Vegetation Establishment

February 2nd , 2020

BOARD OF WATER AND SOIL RESOURCES

Planning Considerations

Most wetland seed needs a period of cold stratification, so fall dormant seeding is commonly conducted

Planning Considerations

Minnesota Board of Water & Soil Resources

Recommended Seeding Dates for Restoration Projects

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 establishment.

Planning Considerations

- ❑ Wetland species – Often broadcast as most species require light to germinate and seeds are very small. They cannot be buried.
- ❑ Upland species – May be drilled or broadcast. Generally, forbs should be broadcast and grasses drilled or broadcast (1/4 inch deep)

Planning Considerations

0.5 cm of sediment will reduce 90 percent of wetland seed emergence *

✓-Stabilize uplands first if needed

✓-Use temporary covers or mulch

✓-Pay attention to water level control

✓-The smaller the seed, the greater the

✓impact of sediment

* Gleason, Robert A. 2003. Effects of Sediment Load on Emergence of Aquatic Invertebrates and Plants From Wetland Soil egg and Seed Banks, Wetlands, Vol. 23, No. 1, pp 26-34

Planning Considerations

Different options can stabilize wetlands prior to installing expensive seed mixes

Temporary cover crops - (allow time for late summer or fall seeding)

Establishing uplands first - (allow time for seeding in fall or the next year)

Oats have worked well as a cover

Planning Considerations

Seeding before or after construction

- Common to seed after construction in later fall (using temporary covers if needed)

- Want to avoid projects getting to wet for seeding equipment

- Sometimes delay seeding fringe mixes until June if water levels will bounce in early spring

Planning Considerations

Sediment Removal

Benefits:

Can expose native seedbank

Limitations:

Can cause compaction, may be difficult to find native seedbank

Planning Considerations

Scraping

Benefits:

Can remove invasive species roots/rhizomes and seed, may expose native seedbank

Limitations:

May remove needed topsoil, can cause compaction

Sediment excavation as a wetland restoration technique had early effects on the developing vegetation community

https://www.fws.gov/Midwest/Planning/r3ssd/main.html?knutson_restoring_wetlands

Planning Considerations

Crop Production

Benefits:

Can produce a relatively clean seedbed with few other steps needed before seeding.

Limitations:

Can disturb soil micro-organisms, may not remove all perennial weeds such as Canada thistle.

Planning Considerations

Perennial Vegetation Removal

Benefits:

Generally necessary to establish native vegetation

Limitations:

Usually requires herbicide treatment and may take a season or longer.

Planning Considerations

Tilling for Weed Control

Benefits:

Can minimize herbicide use and aid in seedbed preparation

Limitations:

Can disturb soil structure and lead to compaction and erosion, herbicide usually also needed for perennial weed control

Planning Considerations

Seedbed Preparation

Benefits:

Necessary step in preparation of seeding

Limitations:

The right seedbed preparation strategy must be selected for the seeding equipment to be used.

Planning Considerations

Temporary Cover Crops

Benefits:

Can allow time for weed management and can be disked
To provide mulch

Limitations:

Can add cost (though may be able to harvest vegetation)

Planning Considerations

Upland Planting Strategies:

Broadcast Seeding
Seed Drills
Containerized Plants and Rootstock
Upland Trees and Shrubs
Bacterial and Mycorrhizal Inoculum
Stabilizing Uplands

Planning Considerations

Broadcast Seeding

Benefits:

Can be conducted without smooth seedbed, seed may not require as much processing, can be conducted on frozen ground in some cases

Limitations:

May require more seed

Planning Considerations

Seed Drills

Benefits:

Ensures good placement of grass seed, no-till versions available.

Limitations:

Specialized equipment and good seedbed preparation needed

Planning Considerations

Containerized Plants and Rootstock

Benefits:

Good method to add species that may not establish well from seed.

Limitations:

Watering and weed control often needed.

Planning Considerations

Wetland Planting Strategies:

Utilizing Existing Native Seedbank
Managing Hydrology
Broadcast Seeding
Hydroseeding Wetlands
Wetland Containerized Plants and Rootstock
Wetland Trees and Shrubs
Mulching Wetlands
Peatland Restoration

Planning Considerations

Managing Hydrology

Benefits:

Water level control can be very helpful to ensure that young plants have sufficient hydrology.

