

Casey A. Furey
100 West Broadway, Suite 250
P.O. Box 2798
Bismarck, ND 58502-2798
701.223.6585
cfurey@crowleyfleck.com

March 23, 2021

Via Electronic Mail

Mr. Steve Kahl
Executive Director
North Dakota Public Service Commission
600 E. Boulevard, Dept. 408
Bismarck, North Dakota 58505-0480
ndpsc@nd.gov

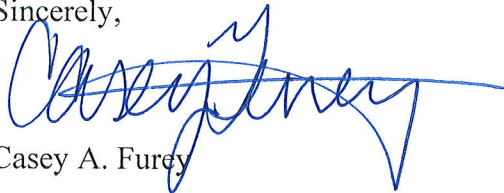
**In re: Northern Divide Wind, LLC
Northern Divide Wind Energy Center
Northern Divide 345-kV Transmission Line
Case Nos. PU-19-376 & PU-19-377
Our Matter No. 035218-000045**

Dear Mr. Kahl:

On behalf of Northern Divide Wind, LLC, please find enclosed for filing in Case Nos. PU-19-376 and PU-19-377, Northern Divide Wind, LLC's Tree and Shrub Mitigation Plan.

Please feel free to contact me with any questions.

Sincerely,



Casey A. Furey

CAF/lh
Enc.

cc: Tracy Davis (via e-mail)
Jerry Lein (via e-mail)

192 PU-19-377 Filed 03/23/2021 Pages: 151
Tree and Shrub Mitigation Plan
Northern Divide Wind, LLC
Casey Furey, Crowley Fleck, PLLP

199 PU-19-376 Filed 03/23/2021 Pages: 151
Tree and Shrub Mitigation Plan
Northern Divide Wind, LLC
Casey Furey, Crowley Fleck, PLLP



March 23, 2021

Mr. Steve Kahl
Executive Director
North Dakota Public Service Commission
600 E. Boulevard Ave., Dept 408
Bismarck, ND 58505-0480

Re: Tree and Shrub Mitigation Plan for the Northern Divide Wind, LLC (PU-19-376) and 345 kV Transmission Line (PU-19-377) Project in Burke and Mountrail Counties, North Dakota

Dear Mr. Kahl:

Environmental Consulting and Technology, Inc. has been tasked to plan and conduct a tree and shrub mitigation plan for the Northern Divide Wind, LLC (Case No. PU-19-376 and PU-19-377) Project. The Project consists of turbines, transmission line, access roads, underground electrical collection systems, collection substations, an operations and maintenance (O&M) building, meteorological evaluation (Met) towers, a construction laydown area, and a batch plant. Construction of the Project required the removal of trees and shrubs.

A total of 5,072 trees and shrubs were removed during construction. Each tree and shrub that was removed will be replaced on a minimum 2:1 ratio for a total of 10,144 trees and shrubs planted. However, 11,528 trees and shrubs will be planted in order to account for potential losses. Planting is currently scheduled to take place in mid-May 2021. Environmental Consulting and Technology, Inc. respectively requests concurrence with the enclosed tree and shrub mitigation plan.

Sincerely,

ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC.

A handwritten signature in blue ink that reads 'Jeffrey T. Bunch'.

Jeffrey T. Bunch
Program Manager, Natural Resources

Enclosure: Tree and Shrub Mitigation Plan

23712 W. 83rd Terrace
Shawnee, KS
66227

(913) 957-1489

Tree and Shrub Mitigation Plan

Northern Divide Wind and Transmission Line Project

Burke and Mountrail Counties, North Dakota

Prepared for:

Northern Divide Wind, LLC
700 Universe Boulevard,
Juno Beach, Florida 33408

March 23, 2021

Prepared by:



23712 West 83rd Terrace
Shawnee, Kansas 66227
(913) 957-1489
ECT Project No. 200363

TABLE OF CONTENTS

Introduction and Regulatory Background Page 1
Inventory of Trees and Shrubs Page 3
Landowner Consultation Page 4
Table 1 – Tree/Shrub Replacement Quantity and Species Page 4-7
Planting Schedules..... Page 8
Follow-up Documentation and Monitoring..... Page 9

APPENDICES

- APPENDIX A: TREE AND SHRUB MITIGATION SPECIFICATIONS**
- APPENDIX B: FIELD OFFICE TECHNICAL GUIDE: WINDBREAK AND WOODLAND TREE CARE MANAGEMENT**
- APPENDIX C: FIGURES**
- APPENDIX D: REMOVED TREE AND SHRUB INVENTORY**
- APPENDIX E: WAIVERS**
- APPENDIX F: PLANTING PLANS**

