

USDA Natural Resources Conservation Service – Minnesota State Technical Committee, Forestry Subcommittee

Recommendations for Tree and Forest Establishment and Management Minnesota’s Prairie Region

Summary:

The USDA Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA) and Soil and Water Conservation Service (SWCD) implement many Farm Bill Programs that include payments for a wide range of conservation practices, including tree planting. These recommendations are an effort to provide the NRCS, FSA and SWCDs with recommendations on where tree planting is ecologically appropriate in western Minnesota prairie landscapes by providing site-level recommendations for tree and forest establishment and management activities. These recommendations are intended to help the conservation professional and the landowner make informed decisions regarding tree planting in Minnesota’s prairie landscape. Training should accompany initial use of these recommendations to ensure their use and interpretation is clear.

Background:

The prairie region of Minnesota is dominated by agricultural land use, primarily row crop production. Much of the region’s native habitat – prairie and forest - has been converted to intensive land uses such as cropping, towns and roads. Conservation professionals have worked to preserve and restore native ecosystem values and functions on the most sensitive or least agriculturally valuable lands in the region. Because of the near obliteration of native grasslands many associated species are rare, threatened or endangered. Therefore prairie preservation and restoration is a very high conservation priority.

However, there have been professional disagreements and public debates over prairie restoration and tree and forest establishment practices in western Minnesota. Some landowners and stakeholders are interested in expanding wooded habitats, while wildlife agencies and other stakeholders are focused on expanding grassland habitats. In some cases, trees have been removed from public lands to improve prairie habitat, while trees have been planted on nearby private land. This results in inefficient use of public funds. Confusion has occurred due to a lack of communication and coordination as well as competing priorities.

The Minnesota Prairie Plan Working Group, comprised of representatives of government agencies and non-profit organizations interested in prairie management, developed the “*Minnesota Prairie Conservation Plan 2010: A habitat plan for native prairie, grassland, and wetlands in the Prairie Region of western Minnesota*”. The Prairie Plan provides a 25-year vision for accelerated prairie conservation, and maps the remaining functional prairies. The plan defines core prairie areas as well as connecting corridors as priority areas for grassland conservation. (Appendix A) It also provides broad recommendations for grassland conservation across the landscape in the “agricultural matrix”. The plan identifies one of the “Threats to Prairie Systems in Minnesota” as “Woody Plant Encroachment”. This section details how trees on the prairie were naturally limited by wildfires and how tree encroachment negatively impacts prairie species by fragmenting open landscapes and providing habitat for predators. Reduced fire and a wide range of tree planting efforts over the past 150 years have introduced significant woody cover that is not associated with pre-settlement vegetation patterns. Tree plantings have been pursued for a variety of reasons, such as protecting farmsteads and communities from wind, reducing soil erosion and providing for certain wildlife management goals.

While there is no similar plan for restoring forests that were historically present in southern and western Minnesota’s prairies, it is well recognized and accepted that there were savannas, groves and even

forested areas in the prairie region. Some of these occurred in the fire shadow of larger lakes and along major rivers systems and their tributaries. The map, *Potential Priority Forest Work Areas* (Appendix A) provides high level delineation of where tree planting is desirable and where it is of greatest concern. Tree planting and prairie conservation landscape are not mutually exclusive at the landscape level, but there is, to some extent, competition between tree planting and grassland conservation on the limited land base that is set-aside for conservation purposes. Care is needed to ensure that site level conservation efforts support landscape level needs and priorities

Landscape-Scale Recommendations:

Prairie and surrogate grassland conservation is a high priority landscape goal in much of the Minnesota's agricultural region. Minnesota's native grasslands have borne the brunt of agricultural development and native grasslands are among the rarest landscape habitat types in the world. Though, native forests in the region are nearly as rare. Careful consideration of these issues is critical in making informed decisions and recommendations for habitat restoration projects in this region. We recommend that NRCS, FSA and SWCD field staff refer to the above mentioned map of historically forested areas that do not conflict with existing prairie management plans (Appendix A). The first priority when considering whether forest restoration work is appropriate is to focus on currently forested areas and their margins. We also recommend that staff and land owners consider regional landscape plans, such as the *Minnesota Prairie Conservation Plan 2010* and the Minnesota Forest Resource Council's West Central Landscape Committee plan where those plans are available.

