



New State Seed Mixes, When , Where and How to Use Them



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Workshop Goal:

Provide a foundation of knowledge for the selection of seed mixes



New State Seed Mixes, When , Where and How to Use Them



Project Types

- Roadside Seeding
- Prairie Reconstruction
- Stormwater Projects
- Wetland Reconstruction
- Woodland Restoration
- DNR Trails
- Agricultural and Urban BMPs



New State Seed Mixes, When , Where and How to Use Them



State Seed Mix Goals

- BWSR, Mn/DOT, DNR Mixes Combined
- Meeting Project/Ecological Needs Across the State
- Use of Ecologically Appropriate Species
- Promote Data Collection and Feedback
- Consistency in Recommendations and Standards



New State Seed Mixes, When , Where and How to Use Them



Additional Mix Considerations

- What's worked in the past?
- Reference plant communities
- Species availability
- What is the cost?
- What is the long-term sustainability and maintenance needs of the mix?



Numbering System

5-digit Numbering System for State Seed Mixes

The following table shows how seed mixes are numbered:

1st digit Native / Non-native	2nd digit Function	3rd digit Planting Area	4th digit Hydrology	5th digit Version
1: Hybrid	1: Cover Crop	1: Statewide	1: General	1: First version
2: Introduced	2: Mid-Term	2: South 1/2 and	2: Dry	2: Second version
3: Native	Stabilization	West 1/3	3: Dry mesic	3: etc.
4: Custom	3: Stormwater	3: NE and North	4: Mesic	
	Facilities	Central	5: Wet mesic	
	4: Wetland	4: NW*	6: Seasonally	
	5: Grassland	5: SW*	flooded	
	6: Woodland	6: SE*	7: Saturated	
		7: Central**	8: Emergent	
			9: Submergent	

Mix Number	Mix Name	Replaces
Cover Crop		
21-111	Oats Cover Crop	MNDOT 110, BWSR UT1
Use: Temporary cover crop for spring and summer plantings Range: Statewide		
21-112	Winter Wheat Cover Crop	MNDOT 100
Use: Temporary cover crop for fall plantings Range: Statewide		
21-113	Soil Building Cover Crop	MNDOT 130
Use: Temporary cover crop with soil building function Range: Statewide		



Mid-term Stabilization Native

32-241

Native Construction

BWSR U12, BWSR U11

Use: Mid-term soil stabilization using native species. Also suitable for sides of agricultural drainage ditches or low-diversity mesic prairie plantings.

Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.



Stormwater Facilities

33-261

Stormwater South and West

MNDOT 310, MNDOT 328, KESTREL TF

Use: Stormwater pond edges, temporarily flooded dry ponds, and temporarily flooded ditch bottoms.

Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.

33-262

Dry Swale / Pond

BWSR W4

Use: Temporarily flooded swales in agricultural settings.

Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.

33-361

Stormwater Northeast

BWSR W7

Use: Stormwater pond edges, temporarily flooded dry ponds, and temporarily flooded ditch bottoms.

Range: Laurentian Mixed Forest Province.



Wetland

34-171	Wetland Rehabilitation	BWSR WT3
Use: Inter-seeding into establishing wetlands after weed control spraying. Also suitable for two to five year short term soil stabilization for areas with saturated soils. Range: Statewide		
34-181	Emergent Wetland	BWSR W1
Use: Emergent wetland restoration for use in wetland mitigation, shoreline restoration, wet stormwater ponds where emergent vegetation is desired. Usually used in a 10 ft. band around open water Range: Statewide		
34-261	Riparian South & West	BWSR R1
Use: Native riparian and floodplain plantings for wetland mitigation, ecological restoration, or general permanent cover. Tolerates partial shade. Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.		
34-262	Wet Prairie	BWSR W3, MNDOT 325
Use: Wet prairie reconstruction for wetland mitigation or ecological restoration. Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.		
34-271	Wet Meadow South & West	BWSR W2
Use: Wet meadow / Sedge meadow reconstruction for wetland mitigation or ecological restoration projects Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.		
34-361	Riparian Northeast	BWSR R1
Use: Native riparian and floodplain plantings for wetland mitigation, ecological restoration, or general permanent cover. Tolerates partial shade. Range: Laurentian Mixed Forest Province.		
34-371	Wet Meadow Northeast	BWSR W2N
Use: Wet meadow / Sedge meadow reconstruction for wetland mitigation or ecological restoration. Range: Laurentian Mixed Forest Province.		



Native Grassland

35-221

Dry Prairie General

MNDOT 330

Use: General dry prairie mix for native roadsides, ecological restoration, or conservation program plantings.
Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.

35-241

Mesic Prairie General

MNDOT 350

Use: General mesic prairie mix for native roadsides, ecological restoration, or conservation program plantings.
Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.

35-421

Dry Prairie Northwest

BWSR U2

Use: Regional dry prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.
Range: Tallgrass Aspen Parklands Province, Red River Prairie Section, Hardwood Hills subsection of the MN & NE IA Morainal Section, may extend into the far western portions of the Laurentian Mixed Forest Province.

35-441

Mesic Prairie Northwest

BWSR U1

Use: Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.
Range: Tallgrass Aspen Parklands Province, Red River Prairie Section, Hardwood Hills subsection of the MN & NE IA Morainal Section, may extend into the far western portions of the Laurentian Mixed Forest Province.

35-521

Dry Prairie Southwest

BWSR U4

Use: Regional dry prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.
Range: North-Central Glaciated Plains Section.

35-541

Mesic Prairie Southwest

BWSR U3

Use: Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.
Range: North-Central Glaciated Plains Section.

35-621

Dry Prairie Southeast

BWSR U6

Use: Regional dry prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.
Range: Eastern Broadleaf Forest Province excluding Hardwood Hills subsection.

35-641

Mesic Prairie Southeast

BWSR U5

Use: Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.
Range: Eastern Broadleaf Forest Province excluding Hardwood Hills subsection.



Woodland

36-211

Woodland Edge South & West

BWSR U7, KESTREL WES

Use: Partly shaded grassland planting for native roadsides, reclamation, etc in southern and western MN.

Range: Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces.

36-311

Woodland Edge Northeast

BWSR U13, BWSR U14, KESTREL WEN

Use: Partly shaded grassland planting for native roadsides, reclamation, etc in north-central and northeast MN.

Increase cover crop in more erosion prone situations according to the chart.

Range: Laurentian Mixed Forest Province excluding Chippewa Plains, Pine Moraines & Outwash Plains, and Mille Lacs Uplands subsections.

36-411

Woodland Edge Northwest

KESTREL WEW

Use: Partly shaded grassland planting for native roadsides, reclamation, etc in far northwest MN.

Range: Tallgrass Aspen Parklands Province.