ATTACHMENTS

- ATTACHMENT 1 – AECOM NDWEC Tree and Shrub Inventory Memo**
- ATTACHMENT 2 – AECOM TLine Tree and Shrub Inventory Memo**

INTRODUCTION AND REGULATORY BACKGROUND

Environmental Consulting and Technology, Inc. (ECT) has been retained to plan and conduct a tree and shrub mitigation plan for Northern Divide Wind, LLC (referred to herein, Northern Divide Wind), a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC, for the Northern Divide Wind Energy Center and 345 kV Transmission Line (collectively, the Projects). The Projects consist of turbines, transmission line, access roads, underground electrical collection systems, collection substations, an operations and maintenance (O&M) building, meteorological evaluation (Met) towers, a construction laydown area, and a batch plant. Construction of the Projects required the removal of trees and shrubs.

On June 10, 2020, in Case No. PU-19-376 and Case No. PU-19-377, the North Dakota Public Service Commission (Commission) issued Findings of Fact, Conclusions of Law, and Order (Order) for the Projects which contained the Tree and Shrub Mitigation Specifications (**Appendix A**). The Projects were constructed in the third and fourth quarters of 2020 and commenced commercial operations in December 2020.

The Commission required that prior to the removal of any tree or shrub for construction, all trees with a diameter at breast height (DBH) larger than one inch be inventoried, to record the quantity, species, and location (**Appendix C**). All shrubs and coniferous trees of any diameter be inventoried to record the quantity, species, and location. AECOM provided tree and shrub inventory data from pre-construction and post-construction. Memos reflecting this data can be found in **Attachments 1 & 2**. This information was used to plan for the proposed quantity, species, and the location. Any species deemed to be noxious or invasive will be replaced with a similar non-invasive, non-noxious species suitable for the North Dakota growing conditions as provided by the Burke County Soil Conservation District. The removed species will be replaced during the 2021 planting season with conservation grade saplings at least two years old and shrubs at a 2:1 ratio.

The tree and shrub replacements will be inspected annually in September for two consecutive years after replanting occurs. The Commission requires a survivability rate of at least 75% by the end of the second year of inspections.

The purpose of this Tree and Shrub Mitigation Plan is to create sustainable plantings that are appropriate for the local growing conditions and soil that will provide landowners, farms and ranchers, the community, wildlife and the environment with long-term benefits. This Tree and Shrub Mitigation Plan was developed in consultation with effected landowners, consultation with the local Soil Conservation District office in accordance with United States Department of Agriculture-Natural Resources Conservation Service-North Dakota Field Office Technical Guide: Windbreak and Woodland Tree Care and Management (**Appendix B**). Northern Divide Wind has elected to not utilize weed barrier fabric, as historically, Northern Divide Wind's affiliates have found that most landowners do not want it. This Tree and Shrub Mitigation Plan includes the inventory of

trees and shrubs that were cleared during construction, the proposed amount, species, and location of trees and shrubs to be replaced at a 2:1 ratio, and approximate date for tree and shrub plantings.

INVENTORY OF TREES AND SHRUBS

The Commission requires that, prior to cutting trees or shrubs for construction, all trees greater than one-inch DBH and all coniferous trees and shrubs of any size must have recorded the location, quantity, and species (**Appendix D**).

Trees and shrubs were inventoried prior to Projects' construction in the spring and summer of 2020 by AECOM. The inventory documented the location, quantity, and species of trees and shrubs. The inventory occurred where the Projects' construction easements intersected trees and shrubs. Silverberry was not recommended to be replaced due to the highly competitive nature of the rooting system providing an advantage over native species (**Attachments 1 & 2**). The inventory documented a total of 5,072 trees and shrubs, not including silverberry (*Elaeagnus commutata*), collectively within the Projects construction easement's that were identified as needing to be removed (**Appendix D**). Two technical memorandums outlining the tree and shrub inventory for the Projects provided by AECOM are included in Attachments 1 & 2. A total of 25 different tree and shrub species were identified including: boxelder (*Acer negundo*), juneberry (*Amelanchier alnifolia*), caragana (*Caragana arborescens*), redosier dogwood (*Cornus sericea*), Arnold hawthorn (*Crataegus arnoldiana*), Russian olive (*Elaeagnus angustifolia*), silverberry, green ash (*Fraxinus pennsylvanica*), Rocky Mountain juniper (*Juniperus scopulorum*), tatarian honeysuckle (*Lonicera tatarica*), Black Hills spruce (*Picea glauca var. densata*), balsam poplar (*Populus balsamifera*), eastern cottonwood (*Populus deltoides*), hybrid poplar (*Populus hybrids*), quaking aspen (*Populus tremuloides*), American plum (*Prunus americana*), chokecherry (*Prunus virginiana*), buckthorn (*Rhamnus cathartica*), peach leaf willow (*Salix amygdaloides*), Bebb's willow (*Salix bebbiana*), sandbar willow (*Salix interior*), silver buffaloberry (*Shepherdia argentea*), common lilac (*Syringa vulgaris*), American elm (*Ulmus Americana*), and Siberian elm (*Ulmus pumila*).

