Recommendations for Tree and Forest Establishment and Management in Minnesota's Prairie Region

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

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Summary

The USDA Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), Soil and Water Conservation Districts (SWCD), Minnesota Department of Natural Resources (DNR), U.S. Fish and Wildlife Service (USFWS), consultants and other private land conservation partners implement many Farm Bill Programs that include payments for a wide range of conservation practices, including tree planting. Recommendations provided in this document by the USDA NRCS State Technical Committee, Forestry Subcommittee are intended to provide these conservation professionals and the landowners they assist with guidance on where tree planting is ecologically appropriate. Both landscape-level (grassland and forest conservation opportunity areas) and site-level recommendations are provided for tree and forest establishment and management activities so informed decisions can be made. These recommendations are applicable to the Prairie Parkland and Tallgrass Aspen Provinces as defined in the Ecological Classification System (ECS). Training should accompany initial use of these recommendations to ensure their use and interpretation is clear.

Background

This document and these guidelines were requested by the NRCS State Conservationist in order to provide more clarity on where tree planting is and is not appropriate in prairie landscapes. Targeting tree planting through informed decision making will maximize the value of conservation investments in both forest and grassland habitat conservation.

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 (Map 1, "Minnesota's Prairie Conservation Plan").[1] It defines core areas and connecting corridors as priority for grassland conservation, and encourages 10% native perennial cover within each ECS Landtype Association (LTA) of the prairie region's "agricultural matrix".

"Woody Plant Encroachment" is one of the "Threats to Prairie Systems in Minnesota" identified in the Prairie Plan. 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

[1] The Minnesota Prairie Conservation Plan spatial scope includes the Prairie Parkland and Tallgrass Aspen Parkland Provinces and the Hardwood Hills and Oak Savannah Subsections of the Eastern Broadleaf Forest Province as defined in the Ecological Classification System (ECS).

predators (Bakker 2003; Appendix A). Reduced fire and a wide range of tree planting efforts over the past 150 years have introduced significant woody cover that is different from pre-settlement vegetation patterns.

Historically, tree plantings have been pursued in the prairie region for a variety of reasons, such as protecting farmsteads and communities from wind, reducing soil erosion and providing for certain wildlife management goals. Some landowners and stakeholders that manage rural lands are interested in expanding wooded habitats because trees and forests provide important values and meet many of their needs and interest. However, some wildlife managers and other stakeholders have prioritized conserving grassland habitats in the prairie region, and are concerned about the potentially significant negative impacts trees have on them and their associated species. In some cases, trees have been removed from public lands to improve prairie habitat, while trees have been planted on nearby private land. These conflicting practices have resulted in inefficient use of public funds. Confusion has occurred due to inadequate communication and coordination, and competing priorities.

Tree planting and prairie conservation are not mutually exclusive at the landscape level. However, to some extent, competition between tree planting and grassland conservation occurs on the limited land base available for conservation purposes. It is well recognized and accepted that savannas, groves and forested areas existed historically in the prairie region and their restoration should be encouraged where appropriate. Some of these forested areas occurred in the fire shadow of larger lakes and along major rivers systems and their tributaries. Care is needed to ensure that site-level conservation efforts support landscape-level needs and priorities.

Landscape-Level Recommendations

Prairie and surrogate grassland conservation is a high priority landscape goal in much of the Minnesota's agricultural region. Native grasslands are amongst the rarest landscape habitat types in Minnesota and the Midwest. Yet, native forests are also rare in this region. Careful consideration of these issues is critical in making informed decisions and recommendations for habitat restoration projects in this region.

All landowners requesting technical and financial assistance should be informed of the landscape in which their land is located and goals for that landscape. Conservation professionals should refer to Map 2, "Grassland and Forest Conservation Opportunity Areas within Minnesota's Prairie Region", which provides coarse, landscape level delineation of grassland and forest conservation opportunity areas. The map provides a general indication of suitability for tree planting or grassland habitat development. It does not replace site level assessment discussed before. Landscape plans such as the *Minnesota Prairie Conservation Plan 2010*, Minnesota Forest Resource Council's Landscape Committee plans (MFRC West Central Region), and DNR Subsection Forest Resource Management Plans (Tallgrass Aspen Parkland), should also be consulted were available. (Appendix B).