All landowners requesting technical and financial assistance should be informed of the landscape in which their land is located and the goals for that landscape. If their proposed project site lies within forest restoration opportunity areas detailed on the *Potential Priority Forest Work Areas* map they can be encouraged to perform forest improvement and establishment activities. (Appendix A) If their land lies outside forest restoration opportunity areas, and in one of the grassland conservation opportunity areas they should be encouraged to perform prairie, grassland and wetland establishment and management activities. The map provided with these guidelines is course and provides a general indication of where tree planting may be most or least appropriate within the landscape. The tree planting opportunity areas are those areas that are currently forested or were historically forested. These suitable areas include approximately 1,400,000 acres within the prairie region of Minnesota. The areas of concern include native prairie, prairie chicken leks, preserves managed by the Nature Conservancy and public conservation lands including: Wildlife Management Areas Scientific and Natural Areas, Waterfowl Production Areas and National Wildlife Refuges and a ½ mile buffer around all these sites. Areas not otherwise defined are those areas where tree planting is not desirable for grassland conservation at a landscape level but is generally not significantly detrimental. Specific site level conditions in all cases should be assessed.

The site level guidelines described below are intended to be used to provide a finer level of guidance regarding tree planting. Establishment and management of savanna need special consideration because it is a prairie system with scattered trees. It should be encouraged where savanna historically occurred.

We recommend that conservation professionals assisting landowners reference the Site-Level Recommendations when a property lies within a forest restoration opportunity area or if landowners express interest in tree planting in the broader agricultural matrix of the prairie region. Communication between wildlife professionals and staff in County Agricultural Service Centers are encouraged to enhance the understanding and context of these guidelines.

Site-Level Recommendations

The committee recognizes the multiple needs and interests that landowners and stakeholders have in managing rural lands throughout Minnesota's prairie region and that trees and forests can provide important values-but that trees can also have significant negative impacts on grassland resources. We also recognize that tradeoffs between competing interests and values are regularly made. These

guidelines describe tree planting in terms of relative appropriateness in the context of conserving grasslands and associated natural resources. There is wide agreement that restoring historically documented native forests is appropriate and desirable. There is also wide agreement that planting trees into high quality native prairie is inappropriate and undesirable. Between these two points there are a wide range of situations where tree planting maybe more or less appropriate. These guidelines are designed to help conservation professionals and landowners make informed decisions on the whole range of situations. The Evaluation Matrix (Appendix B) can be used by field staff and landowners to assess the degree to which a particular tree planting project negatively impacts grassland conservation. The Evaluation Matrix will provide a qualitative assessment of the extent and significance of concerns. The greater the number of concerns and the higher the level of concern at a site, the less appropriate tree planting is as a conservation practice. The user may find situations where not all evaluation criteria clearly align. One example is a historically wooded riparian area with nearby conservation grassland such as a State Wildlife Management Area. Professional judgment will be required to determine an overall assessment of the site and the appropriateness of a tree planting project. We recommend, if there are questions about a site or landscape goals, contacting local DNR Wildlife or US Fish & Wildlife Service staff with questions.

These guidelines were developed primarily envisioning projects that involve establishing blocks of forest or wooded cover. There are other conservation practices that utilize tree plantings in this region, particularly shelterbelts and windbreaks. The committee recognizes that shelterbelts for homes and livestock facilities provide significant benefits to the site inhabitants. These guidelines should not be construed as preventing those practices. However, these guidelines can be used to inform shelter belt design and species selection. Similarly, these guidelines are not intended to prevent the use of wind breaks where needed to prevent soil erosion. Though, these guidelines can help to provide assessments of the merits of wind breaks relative to other soil conservation practices (tillage, cover crops etc.) and again inform species selection.