Trees and shrubs were removed during construction of the Projects between July 2020 and October 2020. Northern Divide Wind restricted the construction easement near trees and shrubs to limit the number of trees and shrubs removed. A total of 5,072 trees and shrubs, not including silverberry, were removed during construction. Each tree and shrub that was removed will be replaced on a minimum 2:1 ratio for a total of 10,144 trees and shrubs planted (Attachments 1 & 2). However, 11,528 trees and shrubs will be planted in order to account for potential losses. Trees and shrubs will be replaced following the Field Office Technical Guide: Windbreak and Woodland Tree Care and Management (**Appendix B**) and recommendations by the local Soil Conservation District office.

LANDOWNER CONSULTATION

Landowners that had trees and/or shrubs removed from their property were contacted to determine how they wanted to proceed with tree and shrub replacement. Landowners were given the option to choose the location, the quantity of trees and shrubs they wanted, and the desired species (depending on availability). Landowners were also given the option to waive their right to have trees and shrubs replaced on their property (**Appendix E**). Some landowners did not send waivers back. If a response was not received after multiple calls and voicemails over a multiple week period, the non-response was considered to be an opt out. The Mountrail and Burke County Soil Conservation Districts were contacted to acquire an approved list of trees and shrubs that are suitable for the North Dakota growing conditions.

The landowners that were interested in having the trees/shrubs replaced on their property were sent individual follow-up emails. The email contained aerial photography of their property showing the areas where the trees/shrubs were removed and areas that planting was not permitted. The landowner identified on the aerial imagery where they would like the replacement trees/shrubs to be planted (**Appendix F**). The email contained a list of the available approved species in accordance with the NRCS guidelines, that the landowner could choose from. Using that information, individual planting plans were created for each landowner. Due to limitations within the ND-CPA-4 Tree and Shrub Planting Worksheet, some of the species ordered and planned had to be substituted with another species to complete the plan worksheet. Twenty-eight (28) golden willows were entered in the plan as peachleaf willows, twenty-eight (28) black willows were entered in the plan as white willows, twenty-eight (28) amur chokecherries were entered in the plan as common chokecherry, and twenty-eight (28) black walnuts were entered in the plan as black cherries. This was done to maintain the correct total in the plan worksheets as these species are not available within the ND-CPA-4 Tree and Shrub Planting Worksheet. If the landowner did not want the trees/shrubs replaced on their property, an alternative site was selected.

Table 1: Tree/Shrub Replacement Quantity and Species by Landowner

Landowner	Number of Trees/Shrubs Removed	Number of Replacement Trees/Shrubs	Tree/Shrub Species Requested	Total of Each Species
Douglas Ness	108 Shrubs	1,926	Buffaloberry	963
			Common lilac	482
			Golden currant	481

Landowner	Number of Trees/Shrubs Removed	Number of Replacement Trees/Shrubs	Tree/Shrub Species Requested	Total of Each Species
Merlyn Witte	5 Trees 29 Shrubs	Opt out	N/A	0
Thomas Burau	13 Trees 30 Shrubs	Opt out	N/A	0
Derek Pulvermacher	1 Tree 38 Shrubs	Opt out	N/A	0
Darrell Dihle	128 Shrubs	1,925	Buffaloberry	642
			Amur maple	642
			Caragana	641
Alexander Brodal	142 Shrubs	1,926	Sandbar willow	482
			Buffaloberry	482
			Caragana	481
			Redosier dogwood	481
Rodney Olson	498 Shrubs	Opt out	N/A	0
Jeffery & Nancy Larson	15 Shrubs	1,000	Caragana	333
			Buffaloberry	334
			Common lilac	333
Vernon & Ardis Zurich Trustees	172 Trees 7 Shrubs	Opt out	N/A	0
Leroy & Marcia Schroeder	34 Trees 60 Shrubs	94	Colorado blue spruce	34
			Common lilac	60
Boyd & Connie Anderson	595 Trees 839 Shrubs	Opt out	N/A	0
Garrett Lalim	12 Trees 75 Shrubs	Opt out	N/A	0
Nels Norstedt	57 Trees 252 Shrubs	Opt out	N/A	0
Owen & Linda Enget	45 Trees 3 Shrubs	48	Colorado blue spruce	45

