf all stem from management issues.
  - ▣ Uses too much water
  - ▣ Depletes soils of nutrients
  - ▣ Maintenance uses too much fossil fuels
  - ▣ Pollutes Surface/groundwater
- A seed mix that meets your **site conditions** and **proper installation** will yield a low input lawn.
- Low-Input Characteristics
  - ▣ Disease/pest resistance
  - ▣ Drought tolerance
  - ▣ Slow vertical growth
  - ▣ Low fertility needs



# Fine Fescue Species for Minnesota

## **Strong creeping red fescue**

- ♦ Often mixed with Kentucky bluegrass for partial shade
- ♦ Rhizomatous growth
- ♦ Disease problems
- ♦ Not as good in heat/drought

## **Chewings fescue**

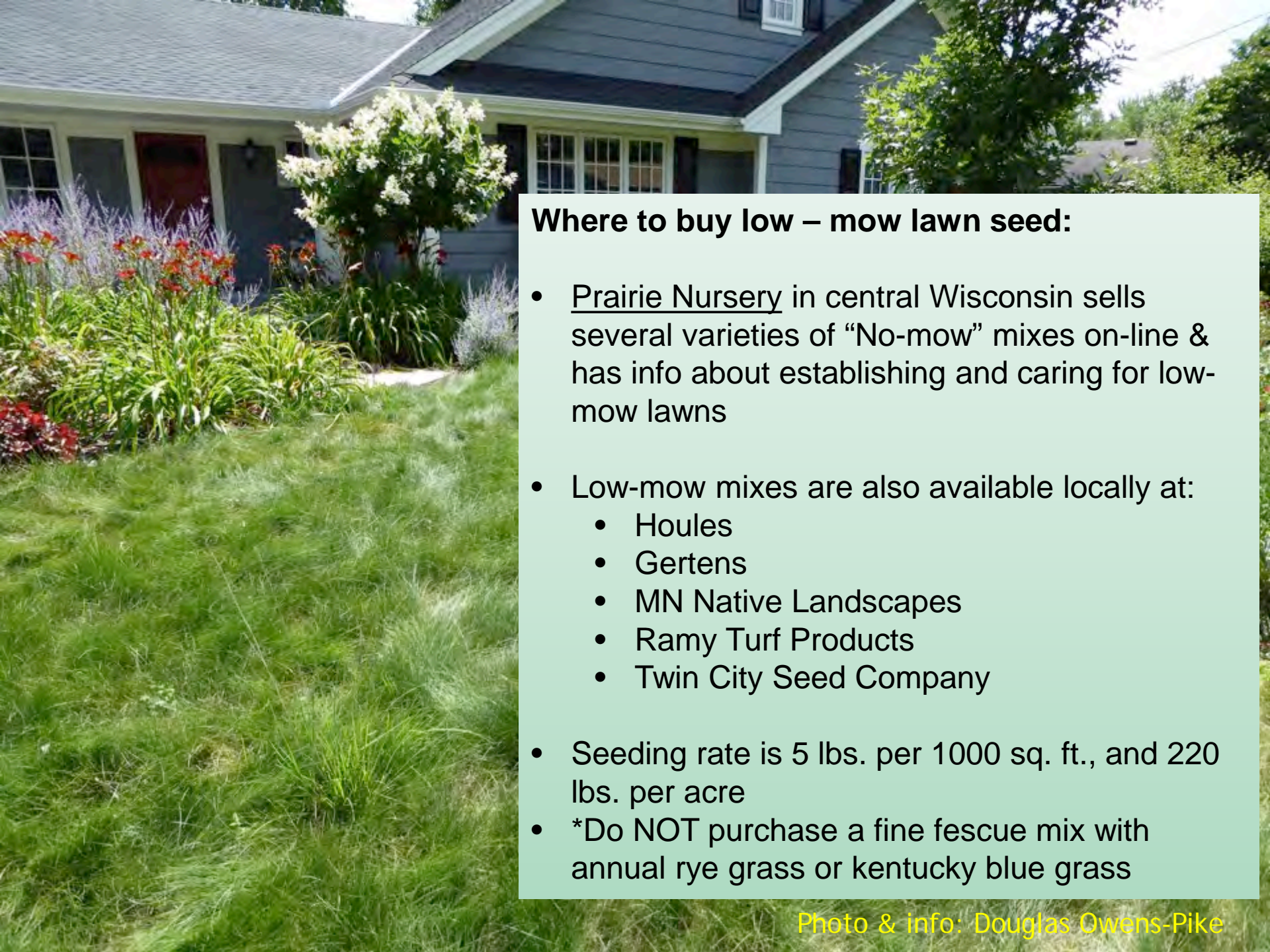
- ♦ Excellent density
- ♦ Very aggressive
- ♦ Summer-stress tolerance
- ♦ Snow-mold susceptibility
- ♦ Bunch-type

## **Slender creeping red fescue**

- ♦ Similar to strong creeping red fescue
- ♦ Salt-tolerance

## **Sheeps fescue**

- ♦ Slow vertical growth rate
- ♦ Lowest input
- ♦ Grayish-green color



## Where to buy low – mow lawn seed:

- Prairie Nursery in central Wisconsin sells several varieties of “No-mow” mixes on-line & has info about establishing and caring for low-mow lawns
- Low-mow mixes are also available locally at:
  - Houles
  - Gertens
  - MN Native Landscapes
  - Ramy Turf Products
  - Twin City Seed Company
- Seeding rate is 5 lbs. per 1000 sq. ft., and 220 lbs. per acre
- \*Do NOT purchase a fine fescue mix with annual rye grass or kentucky blue grass



# Installation Tips



## Site Prep & Install


- ▣ Kentucky bluegrass is your biggest competitor. Kill it well!
- ▣ Lightly rake or Aerate the lawn, then broadcast seed. No hydromulch needed.
- ▣ Ideal time is Late September-October
- ▣ Use a germination blanket to keep seeds moist until they sprout

## Maintenance

- ▣ Water lightly 4x/day until germination
- ▣ Do not over water, this will encourage weeds
- ▣ Mow 1x in the spring to deter seedheads.
- ▣ Mow 1x in the fall to deter snow mold. Does not tolerate dead material well.







