

Tree and Shrub Inventory Plan

Center to Grand Forks Transmission Line Project

Case No. PU-09-670

Prepared for:



February 2012

Introduction

Minnkota Power Cooperative, Inc. (Minnkota) proposes to construct, own, and operate an approximate 250-mile-long 345 kV transmission line from the Center 345 kV Substation near Center, North Dakota to the Prairie Substation adjacent to Grand Forks, North Dakota. The project is called the Center to Grand Forks Project (case number PU-09-670). Minnkota will comply with the North Dakota Public Service Commission (Commission) tree and shrub replacement specifications. Minnkota proposes to contract HDR Engineering and McCain and Associates for the tree and shrub inventory. The tree and shrub mitigation specifications are found in Appendix A of this Tree and Shrub Inventory Plan (Plan). Specifically, this Plan outlines the process for completing the tree and shrub inventory within the 150-foot-wide right-of-way (ROW).

Within the Commission's tree and shrub mitigation specifications (Appendix A), Specification number 8 states that "The width of clear cuts through windbreaks, shelterbelts and all other wooded areas shall be limited to 50 feet or less unless otherwise approved by the NDPSC." Minnkota requests that the Commission approve clear clearing the entire 150-foot-wide ROW easement, if warranted.

Inventory Methods

Minnkota will inventory trees and shrubs, including those considered invasive species, to be cleared within the 150-foot-wide ROW easement. Inventories will be documented on standard forms and will include the inventory location, species present, and number of trees and shrubs in the location. An example form is found in Appendix B.

Windbreaks, Shelterbelts, and Other Planted Areas

In windbreaks, shelterbelts, and other planted areas, trees and shrubs anticipated to be cleared regardless of size will be counted by direct stem count. Trees that are one-inch or greater diameter at breast height (DBH) will be inventoried for replacement. Inventoried trees will be categorized into two separate groups:

- 1) one-inch to two inches DBH
- 2) greater than two inches DBH

In windbreaks, shelterbelts, and other planted areas, shrubs that form colonies (such as buffalo currant, chokecherry, dogwood, plum, pussy willow, sandbar willow, western snowberry, and Woods rose) and that are cut flush with the ground surface and not cleared, so as to leave the naturally occurring seed bank and root stock intact will not be direct stem counted. Instead, the area will be delineated on an aerial photo and indicated on construction drawings to not be cleared or have the ground disturbed. If ground disturbance occurs, Minnkota will conduct a direct stem count of the disturbance area or estimate the number of stems cleared using a Commission approved sampling estimate method (see Shrub Sampling Method, Appendix C).

Native Growth Areas

In native growth areas, trees that are one-inch or greater diameter at breast height (DBH) will be inventoried for replacement. Further, trees placed in the inventory will be categorized into two separate groups:

- 1) one-inch to two inches DBH
- 2) greater than two inches DBH

In high-density woodland areas, a Commission approved sampling method may be used in place of individual counting (see Tree Sampling Method, Appendix D).

In native growth areas, shrubs that form colonies (such as buffalo currant, chokecherry, dogwood, plum, pussy willow, sandbar willow, western snowberry, and Woods rose) and that are cut flush with the ground surface and not cleared, so as to leave the naturally occurring seed bank and root stock intact will not be direct stem counted. Instead, the area will be delineated on an aerial photo and indicated on construction drawings to not be cleared or have the ground disturbed. If ground disturbance occurs, Minnkota will conduct a direct stem count of the disturbance area or estimate the number of stems cleared using a Commission approved sampling estimate method (see Shrub Sampling Method, Appendix C).

Shrub Sampling Method

Per the Commission's Tree and Shrub Mitigation Specifications (Inventory Specification No. 6 in Appendix A), in high-density woodland areas, Minnkota proposes the following sampling method for the shrub inventory. The dimensions of the entire woodland stand within the ROW will be delineated to determine the area of the woodland. Shrub counts will be made in representative sample site areas within the woodland. Transect will be developed and the circular sample sites placed along the transect. The number of sample sites within a woodland stand will be dependent on woodland size and uniformity. A smaller, more uniform woodland stand would require fewer sample sites than a larger, less uniform woodland stand.

