

## -Info-Public Service Commission

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**From:** Aron Anderson <aanderson@solasenergyconsulting.com>  
**Sent:** Friday, November 11, 2016 1:35 PM  
**To:** Lein, Jerry R.; -Info-Public Service Commission  
**Cc:** Jed Dailey; Cindy Whitney; Ryan Hartleben; Jon Johnson  
**Subject:** Sunflower Wind Project - Case Number: PU-14-105  
**Attachments:** Sunflower\_Tree\_Shruh\_Post\_Construction\_Inventory\_FINAL.pdf; Sunflower No Tree Replanting Landowner Letters - Case Number PU-14-105.pdf; Sunflower - NRCS Tree and Shrub Planting Plan.pdf

Jerry,

Per the Tree and Shrub Mitigation Specifications provided as part of the PU-14-105 Siting Application, please see attached post construction tree and shrub inventory, letters documenting landowners not wanting trees replanted on their property and the proposed planting locations and tree/shrub schedule from the Stark County NRCS for the PSC's review and approval. The NRCS is currently completing the soils reports for each location and expect to deliver final reports to Sunflower within the next 4 weeks, at which time we will provide to the PSC. The NRCS is planning there fall tree order for spring 2017 plantings, so an expedited response would be appreciated. Please give me a call with any questions.

See below for further details written into the Tree and Shrub Mitigation Specifications:

### Replacement

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval. **See attached post construction inventory.**
11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed. **700 trees/shrubs were removed during construction. The prescribed planting schedule calls for 1,406 trees/shrubs to be planted.**
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. Invasive or noxious species must be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. **The tree/shrub planting is slated for spring 2017 planting at 3 locations on Steve Kitzan's property and 1 location on Lynn Underdahl's property. The species selected for planting were selected by the NRCS based on location and soils analysis as well as landowner preference. Silver sagebrush was considered invasive and replaced on the planting schedule with Silverberry and Juniper.**
13. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property. **Landowners with tree/shrub replacement were given tree/shrub species options for replanting based on NRCS recommendations. Two landowners requested tree/shrub while the remaining landowners declined the replanting of trees/shrubs. See attached letters from landowners declining the replanting of trees/shrubs.**

14. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission. **To be provided spring of 2017.**

15. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s). **To be completed annually post planting.**

*Thank You,*

*Aron Anderson*  
*Senior Project Manager*  
*Solas Energy Consulting US Inc.*  
Mobile: (612) 599-4251  
Email: [aanderson@solasenergyconsulting.com](mailto:aanderson@solasenergyconsulting.com)

# **Sunflower Wind Energy Project - Tree And Shrub Inventory and Replacement Plan**

*Prepared for:*

Sunflower Wind Project, LLC.  
767 Third Avenue  
New York, New York 10017

*Prepared by:*

Derek Klostermeier and Clayton Derby  
**Western EcoSystems Technology, Inc.**  
4007 State Street, Suite 109  
Bismarck, North Dakota



November 1, 2016

**TABLE OF CONTENTS**

INTRODUCTION ..... 1  
STUDY AREA ..... 1  
METHODS ..... 1  
    Tree and Shrub Inventory ..... 1  
RESULTS ..... 1  
    Inventory ..... 1  
    Impact to Trees and Shrubs ..... 2  
Tree and shrub replacement plan ..... 3

**LIST OF TABLES**

Table 1. Results of tree and shrub inventory by common name, scientific name and number of individual plants for the Sunflower Wind Energy Project. .... 2  
Table 2. Landowner and estimated number of trees or shrubs removed/destroyed due to construction of the Sunflower Wind Energy Project. .... 2

**LIST OF FIGURES**

Figure 1. Location of the Sunflower Wind Energy Project in western North Dakota and locations of individual tree and shrub removal. .... 4

**LIST OF APPENDICES**

Appendix A: North Dakota Public Service Commission’s Tree and Shrub Mitigation Specifications (Case No. PU-14-105).