Path rush (*Juncus tenuis*)  
on shadier southern end

### Non-Traditional Turfgrass Species:

- Buffalograss
- Blue Grama
- Texas Bluegrass
- Tufted Hairgrass
- Prairie Junegrass

Still need to gain public acceptance.

No mow on sunnier northern side





# BEE LAWN HOW-TO

## Let it happen







# BEE LAWN – Components

## Fine Fescue





# BEE LAWN FLORAL SPECIES



Self Heal  
(*Prunella vulgaris* ssp.  
*lanceolata*)



Creeping Thyme  
(*Thymus serpyllum*)



Dutch White Clover  
(*Trifolium repens*)



# BEE LAWN SPECIES: Native Flowers



- Ground Plum (*Astragalus crassicarpus*)
  - In the legume family. Great for soil health!
  - Good for sunny dry lawns
  - Loved by bumble and mason bees
- Lanceleaf coreopsis (*Coreopsis lanceolata*)
  - Late spring bloomer
  - Highly visited by long-horned bees
- Calico Aster (*Symphyotrichum lateriflorum*)
  - Late Fall bloomer
  - Many bees specialize on flowers in the aster family, such as sweat bees!



# BEE LAWN

## Overseeding existing lawn

- Scalp lawn to within 1"
- Rough-up soil with rake
  - Or aerate
- Seed with 3 flower species OR
- Seed with flowers and fescue





# BEE LAWN

## Seeding and care

- Mix seed with an organic fertilizer such as Sustane or Milorganite.
- Water daily, if no rain, for 2 weeks
  - After germination, no additional water (unless an unusual dry spell) or fertilizer needed
- Mow at 3" or higher infrequently to encourage flowers.

# Beyond the Lawn

- Shady groundcover
  - Moss
  - Strawberry
  - Wineleaf cinquefoil
  - Violets
  - Wild ginger



Photo source: Moss lawn [www.ecoterrallandscape.com](http://www.ecoterrallandscape.com)



Photo source: [steppables.com](http://steppables.com)







**Incorporate native plants**

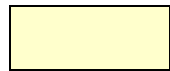
# Pre-settlement Native Plant Communities