36-711

Woodland Edge Central

KESTREL WEC

Use: Partly shaded grassland planting for native roadsides, reclamation, etc in central MN.

Range: Chippewa Plains, Pine Moraines & Outwash Plains, and Mille Lacs Uplands subsections.



A Sample Mix



34-271 Wet Meadow South & West

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
fringed brome	<i>Bromus ciliatus</i>	1.23	1.10	9.18%	4.45
bluejoint	<i>Calamagrostis canadensis</i>	0.06	0.05	0.41%	5.00
Virginia wild rye	<i>Elymus virginicus</i>	1.12	1.00	8.37%	1.55
rice cut grass	<i>Leersia oryzoides</i>	0.28	0.25	2.07%	3.10
tall manna grass	<i>Glyceria grandis</i>	0.17	0.15	1.26%	3.90
fowl manna grass	<i>Glyceria striata</i>	0.11	0.10	0.83%	3.30
fowl bluegrass	<i>Poa palustris</i>	0.39	0.35	2.88%	16.50
	Total Grasses	3.36	3.00	25.00%	37.80
bristly sedge	<i>Carex comosa</i>	0.24	0.21	1.78%	2.36
pointed broom sedge	<i>Carex scoparia</i>	0.06	0.05	0.43%	1.60
awl-fruited sedge	<i>Carex stipata</i>	0.19	0.17	1.40%	2.10
tussock sedge	<i>Carex stricta</i>	0.03	0.03	0.21%	0.50
fox sedge	<i>Carex vulpinoidea</i>	0.16	0.14	1.13%	5.00
path rush	<i>Juncus tenuis</i>	0.04	0.04	0.34%	15.00
dark green bulrush	<i>Scirpus atrovirens</i>	0.20	0.18	1.48%	30.00
woolgrass	<i>Scirpus cyperinus</i>	0.09	0.08	0.67%	50.00
	Total Sedges and Rushes	1.01	0.90	7.44%	106.56
marsh milkweed	<i>Asclepias incarnata</i>	0.27	0.24	2.03%	0.43
common boneset	<i>Eupatorium perfoliatum</i>	0.02	0.02	0.18%	1.30
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	0.01	0.01	0.06%	1.00
spotted Joe pye weed	<i>Eutrochium maculatum</i>	0.02	0.02	0.18%	0.75
autumn sneezeweed	<i>Helenium autumnale</i>	0.03	0.03	0.23%	1.30
sawtooth sunflower	<i>Helianthus grosseserratus</i>	0.04	0.04	0.30%	0.20
great lobelia	<i>Lobelia siphilitica</i>	0.02	0.02	0.13%	2.90
blue monkey flower	<i>Mimulus ringens</i>	0.01	0.01	0.07%	6.80
Virginia mountain mint	<i>Pycnanthemum virginianum</i>	0.07	0.06	0.53%	5.10
giant goldenrod	<i>Solidago gigantea</i>	0.02	0.02	0.14%	1.50
eastern panicled aster	<i>Symphotrichum lanceolatum</i>	0.03	0.03	0.22%	1.50
red-stemmed aster	<i>Symphotrichum puniceum</i>	0.19	0.17	1.42%	5.00
tall meadow-rue	<i>Thalictrum dasycarpum</i>	0.01	0.01	0.12%	0.11
blue vervain	<i>Verbena hastata</i>	0.15	0.13	1.12%	4.61
bunched ironweed	<i>Vernonia fasciculata</i>	0.03	0.03	0.28%	0.30
Culver's root	<i>Veronicastrum virginicum</i>	0.01	0.01	0.12%	4.20
golden alexanders	<i>Zizia aurea</i>	0.28	0.25	2.06%	1.00
	Total Forbs	1.23	1.10	9.19%	38.00
Oats	<i>Avena sativa</i>	7.85	7.00	58.37%	3.12
	Total Cover Crop	7.85	7.00	58.37%	3.12
	Totals:	13.45	12.00	100.00%	185.48

Purpose:	Wet meadow / Sedge meadow reconstruction for wetland mitigation or ecological restoration projects
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. Mn/DOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.



A Sample Mix



Grasses



Functional Groups:

Cool-season grasses

Warm-season grasses

A Sample Mix



Sedges and Rushes



Functional Groups:
Sedges and Rushes

A Sample Mix

Forbs



Functional Groups:

Asters, Legumes, Other forbs

Mix Selection – Major Considerations



Numbering System

5-digit Numbering System for State Seed Mixes

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3: Native	3: Stormwater Facilities	3: NE and North Central	3: Dry mesic	3: etc.
4: Custom	4: Wetland	4: NW*	4: Mesic	
	5: Grassland	5: SW*	5: Wet mesic	
	6: Woodland	6: SE*	6: Seasonally flooded	
		7: Central**	7: Saturated	
			8: Emergent	
			9: Submergent	