The sample sites will be 0.001 acres (3.72-foot radius circles). A rope 3.72 feet in length will be attached to a central stake and rotated in a circle (Appendix C). Shrubs within the circle will be counted. Tree and shrub density for the entire woodland area within the ROW will be calculated based on the average density from all of the sample locations within the woodland, weighted against the woodland size.

Tree Sampling Method

Per the Commission's Tree and Shrub Mitigation Specifications (Inventory Specification No. 6 in Appendix A), in high-density woodland areas, Minnkota proposes the following sampling method for the tree inventory. The dimensions of the entire woodland stand within the ROW will be delineated to determine the area of the woodland. Tree and shrub counts will be made in representative sample site areas within the woodland. Transect will be developed and the circular sample sites placed along the transect. The number of sample sites within a woodland stand will be dependent on woodland size and uniformity. A smaller, more uniform woodland stand would require fewer sample sites than a larger, less uniform woodland stand.

The sample sites will be 0.10 acres (37.42-foot radius circles). A rope 37.42 feet in length will be attached to a central stake and rotated in a circle (Appendix D). Trees and shrubs within the circle will be counted. Tree and shrub density for the entire woodland area within the ROW will be calculated based on the average density from all of the sample locations within the woodland, weighted against the woodland size.

Appendix A

Tree and Shrub Mitigation Specifications

Inventory

1. Trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (e.g., *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*), shall be inventoried before cutting. The inventory shall record the location, number, and species of trees and shrubs.
2. In windbreaks, shelterbelts and other planted areas, trees or shrubs anticipated to be cleared, regardless of size, shall be inventoried for replacement.
3. In native growth areas, trees anticipated to be cleared that are 1 inch diameter at breast height ("dbh") or greater shall be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way shall be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs shall be cut flush with the surface of the ground, taking care to leave the naturally occurring seed bank and root stock intact. If soil disturbance is necessary, the native topsoil shall be preserved and replaced after construction. Shrubs shall be allowed to regenerate naturally where native topsoil is preserved and replaced. Where native topsoil is not preserved and replaced, shrubs anticipated to be cleared shall be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by sampling method that will properly represent the woody vegetation population. A sampling plan developed by the company, filed with the North Dakota Public Service Commission (Commission) and approved prior to the start of construction shall define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots shall be extrapolated to the total acreage of the wooded area to be cleared to determine the species and quantity of trees and shrubs to be replaced.

Clearing for Construction

7. Trees and shrubs shall be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The width of clear cuts through windbreaks, shelterbelts and all other wooded areas shall be limited to 50 feet or less unless otherwise approved by the NDPSC. [Minnkota will clear within the 150-foot-wide ROW easement, if warranted.]
9. If the area of trees or shrubs actually cleared differs from the area inventoried, the difference in number of trees and shrubs to be replaced shall be noted on the inventory.

Replacement

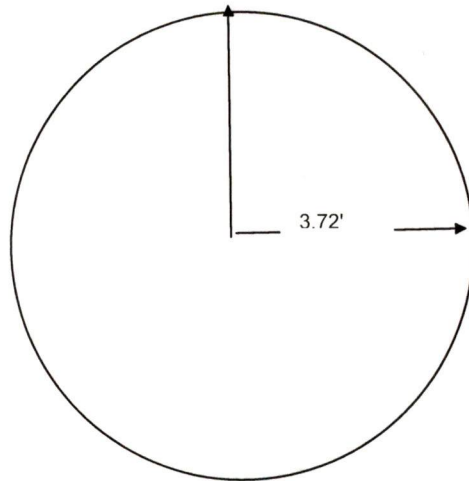
10. Prior to tree/shrub replacement, documentation identifying the number and variety of trees removed as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings shall be filed with the NSPSC for approval.
11. Tree replacement shall be on a 2 to 1 basis with 2-year-old saplings. Shrub replacement shall be on a 2 to 1 basis with stem cuttings.
12. Trees and shrubs shall be replaced by the same species or similar species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.
13. Landowners shall be given the option of having replacement trees/shrubs planted off the right-of-way on the landowner's property or waiving that requirement in writing and allowing those replacement trees/shrubs to be planted at alternative locations.
14. At the conclusion of the project, documentation identifying the actual number, variety, type, location, and date of the replacement plantings shall be filed with the NDPSC.
15. Tree/shrub replacements shall be inspected once a year for three years, on about the anniversary of the plantings, and, on or shortly before October 1 of each year, a report shall be submitted to the NDPSC documenting the condition of replacement planting and any woodlands work completed. If after three years from the anniversary of the plantings the survival rate is less than 75%, the NDPSC may order additional planting(s).