Grassland conservation opportunity areas (gold on Map 2, approximately 4.4 million acre) include native prairie, prairie chicken leks, Nature Conservancy preserves, public conservation lands (including Wildlife Management Areas, Scientific and Natural Areas, Waterfowl Production Areas and National Wildlife Refuges) and a ½ mile buffer around these areas.[2] Tree planting is generally considered least appropriate and of greatest concern in them. If a landowner's proposed project site lies within a grassland conservation opportunity area,

[2] Public conservation lands are generally managed for grassland habitats and open landscapes in these areas. However, some units are managed wholly or partially as forested or woody cover. Site level assessment should consider actual cover.

they should be encouraged to perform prairie, grassland and wetland establishment and management activities. Establishment and management of savanna require special consideration because it is a prairie system with scattered trees. It should be encouraged where savanna historically occurred

Forest conservation opportunity areas (red on Map 2, approximately 1.4 million acres) include currently forested (excluding grasslands encroached upon by woody vegetation) or historically forested areas. Tree planting is generally considered be to appropriate these areas. If a landowner's proposed project site lies within a forest conservation opportunity area, they can be encouraged to perform forest improvement and establishment activities. Focusing on currently forested areas and their margins should be first priority. Tree planting in areas outside defined grassland and forest conservation opportunity areas (white on Map 2) is not desirable, but generally not significantly detrimental.

Site-Level Recommendations

In addition to the above coarse-scale, landscape-level recommendations, specific site level characteristics should be assessed in regard to tree planting on all proposed project sites using the below fine-scale, site-level recommendations. This assessment is particularly important if a proposed project site lies within a forest conservation opportunity area or in the broader agricultural matrix outside grassland and forest conservation opportunity areas of the prairie region because it can further inform conservation practice decisions. Communication between wildlife professionals and conservation professionals, such as staff in County Agricultural Service Centers, are encouraged to enhance the understanding and context of these recommendations.

The evaluation matrix in Table 1 should be used by conservation professionals to assess the appropriateness of a possible tree planting project at the site. It will provide a qualitative assessment of the extent and significance of concerns. The greater the number of concerns and higher the level of concern at a site, the less appropriate tree planting is at the site. 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 tree planting. If questions exist about a site or landscape goals, local DNR Wildlife or USFWS staff should be contacted.

These site-level recommendations were primarily developed to address establishment of blocks of forest or wooded cover. Other tree planting, conservation practices in this region, such as shelterbelts and windbreaks, also exist. Shelterbelts and windbreaks can provide significant benefits to home owners, agricultural producers and livestock facilities in the form of energy conservation, reduced soil erosion and wind protection. These site-level recommendations do not prevent these practices but can inform their design (e.g., shrubs vs. trees) and species selection (e.g., native vs. non-native species, invasive vs. non-invasive species), and merit relative to other soil conservation practices (e.g., conservation tillage or cover crops vs. windbreaks).

The following site-level recommendations describe tree planting in terms of relative appropriateness in the context of conserving grasslands and associated natural resources. Wide agreement exists for not planting trees into high quality native prairie and for restoring historically documented native forests. Between these two points, a wide range of situations occur where tree planting may be more or less appropriate. These

recommendations are designed to help conservation professionals and landowners make informed decisions on the whole range of situations. They do not replace or override USDA program rules or processes.

Current Land Cover:

- It may be appropriate to encourage trees where the site:
  - is already managed as forest or wooded cover (excluding encroachment into grasslands).
  - part of a large, extensive area of cultivated crop land (such as a windbreak around a farmstead).
  - 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.

Adjacent/Nearby 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.
  - 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 trees do not exist within one-half mile of the site, the planted area should be large enough (>25 acres) to enhance colonization 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 as forested at time of settlement.
- It is less appropriate to encourage trees if the site was documented as grasslands or treeless wetlands at time of settlement.