Landowner	Number of Trees/Shrubs Removed	Number of Replacement Trees/Shrubs	Tree/Shrub Species Requested	Total of Each Species
			Buffaloberry	3
Jonathan & Elizabeth Enget	7 Trees	Opt out	N/A	0
Embarc Farm LLP	20 Trees	1,000	Common lilac	376
			Amur maple	288
			Colorado blue spruce	195
			Poplar	195
			Seedless cottonwood	33
			Crabapple	33
			Juneberry	15
			Chokecherry	15
			Buffaloberry	15
			Sand cherry	15
Colorado blue spruce	15			
William Bentley	21 Trees 47 Shrubs	Opt out	N/A	0
Mark Skalicky	12 Trees 6 Shrubs	Opt out	N/A	0
Jody Schroeder	70 Trees 82 Shrubs	Opt out	N/A	0
Hank's Difficult Decisions	88 Trees	Opt out	N/A	0
Skalicky Family Trust	88 Trees 78 Shrubs	Opt out	N/A	0
Galen Moody	68 Trees	Opt out	N/A	0
Marvin Tande	45 Trees 182 Shrubs	Opt out	N/A	0
Norman Westernness	72 Shrubs	72	Juneberry	36

Landowner	Number of Trees/Shrubs Removed	Number of Replacement Trees/Shrubs	Tree/Shrub Species Requested	Total of Each Species
			Nanking cherry	36
Larry Grindy	1 Tree 10 Shrubs	2,025	Ponderosa pine	100
			Nanking cherry	481
			Common lilac	481
			Buffaloberry	963
John Aufforth	6 Trees 265 Shrubs	Opt out	N/A	0
James Elsbernd	56 Trees 689 Shrubs	1,512	Colorado blue spruce	28
			Amur chokecherry	28
			Golden willow	28
			Black walnut	28
			Buffaloberry	313
			Nanking cherry	312
			Juneberry	149
			Sandbar willow	313
			Redosier dogwood	313
Maxine Rust	35 Shrubs	Opt out	N/A	0
Kenneth Jorgeson	8 Shrubs	Opt out	N/A	0

PLANTING SCHEDULES

Replacement trees and shrubs will be planted in the spring of 2021 (***Appendix F***). The planting plans will outline the location of the plantings for each individual landowner in ***Appendix F***. All required materials such as stakes, tube tree protectors, etc. will be acquired prior to planting. Not every County Soil Conservation District in North Dakota has the facilities to store large quantities of seedlings. Therefore, arrangements have been made with the Burke County Soil Conservation District to acquire trees and shrubs in Bowbells, North Dakota. The preparation of the sites and planting will be conducted by qualified ECT biologists. Trees and shrubs will be two-foot conservation grade bareroot handplant seedlings.

FOLLOW-UP DOCUMENTATION AND MONITORING

For two consecutive years (2021, 2022) after completion and execution of tree and shrub mitigation plan, ECT will conduct annual visual surveys in September of the planting areas to document success/mortality. In 2022, after implementing the plan for two consecutive years, ECT will produce a technical report documenting planting success and mortality of replacement trees and shrubs. Only the technical report will be submitted to the Commission, as outlined in the Tree and Shrub Mitigation Specifications (***Appendix A***)

APPENDIX A: TREE AND SHRUB MITIGATION SPECIFICATIONS

**STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION**

Northern Divide Wind, LLC
200 MW Northern Divide Wind Energy Center - Burke
Siting Application

Case No. PU-19-376

Tree and Shrub Mitigation Specifications

Inventory

Prior to cutting or clearing trees or shrubs for construction:

- All trees one-inch or greater in diameter at breast height must be inventoried to record the location, number, and species.
- All shrubs and all coniferous trees of any diameter must be inventoried to record the location, number, and species.

Clearing

The maximum width of tree and shrub removal is 50 feet, unless otherwise approved by the Commission or Commission staff.