## INTRODUCTION

Sunflower Wind Project, LLC. (Sunflower) developed the Sunflower Wind Energy Project (Project), a 104-megawatt (MW) wind farm; including 52 turbines, access roads, collection lines, substation and associated infrastructure in Morton and Stark Counties, North Dakota.

In the course of construction, trees and shrubs were cut and/or removed to facilitate construction activities. Sunflower contracted with Western EcoSystems Technology, Inc. (WEST) to document the species, number, and location of impacted trees and shrubs and to develop a replacement plan for trees and shrubs according to the North Dakota Public Service Commission's Tree and Shrub Mitigation Specifications (Case No. PU-14-105; Appendix A).

## STUDY AREA

The Project begins approximately 3.5 miles south of Hebron, North Dakota, continuing east-west approximately 6.5 miles, including approximately 2-mile of eastern Stark County, ND and 4.5-mile of western Morton County, ND (Figure 1). Cultivated agriculture is the dominate land cover type; however, grasslands and wooded draws occur within the Project area containing various tree and shrub species.

The Project infrastructure largely includes construction of turbine structures and pads, access roads and underground collection lines, as well as temporary paths where large cranes, traveled. Trees and shrubs within the project right-of-way and turbine locations were cleared, and some shrubs within the temporary right-of-way were removed due to construction traffic.

## METHODS

### Tree and Shrub Inventory

WEST biologists and Geographic Information System (GIS) specialists conducted an initial GIS-based (desktop) review of the July 2015 provided proposed layout plan in conjunction with aerial imagery to evaluate and define all areas potentially containing tree and shrub species. This included all grassland tracts, no tilled agricultural tracts were deemed appropriate for survey. A ground-based tree and shrub inventory was conducted by WEST botanists on August 11, 12, and September 4, 2015. An area 75-foot either side of proposed access roads, collection lines and temporary paths, as well as 150-foot radius around turbines was searched within grassland or treed areas; tilled agricultural areas were not searched. Tree/shrub locations of individuals or clusters, species and number of individuals were recorded.

## RESULTS

### Inventory

Approximately 190 acres were surveyed resulting in a total of 12 individual tree and shrub species inventoried within the survey boundary. About 71% of all individual tree and shrub species were Silver sagebrush (*Artemisia cana*) and 9% were Western snowberry (*Symphoricarpos occidentalis*) (Table 1).

**Table 1. Results of tree and shrub inventory by common name, scientific name and individual plants for the Sunflower Wind Energy Project.**

Tree or Shrub Common Name	Scientific Name	Number of Individuals
<b>Trees</b>		
Green Ash	<i>Fraxinus pennsylvanica</i>	8
Russian Olive	<i>Elaeagnus angustifolia</i>	30
Siberian Elm	<i>Ulmus pumila</i>	16
<b>Subtotal</b>		<b>54</b>
<b>Shrubs</b>		
Chokecherry	<i>Prunus virginiana</i>	31
Common snowberry	<i>Symphoricarpos albus</i>	2
Creeping juniper	<i>Juniperus horizontalis</i>	8
Juneberry	<i>Amelanchier alnifolia</i>	11
Round-leaved hawthorn	<i>Crataegus rotundifolia</i>	4
Silver buffaloberry	<i>Shepherdia argentea</i>	26
Silver sagebrush	<i>Artemisia cana</i>	498
Western snowberry	<i>Symphoricarpos occidentalis</i>	66
<b>Subtotal</b>		<b>646</b>
<b>Total</b>		<b>700</b>

### Impact to Trees and Shrubs

#### Trees

Approximately 54 trees, representing three species were within the cleared right-of-way and turbine pads and therefore removed during construction (Table 2). Three individual landowners were affected (Table 2).

#### Shrubs

Approximately 646 shrubs, representing eight species were removed or otherwise considered destroyed during construction (Table 2). Seven individual landowners were affected (Table 2).