- Slope and Proximity to Water: Prairie wildfires spared woody vegetation due to changes in slope and inability to cross water bodies, resulting in naturally occurring forest cover. Physiographic characteristics are important in determining these sites.
 - It may be appropriate to encourage trees and forests:
 - along large rivers from blufftop to blufftop. (Even within these zones, there may be flatter or drier areas that are very conducive and appropriate to prairie conservation.¹);
 - on the east side of large water bodies,
 - on steeper or bluff slopes with east and north facing slopes,
 - in gullies and ravines, and
 - in floodplains, which are often more easily managed for trees than for prairie.
 - It is not appropriate to encourage trees and forests on functional “goat prairies” – southern and western facing prairies on steep slopes. Efforts should be made to clear these areas of invading woody vegetation such as red cedar, sumac, buckthorn, etc.
- Current Land Cover:
 - It may be appropriate to encourage trees where land is already managed as forest or wooded cover (excluding encroachment into grasslands), the site is part of a large, extensive area of cultivated crop land, as a windbreak around a farmstead or if the site has been converted to other uses incompatible with prairie landscape
 - It is not appropriate to promote trees where the site is currently native prairie, treeless wetland or functional grassland.

¹ For example, please see the Forest and Grassland Restoration Opportunities Map in Appendix A. The Minnesota River corridor is has both important forest habitats and grassland habitats. Review of maps and the full set of site level considerations is needed in these areas.

- Adjacent Land Cover:
 - It may be appropriate to promote trees where the adjacent cover is forested.
 - It is not appropriate to encourage trees if adjacent land:
 - is native prairie, treeless wetland, or functional grassland.
 - is conservation land (CRP, WRP, public land etc.), with a focus on open landscapes and grassland habitat.

- Size and Proximity to other forested cover:
 - It may be appropriate to encourage trees where resource professionals agree that forest historically existed AND forest currently exists within one-half mile of the site, allowing forest wildlife to colonize it.
 - It is not appropriate to encourage trees where trees do not exist within one-half mile of the site and there is no evidence of historic tree cover.
 - If historic evidence supports forest establishment, but where trees do not exist within one-half mile of the site, the planted area will be large enough (>25 acres) to be colonized by forest wildlife and serve as a source for colonizing other areas.

- Historical Land Cover
 - It is more appropriate to encourage trees if the site was documented to be forested at time of settlement.
 - It is less appropriate to encourage trees if the site was documented to be grasslands or treeless wetlands at time of settlement.

- Tree Species:
 - Conservation projects should utilize native species that are found in that landscape. Preference should also be given to hard and soft mast-producing trees and shrubs, those that can provide thermal cover, and those that can rapidly provide roost trees and cavity-making capacity. Shorter woody species may be more appropriate than taller species in some conservation plantings, such as pheasant winter cover.
 - Discourage planting non-native invasive woody species (e.g., Russian olive) and non-native species with little benefit to wildlife.

- Winter cover for wildlife.
 - It is more appropriate to complete winter cover projects for non-migratory birds like ring-necked pheasants that are suitable and appropriate.
 - Consult with DNR area wildlife manager regarding winter cover needs and design.
 - Tree plantings intended to provide winter cover, but which are inadequate in size, poorly placed or redundant to existing local winter cover such as large cattail sloughs should be discouraged.

Site recommendations are summarized in the Evaluation Matrix for Tree Planting within the Prairie Landscape (Appendix B).

Recommended Forestry Practices

If a site is determined to be appropriate for tree planting, we recommend all available practices and components for establishing, protecting and improving forest stands, including (but not limited to):

- 490 – Site Preparation
- 612 - Planting
- 666 – Forest Stand Improvement
- 338 – Prescribed Burning

- 394 – Firebreak
- 315 – Herbaceous Weed Control
- 314 – Brush Management
- 391 – Riparian Forest Buffers
- 647 – Early Successional Habitat Development and Management
- 655 – Forest Trails and Landings

Funding Recommendations

The committee recommend that the NRCS, FSA and SWCD develop application rankings that favors funding projects and practices that meet and help achieve landscape goals. Ranking may be more effective at meeting landscape goals than dedicating a portion of the Forestry Initiative funding to any particular landscape.