Big Woods



Oak Openings & Barrens

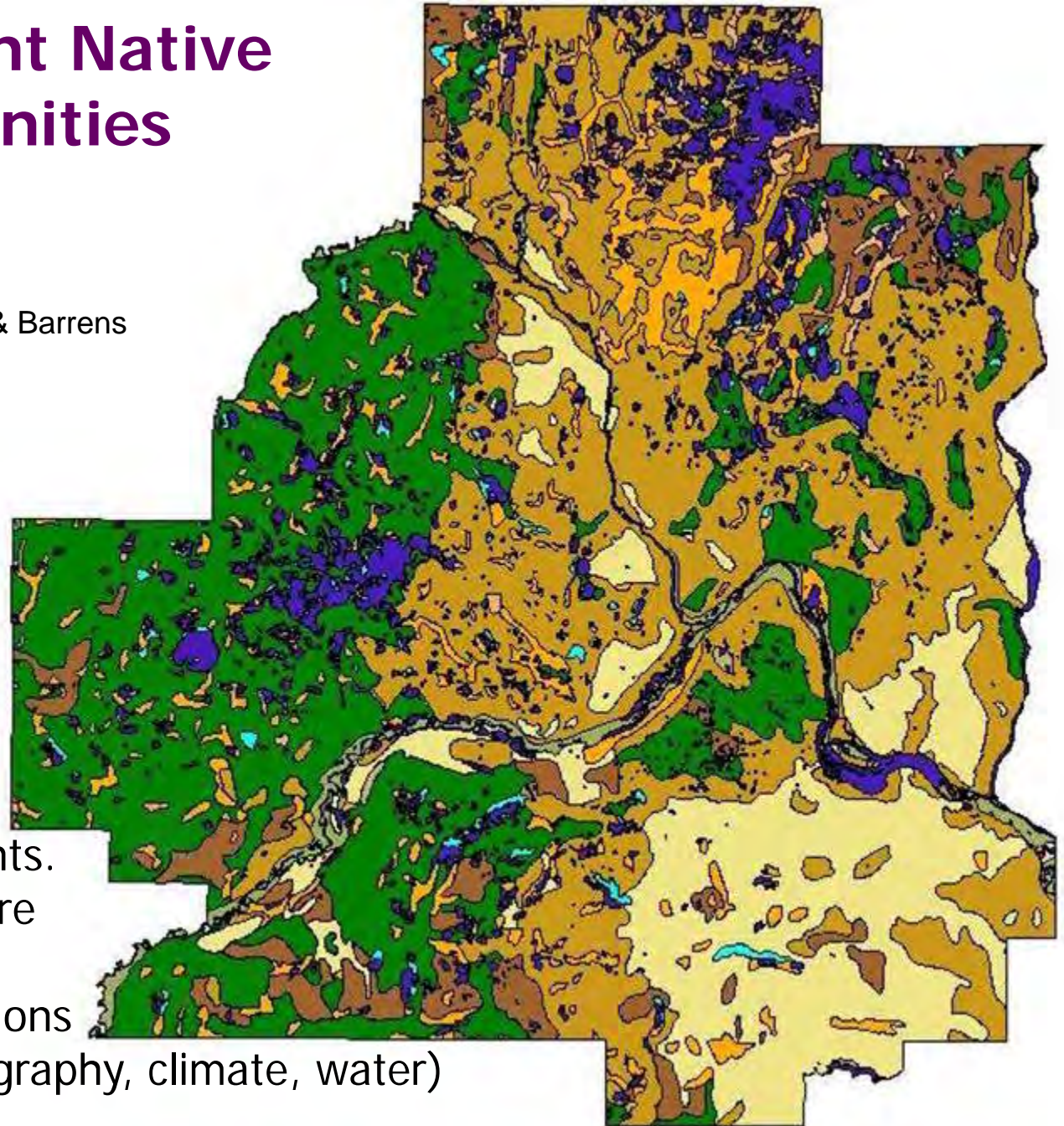


Prairie



Wet Meadow

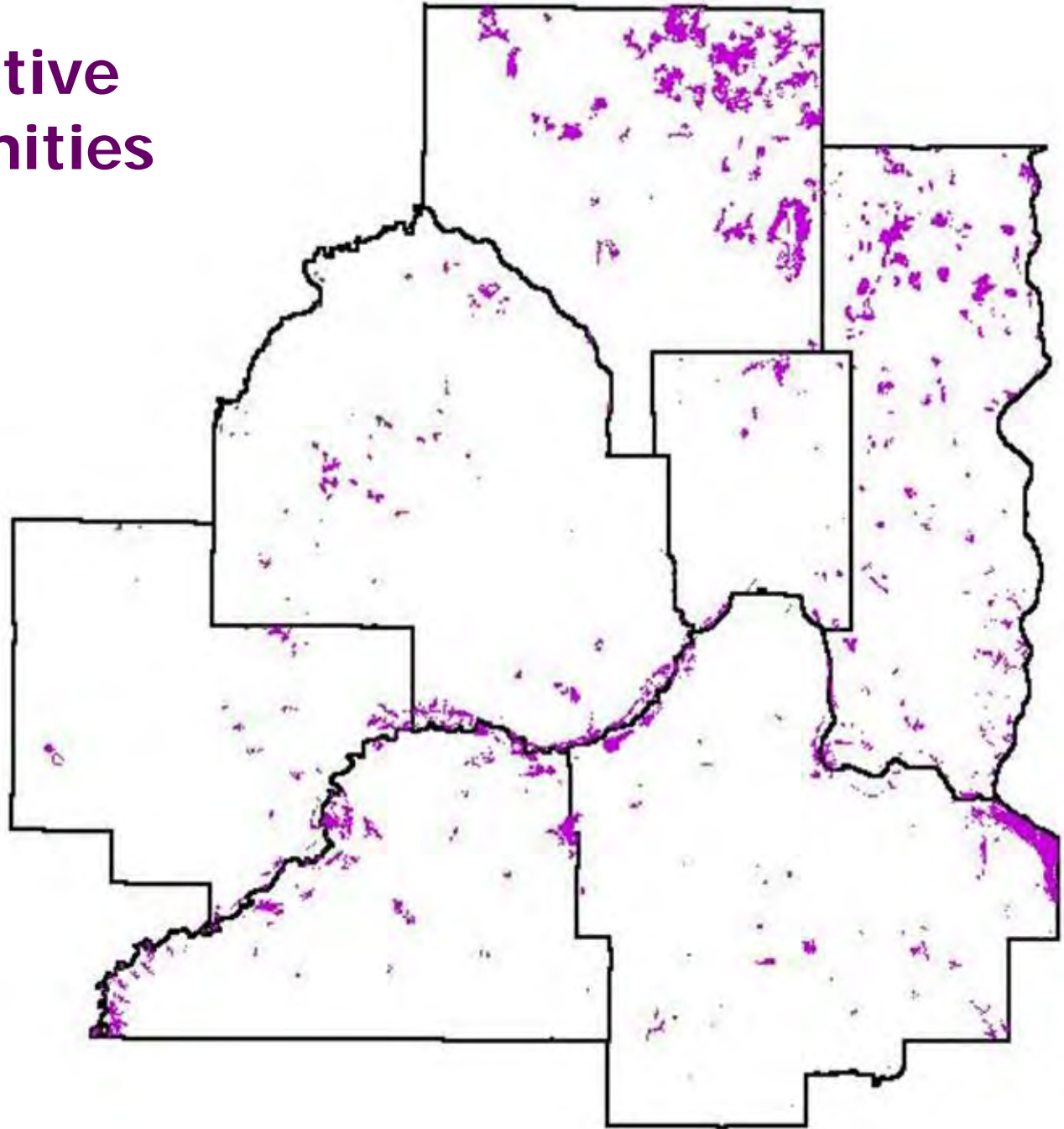
In nature, plants commonly grow in association with a particular group of other compatible plants. These communities are found where specific environmental conditions exist (e.g. soils, topography, climate, water)



