

**Basin Electric Belfield-to-Rhame
Transmission Project - Tree and
Shrub Replacement Plan**

Prepared for:

Basin Electric Power Cooperative
1717 East Interstate Ave
Bismarck, North Dakota 58503

Prepared by:

Clayton Derby and Terri Thorn
Western EcoSystems Technology, Inc.
4007 State Street, Suite 109
Bismarck, North Dakota



August 20, 2010

TABLE OF CONTENTS

INTRODUCTION 1
STUDY AREA 1
METHODS 1
RESULTS 1
 Trees 1
 Shrubs 2
RECOMMENDATIONS 3
REFERENCES 4

LIST OF TABLES

Table 1. Landowner and estimated number of trees or shrubs destroyed due to construction of the Belfield-to-Rhame transmission line. 2

LIST OF FIGURES

Figure 1. Location of the Belfield-to-Rhame transmission line in southwest North Dakota.. ... 5
Figure 2. Tree and shrub impact locations along the Belfield-to-Rhame transmission line..... 6

LIST OF APPENDICES

Appendix A: North Dakota Public Service Commission’s Tree and Shrub Mitigation Specifications (Case No. PU-07-169).

INTRODUCTION

Basin Electric Power Cooperative (Basin) constructed an approximately 112.6 kilometer (70 mile) electrical transmission line in the following southwestern North Dakota counties: Stark, Slope, and Bowman.

In the course of construction, trees and shrubs were cut and/or destroyed. Basin contracted with Western EcoSystems Technologies (WEST) to document the species, number, and location of impacted trees and shrubs and develop a replacement plan of these trees and shrubs according to the Public Service Commission's Tree and Shrub Mitigation Specifications (Case No. PU-07-169; Appendix A).

STUDY AREA

The transmission line project begins approximately 6 miles southeast of Belfield, North Dakota, and continues to the south-southwest to 4 miles south of Rhame, North Dakota (Figure 1). Cultivated agriculture is the dominate landcover type; however, grasslands occur along the route. There are also scattered areas of trees and shrubs.

This transmission project used above ground structures and lines. Equipment and materials were transported along the route via temporary roads/trails. Trees within the project right-of-way were cut, trees and shrubs at tower structure locations were removed, and some shrubs in the temporary roads/trails were driven over.

METHODS

Trees and shrubs along the project route were inventoried by WEST botanists during the summer 2009 (see Derby and Dahl 2009 for methods and results). During summer 2010, WEST personnel visually inspected areas representing three main disturbance types along the transmission line to help better estimate the actual number of trees and shrub impacted. The three disturbance types included angle points, line structures, and driving path between structures. The area of disturbance was estimated for each disturbance type. This information along with the GPS location of inventoried trees and shrubs was used in a GIS to determine location of impacted trees and shrubs. A review of the 2009 inventory was conducted to refine the actual number of individuals as compared to stems since several inventoried shrub species have colonial growth form.

RESULTS

Trees

Approximately 160 trees, representing seven known and one unknown species (were already removed when surveys were completed), were removed during construction of the transmission line (Table 1). Nine different landowners were affected (Table 1; Figure 2). An August 14, 2010 inspection of location 8 (Figure 2) revealed that the junipers inventoried there were ground

or spreading junipers (branches grew along ground reaching approximately 0.5 meters [m; 1.6 feet {ft}] in several spots) and should be classified as shrubs and not trees. The temporary construction trail impacted some of these shrubby junipers but did not appear to have killed them. Other than these junipers, it appears that the majority of inventoried trees within the right-of-way were cleared during construction.