Mix Selection – Major Considerations

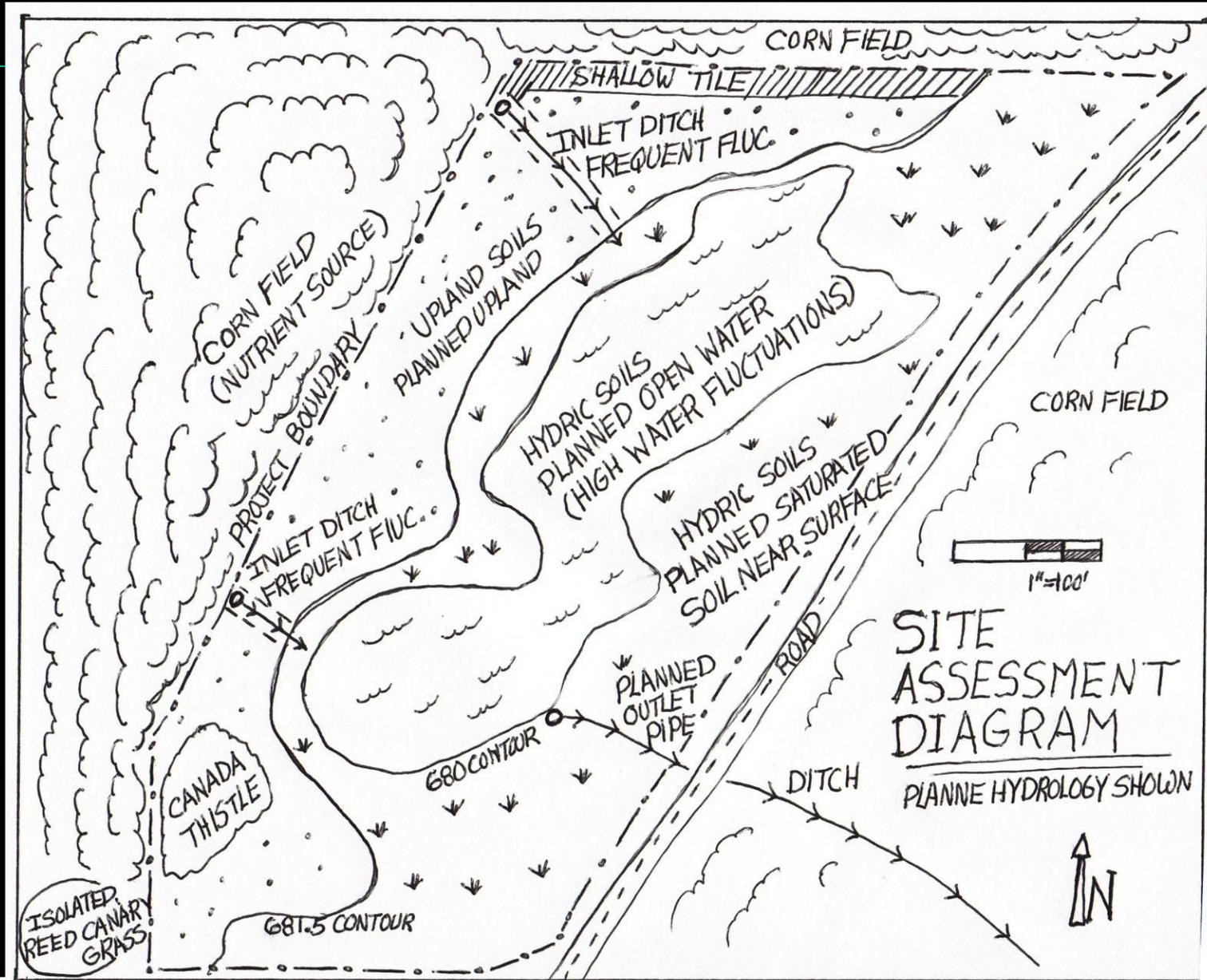


Sample Project



Mix Selection – Major Considerations

Diagram
of site
conditions



Mix Selection – Major Considerations



Question 1: Native vs. Non-native

Question 2: Functions/Plant Community

Question 3: Planting Area

Question 4: Hydrology

Question 5: Version

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Mix Selection – Major Considerations

Questions 1: Native vs. Non-native



What are the functional goals for the Project?

What impact might non-native species have?

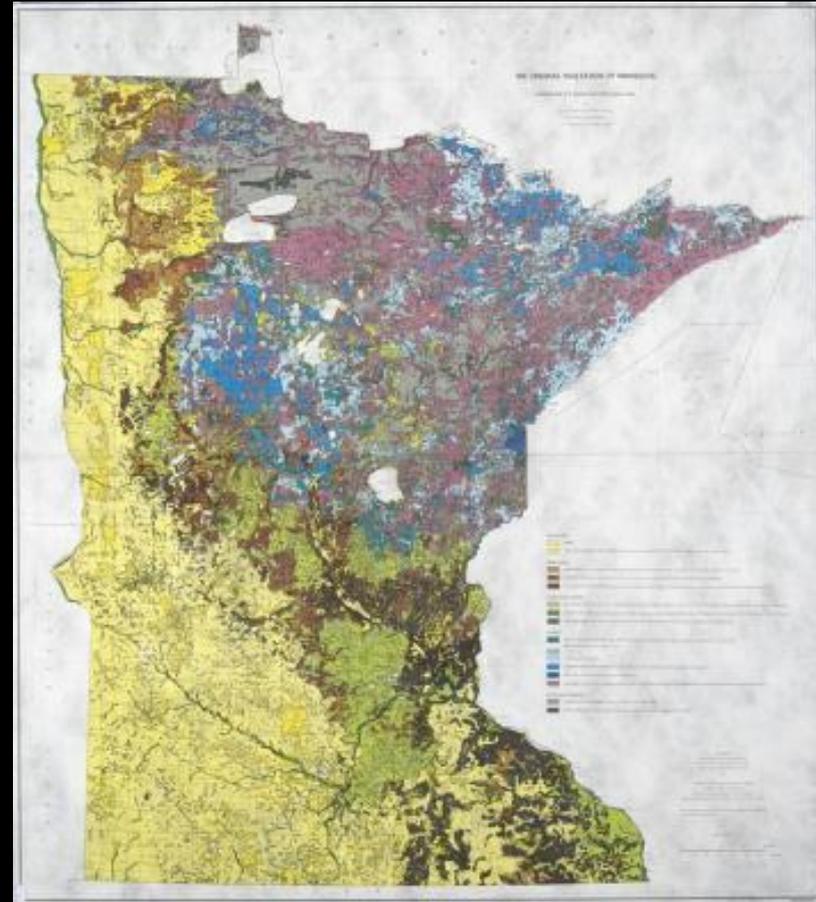
What are program requirements?

Mix Selection – Major Considerations

Questions 2: Function/Plant Community

Plant community decisions based on:

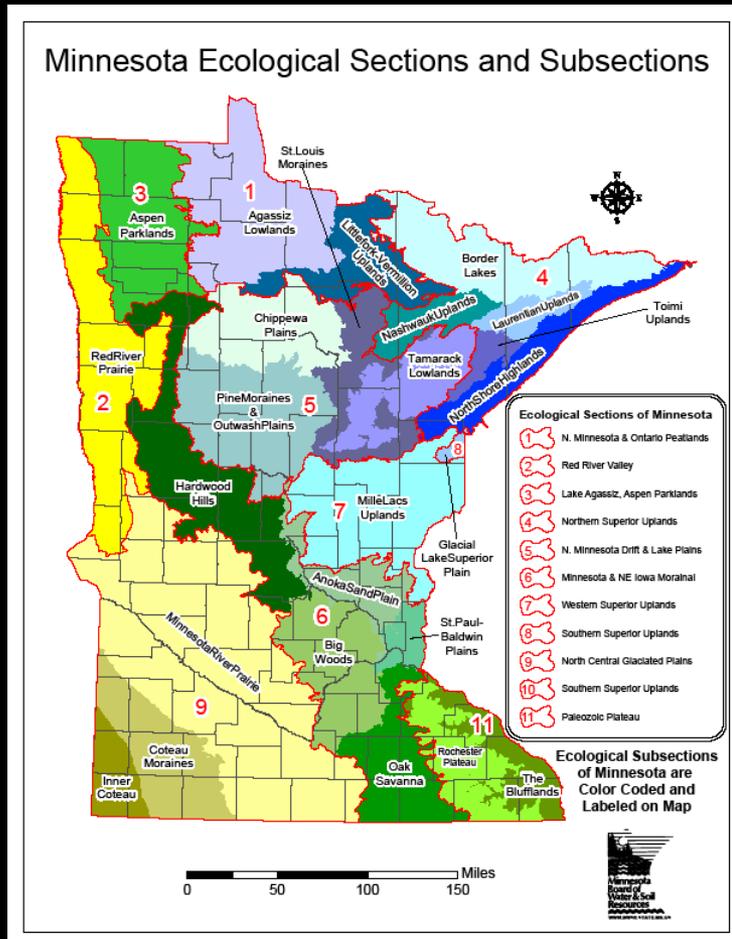
- Historic vegetation,
- Buffering/connecting adjacent habitats
- Current site conditions
- Functional goals (habitat, filtering, biodiversity, carbon, aesthetics)