Landscape Position (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 bluff top to bluff top. (Within these zones, flatter or drier areas that are very conducive and appropriate to prairie conservation may exist.[3])
  - on the east side of large water bodies.
  - on steep or bluff slopes with east and north facing slopes.
  - in gullies and ravines.
  - in floodplains, which are often more easily managed for trees than for prairie.

[3] For example, see Map 1. Grassland and Forest Conservation Opportunities Areas within Minnesota's Prairie Region. The Minnesota River corridor has both important forest and grassland habitats. Review of maps and site-level recommendations is needed in this area.

- 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.

At Risk Species (within a 1 mile): To consider these species in grassland or forest conservation projects, the following should be consulted:

- Minnesota's State Wildlife Action Plan list of Species of Greatest Conservation Need and their associated key habitats.
- DNR Natural Heritage database.
- Local DNR area wildlife managers and USFWS staff.

Tree and Shrub Species:

- Where tree planting is considered appropriate, preference should be given to:
    - native species found in the local landscape.
    - hard and soft mast-producing trees and shrubs.
    - species that provide thermal cover.
    - species that can rapidly provide roost trees and cavity-making capacity.
- Shorter woody species such as shrubs may be more appropriate than taller species in some conservation plantings, such as pheasant winter cover.
- Planting non-native species (e.g., Russian olive), native species that can rapidly expand into adjacent grasslands (e.g., red cedar, boxelder, cottonwood), and species with little benefit to wildlife should be discouraged.

Winter Cover for Wildlife:

- It is more appropriate to complete winter cover projects for non-migratory birds such as ring-necked pheasants that are suitable and appropriate.
- DNR area wildlife managers should be consulted 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.

These site-level recommendations are summarized in the "Evaluation Matrix for Tree Planting within Minnesota's Prairie Region" (Table 1).

Funding Recommendations

Conservation professionals should utilize applicable forest management practices and programs to support tree planting and forest management that is consistent with these guidelines.

NRCS, FSA and SWCD and other conservation partners are encouraged to develop ranking systems for proposed projects that favor funding projects and practices that meet and help achieve landscape goals. Ranking may be more effective at meeting landscape goals than dedicating funding to any particular landscape.

Training Recommendations

NRCS, FSA and SWCD and other conservation partners are encouraged to attend training regarding these recommendations to ensure they are interpreted clearly.