Shrubs

Approximately 290 shrubs, represented only by sagebrush (*Artemisia tridentata*), were considered destroyed during construction of the transmission line (Table 1). Two landowners were affected (Table 1; Figure 2). Summer 2010 checks of various locations along the transmission line revealed that destruction of shrubs was minimal. Physical ground disturbance along the transmission line appeared to be limited to the holes needed for line and angle point structures. Also, it appeared no driving routes between structures were graded or cleared of shrubs and driving on shrubs did not appear to kill them as the roots were left intact. Item number 5 in Case No. PU-07-169 indicates that “shrubs shall be allowed to regenerate naturally where native topsoil is preserved and replaced.” The destruction of sage brush appeared to be caused by placement of structures in these areas (i.e., ground disturbing) and to a much lesser extent by driving over. Re-growth of most of these plants was observed during summer 2010 inspections.

Table 1. Landowner and estimated number of trees or shrubs destroyed due to construction of the Belfield-to-Rhame transmission line.

MAP ID	Landowner tree common name	Scientific Name	Estimated Number of Plants Destroyed
1	Alex Stockert Ranch Trust boxelder	<i>Acer negundo</i>	5
2	Betty Metz juniper	<i>Juniperus spp.</i>	1
	unknown tree (cut)	Unknown	10
	willow	<i>Salix spp.</i>	5
3	Bruce & Teresa Bowman American elm	<i>Ulmus americana</i>	5
4	Cornelius Kooren cottonwood	<i>Populus spp.</i>	1
	willow	<i>Salix spp.</i>	65
5	Dorothy Eldringhoff Russian olive	<i>Elaeagnus angustifolia</i>	10
6	Frank A. Hurt et. al. sagebrush	<i>Artemisia tridentate</i>	90
7	George & Edward Schmidt sagebrush	<i>Artemisia tridentate</i>	200
8	Kenneth & Roberta Volesky		20

Table 1. Landowner and estimated number of trees or shrubs destroyed due to construction of the Belfield-to-Rhame transmission line.

MAP ID	Landowner tree common name	Scientific Name	Estimated Number of Plants Destroyed
9	boxelder	<i>Acer negundo</i>	
	Marlene L. Powell cottonwood	<i>Populus spp.</i>	1
	willow	<i>Salix spp.</i>	5
10	Wagner Farms (Phillip) cottonwood	<i>Populus spp.</i>	1
	hawthorn	<i>Crateaegus spp.</i>	20
	willow	<i>Salix spp.</i>	5
11	Wayne & Rita Stebbins cottonwood	<i>Populus spp.</i>	5
	Tree Total		160
	Shrub Total		290

RECCOMENDATIONS

Basin has contacted the US Forest Service to determine a list of tree and shrub species suitable for planting in south-western North Dakota if existing species are not replanted. Impacted landowners will be contacted and given the choice of having the replacement trees or shrubs planted off the right-of-way on the property or waiving this choice in writing and allowing those replacement trees or shrubs to be planted in an alternate location. Tree and shrub planting will occur in spring, 2011 and plantings will be inspected once a year for three years with reports due to the North Dakota Public Service Commission before October 1st of each year.

Item number 11 in Case No. PU-07-169 states that both trees and shrubs shall be replaced on a two for one basis. Therefore, approximately 320 trees and 580 shrubs will be planted. Species and location will be documented once impacted landowners are contacted and responses received.

REFERENCES

Derby, C. and A. Dahl. 2009. Basin Electric Belfield-to-Rhame Transmission Project, Tree and Shrub Inventory. Prepared for Basin Electric Power Cooperative, Bismarck, North Dakota. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. August 11, 2009.