Replacement

1. Landowners must be given the option to have trees and shrubs that are removed from their property replaced on their property. The landowner may waive this option in writing. If the landowner waives this option, the company shall plant replacement trees and shrubs in an alternate location in the same region, if practical.
2. Trees and shrubs must be replaced on a minimum two-to-one basis. The company shall develop a Tree and Shrub Mitigation Plan (Plan) in consultation with landowners who are seeking replacement trees and shrubs and in accordance with USDA-NRCS-North Dakota Field Office Technical Guide: Windbreak and Woodland Tree Care and Management. The guidelines outlined in the Technical Guide shall be followed until filing of the Plan summary outlined in number 5 below.
3. The purpose of the company's Tree and Shrub Mitigation Plan is to create sustainable plantings, appropriate for the local soil and growing conditions that will provide long-term benefit to landowners, farmers and ranchers, the community, wildlife and the environment.
4. The Plan, including the proposed number, variety, type, location, and approximate date for plantings, shall be filed with and approved by the Commission.
5. Two years after completion of the plan, the company must file a summary documenting how the plan achieved the purpose outlined in number 3 above. The summary must also report the number of surviving replacement trees and shrubs.
6. The Commission will consider, on a limited basis as conditions warrant, mitigation plans that provide long-term wildlife habitat and conservation benefits but do not involve the replanting of trees and shrubs.

STATE OF NORTH DAKOTA
PUBLIC SERVICE COMMISSION

Northern Divide Wind, LLC
345 kV Transmission Line -Burke and Mountrail
Siting Application

Case No. PU-19-377

Tree and Shrub Mitigation Specifications

Inventory

Prior to cutting or clearing trees or shrubs for construction:

- All trees one-inch or greater in diameter at breast height must be inventoried to record the location, number, and species.
- All shrubs and all coniferous trees of any diameter must be inventoried to record the location, number, and species.

Clearing

The maximum width of tree and shrub removal is 150 feet, unless otherwise approved by the Commission or Commission staff.

Replacement

1. Landowners must be given the option to have trees and shrubs that are removed from their property replaced on their property. The landowner may waive this option in writing. If the landowner waives this option, the company shall plant replacement trees and shrubs in an alternate location in the same region, if practical.
2. Trees and shrubs must be replaced on a minimum two-to-one basis. The company shall develop a Tree and Shrub Mitigation Plan (Plan) in consultation with landowners who are seeking replacement trees and shrubs and in accordance with USDA-NRCS-North Dakota Field Office Technical Guide: Windbreak and Woodland Tree Care and Management. The guidelines outlined in the Technical Guide shall be followed until filing of the Plan summary outlined in number 5 below.
3. The purpose of the company's Tree and Shrub Mitigation Plan is to create sustainable plantings, appropriate for the local soil and growing conditions that will provide long-term benefit to landowners, farmers and ranchers, the community, wildlife and the environment.
4. The Plan, including the proposed number, variety, type, location, and approximate date for plantings, shall be filed with and approved by the Commission.
5. Two years after completion of the plan, the company must file a summary documenting how the plan achieved the purpose outlined in number 3 above. The summary must also report the number of surviving replacement trees and shrubs.
6. The Commission will consider, on a limited basis as conditions warrant, mitigation plans that provide long-term wildlife habitat and conservation benefits but do not involve the replanting of trees and shrubs.

**APPENDIX B: FIELD OFFICE TECHNICAL GUIDE: WINDBREAK
AND WOODLAND TREE CARE MANAGEMENT**

TREE CARE AND MANAGEMENT

This technical note provides guidance for establishing trees and shrubs as part of the following Natural Resources Conservation Service (NRCS) Field Office Technical Guide (FOTG) Practices:

- Alley Cropping (practice code 311)
- Recreation Area Improvement (practice code 562)
- Riparian Forest Buffer (practice code 391)
- Stream Bank and Shoreline Protection (practice code 580)
- Tree/Shrub Establishment (practice code 612)
- Upland Wildlife Habitat Management (practice code 645)
- Wetland Wildlife Habitat Management (practice code 644)
- Windbreak/Shelterbelt Establishment (practice code 380)
- Windbreak/Shelterbelt Renovation (practice code 650)

The success of any tree planting is dependent upon site preparation, stock quality, planting and handling techniques, and maintenance employed by the planner, vendor, planter, and landowner. This document illustrates a wide variety of methods that have proven successful for conservation tree and shrub plantings in North Dakota.