Mix Selection – Major Considerations

Questions 3: Planting Area

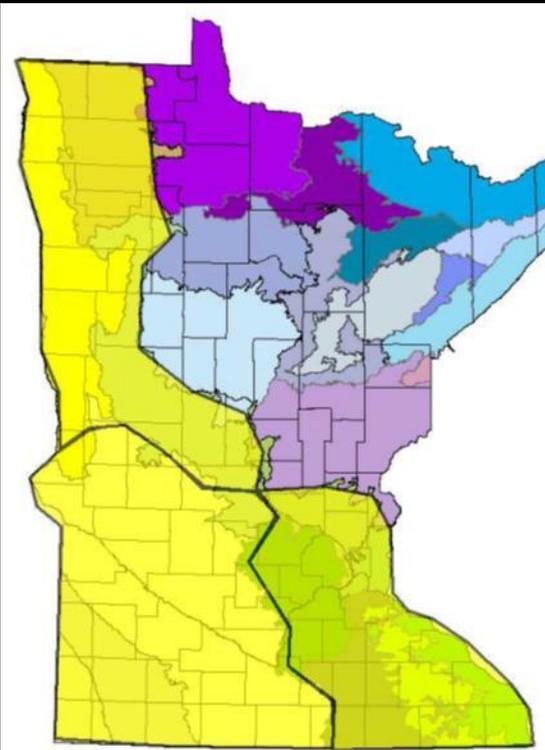
Minnesota DNR
Ecological Sections and
Subsections are used for
seed mix ranges.



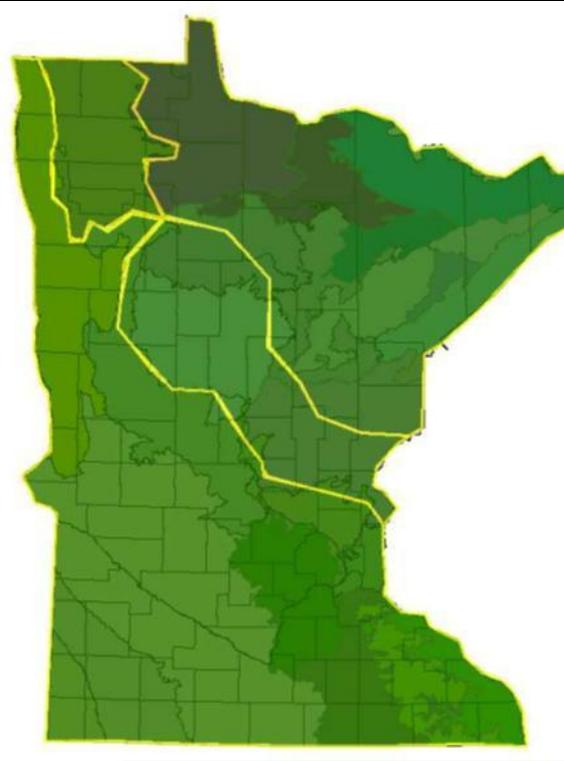
Mix Selection – Major Considerations

Questions 3: Planting Area

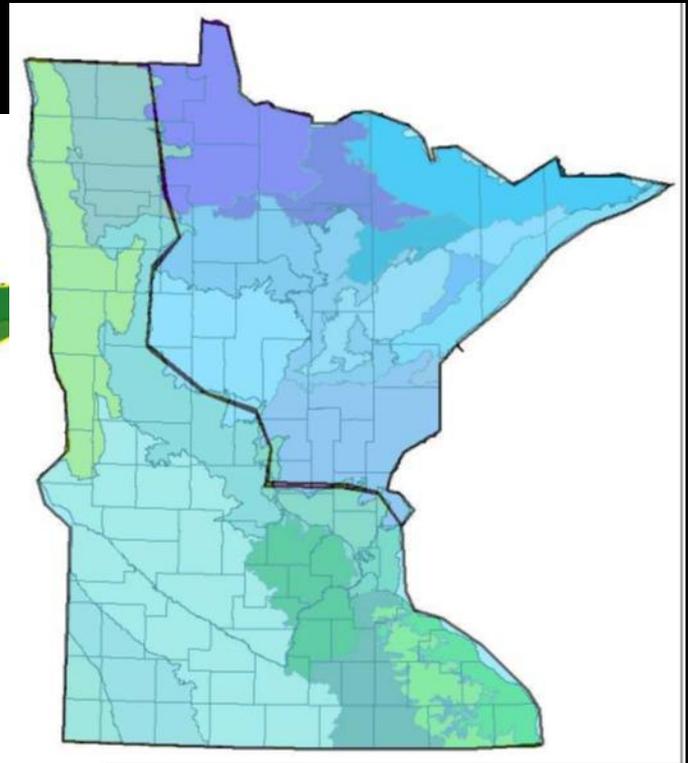
Grassland Mixes



Woodland Mixes



Wetland Mixes



Areas: Statewide, South 1/2 West 1/3, NE and North Central, NW, SW, SE, Central

Mix Selection – Major Considerations



Questions 4: Hydrology



Hydrology Types:

Dry

Dry Mesic

Mesic

Wet Mesic

Seasonally Flooded

Saturated

Emergent

Submergent

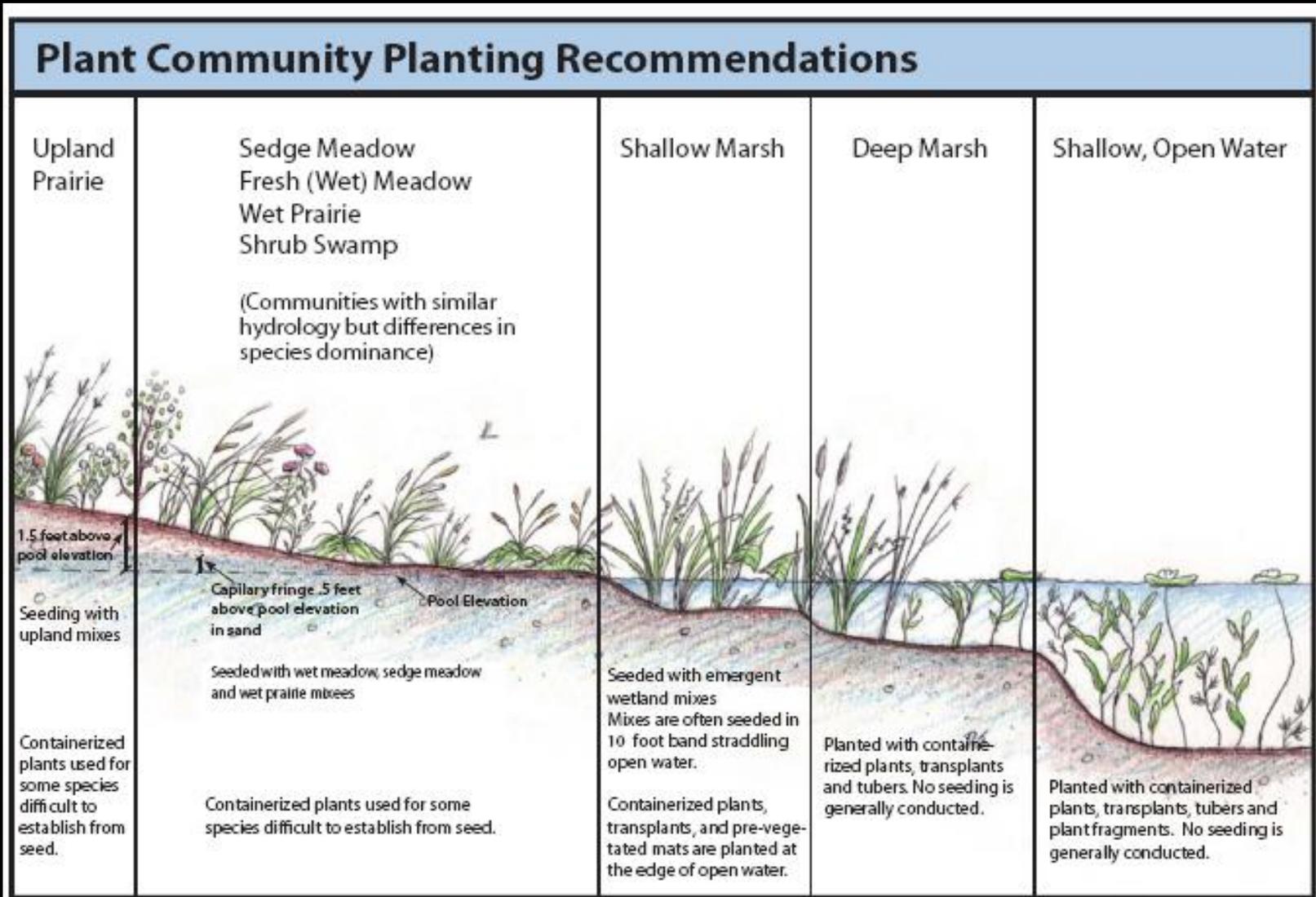
Mix Selection – Major Considerations

Questions 5: Version

- All mixes are version one, changes again in approx. 3-4 years
- Collecting Data on Mixes



Other Mix Considerations



Other Mix Considerations



Recommended Dates / Vegetation Type

Vegetation Type	Spring/Early Summer	Mid-Summer	Early Fall	Late Fall (Dormant Seeding)	Snow Seeding
Prairie Grasses	Apr.15 - Jun 30	*	Aug 1 - Oct 1	Oct 15 - Frozen Soil	Feb 15 - April 7
Prairie Sedges and Forbs	Apr.1 - Jun 30	*	Aug 1 - Oct 1	Oct 15 - Frozen Soil	Feb 15 - April 7
Wetland Grasses	Apr.1 - Jun 30	*	Aug 1 - Oct 1	Oct 15 - Frozen Soil	Feb 15 - April 7
Wetland Sedges and Forbs	Apr.1 - Jun 30	*	Aug 1 - Oct 1	Oct 15 - Frozen Soil	Feb 15 - April 7
Native Construction Mix	Apr.1 - Jun 30	*	Aug 1 - Oct 1	Oct 15 - Frozen Soil	Feb 15 - April 7
Oats Cover	Apr.1 - Jun 30	*	**	Oct 15 - Frozen Soil	Feb 15 - April 7
Winter Wheat Cover	**	*	Aug 1 - Oct 1	Oct 15 - Frozen Soil	Feb 15 - April 7

Success Rates:

High Success Rates
Medium Success Rates
Low Success Rates
* Not Recommended Without Watering
** Not Recommended

Note: Planting dates will vary from northern to southern Minnesota.

Notes about success rates: Success is less predictable for optional vegetation types and seeding dates, so use the recommended dates for each vegetation type unless construction sequencing or other factors make that impossible. For example, if the state of Minnesota "Native Construction" mix is used in early fall watering is recommended to aid

Other Mix Considerations



Seedbank



Working toward a consistent recommendation for maximizing seedbank (“local seed”)

Other Mix Considerations



Weed Pressure



We are still learning how to compete with reed canary grass. Quick establishment of diverse native species definitely helps.



Other Mix Considerations

Planting Methods



Seeding methods should be tailored to seed type and site conditions.

Other Mix Considerations

Maintenance Ability



Resources



Native Vegetation Establishment and Enhancement Guidelines

New guidelines were developed By BWSR In 2009 for the use of native species

www.bwsr.state.mn.us/native_vegetation/



NATIVE VEGETATION ESTABLISHMENT AND ENHANCEMENT GUIDELINES 12/23/09



Intent: This document summarizes current guidelines for the use of native seed and plants (herbaceous and woody). Consistent with the following legislation, projects are required to use local sources of plant materials and strive for diversity levels that will provide high levels of ecological function.

(2009 Legislation) "To the extent possible, any person conducting a restoration with money appropriated in this section must plant vegetation or sow seed only of ecotypes native to Minnesota, and preferably of the local ecotype, using a high diversity of species originating from as close to the restoration site as possible, and protect existing native prairies from genetic contamination."

The following guidelines apply to BWSR programs across the state for seed and plants.

Diversity Levels: High species diversity is recommended for projects to promote native community stability and function, to provide benefits to multiple wildlife species and to prevent establishment of invasive species. Diversity levels may vary depending on the target plant community, site conditions and project goals. The following table provides baseline diversity levels for a range of project conditions and goals.