Appendix C

Shrub Sampling Method

Sample Plot

- Circular sample plots with a radius of 3.72 feet, or area equivalent to 0.001 acres created with a central stake and rope.
- The rope, 3.72 feet in length, anchored to the central stake and rotated in a circle



Shrub Counts

- Direct stem counts from each plot
- Talled on work sheet by species

Woodland size

- GPS points taken in the field around boundary
- GIS used to calculate acreage

Calculations

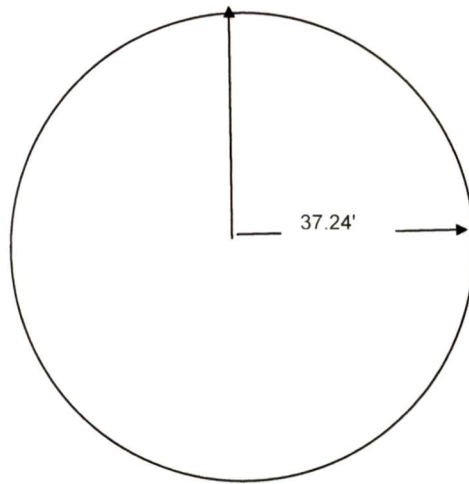
- Average determined from all plots sampled in a woodland area or area is equivalent to stems/0.001 acre
- Converted to a per acre basis (average times 1000)
- Total number per woodland determined by multiplying average number per acre with woodland size

Appendix D

Tree Sampling Method

Sample Plot

- Circular sample plots with a radius of 37.24 feet, or area equivalent to 0.10 acres created with a central stake and rope.
- The rope, 37.24 feet in length, anchored to the central stake and rotated in a circle



Tree Counts

- Direct stem counts from each sample site
- Talled on work sheet by species

Woodland size

- GPS points taken in the field around boundary
- GIS used to calculate acreage

Calculations

- Average determined from all plots sampled in a woodland area or area is equivalent to stems/0.10 acre
- Converted to a per acre basis (average times 10)
- Total number per woodland determined by multiplying average number per acre with woodland size

Exhibit P – Updated Table 6.0-1. Potential Required Permits and Approvals

Agency	Type of Permit, Regulatory or Compliance	Need	Status
Federal			
Rural Utilities Service	Approval of Financial Assistance	Needed to receive financial assistance.	In progress
	NEPA Compliance	Required for projects considered a federal undertaking (e.g., federal funding).	Finding of No Significant Impact (FONSI) anticipated in late February
	Section 7 of the Endangered Species Act	Required as part of NEPA compliance.	Biological Assessment submitted to USFWS
	Section 106 of the National Historic Preservation Act Coordination	Required as part of NEPA compliance	Programmatic Agreement executed
	Native American Consultation	Required as part of Section 106 consultation/NEPA compliance.	Programmatic Agreement executed
U.S. Fish and Wildlife Service	Special Use Permit	Special Use Permit needed for disturbance to land subject to a grassland easement or wetland subject to a wetland easement.	EA submitted - USFWS is drafting the Special Use Permit
U.S. Army Corps of Engineers	Section 404 of the Clean Water Act	Nationwide Permit 12 - required for dredging or fill in jurisdictional waters of the United States for utility line projects.	Only pre-construction notification required
	Section 10 of the Rivers and Harbors Act of 1899	Section 10 Permit - Letter of Permission required for the Missouri River crossing.	Will submit application after FONSI issued
	Pre-Construction Notification	Pre-Construction Notification needed for the Nationwide Permit 12 and Section 10 - Letter of Permission.	Will submit notification after FONSI issued
Federal Aviation Administration	FAA Form 7460-1 - Notice of Proposed Construction or Alteration	The FAA must confirm that construction of the Project does not constitute a hazard to air navigation.	Form submitted
	FAA Form 7460-2 - Notice of Actual Construction or Alteration	Notifies FAA of actual constructed or altered structures.	Will submit form after construction