The committee also recommends that NRCS, FSA and SWCD staff be trained in these recommendations.

Committee Members:

Minnesota DNR: Mark Lindquist (Chair), Gary Michael, Bill Penning/Bob Welsh, Jason Garms, Jodie Provost

Minnesota Forest Resources Council: Dave Zumeta, Lindberg Ekola

National Wild Turkey Federation: Rick Horton

The Nature Conservancy: Neal Feeken

US Fish and Wildlife Service: Sheldon Myerchin

NRCS: Mark Oja

Appendix A: Maps

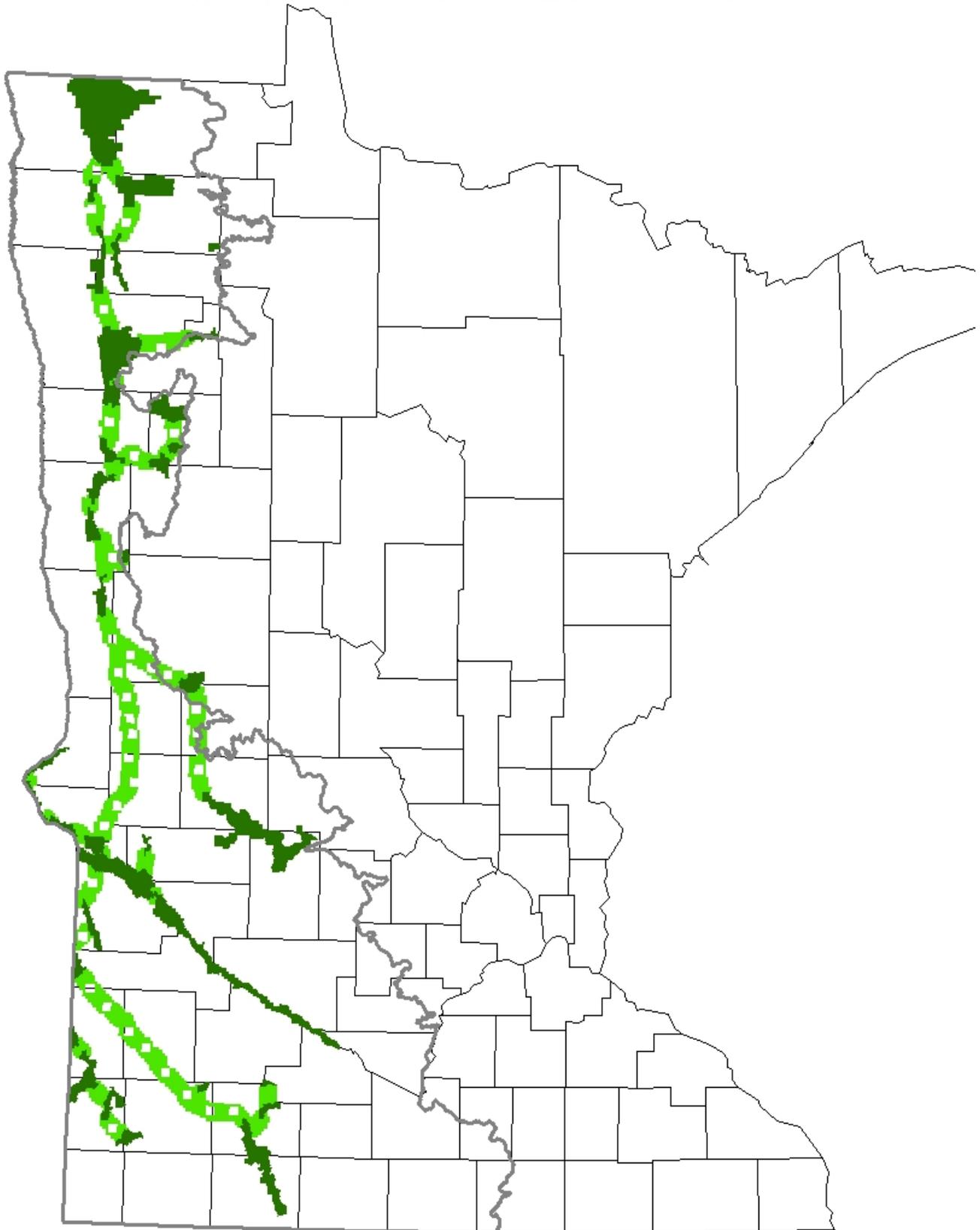
- *Prairie Plan Core, Complex and Corridors* is included to provide context regarding high priority prairie conservation areas. These areas are not necessarily “no tree planting” zones. There are forested and historically forested areas where it is appropriate to plant trees in accordance with the site level guidelines. Similarly there are areas outside of the core, complex and corridors where tree planting will have negative impacts on grassland conservation.
- *Forest and Grassland Conservation Opportunity Areas in the Prairie Region*. This map is closely tied to the site level guidelines and can be used to make a preliminary assessment of the appropriateness of tree planting.
 - Tree planting will be generally appropriate and acceptable in the red areas
 - Tree planting will be generally inappropriate and discouraged in the brown areas.
 - The area neither mapped as appropriate or inappropriate for tree planting are middle areas where tree planting may not be desirable, but it not likely highly detrimental to grassland conservation goals.