**Table 2. Landowner and estimated number of trees or shrubs removed due to construction of the Sunflower Wind Energy Project.**

Landowner Common Name	Scientific Name	Estimated Number of Individuals Removed
<b>Dale &amp; Constance Heinle</b>		<b>6</b>
Chokecherry	<i>Prunus virginiana</i>	6 shrubs
<b>Dennis &amp; Donna Reich</b>		<b>22</b>
Silver buffaloberry	<i>Shepherdia argentea</i>	22 shrubs
<b>David &amp; Claudia Meberg</b>		<b>75</b>
Creeping juniper	<i>Juniperus horizontalis</i>	6 shrubs
Green ash	<i>Fraxinus pennsylvanica</i>	8 trees
Juneberry	<i>Amelanchier ulnifolia</i>	11 shrubs
Round-leaved hawthorn	<i>Crataegus rotundifolia</i>	4 shrubs
Russian olive	<i>Elaeagnus angustifolia</i>	30 trees

**Table 2. Landowner and estimated number of trees or shrubs removed due to construction of the Sunflower Wind Energy Project.**

<b>Landowner Common Name</b>	<b>Scientific Name</b>	<b>Estimated Number of Individuals Removed</b>
Siberian elm	<i>Ulmus pumila</i>	16 trees
<b>Lyle R. Hoerauf</b>		<b>27</b>
Chokecherry	<i>Prunus virginiana</i>	25 shrubs
Common snowberry	<i>Symphoricarpos occidentalis</i>	2 shrubs
<b>Lynn Underdahl</b>		<b>528</b>
Silver buffaloberry	<i>Shepherdia argentea</i>	4 shrubs
Silver sagebrush	<i>Artemisia cana</i>	498 shrubs
Western snowberry	<i>Symphoricarpos occidentalis</i>	26 shrubs
<b>Roger Vetter</b>		<b>40</b>
Western snowberry	<i>Symphoricarpos occidentalis</i>	40 shrubs
<b>Russell C. Kreis</b>		<b>2</b>
Creeping juniper	<i>Juniperus horizontalis</i>	2 shrubs
<b>Tree Total</b>		<b>54</b>
<b>Shrub Total</b>		<b>646</b>
<b>Grand Total</b>		<b>700</b>

### TREE AND SHRUB REPLACEMENT PLAN

Sunflower has contacted and is working with the Morton and Stark County Natural Resource Conservation Service (NRCS) office to determine a list of tree and shrub species suitable for planting at the Sunflower Wind Project. The NRCS will help Sunflower to identify species to be planted if existing species (i.e. species removed) are not available to be used in plantings or landowners prefer a different species be planted on the respective parcels. Landowners will be contacted and given the choice of having the replacement trees or shrubs planted off the right-of-way on their 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 the spring of 2017 and plantings will be inspected once a year for three years with reports due to the North Dakota Public Service Commission before October 1<sup>st</sup> of each year.

Item number 11 under replacement specifications in Case No. PU-14-105 (Appendix A), states that both trees and shrubs shall be replaced on a two to one ratio; therefore, approximately 108 trees and 1,292 shrubs will be planted based on the pre- and post-construction inventories and GIS analysis.