Limitations:

control structures add cost and require adjustment.

Planning Considerations

Wetland Containerized Plants and Rootstock

Benefits:

Good method to add species that do not do well from seed, and to add species along the edge of open water where seedlings may not do well.

Limitations:

Changing water levels may influence survival.

Planning Considerations

Maintenance Strategies:

Herbivore Control
Prescribed Burning
Mowing
Tree and Shrub Care
Haying
Grazing
Biological Control
Herbicide Application
Hand Weeding
Hydrology Control
Supplemental Planting
Watering

Planning Considerations

Prescribed Burning

Benefits:

Burning invigorates prairies and can aid the control of woody plants.

Limitations:

Burning in wet meadow restorations can lead to spread of thistle and reed canary grass depending on timing.

Planning Considerations

Mowing

Benefits:

Mowing is essential for the establishment of prairie and can aid control of species such as Canada thistle.

Limitations:

Mowing may be limited by hydrology or steep slopes.

Planning Considerations

Haying

Benefits:

Aid the removal of thatch and woody seedlings. Allows light to reach lower growing species.

Limitations:

May be a temporary solution and limited by hydrology.

Planning Considerations

Biological Control

Benefits:

Effective for species such as purple loosestrife and leafy spurge.

Limitations:

Less effective for scattered plants and bio-control may be lost due To flooding or fire.

Planning Considerations

Herbicide Application -Spot Treatment

Benefits:

Can decrease invasive species before they have a chance to spread.

Limitations:

Repeated visits may be needed and care must be taken to ensure proper use of herbicides.

Planning Considerations

Hydrology Control

Benefits:

Allows lowering of water levels for access of equipment.

Limitations:

Careful control of water levels is needed as multiple wildlife species can be influenced

Planning Considerations

Supplemental Planting

Benefits:

Ensures that weeds will not become dominant in areas of poor establishment.

Limitations:

Requires access that could cause more disturbance.