TABLE OF CONTENTS



Subject Matter	Page
Windbreak Suitability Groups	2
Plant Stock Requirements	2
Storage of Stock	3
Care and Handling Requirements	3
Planting Site Preparation	4
Planting	8
Maintenance After Planting	11
Replanting	16
Preventing and Repairing Damage	16
Required Survival Percentage	19
Additional Information	20
Acknowledgements	20
Other Resources	20



WINDBREAK SUITABILITY GROUPS

Refer to "[Expected 20-Year Tree Heights](#)" in Section II - North Dakota FOTG to determine expected 20-year heights of trees and shrubs for the soils of each windbreak suitability group.

PLANT STOCK REQUIREMENTS

Planting stock must be grown from locally adapted seed or cuttings of known origin and meet height and caliper standards listed below. Planting stock should not come from sources greater than 200 miles away in latitude, 400 miles away in longitude, or 2,000 feet difference in elevation, unless long-term replicated field trials or extensive historical data indicate that the stock is hardy for a given location. "Planting stock sources" refers to the location where the plant naturally occurred or was propagated, not the location of the nursery from where it was purchased.

Bare Root Deciduous Seedlings shall not be less than ¼ inch caliper at 1 inch above the root collar. Bare root deciduous seedlings shall have a shoot (top growth) of at least 12 inches. Bare root seedlings should not be topped, unless untopped stock is not available. Rooted planting stock must not exceed a 2:1 shoot-to-root ratio (see Figure 1).

Bare Root Coniferous Stock shall be either 3-0 or 2-1 aged stock at a minimum (3-0 equals 3 years in a seedling bed; 2-1 equals 2 years in a seedling bed and 1 year in a transplant bed). Coniferous seedlings or transplants shall have at least a 6-inch shoot. Coniferous seedlings or transplants shall have a minimum stem diameter of 3/16 inch at 1 inch above the root collar. Rooted planting stock should have a well-developed fibrous root system and should not exceed a 2:1 shoot-to-root ratio (see Figure 1).

Vegetative Deciduous Cuttings shall be no less than ½ inch diameter at the base, have the apical bud and all lateral side branches removed, and produced in lengths long enough to reach a soil depth that remains saturated throughout the growing season, or the site must be irrigated (see Figure 7). Depth to the saturated zone must be determined before cuttings are ordered or harvested. In no case will vegetative deciduous cuttings be less than 10 inches in length. Tops of dormant-season-collected cuttings may be dipped in latex paint,

paraffin or sealing wax to prevent desiccation and mark the top.

Vegetative material should be collected while dormant. Dormancy means no bud swell, no green showing on buds, and no separation of bud scales. Actively growing materials can be used, but survival will usually be lower.

Vegetative material works best if planted within 2-3 weeks of harvest. Willow and cottonwood species can be stored up to 6 months. Proper storage consists of 34-38 degrees F with nearly 100 percent relative humidity. Storage in plastic bags will achieve the desired humidity. Care must be taken to prevent mold buildup. Do not allow stock to dry out for even short periods of time, as survival will be greatly reduced.

Container-grown Stock shall have a root mass of at least 7 cubic inches. Seedling height should be at least 6 inches. Container grown stock must be produced in containers that minimize girdling roots or J-roots.

Bare root seedlings, transplants, or container grown stock shall be dormant when planted. Avoid planting stock after bud break, except for bur oak and hackberry that have been sweated, or golden currant, common lilac, late lilac, Peking cotoneaster, and Tatarian honeysuckle. Container grown stock in gallon pots or larger may be planted after bud break, based on specific situations and individual requests of a variance.

Seeds shall be viable within the limits of the species. There is a large variation in seed quality between species. Some species of trees and shrubs have a high percentage of viable seeds that will easily germinate the first season

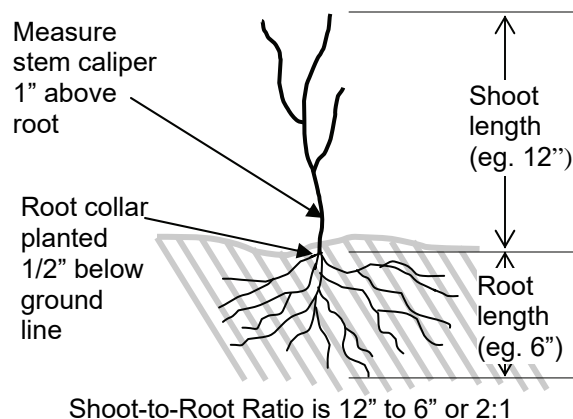


Figure 1: Shoot/Root Ratio

after planting. Other species have seed that is very difficult to germinate. Even with proper scarification and/or stratification, some species exhibit only 2-3 percent germination 2 years after planting.