USDA NRCS, Minnesota State Technical Committee, Forestry Subcommittee Members

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

Resources

Publications

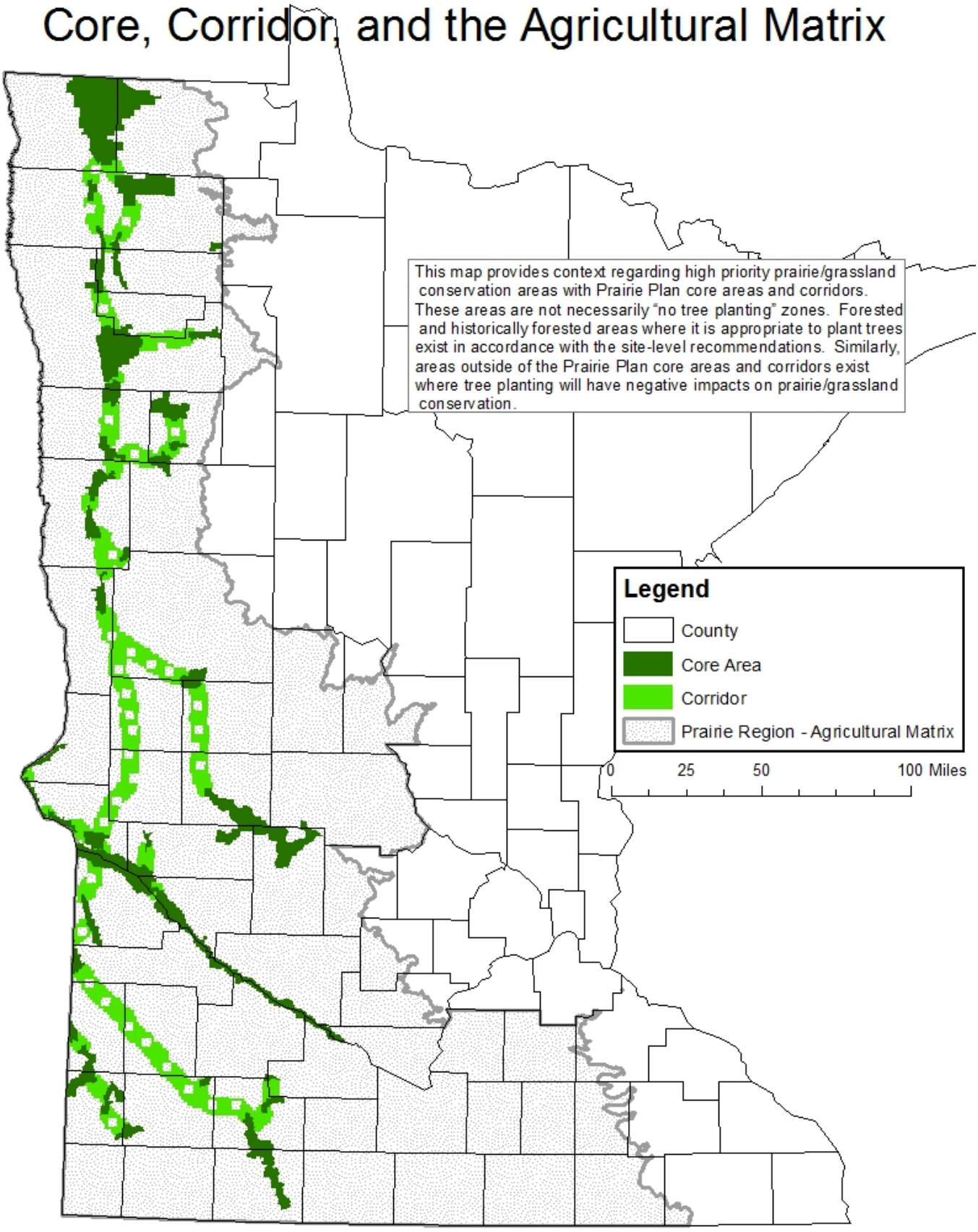
Bakker, K. K. (2003). A synthesis of the effect of woody vegetation on grassland nesting birds. Proceedings of the South Dakota Academy of the Sciences, 82, 119-141.

Plans

- Minnesota Prairie Plan http://files.dnr.state.mn.us/eco/mcbs/mn_prairie_conservation_plan.pdf
- MFRC West Central Landscape Plan http://www.frc.state.mn.us/documents/council/landscape/WC%20Landscape/MFRC_West_Central_LA_Plan_1.25_2004-03-16.pdf
- DNR Tallgrass Aspen Parkland Subsection Forest Resource Management Plan http://www.dnr.state.mn.us/forestry/subsection/aspenparklands/plan.html
- Minnesota State Wildlife Action Plan http://www.dnr.state.mn.us/cwcs/index.html

GIS Data Available on the DNR Data Deli
Minnesota Prairie Plan Core Areas, Corridors and Agricultural Matrix
Grassland Conservation Opportunity Areas
Forest Conservation Opportunity Areas
Public Land Locations- WMAs, WPAs, NWRs
Marshner Pre-settlement Vegetation of Minnesota

Map 1. Minnesota Prairie Conservation Plan Core, Corridor, and the Agricultural Matrix



Map 2. Grassland and Forest Conservation Opportunity Areas Within Minnesota's Prairie Region