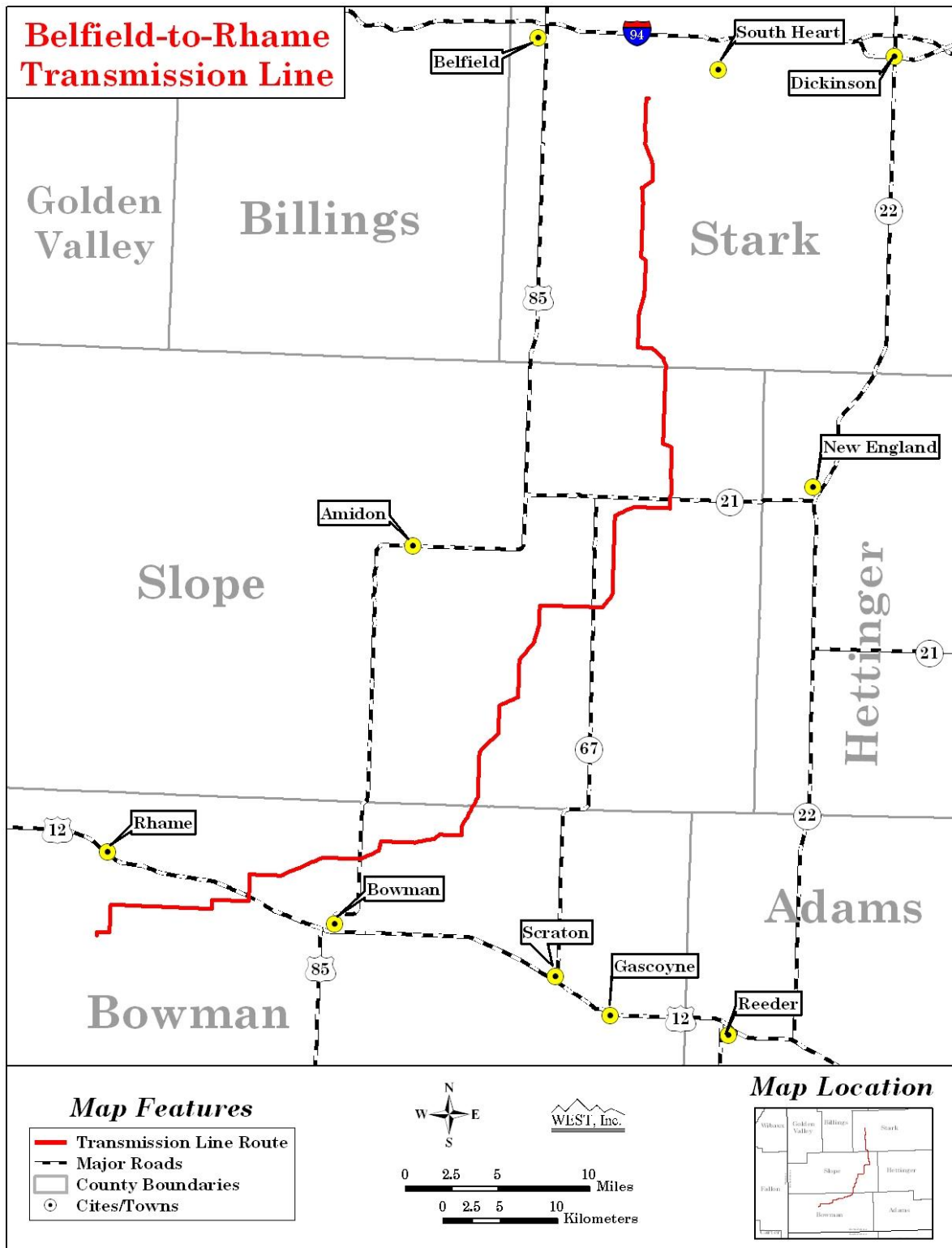


Figure 1. Location of the Belfield-to-Rhame transmission line in southwest North Dakota.