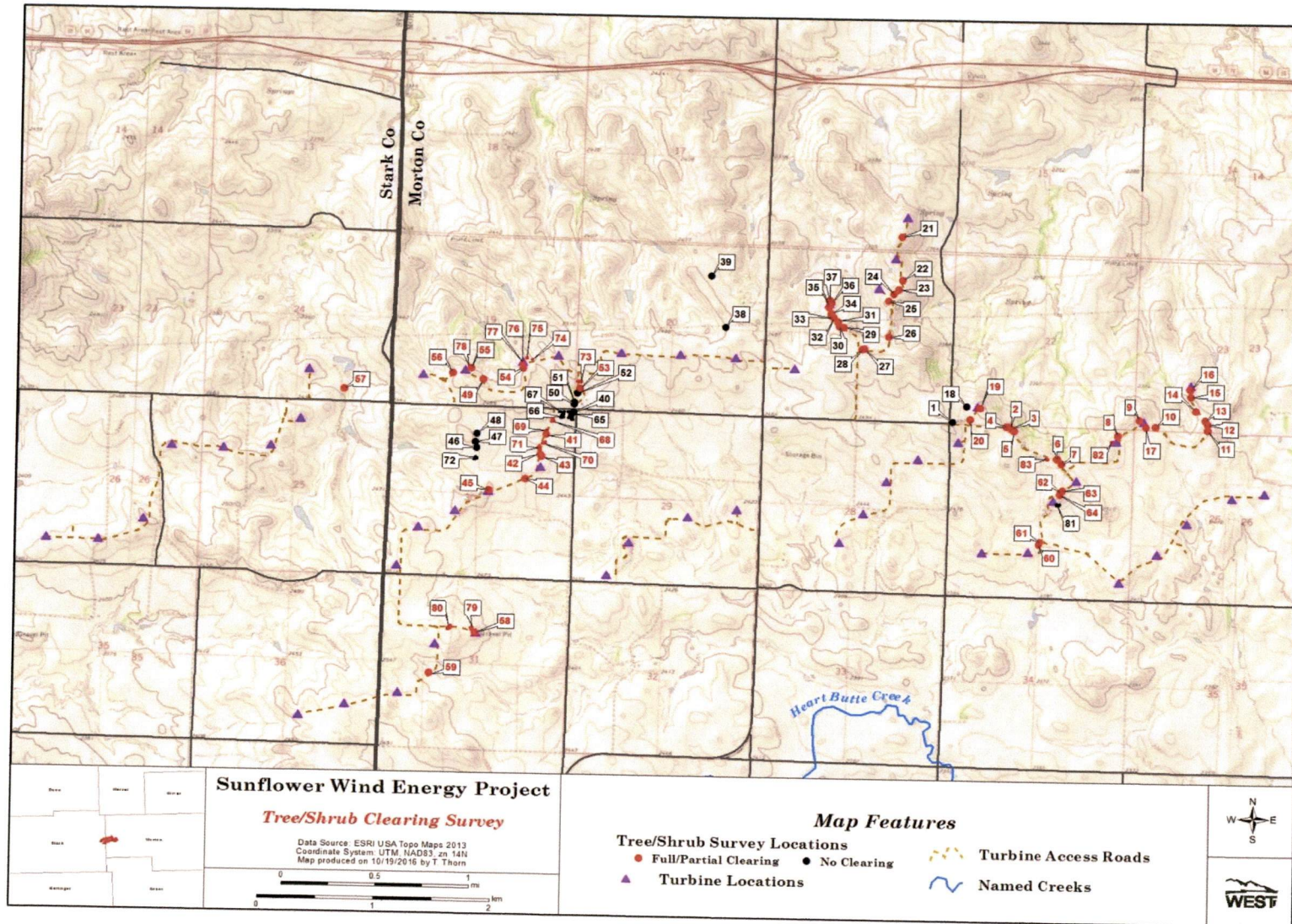


Figure 1. Location of the Sunflower Wind Energy Project in western North Dakota, and locations of individual tree and shrub removal.

**Appendix A: North Dakota Public Service Commission's Tree and Shrub  
Mitigation Specifications (Case No. PU-14-105).**

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF NORTH DAKOTA**

Sunflower Wind Project, LLC  
Wind Energy Conversion Facility –  
Stark and Morton Siting Application

Case No. PU-14-105

**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*), must be inventoried before cutting. The inventory must 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, must 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 must be inventoried for replacement.
4. In native growth areas, shrubs anticipated to be cleared in the permanent right-of-way must be inventoried for replacement.
5. In native growth areas outside the permanent right-of-way, shrubs must 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 must be preserved and replaced after construction. Shrubs must 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 must be inventoried for replacement.
6. In native growth areas, trees and shrubs may be inventoried by actual count or by a 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 must define the sampling method to be used for trees, for tall shrubs and for low shrubs. The data from the sample plots must 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 must be selectively cleared, leaving mature trees and shrubs intact where practical.
8. The maximum width of clear cuts through windbreaks, shelterbelts and all other wooded areas is 50 feet, unless otherwise approved by the Commission.
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 must be noted on the inventory.