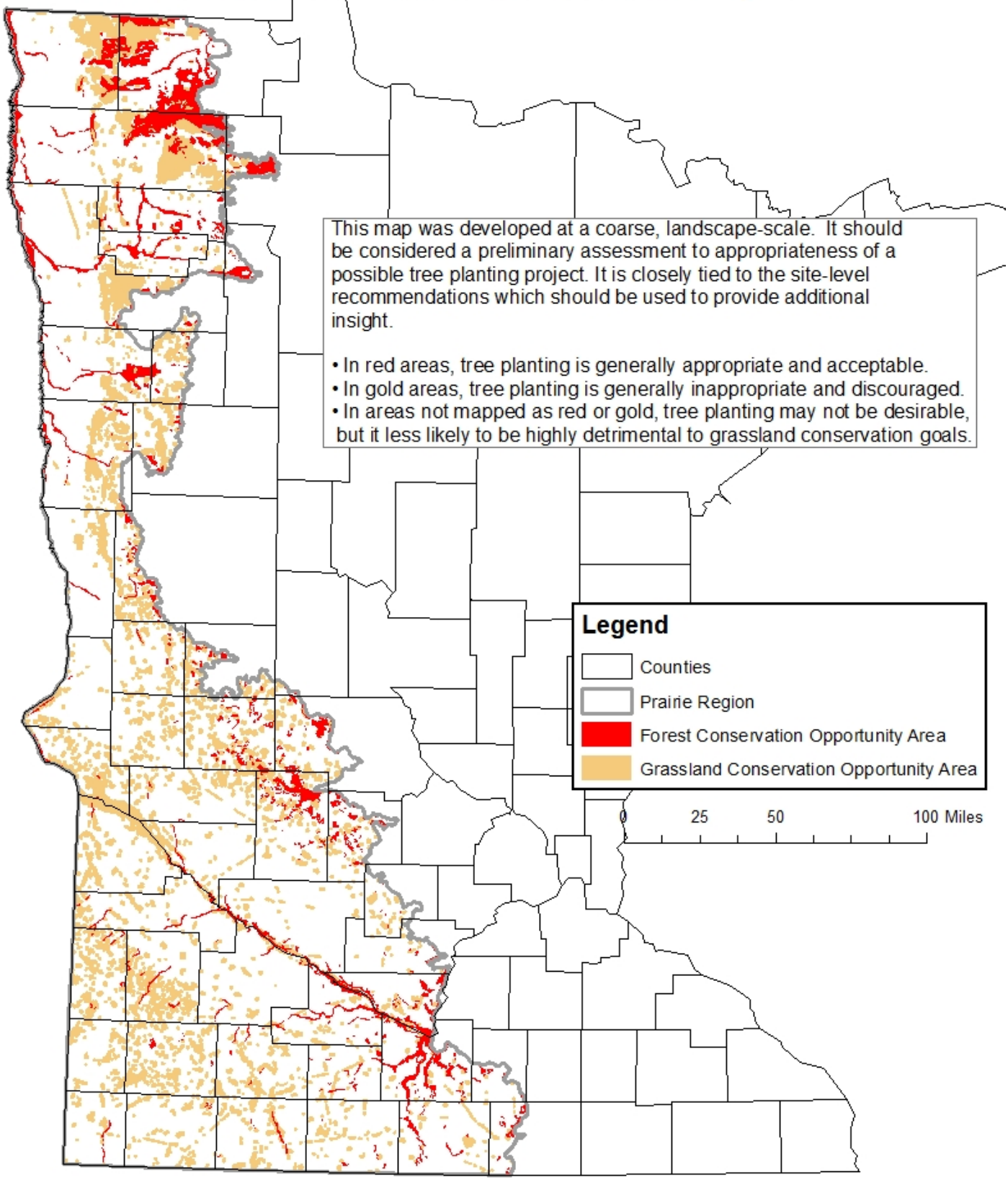


Table 1. Site –Level, Evaluation Matrix for Tree Planting within Minnesota's Prairie Region

This evaluation matrix indicates the appropriateness of a possible tree planting project at the site level. It is intended to aid conservation professionals and landowners in making informed decisions regarding tree planting within the Minnesota's prairie region and does not replace or override USDA program rules or processes. Each site characteristic should be considered to assess the degree of appropriateness of a possible project. The number and level of concerns can be weighed against benefits. Appropriate design factors should also be weighed.

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 mile)	**Select most appropriate box**				
Open Landscape 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 (Map 1)					
Consistent with Other Landscape Plans					
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 veg. (e.g., 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"

Appendix: Smaller scale excerpts of the <u>Grassland and Forest Conservation Opportunity Areas Within Minnesota's Prairie Region</u> map.