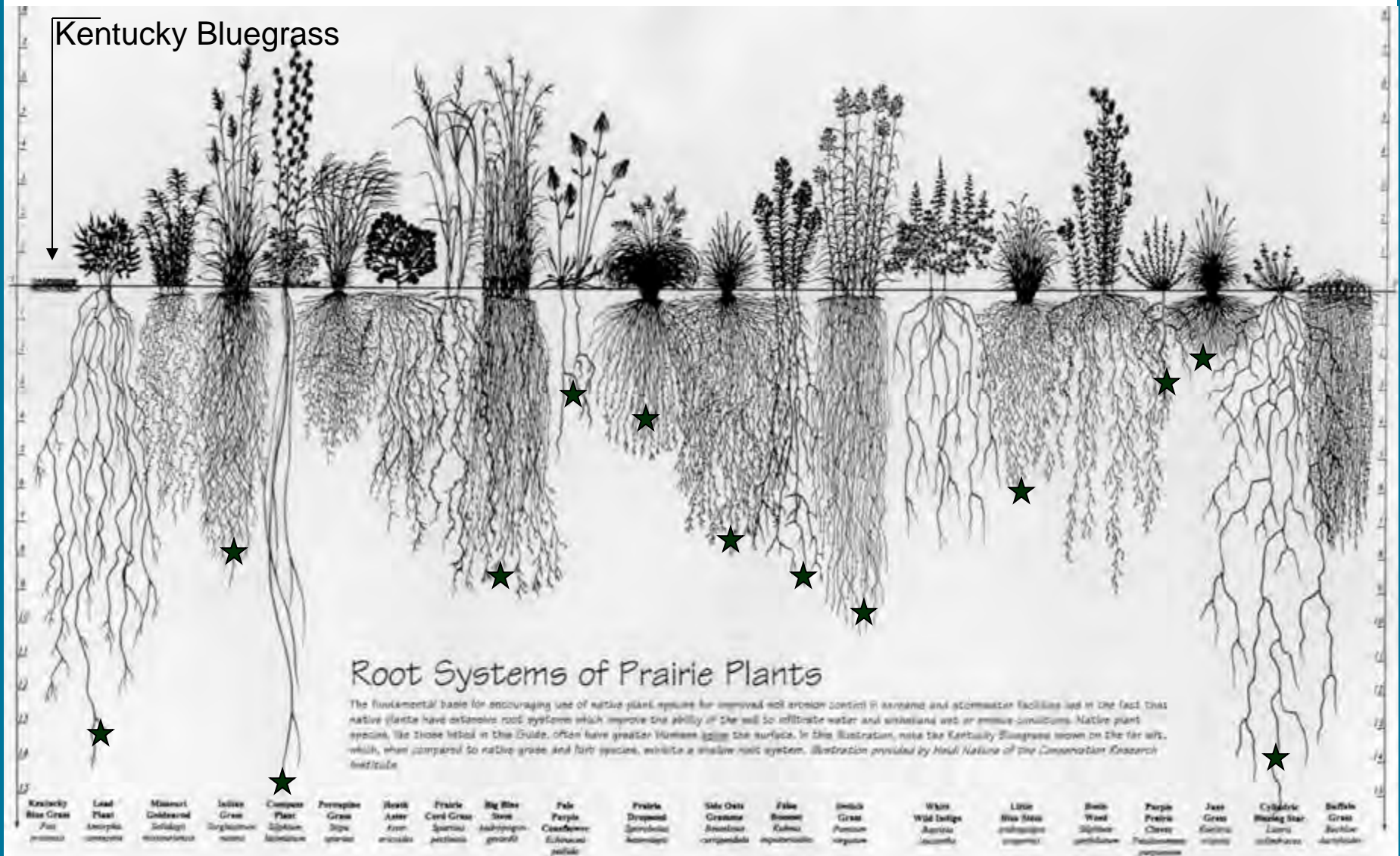


# Remaining Native Plant Communities

Vegetation removal and soil disturbance (and soil compaction) reduces the amount of runoff absorbed, increasing sediment-laden runoff into lakes, streams & wetlands.