Current Site Conditions	Soil Stabilization	Water Quality	Channel Bank Restoring	Habitat for Multiple Wildlife Groups	Native Plant Community Restoration (marsh and wetland restoration)	Native Plant Community Restoration (prairie, savanna, shrub)
Natural Areas with High Species Diversity	15	20	30	30	30	40
Some Intact Ecological Characteristics	10	20	25	25	25	35
Agricultural Field	10	15	10	20	20	25
Disturbed Site (Urban Soils, Compactive etc.)	5	10	15	20	20	25
Disturbed Site with High Invasive Species Risk	5	5	15	20	20	20

Resources



Native Vegetation Establishment and Enhancement Guidelines

Recommended process for finding seed included with guidelines

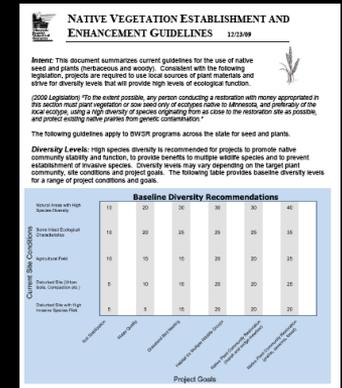
When bidding:

-Keep seed mixes and range requirements consistent

-In most cases it doesn't come down to the least expensive bid

-Bid scoring is recommended to compare cost and source criteria together.

www.bwsr.state.mn.us/native_vegetation/



State Seed Mix Substitution Table

This table lists approved substitutions for species in state seed mixes. The substitutions are based on relative costs and functional group/ecological role within a seed mix.

Minnesota Ecological Sections are listed next to species with limited ranges. Substituted species are to be used only in those regions of the state. Species without ecological sections can be used statewide.

[Nomenclature follows that used by GRIN Taxonomy for Plants](#)

Grasses				
Common Name	Botanical Name	Acceptable Substitutions		
Big Bluestem	<i>Andropogon gerardi</i> (2-9)	<i>Sorghastrum nutans</i>	<i>Bromus ciliatus</i> (1-9)	<i>Panicum virgatum</i> (3,4,7-9)
American Slough grass	<i>Beckmannia syzigachne</i>	<i>Leersia oryzoides</i>		
Sideoats Grama	<i>Bouteloua curtipendula</i> (3-4,6-9)	<i>Koeleria macrantha</i> (3-9)	<i>Bouteloua hirsuta</i> (3-4, 7-9)	
Blue Grama	<i>Bouteloua gracilis</i> (3,4,7-9)	<i>Bouteloua hirsuta</i> (3-4, 6-9)	<i>Koeleria macrantha</i> (3-9)	
Fringed Brome	<i>Bromus ciliatus</i> (1-9)	<i>Panicum virgatum</i> (3,4,7-9)	<i>Muhlenbergia glomerata</i>	
Kalm's Brome	<i>Bromus kalmii</i> (2-8)	<i>Hesperostipa spartea</i> (2-9)	<i>Bromus purgans</i> (4,6-9)	
Bluejoint Grass	<i>Calamagrostis canadensis</i>	<i>Calamagrostis stricta</i> (2,5, 8,9)	<i>Muhlenbergia racemosa</i>	
Poverty Oats	<i>Danthonia spicata</i> (1-4, 4-6, 8-9)	<i>Carex sprengeii</i>		
Canada Wildrye	<i>Elymus canadensis</i>	<i>Elymus riparius</i>	<i>Elymus villosus</i> (1,3-4, 7-9)	
Bottlebrush Grass	<i>Elymus hystrix</i> (<i>Hystrix patula</i>)	<i>Bromus purgans</i> (6-8)	<i>Bromus kalmii</i> (2-8)	
Slender Wheat Grass	<i>Elymus trachycaulus</i>	<i>Elymus canadensis</i>	<i>Stipa spartea</i> (3-4, 8-9)	
Virginia Wildrye	<i>Elymus virginicus</i>	<i>Elymus riparius</i>	<i>Bromus purgans</i> (4,6-9)	<i>Elymus villosus</i>
Western Wheat Grass	<i>Pascopyrum smithii</i> (3,4,7-9)	<i>Muhlenbergia cuspidata</i> ((3-4, 7-9)	<i>Muhlenbergia glomerata</i>	<i>Nassella viridula</i> (4.9)
Reed Manna Grass	<i>Glyceria grandis</i>	<i>Glyceria striata</i>		
Fowl Manna Grass	<i>Glyceria striata</i>	<i>Glyceria canadensis</i> (1,2,5,6)	<i>Muhlenbergia glomerata</i>	
Porcupine Grass	<i>Hesperostipa spartea</i> (2-9)	<i>Sporobolus heterolepis</i> (3-4, 7-9)	<i>Dichanthelium oligoanthos</i>	
June Grass	<i>Koeleria macrantha</i> (3-9)	<i>Sporobolus heterolepis</i> (3-4, 7-9)	<i>Hesperostipa spartea</i> (2-9)	
Cut-grass, rice	<i>Leersia oryzoides</i>	<i>Leersia virginica</i> (6-9)		
Switch Grass	<i>Panicum virgatum</i> (3,4,7-9)	<i>Andropogon gerardi</i> (2-9)	<i>Bromus ciliatus</i> (1-9)	<i>Sorghastrum nutans</i>
Fowl Bluegrass	<i>Poa palustris</i>	<i>Leersia oryzoides</i>		
False Melic	<i>Schizachne purpurascens</i> (1-8)	<i>Calamagrostis canadensis</i>	<i>Elymus hystrix</i>	
Little Bluestem	<i>Schizachyrium scoparium</i> (2-9)	<i>Koeleria macrantha</i> (3-9)	<i>Sporobolus heterolepis</i> (3-4, 7-9)	
Indian Grass	<i>Sorghastrum nutans</i> (3,4,7-9)	<i>Andropogon gerardi</i> (2-9)	<i>Bromus ciliatus</i> (1-9)	
Prairie Cordgrass	<i>Spartina pectinata</i>	<i>Calamagrostis canadensis</i>	<i>Calamagrostis stricta</i> (2,5,8,9)	
Sand Dropseed	<i>Sporobolus cryptandrus</i>	<i>Calamovilfa longifolia</i> (3-5, 7-9)	<i>Hesperostipa spartea</i> (2-9)	
Prairie Dropseed	<i>Sporobolus heterolepis</i> (3-4, 7-9)	<i>Hesperostipa spartea</i> (2-4, 6-9)		
Green Needle Grass	<i>Nassella viridula</i> (4,9)	<i>Calamovilfa longifolia</i> (3-5, 7-9)	<i>Sporobolus heterolepis</i> (3-4, 7-9)	

Sedges & Rushes			
Common Name	Botanical Name	Acceptable Substitutions	
Bottlebrush Sedge	<i>Carex comosa</i> (1,5-9)	<i>Carex hystericina</i>	<i>Carex crinita</i>
Porcupine Sedge	<i>Carex hystericina</i>	<i>Carex stricta</i>	<i>Carex crinita</i>
Lake Sedge	<i>Carex lacustris</i>	<i>Carex stricta</i>	
Wooly Sedge	<i>Carex pellita</i>	<i>Carex haydenii</i>	<i>Carex stricta</i>