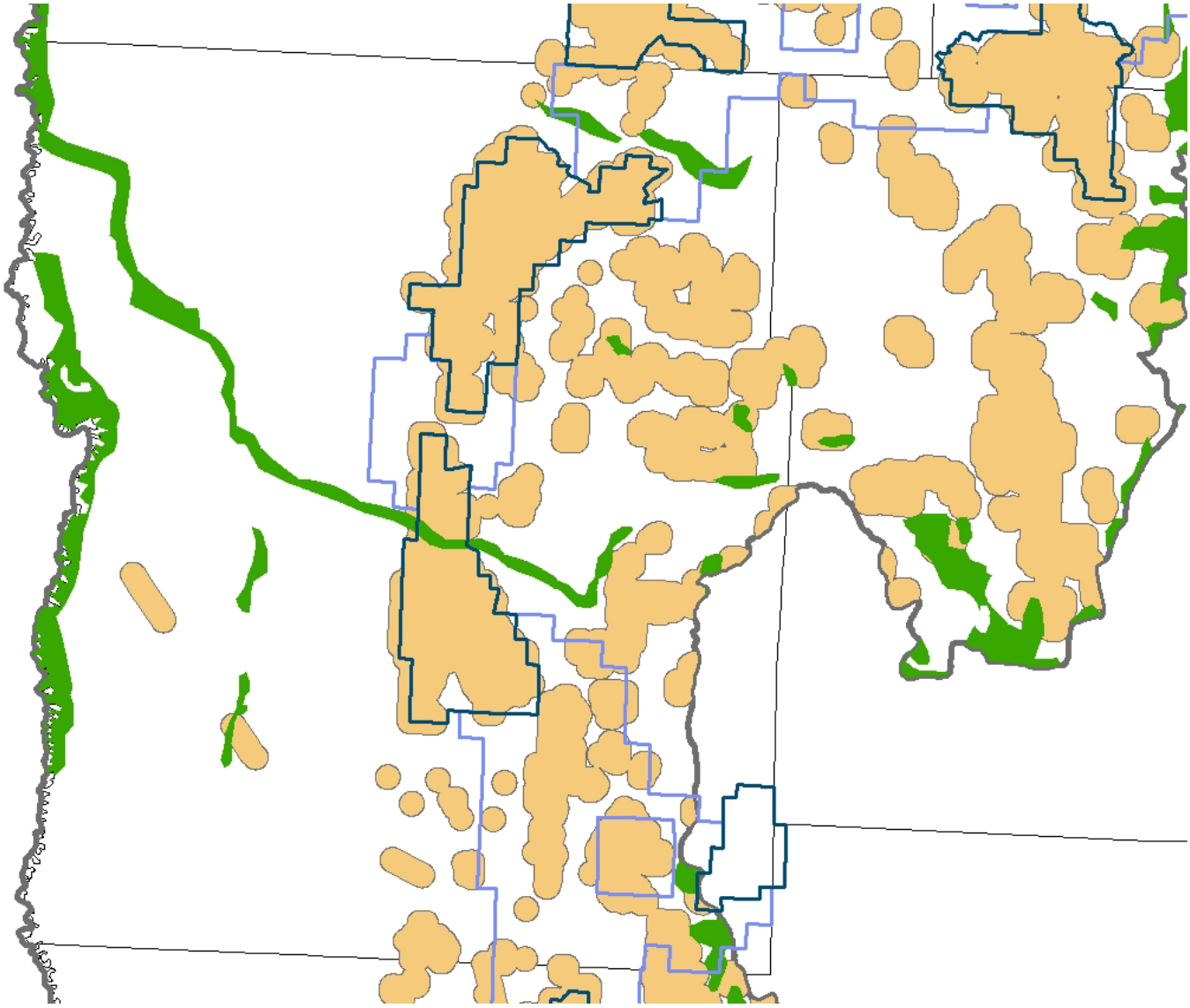


Figure 1. Clay County Grassland and Forest Conservation Opportunity Areas, with Prairie Plan Core and Corridor Overlay