# Roots of Native Prairie Plants







**Common Milkweed**

*Asclepias syriaca*





# Butterfly Milkweed

*Asclepias tuberosa*





**Butterfly weed**





**Marsh milkweed**





Wood thrush









**Stop growing grass where it doesn't want to grow**





Cardinal Flower

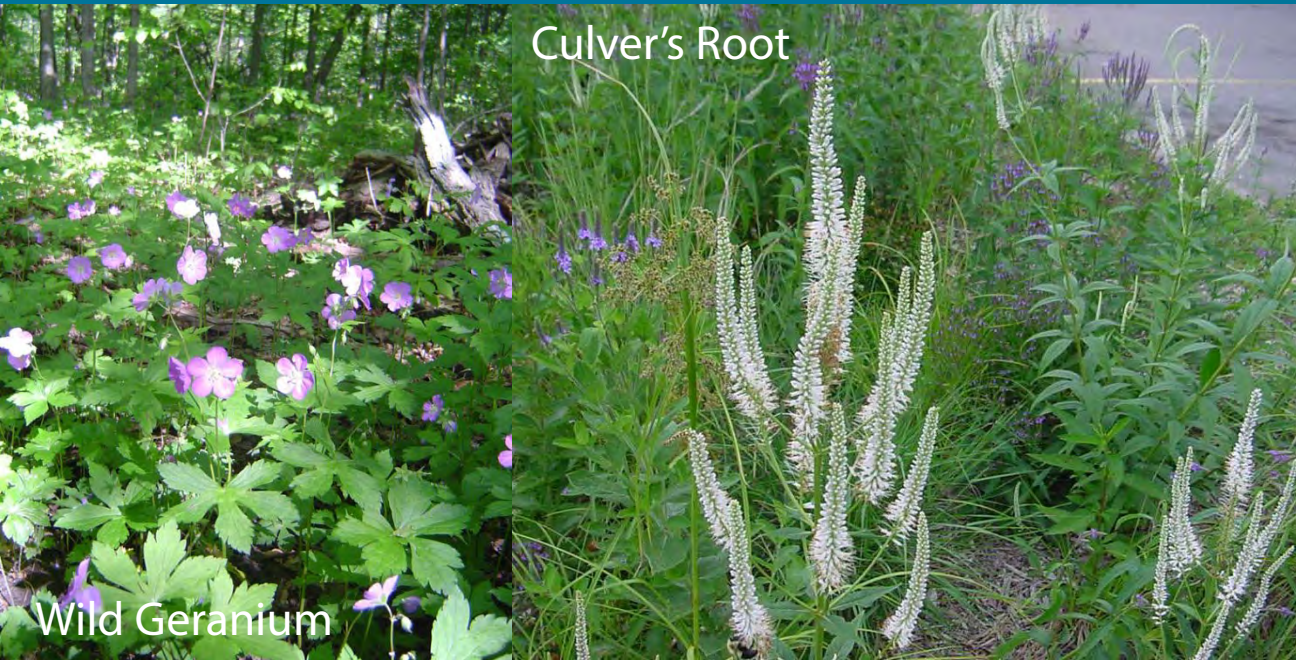
Yellow coneflower

Purple coneflower

Aster species



# Shady to Partial Shade



Culver's Root

Wild Geranium



Columbine



Lady Fern



Fox Sedge



# Partial Sun to Partial Shade



Culver's Root



Blue Lobelia



Turtlehead



Sprengel's Sedge



Bottle Gentian



# Full Sun



Prairie Dropseed



Coreopsis



Pale Purple Coneflower



Anise Hyssop



Black-eyed Susan



Butterfly Milkweed



# Full Sun



Prairie Blazing Star



Azure Aster



*Calamagrostis x acutiflora*  
'Karl Foerster'  
Feather Reed Grass



Meadow Blazing Star



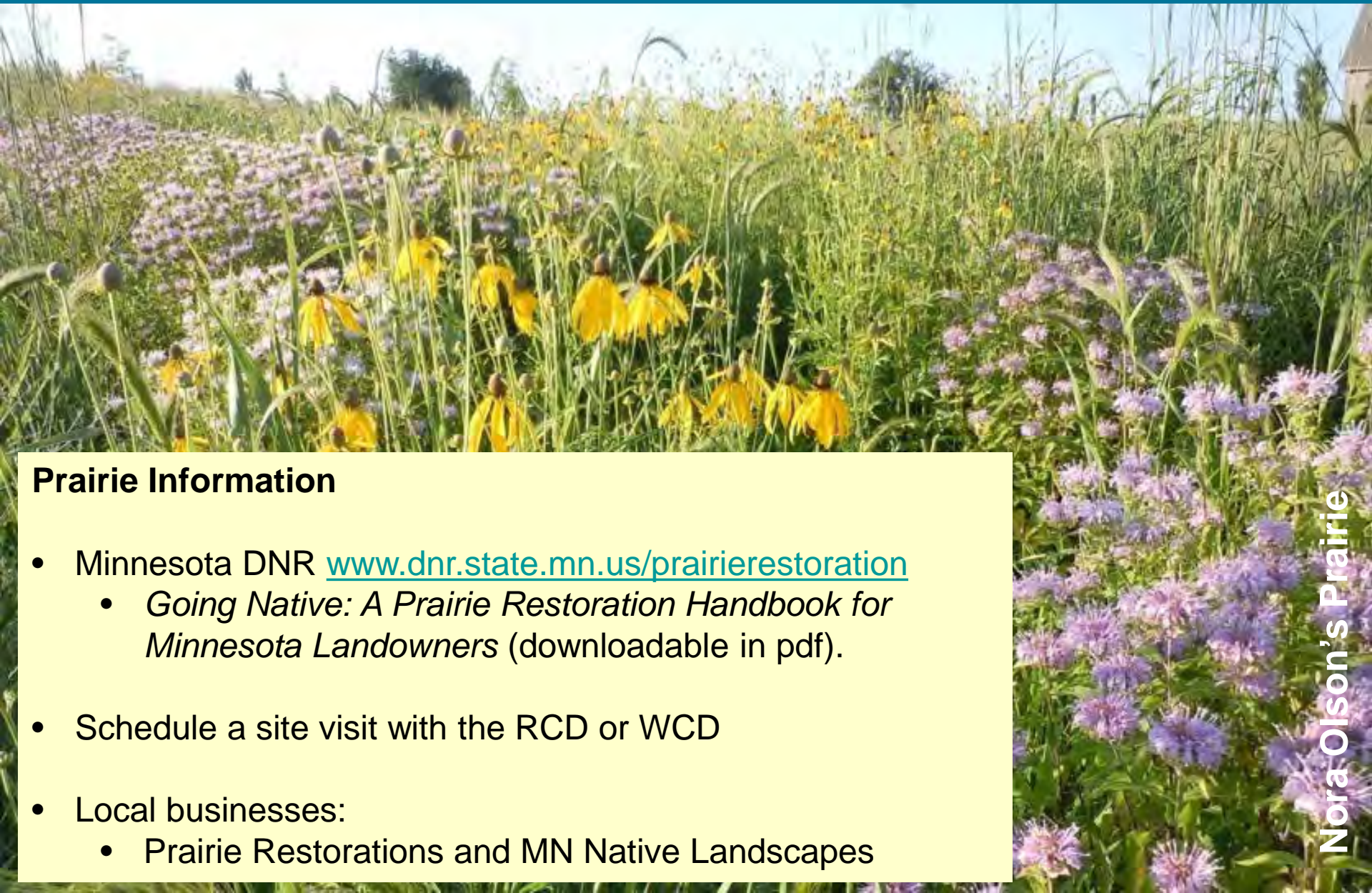
Side Oats Grama



Early Sunflower



# Prairies



## Prairie Information

- Minnesota DNR [www.dnr.state.mn.us/prairierestoration](http://www.dnr.state.mn.us/prairierestoration)
  - *Going Native: A Prairie Restoration Handbook for Minnesota Landowners* (downloadable in pdf).
- Schedule a site visit with the RCD or WCD
- Local businesses:
  - Prairie Restorations and MN Native Landscapes









# Woodland Management

- Aspen
- Tamarack
- Maple







College of Food, Agricultural  
and Natural Resource Sciences  
UNIVERSITY OF MINNESOTA

## Climate Change Field Guide for Northern Minnesota Forests: Site-level considerations and adaptation



Northern Forests Climate Hub  
U.S. DEPARTMENT OF AGRICULTURE



[forestadaptation.org/MN\\_field\\_guide](http://forestadaptation.org/MN_field_guide)

## MESIC HARDWOOD FOREST

### System Characteristics



Mesic Hardwood Forests generally occur on fine-textured soils or in areas with dense subsoil layers that retain water. These moist sites are generally protected from fire.