Agency	Type of Permit, Regulatory or Compliance	Need	Status
	FAA Form 7461-1, Notice of Proposed Construction Hazard Determination	Notifies FAA of structures that might affect navigable airspace. Form requires proposed markings and lighting. FAA must review possible impacts to air safety and navigation, as well as the potential for adverse effects on radar systems.	Form submitted
Environmental Protection Agency	Spill Prevention Control and Countermeasure (SPCC) Plan	Required if the substation facility has greater than 1,320 gallons of oil. Current SPCC Plans will be revised as necessary. A copy of the plan will be maintained on file with the substation's owner/operator and will be reviewed by the certifying engineer every five years.	To be updated, if necessary
U.S. Department of the Interior - Bureau of Reclamation	Special Use Permit	Needed for structures located within the Chain of Lakes Recreation Area and McClusky Canal lands in Sheridan County.	Application submitted
State			
Public Service Commission	Certificate of Corridor Compatibility	Required prior to construction of a transmission facility; designates corridor within which a route may be located.	Issued September 7, 2011
	Route Permit	Required prior to construction of a transmission facility; designates route location within approved corridor.	Route Permit Application submitted
Department of Health	NPDES Permit: General Construction Storm Water	Required for disturbance of over 1 acre of land. Must prepare a SWPPP.	Will submit application prior to construction
Division of Emergency Management	Emergency Planning and Community Right-to-Know Act (EPCRA) Tier II report	Required for owner/operators of facilities containing hazardous materials. A copy of the report must be filed annually by March 1 st .	Will file, if necessary
State Water Commission – Office of State Engineer	State Sovereign Lands Permit	If a project's proposed construction activities could impact an island or bed of a navigable water or stream, a Sovereign Lands Permit must be obtained from the North Dakota State Water Commission, Office of the State Engineer.	Applications submitted

Agency	Type of Permit, Regulatory or Compliance	Need	Status
	Conditional Water Permit	For water appropriation	Will submit if necessary (currently, not anticipated that permit will be necessary)
State Historical Society	Section 106 of the National Historic Preservation Act Coordination	Compliance with NDCC §§ 55-03-01 and 55-03-01.1 and consultation under Section 106 of the NHPA is required for projects considered a federal undertaking (e.g., federal funding, federal permit).	Programmatic Agreement executed
North Dakota Highway Patrol	Overheight/Overweight Permit	Permit required for hauling construction equipment and materials on state highways. Contractors will obtain as necessary.	Will submit application after Route Permit issued
Department of Transportation	Road Approach/Access Permit	Permit required for construction of access roads from state highways.	Will submit application after Route Permit issued
	Utility Permit/Risk Management Documents	Permit required for utility crossings on state highway ROW.	Will submit application after Route Permit issued
Local			
Counties	Conditional Use Permits (See Table 2 below)	Permit may be required for project construction depending on zoning regulations.	Applications submitted
	Building Permit	Permit may be required for substation construction, fiber optic station, and structure locations.	Will submit applications after Route Permit issued
	Haul Road Agreement	Permit may be required for hauling construction equipment and materials on county roads.	Will submit applications after Route Permit issued
	Utility Permit	Permit required for utility crossings on county road ROW.	Will submit applications after Route Permit issued
Grand Forks County	Floodplain approval	Elevation certificates are required for any building in the floodplain	Will submit certificates after Route Permit issued
Townships	Conditional Use Permits (See Table 2 below)	Permit may be required for project construction depending on zoning regulations.	Applications submitted

Table 2. Conditional Use Permit Status

County/Township	Conditional Use Permit Approval
Oliver Co.	Yes
Painted Woods Twp – Burleigh Co.	Yes
Wilson Twp – Burleigh Co.	Yes
McLean Co.	Yes
Sheridan Co.	Yes
Wells Co.	Yes
Eddy Co. ¹	Yes
Foster Co.	Yes
Griggs Co.	Yes
Addie Twp – Griggs Co.	Yes
Sharon Twp – Steele Co.	Yes
Franklin Twp – Steele Co.	Yes
Nelson Co.	Yes
Grand Forks Co.	Yes
Fairfield Twp – Grand Forks Co.	(See Note 2)
Logan Twp – Grand Forks Co.	(See Note 2)
Lorretta Twp – Grand Forks Co.	(See Note 2)

Notes:

¹ Eddy Co. does not have formal process, but has issued letter from County Commissioners authorizing approval.

² Townships with planning & zoning authority in Grand Forks Co. requested delay in local permitting process until Grand Forks Co. approval was authorized.