STORAGE OF STOCK

Rooted planting stock and cuttings will be stored in a cool, moist environment (34-38°F) or heeled into the soil. During all stages of handling and storage, keep stock free of mold, and roots moist and cool. Keep roots covered at all times. Evaluate stock that has been allowed to dry, heat up (e.g., within a bale, delivery carton or container), or that has developed mold or other problems. Destroy stock if there is any doubt as to the viability. Live cuttings that are not immediately planted after harvest shall be promptly placed in controlled storage conditions (34-38°F) and protected until planting time.

Seeds shall be stored in a cool (35-40°F), dark area. Depending upon the species, seed storage may require moist or dry conditions. Become knowledgeable of the duration of seed viability. Some species of seeds lose viability within months after maturity. Others, with proper storage, remain viable for years. To learn seed characteristics of a particular species, go to the Woody Plant Seed Manual. <http://www.nsl.fs.fed.us/wpsm/>.

Landowners may keep stock for up to one week before planting by storing it in a shaded, cool, moist place. A basement or fruit cellar works very well. Plant bundles should be turned every day when temporarily stored to avoid mold and/or drying problems within the bundle. Ensure roots are moist and not exposed to the air. Do not store in a bucket of water. Trees will commonly break dormancy (begin to leaf out) with this type of storage, resulting in poorer survival.

For longer storage periods, stock may be heeled in. This can be described as high-density planting in a furrow. Locate the heel-in bed in good soil in a protected location. See Figure 2 for details.

Cover roots quickly to minimize exposure to sun and air. Short periods of exposure can greatly

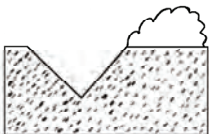


Figure 2A: Dig a trench deep enough for proper root placement.

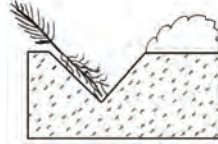


Figure 2B: Break bundles and spread along the trench wall with 2-3 inches between each plant.

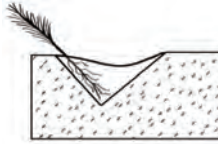


Figure 2C: Immediately cover roots with soil and lightly pack. Thoroughly soak the trench with water after planting to remove air spaces and improve root soil contact.

reduce survival and establishment. Leaving plants in a heel-in bed for longer than one season increases the difficulty of transplanting and decreases survivability.

CARE AND HANDLING REQUIREMENTS

Roots of bare root stock shall be kept moist at all times during planting operations by placing in a water-soil (mud) slurry, super-absorbent (e.g., polyacrylamide) slurry, or covering with wet peat moss, wet shingle tow, or other equivalent material. Do not cover with dry shingle tow, peat moss, etc. and expect to thoroughly wet it afterwards. No matter the amount of water applied, some roots will remain dry.

The rooting medium of container or potted stock shall be kept moist at all times by periodic watering.

Pre-treat stored unrooted cuttings prior to planting by soaking in water for 24-48 hours. **Note:** There is some debate as to the effectiveness of soaking stored, unrooted cuttings prior to planting. However, soaking will not harm cuttings and may increase survivability.

Pre-treat bare root stock by soaking roots in water or polyacrylamide for several minutes before placing on the tree-planting machine. Keep roots moist and covered throughout the entire planting operation. To further reduce planting shock, stock could be carried during the planting process in buckets of water or slurry. Do not allow rooted conifer stock to be immersed for longer than one hour.

Stock shall not be planted when soil is frozen or dry. Do not handle trees or shrubs when temperatures are freezing or below.

Reduce exposure of bare root seedlings to air and sunshine while loading the planter and during the planting operation. Studies from South Dakota have shown that exposure of Scotch pine roots to air and sun on a 73-degree day for only 2 minutes resulted in 80 percent mortality.

Do not plant on hot, dry, windy days. Refer to Figure 3, Climatic Stress Chart, to identify suitable conditions for planting.