These forests develop dense, continuous canopies of shade-tolerant trees and shade-tolerant understory plants.



Water and nutrient availability follows a relatively predictable annual or seasonal pattern.



Common disturbances are individual canopy gaps or small patches created by wind, disease, or other fine-scale events.



MESIC HARDWOOD FOREST



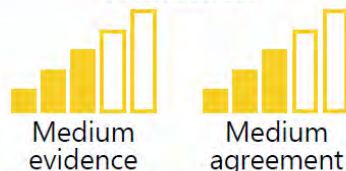


## Climate Change Vulnerability

### Overall Vulnerability:



### Confidence:



## Climate Change Impacts: Moderate



Droughts could increase stress in Mesic Hardwood Forests, and also raise the risk of pests, diseases and wildfire on drier sites.



Forest tent caterpillar and other pests may cause more frequent and severe damage in climate-stressed forests. New pests such as gypsy moth and Asian longhorned beetle present unknown risks.



Deer populations may increase with warmer winters, which may limit regeneration and the northward expansion of Mesic Hardwood species.



Deciduous forest types may have increased productivity with longer growing seasons and elevated carbon dioxide.



Earthworm activity may make these forests more susceptible to drought stress.

## Tree Species Projections

Projected changes for individual tree species across the Laurentian Mixed Forest Province by 2100, under low and high climate scenarios, as modeled by Tree Atlas and LANDIS. Species are presented roughly in order of importance for Mesic Hardwood Forests. Species marked with (+) or (-) have traits that might make them more or less adaptable to future change than indicated by the Tree Atlas model. See [Handler et al. \(2014\)](#) for more detail. The legend for this table is on page 21.

Species	Low Climate Change (PCM B1)		High Climate Change (GFDL A1FI)	
	Tree Atlas	LANDIS	Tree Atlas	LANDIS
Sugar maple +	▲	▲	▲	▲
American basswood	●	▲	▲	▲
Paper birch	●	▼	▼	▼
Quaking aspen	▼	▼	▼	▼
Northern red oak +	▲	▲	●	▼
Red maple +	▲	▲	▲	▲
Bur oak +	●	●	▲	●
Ironwood +	▲		▲	
Green ash	●	▲	▲	▲
Black ash -	●	▲	▼	▼
Yellow birch	▲	▲	▼	▼
White spruce	▼	▼	▼	▼
Northern white-cedar*	▼	▲	▼	▼
Eastern white pine	▲	▲	▲	▲
White oak +	▲	▲	▲	▲

\*Projected to increase in the Northern Minnesota Drift & Lake Plains Ecological Section ([Lucash et al. 2017](#)).



# FORESTED RICH PEATLAND

## System Characteristics



Forested Rich Peatlands are conifer-dominated wetlands on deep peat (>15 inches).



These systems exist on large, flat, poorly drained landscapes where the water table is typically below the peat surface and drops during the summer.



Topography is undulating, and hummocks remain dry and aerated enough to support trees and shrubs.



Peat accumulation requires saturated soils, cool conditions, and low oxygen levels to inhibit plant decomposition.



These systems are nutrient-poor, where nutrients typically come from rainfall, runoff from adjacent uplands, and groundwater.



## Climate Change Vulnerability

Overall Vulnerability:



Confidence:



## Climate Change Impacts: Negative



Forested Rich Peatlands function in a narrow range of water table conditions.



If water tables rise due to intense rainfall or increased precipitation, these systems could convert to open peatlands.



Water table changes may be more likely where roads, drainage ditches, or beaver dams have altered local hydrology



Longer, warmer growing seasons could cause peat to dry and decompose, allowing other forest species to invade.



Sphagnum moss may not tolerate warmer conditions.



Milder winters may increase winterburn or promote more frequent outbreaks of pests like tamarack sawfly and eastern larch beetle.



These systems sometimes occur within a matrix of Fire-Dependent Forests (such as jack pine), increasing wildfire risk if northern Minnesota has a more active wildfire regime in the future.



There are three basic Adaptation Options:

**PERSISTENCE**

***Resistance:*** Protect the system from change. Useful when trying to maintain a resource with high economic, cultural, or ecological value in the short-term.

***Resilience:*** Enable the system to rebound to normal conditions after disturbance. Useful with systems and species that can tolerate a wide range of environmental conditions and disturbance.

**CHANGE**

***Transition:*** Actively encourage change for long-term success. Useful in highly vulnerable systems or when resistance and resilience actions may be too risky.