Because the map was developed at a large scale, it should be considered a starting point. Site level assessment using on-the ground information will provide additional insight on tree planting impacts.

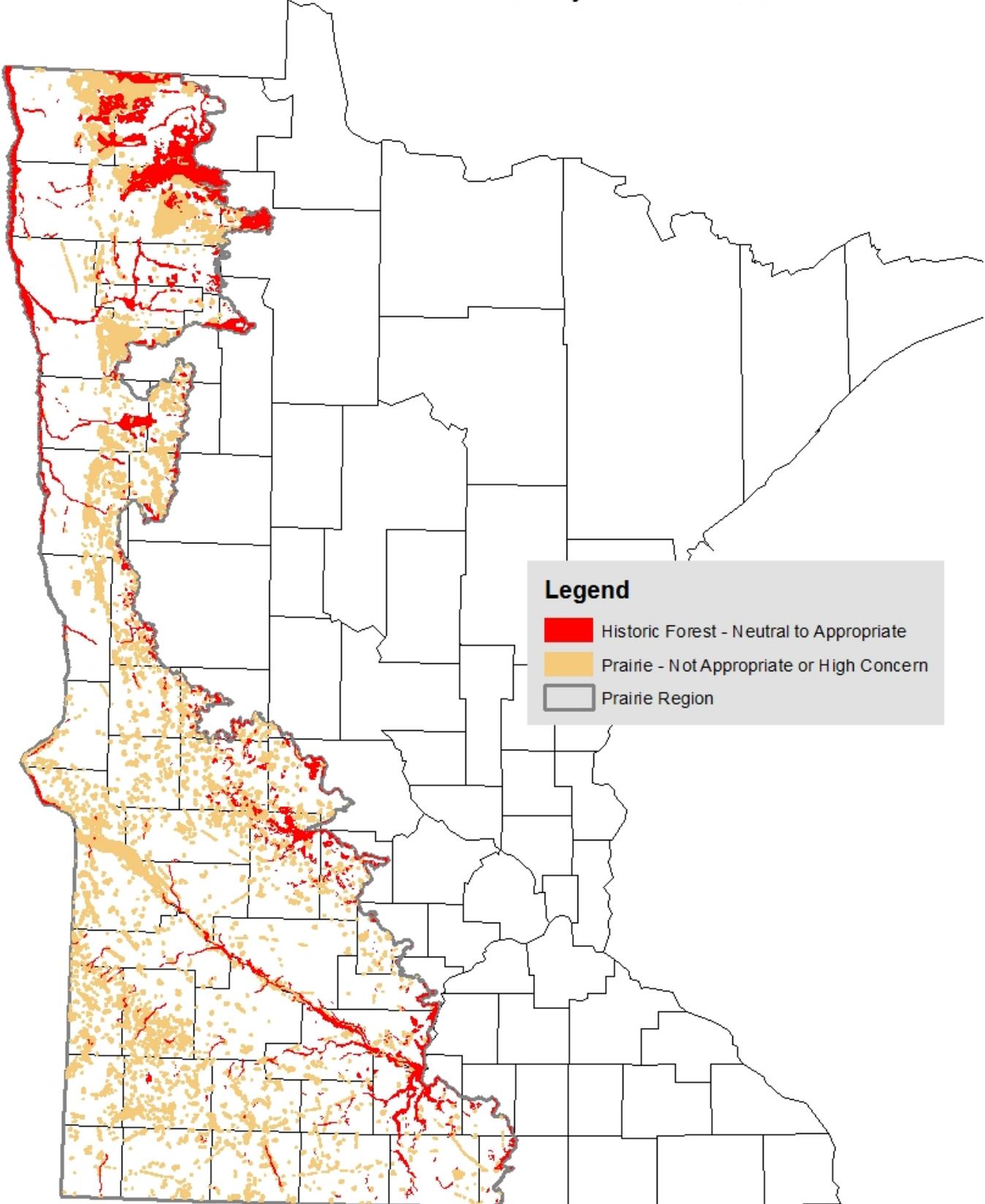
ArcGIS shape files are available at through Minnesota DNR. Please contact:

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Prairie Plan - Core and Corridors



Potential Forest Priority Work Areas



Appendix B: Evaluation Matrix

Evaluation Matrix for Tree Planting within the Prairie Landscape

This evaluation matrix is intended indicate the appropriateness of a tree planting project at a site level. This indication is intended to help the conservation professional and the landowner make an informed decision regarding the tree planting within the Minnesota Prairie landscape.

Site Characteristic	Not Appropriate	High Concern	Concern	Neutral to Appropriate	Site Specific Determination
Current Land Cover	Select most appropriate box				
Native Prairie	X				
Conservation Grassland		X			
Other Grassland		X			
Cropland			X		
Wooded				X	
Developed (urban/farmstead)				X	
Adjacent/ Nearby Land Cover	Select most appropriate box				
Native Prairie (within ½ mile)	X				
Conservation Grassland (w/in ½ mile)		X			
Other grassland (adjacent)		X			
Cropland				X	
Wooded (within ½ mile)				X	
Developed				X	
Historical Land Cover*	Select most appropriate box				
Prairie (including prairie pothole wetlands)			X		
Savanna/Parkland/Brushland			X		
Forest				X	
Landscape Position	Select most appropriate box				
Large river floodplain					X
West / South facing slope			X		
North /East Facing Slope					X
“Fire Shadow” East side of large water bodies					X
At-Risk Species (within 1.0 mile)	Select most appropriate box				
Openland Dependent	x				
Other			x		
Landscape Plans	If the answer is no, then check the “Concern” box. If the answer is yes, then check “Neutral/Appropriate” box.				
Consistent with Prairie Plan					
Consistent with other plans (i.e. MFRC West Central Landscape Plan)					
Appropriate design	If the answer is no, then check “Concern” box. If the answer is yes, then check “Neutral/Appropriate” box.				
Conservation objective requires trees/woody vegetation (eg shelter belt)					
Proposed tree planting is adequate to meet the conservation objective					
Native tree species are used					
Shortest woody species suitable for objective are used.					

* Reference Marshner “Pre-settlement Vegetation of Minnesota”

Using the Evaluation Matrix This matrix and associated guidelines do not replace or override any USDA program rules or processes. It is a tool for working with landowners to make a qualitative assessment of the impacts of tree planting on grassland conservation within the Minnesota prairie region. Assess each factor (i.e. current land cover) to determine if there is a concern at the site and the degree of the concern. The conservation professional and land owner can then weigh the number and level of concerns raised against the benefits of a tree planting project to make an informed decision regarding a proposed conservation practice. Appropriate design factors should be weighed as well.

Potential Forest Priority Work Areas