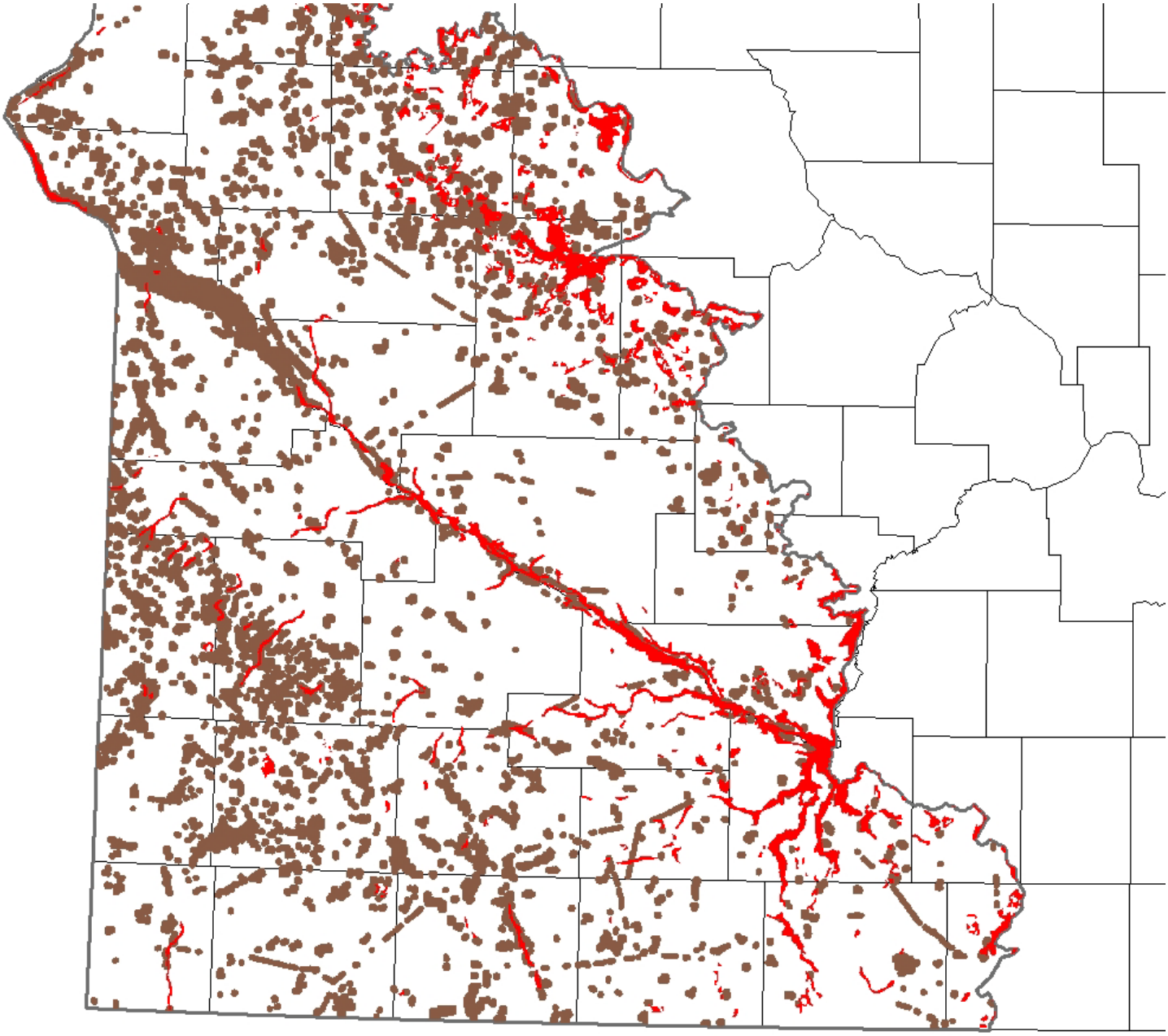


Figure 2. Grassland and Forest Conservation Opportunity Areas - SW MN (grassland in brown and forest in red)