Species Name	Climate Change Vulnerability	Tolerates	Risks
American (Wild) Plum	low-moderate		
American Linden (Basswood)	moderate-high	flooding	drought, Asian longhorned beetle
Balsam Fir	moderate-high		drought, air pollution
Black Cherry	high	drought	flooding, air pollution
Black Spruce	high	flooding	drought
Bur Oak	low	drought, pollution	bur oak blight, oak wilt, gypsy moth
Chokecherry	moderate-high		flooding, black knot
Common Purple Lilac	moderate		
Eastern Redbud	low-moderate	flooding	
Hazelnut	low	drought	
Norway Spruce	moderate		spruce budworm, flooding
Ohio Buckeye	low-moderate		Asian longhorned beetle, pollution
Paper Birch	moderate-high		gypsy moth, drought, pollution
Red Maple	low-moderate	flooding	Asian longhorned beetle, drought, pollution, maple decline
Red Pine	moderate		drought, pollution
Redosier Dogwood	low	flooding	
River Birch	moderate		gypsy moth, Asian longhorned beetle
Serviceberry (Juneberry)	low		drought, pollution
Sugar Maple	moderate-high		Asian longhorned beetle, flooding, pollution, maple decline
Tamarack	moderate	flooding	larch casebearer , larch sawfly
Washington Hawthorn	low	drought	
White Oak	low-moderate		Oak wilt, gypsy moth, flooding, air pollution
White Pine	moderate-high		white pine blister rust, drought, air pollution
White Spruce	moderate		spruce budworm





## Resources

Home energy audits

- [Xcel Energy](#)
- [CenterPoint Energy](#)

WCD site visits for conservation projects

MN DNR [Woodland Stewardship Program](#) and grants

Watershed District cost-share grants

Native plant sales – WCD Tree Sale – [BlueThumb.org](http://BlueThumb.org)

# MN DNR Cost-share for Woodland Owners

*Funds available until June 30, 2019*

- Reforestation and tree planting
- Removing invasive species such as buckthorn or garlic mustard
- Planting a native prairie to improve habitat for wildlife.
- **Woodland stewardship plans**
  - A \$300 payment will be made to the landowner if the following is met:
    - The plan is prepared by a [DNR approved plan writer](#).
    - The plan is approved by the DNR and registered.
    - The landowner applies for financial assistance before the plan is started or while the plan is in progress. Plans already completed before applying for financial assistance are not eligible.

[Andy McGuire](#) –Metro Area  
651-259-5827  
1200 Warner Road  
St Paul, MN 55106

[Jeff Wilder](#) –Sandstone Area  
763-284-7205  
800 Oak Savanna Lane  
Cambridge, MN, 55008





## Need plants?

### Master Gardener Plant Sale

- Washington – May 19 | 11am-3pm:
  - Washington County Fairgrounds

### Landscape Revival Native Plant Expo and Market

- June 1 | 9am-1pm – Shoreview
  - Shepherd of the Hills, 3920 Victoria St N
- June 8 | 9am-1pm – Oakdale City Hall

And many local native nurseries! Visit your local Wild Ones chapter website for more information.

# MINNESOTA & WESTERN WISCONSIN NATIVE PLANT NURSERIES



**SYMBOLS** d: Design Services i: Installation Services m: Maintenance Services

## 1 Blazing Star Gardens

**Phone:** 507-402-8337  
**Email:** blazingstargardens@gmail.com  
**Web:** www.blazingstargardens.com

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## 2 Boreal Natives

3943 Munger Shaw Road, Cloquet, MN 55720  
**Phone:** 218-729-7001  
**Email:** borealnatives@prairieresto.com  
**Web:** prairieresto.com/boreal\_natives.shtml

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## 3 Sogn Valley Farm

**Phone:** 763-614-8853  
**Email:** dana@sognvalleyfarm.com  
**Web:** www.sognvalleyfarm.com

Purchase at events & St. Paul Farmers' Market

## 4 Ecoscapes Sustainable Landscaping

**Phone:** 612-965-0848  
**Email:** info@ecoscapes1.com  
**Web:** www.ecoscapes1.com

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## 5 Glacial Ridge Growers

**Phone:** 320-634-0136  
**Email:** glacialridgegrowers@aol.com  
**Web:** www.glacialridgegrowers.com  
 St. Paul Farmers' Market on Saturdays

## 6 Shoreview Natives

1185 Shoreview Rd, Two Harbors, MN 55616  
**Phone:** 218-341-5286  
**Email:** shoreviewnatives@gmail.com  
**Web:** www.shoreviewnatives.com

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## 7 Landscape Alternatives

25316 St. Croix Trail, Shafer, MN 55074  
**Phone:** 651-257-4460  
**Email:** landscapealt@frontiernet.net  
**Web:** www.landscapealternatives.com

## 8 MN Native Landscapes

8740 77th St NE, Otsego, MN 55362  
**Phone:** 763-295-0010  
**Email:** bre@mnlcorp.com  
**Web:** www.mnnativelandscapes.com

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## 9 Morning Sky Greenery

44804 East Highway 28, Morris, MN 56267  
**Phone:** 320-795-6234  
**Email:** info@morningskygreenery.com  
**Web:** www.morningskygreenery.com

## 10 Natural Shore Technologies

1480 Cty Rd 90, Maple Plain, MN (new location)  
**Phone:** 612-703-7581  
**Email:** Rob.l@naturalshore.com  
**Web:** www.naturalshore.com

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## 11 Naturally Wild

**Phone:** 612-922-9279  
**Email:** info@naturallywildflowers.com  
**Web:** www.naturallywildflowers.com  
 Purchase at website-listed events.