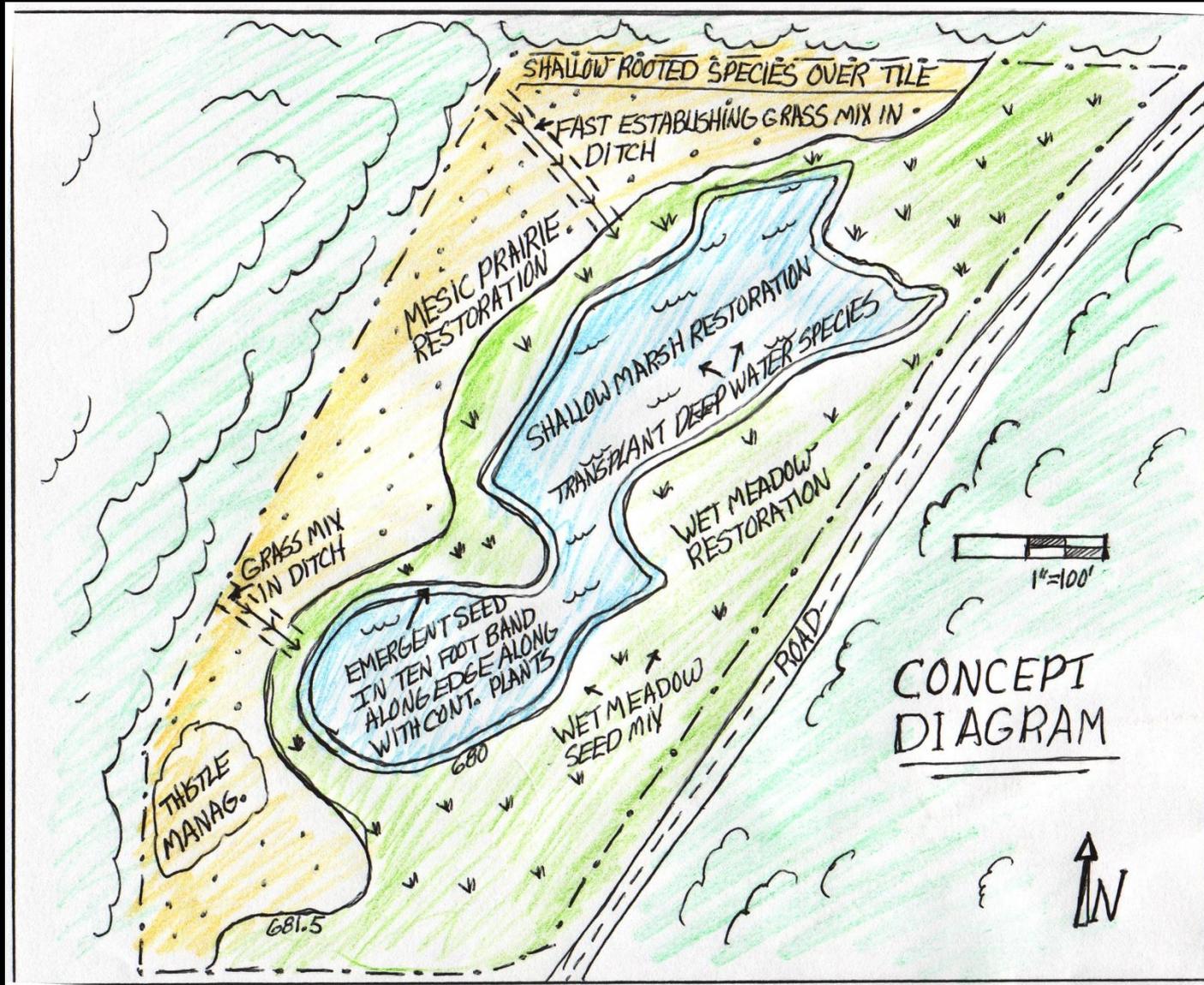


Sample Project – What mixes would you use?



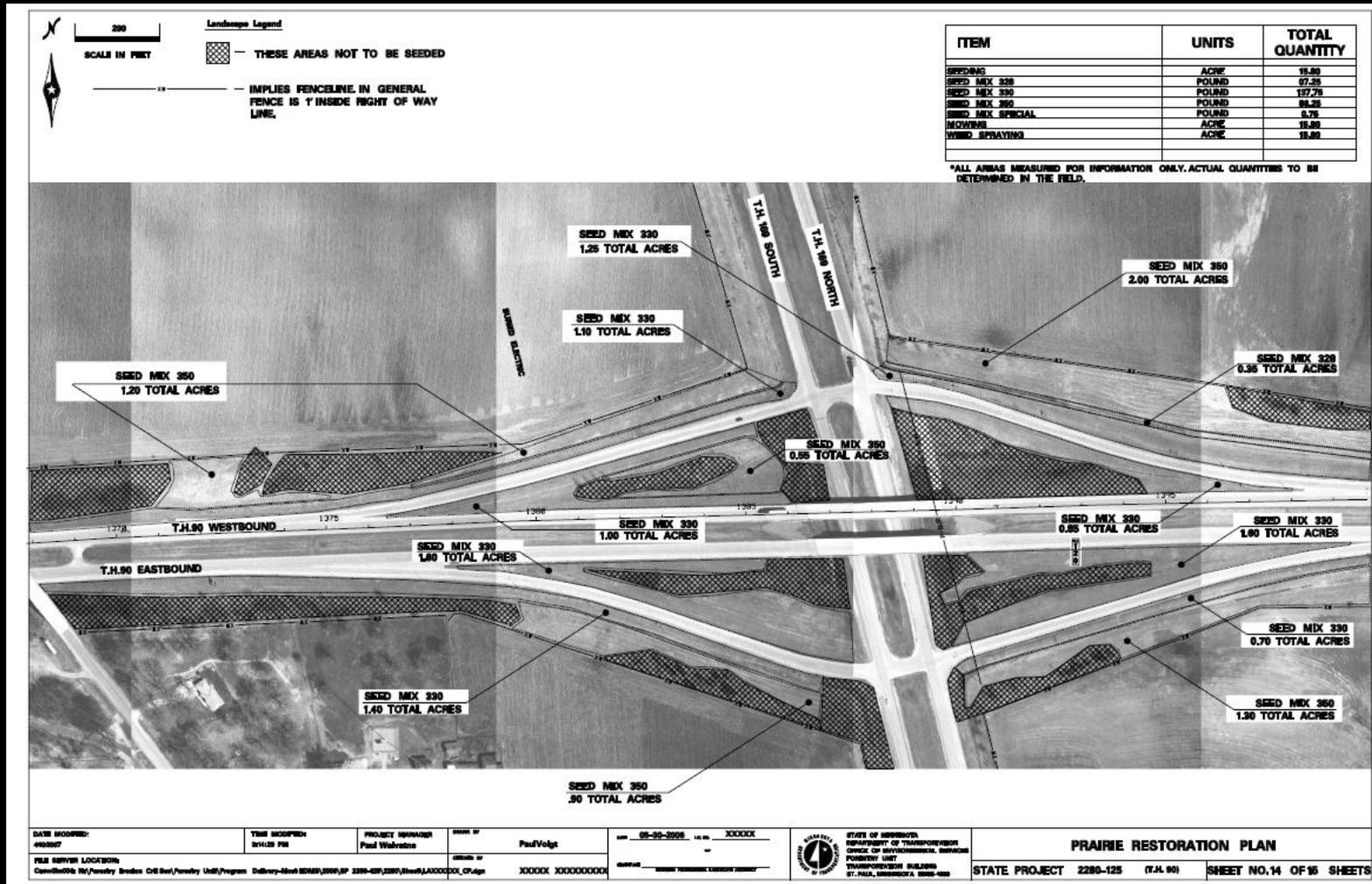


Sample Project – What mixes would you use?