Planning Considerations

Site Kanabec County – Mowed 1st Year

Planning Considerations

Site Kanabec Co. – 2nd Yr Emergent Zone Spring

Planning Considerations

Site Kanabec Co. – 2nd Yr Saturated Zone Spring

Planning Considerations

Site Kanabec Co. – 2nd Yr Emergent Zone Late Summer

Planning Considerations

Wetland Restoration Guide

www.bwsr.state.mn.us/publications/restoration_guide.html

-Minnesota Wetland Plant ID Guide

www.mn.nrcs.usda.gov/programs/wrp/plantid/about.html

-State Seed Mixes

www.bwsr.state.mn.us/wetlands/vegetation/index.html

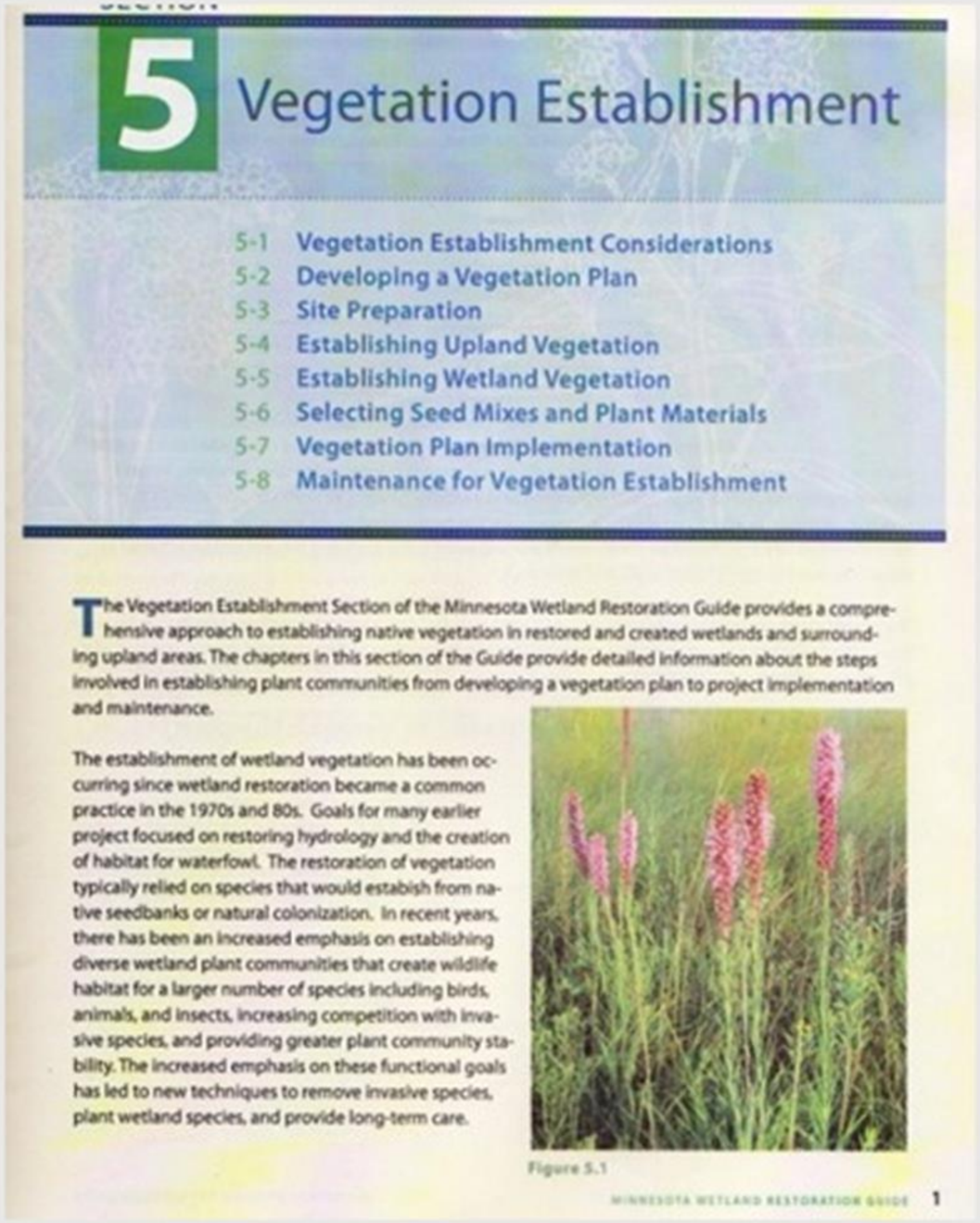
-Grassland Inter-seeding Guidelines

www.bwsr.state.mn.us/grantscostshare/native-buffer.html

-Conservation/Restoration "What's Working" Information

www.bwsr.state.mn.us/grants/WhatsWorking.html

Planning Considerations
Minnesota Wetland Restoration Guide



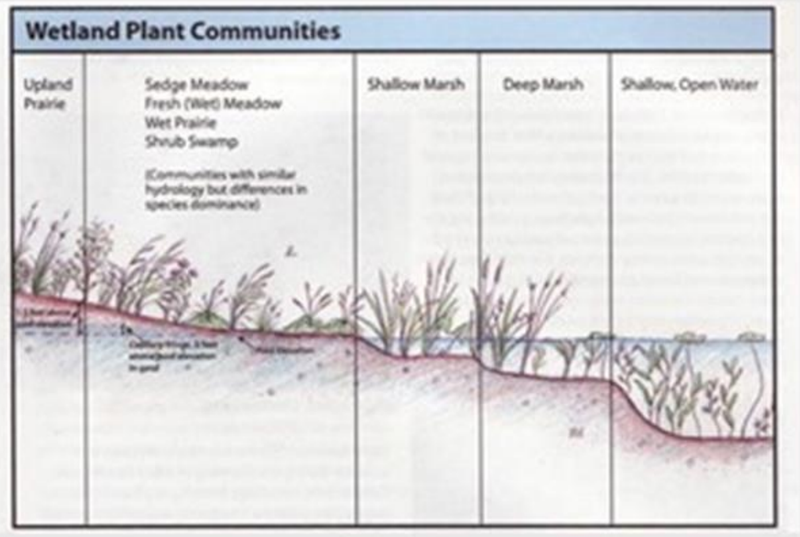
5 Vegetation Establishment

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 project focused on restoring hydrology and the creation of habitat for waterfowl. The restoration of vegetation typically relied on species that would estabish 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



http://www.bwsr.state.mn.us/publications/restoration_guide.html