## 12 Out Back Nursery

15280 110th St S, Hastings, MN 55033  
**Phone:** 651-438-2771  
**Email:** sales@outbacknursery.com  
**Web:** www.outbacknursery.com

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## 13 Bluprairie Native Plant Nursery

12975 32nd St, Watertown, MN 55388  
**Phone:** 612-720-7941  
**Email:** jdanie@bluprairie.com  
**Web:** www.bluprairie.com

## 14 Prairie Moon Nursery

32115 Prairie Lane, Winona, MN 55987  
**Phone:** 866-417-8156  
**Email:** info@prairiemoon.com  
**Web:** www.prairiemoon.com

Purchase online

## 15 Prairie Restorations Inc

31646 128th St NW, Princeton, MN 55371  
 21120 Ozark Court North, Scandia, MN 55012  
**Phone:** 800-837-5986  
**Email:** info@prairieresto.com  
**Web:** www.prairieresto.com

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## 16 Native Sun Seeds and Plants

St. Croix Valley, MN  
**Phone:** 651-318-8667  
**Email:** nativesunseedsandplants@gmail.com  
**Web:** www.nativesunseedsandplants.com

Purchase online or at website-listed events.

## 17 Shooting Star Native Seeds

20740 Cty Rd 33, Spring Grove, MN 55974  
**Phone:** 888-983-3670  
**Email:** info@ssns.co  
**Web:** www.shootingstarnativeseed.com

## 18 Sunshine Gardens Nursery and Landscaping

1286 Shadywood Shores Dr NW  
 Pine River, MN 56474  
**Phone:** 218-947-3154  
**Email:** sgardens@uslink.net  
**Web:** www.sunshinegardens.tripod.com

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## 19 Dragonfly Gardens

491 State Highway 46 Amery, WI  
**Phone:** 715 268-7660  
**Email:** info@dragonflygardens.net  
**Web:** www.dragonflygardens.net

## 20 Lupine Gardens

880 155th St, Amery, WI 54001  
**Phone:** 715-222-6669  
**Email:** lupinegardens@yahoo.com  
**Web:** www.lupinegardens.com

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## 21 Kinnickinnic Natives

235 State Road 65, River Falls, WI 54022  
**Phone:** 715 425 7605 or 715 222 6910  
**Email:** whuhnke@dishup.us  
**Web:** www.kinninnatives.com

## 22 Learning Pine Natives

3130 S Camp Amnicon Rd, South Range, WI  
**Phone:** 715-398-5453  
**Email:** phlina@gmail.com

Call for appointment.





## **Washington Conservation District Tree Sale**

- \$35.00 per bundle of 25 trees
- Bird packets are \$55.00 per bundle of 30 trees
  - 5 each of: Bur Oak, White Oak, Black Cherry, White Pine, Chokecherry, Wild plum

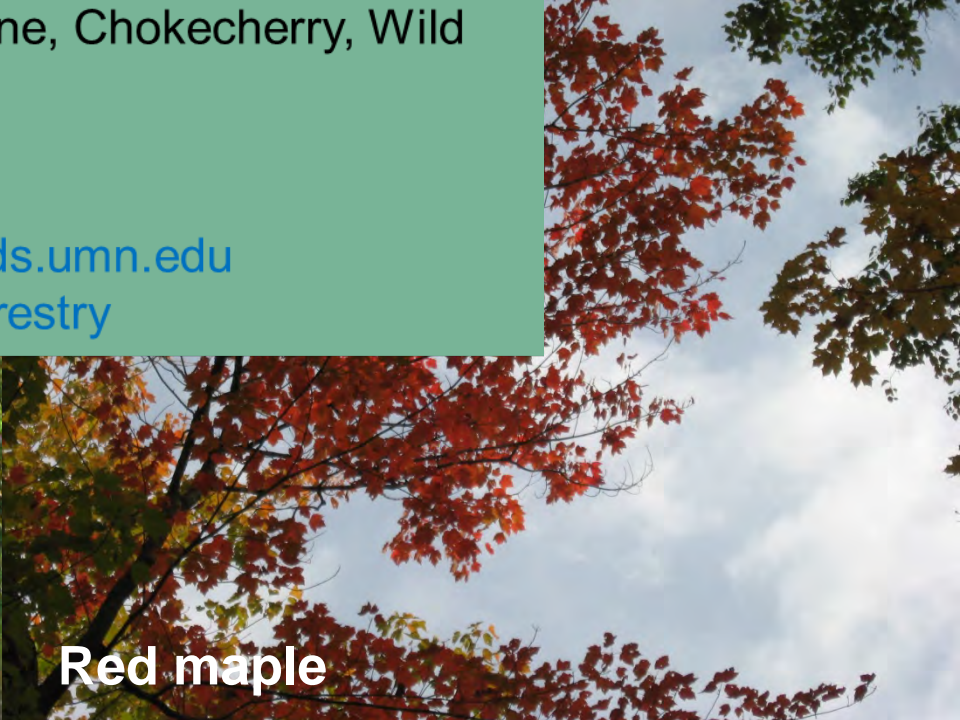
## **Web resources**

[www.myminnesotawoods.umn.edu](http://www.myminnesotawoods.umn.edu)

[www.dnr.state.mn.us/forestry](http://www.dnr.state.mn.us/forestry)



**White oak**



**Red maple**





# Questions?



**Angie Hong** – [angie.hong@mnwcd.org](mailto:angie.hong@mnwcd.org), 651-330-8220 x.35



**Washington Conservation District:** [www.mnwcd.org](http://www.mnwcd.org)



**Comfort Lake – Forest Lake WD –** [www.cflwd.org](http://www.cflwd.org)

Tara Kline – [tkline@mnwcd.org](mailto:tkline@mnwcd.org), 651-330-8220 x.28



**Carnelian-Marine-St. Croix WD–** [www.cmscwd.org](http://www.cmscwd.org)

Mike Isensee – [misensee@mnwcd.org](mailto:misensee@mnwcd.org), 651-330-8220 x.22



**Rice Creek Watershed District –** [www.ricecreek.org](http://www.ricecreek.org)

Bryan Pynn – [bpynn@mnwcd.org](mailto:bpynn@mnwcd.org), 651-330-8220 x.36