**Replacement**

10. Prior to tree and shrub replacement, documentation identifying the number and variety of trees and shrubs removed, as well as the mitigation plan for the proposed number, variety, type, location and date of replacement plantings, must be filed with the Commission for approval.
11. Two 2-year-old saplings must be planted for every one tree removed. Two shrubs (stem cuttings) must be planted for every one shrub removed.
12. Except in the case of invasive or noxious species, trees and shrubs must be replaced by the same species or similar species, suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service. Invasive or noxious species must be replaced by similar non-invasive or non-

noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

13. Landowners must be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner must also be given the opportunity to waive those options in writing in order to have replacement trees and shrubs planted off the landowner's property.
14. At the conclusion of the project, documentation identifying the actual number, variety, type, location and date of the replacement plantings must be filed with the Commission.
15. Tree and shrub replacements must be inspected annually, in September, for three years. The first annual inspection must be at least one year from the anniversary date of the original plantings. A report of each annual inspection must be submitted to the Commission by October 1 of each year, documenting the condition of plantings and any woodlands work completed as of September of each year. If after the third annual report the survival rate is less than 75%, the Commission may order additional planting(s).













October 28, 2016

## Sunflower Wind Project Tree Planting

Dear Sunflower Landowner,

Prior to the start of construction Sunflower Wind Project, LLC provided a tree and shrub inventory to the Public Service Commission (PSC). Per our permit obligations we conducted a post construction survey to quantify the number of trees/shrubs removed on each landowner's property.

Based on the survey trees/shrubs were removed from your property. I reached out to you by telephone to see if you would like the trees/shrubs replanted on your property. During this call you stated you did not want trees/shrubs replanted on your property.

To satisfy our obligations to the PSC we need documentation from the landowner stating you do not want trees/shrubs replanted on your property.

Please sign this letter and return in the postage paid envelope provided.

Sunflower Landowner Signature: *Danna Reed*

We appreciate your partnership in this project as we work towards project completion. As always, please feel free to contact me with any questions, or feel free to stop by the project job trailer.

Sincerely,

Aron Anderson  
Senior Project Manager  
Solas Energy Consulting  
612-599-4251  
[aanderson@solasenergyconsulting.com](mailto:aanderson@solasenergyconsulting.com)



October 28, 2016

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Please sign this letter and return in the postage paid envelope provided.

Sunflower Landowner Signature: Roger W Vetter

We appreciate your partnership in this project as we work towards project completion. As always, please feel free to contact me with any questions, or feel free to stop by the project job trailer.

Sincerely,

Aron Anderson  
Senior Project Manager  
Solas Energy Consulting  
612-599-4251  
[aanderson@solasenergyconsulting.com](mailto:aanderson@solasenergyconsulting.com)



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Please sign this letter and return in the postage paid envelope provided.

Sunflower Landowner Signature:

*Dale Heine*

We appreciate your partnership in this project as we work towards project completion. As always, please feel free to contact me with any questions, or feel free to stop by the project job trailer.

Sincerely,

*Aron Anderson*

Aron Anderson  
Senior Project Manager  
Solas Energy Consulting  
612-599-4251

[aanderson@solasenergyconsulting.com](mailto:aanderson@solasenergyconsulting.com)



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Sunflower Landowner Signature: 

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Aron Anderson  
Senior Project Manager  
Solas Energy Consulting  
612-599-4251  
[aanderson@solasenergyconsulting.com](mailto:aanderson@solasenergyconsulting.com)



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Please sign this letter and return in the postage paid envelope provided.

Sunflower Landowner Signature:

A handwritten signature in black ink, appearing to read "Russell C. Gray", written over a horizontal line.

We appreciate your partnership in this project as we work towards project completion. As always, please feel free to contact me with any questions, or feel free to stop by the project job trailer.

Sincerely,

A handwritten signature in black ink, appearing to read "Aron Anderson", written in a cursive style.

Aron Anderson  
Senior Project Manager  
Solas Energy Consulting  
612-599-4251

[aanderson@solasenergyconsulting.com](mailto:aanderson@solasenergyconsulting.com)