Resources

New Mn/DOT Specs



Resources



Minnesota Wetland Restoration Guide



5 Vegetation Establishment

- 5-1 Vegetation Establishment Considerations
- 5-2 Developing a Vegetation Plan
- 5-3 Site Preparation
- 5-4 Establishing Upland Vegetation
- 5-5 Establishing Wetland Vegetation
- 5-6 Selecting Seed Mixes and Plant Materials
- 5-7 Vegetation Plan Implementation
- 5-8 Maintenance for Vegetation Establishment

The Vegetation Establishment Section of the Minnesota Wetland Restoration Guide provides a comprehensive approach to establishing native vegetation in restored and created wetlands and surrounding upland areas. The chapters in this section of the Guide provide detailed information about the steps involved in establishing plant communities from developing a vegetation plan to project implementation and maintenance.

The establishment of wetland vegetation has been occurring since wetland restoration became a common practice in the 1970s and 80s. Goals for many earlier projects focused on restoring hydrology and the creation of habitat for waterfowl. The restoration of vegetation typically relied on species that would establish from native seedbanks or natural colonization. In recent years, there has been an increased emphasis on establishing diverse wetland plant communities that create wildlife habitat for a larger number of species including birds, animals, and insects, increasing competition with invasive species, and providing greater plant community stability. The increased emphasis on these functional goals has led to new techniques to remove invasive species, plant wetland species, and provide long-term care.

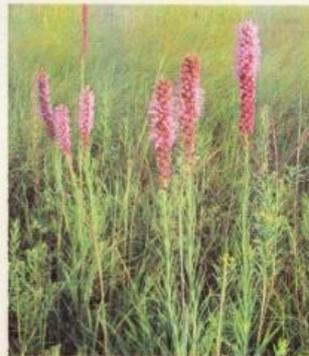


Figure 5.1

MINNESOTA WETLAND RESTORATION GUIDE 1

Resources



“What’s Working Information Compiled from Practitioners



The screenshot shows a web browser window displaying the Minnesota Board of Water & Soil Resources website. The page is titled "What's Working" and contains the following text:

The following information has been compiled through contributions from professionals, research efforts, field trials and reporting through BWSR grant programs. Practitioners are encouraged to submit findings from their projects for the continued development of this effort. Please submit information to dawn.shaw@state.mn.us.

Sections:

- Conservation Project Planning and Promotion
- Vegetation Establishment and Maintenance
- Invasive Species Control

What's Working for Conservation Project Planning and Promotion

The following information is a continuation of a chapter that was developed in Volume II of the publication "Plants for Stormwater Design: Species Selection for the Upper Midwest" (Great River Greening, 2007).

Categories:

- Site Selection
- Project Design
- Partnering
- Project Promotion

Site Selection

-We perform a thorough pre-application site investigation of all potential wetland restoration projects, including drainage investigations such as the location, flow direction, size of intake(s), elevations, private and public systems etc. Part of the pre-application process is reviewing the site with a landowner. Good communication with the landowner and the neighboring landowner from the get-go prevents mistakes in the design and construction stage (Reminiscent BWSR).

-When assessing funding priorities, Roadsides for Wildlife considers the following questions: which sites will provide the best grassland bird habitat (larger projects are usually better and our prime target area is within the pheasant range), which sites are publicly owned and likely to remain as long-term investments, at which sites will road construction be completed within the funding cycle.

www.bwsr.state.mn.us/native_vegetation/

Resources



- Send Information/images to dan.shaw@state.mn.us
- Also send comments and observations about state seed mix establishment/success

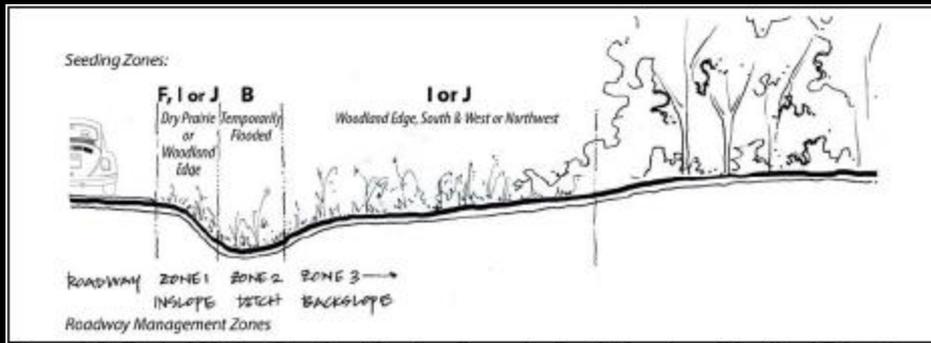
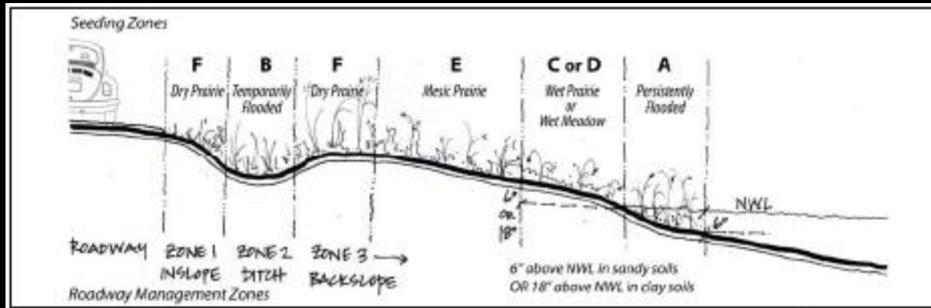


www.bwsr.state.mn.us/native_vegetation/

Resources



-Native Seed Mix Design Manual



Native Seed Mix Design for Roadside

Your Destination... Our Priority

Resources



Proposed Seed Mix Design Tool