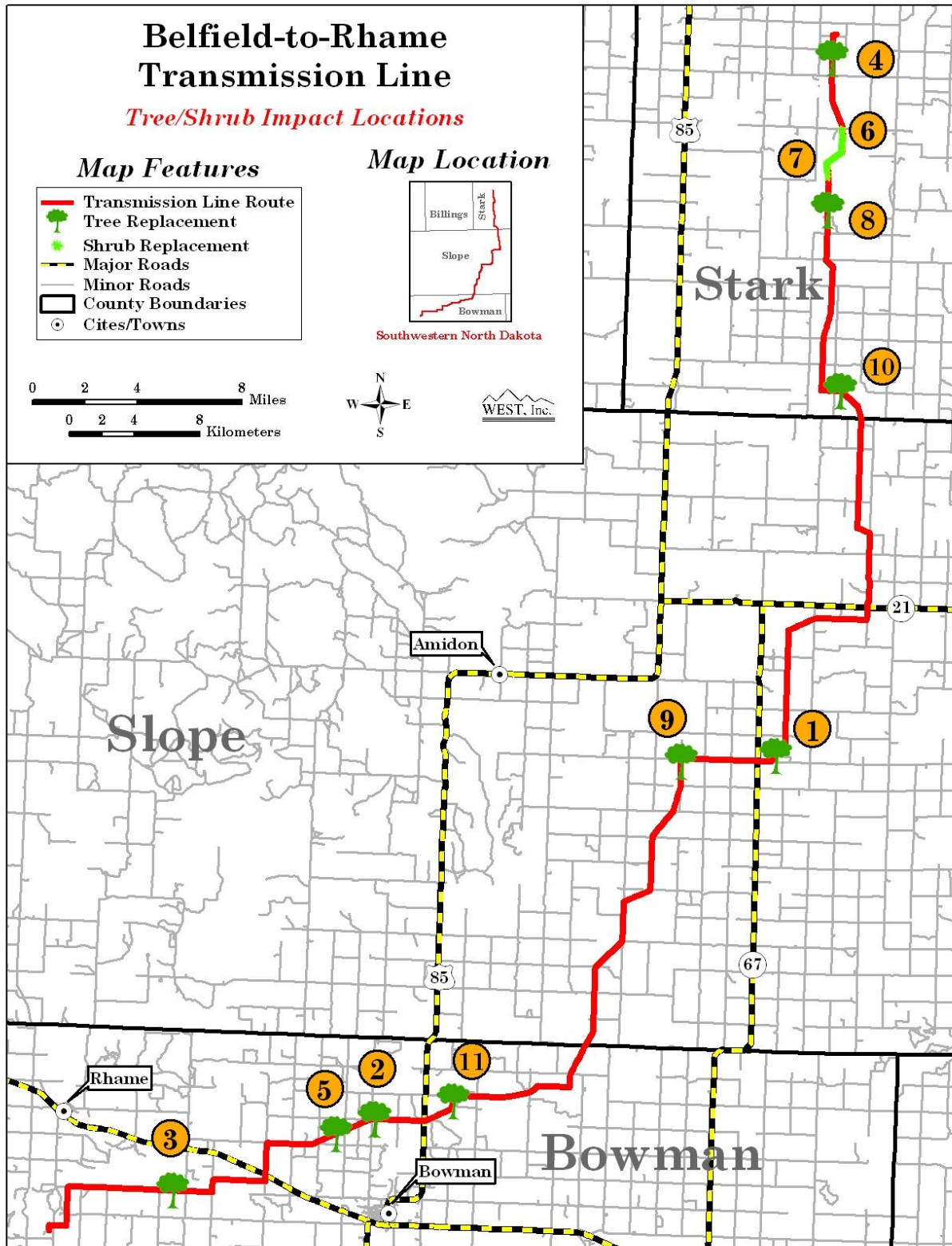


Figure 2. Tree and shrub impact locations along the Belfield-to-Rhame transmission line.

Appendix A: North Dakota Public Service Commission's Tree and Shrub Mitigation Specifications (Case No. PU-07-169).

Case No. PU-07-169

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 (NDPSC) 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.

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. Tree and shrub replacement shall not be conducted within a 20 to 30 foot wide path over the pipeline to facilitate visual inspections of the right-of-way in accordance with U.S. Department of Transportation safety regulations.
14. 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.
15. 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.
16. 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).