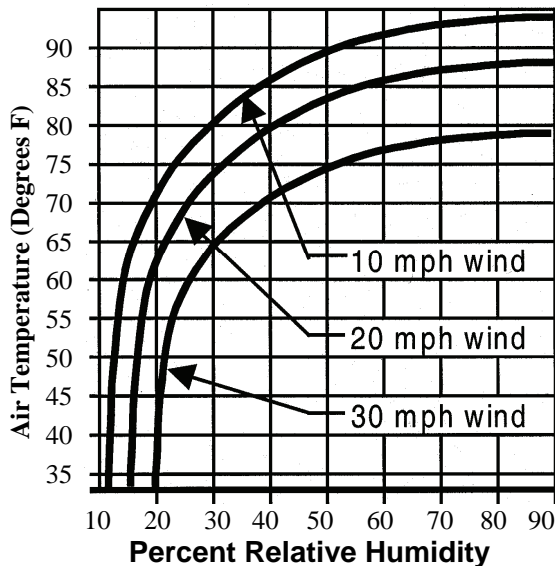


Figure 3: Climate Stress Chart

Cease planting when field temperature and humidity conditions fall above the curved line appropriate for sustained wind speeds at the site. As conditions approach those indicated by the appropriate wind speed line, use extra care to prevent desiccation of roots and tops. Site conditions falling below the appropriate wind speed line are generally considered good for tree and shrub planting. Cease planting when sustained wind speeds exceed 30 mph (miles per hour). To get a feel for changing climatic conditions throughout the previous day, go to the NDSU weather site at <http://ndawn.ndsu.nodak.edu/>.

Remove any wire or plastic ties that encircle the trunk or limbs of planted stock. If left on, they can girdle and kill the stem above that point as the stem increases in diameter.

Sweating Seedlings

Certain species such as bur oak and hackberry may require special preparation before planting,

especially in cold, wet soils. These species have a tendency to not break dormancy without a "sweating" treatment. Trees that do not break dormancy during the first growing season will likely die.

Sweating trees is a simple process that usually requires nothing more than large sheets of plastic, large cardboard boxes and tape. One to two weeks before the trees are to be planted, remove them from the cooler. Line the cardboard boxes with a large piece of plastic. Place broken bundles of trees loosely in the plastic-lined box. Wet them thoroughly. Fold and tape the plastic together to make an air tight seal. Store the wrapped trees at room temperature, away from direct sunlight, for one to two weeks, checking to ensure they do not dry out.

Condensation should form on the inside of the plastic within hours, indicating a tight seal and that the process is working.

When properly sweated, the buds of these species will have swollen and in some cases broken open. Use extra precautions when planting sweated stock, especially if leaves are starting to emerge, because they are very sensitive to drying out during handling and the effects of hot dry winds immediately after planting.

PLANTING SITE PREPARATION

Planting sites shall be properly prepared based on soil and vegetative conditions listed below. Avoid sites that have had recent application of pesticides that may be harmful to woody species.

Check waiting period restrictions and carryover characteristics of pesticides applied to the planting site in the previous one to two years prior to initiating tree planting. If pesticides are used, apply only as needed within Federal, State, and local regulations. Follow label directions and heed all precautions listed on the container.

On sites treated with pesticides, especially tilled sites, be alert to health risks that may result from handling the chemically treated soil or breathing the chemically impregnated dust.

Do not plant trees where previously have been feedlots, manure piles, hay piles, or manure runoff without extensive soil testing to determine

salt and nutrient levels and chemical properties in the proposed planting area.

Site preparation may include the whole field, strips, or patches. Individual site preparation for each tree/shrub should provide a minimum 6-foot diameter circle, or a minimum 6-foot x 6-foot square, or a 6-foot wide strip at each planting spot (3 feet on each side of the planted stock).

The planting area must be free of living sod and perennial weeds before planting.

Tillage Site Preparation

Site Preparation by Tillage on Sod-covered Sites (or Sites With Perennial Herbaceous Cover)

Perform sufficient tillage to kill the sod and maintain the entire site in a reasonably weed free condition for one growing season prior to tree and shrub planting.

Nonselective herbicides may be used to kill sod grasses and other herbaceous species prior to tillage. Follow guidelines under “Chemical Site Preparation” and instructions found on the herbicide label.

Avoid tilling soils that are wet, to minimize compaction. Compacted soils can reduce rooting success and plant vigor.

Be alert to potential wind and water erosion risks during the fallow period. Seed an annual cover crop of oats or spring grains to control erosion while minimizing water usage. Oats and spring grains will die over winter, but must be seeded early enough to attain 4-6 inch height prior to freeze up to provide soil protection.

For very erosive sites without rhizomatous grasses, (smooth brome grass, canary grass, Kentucky bluegrass, or quackgrass) and no plans for cover crops, till only 6-10 foot wide strips where the trees/shrubs will be planted while leaving and maintaining the existing vegetation between the rows. This will reduce wind and water erosion, sandblasting, provide easier site access, and provide wildlife benefits. The wider tilled area is appropriate for locations where weed control fabric is to be installed after the tree or shrub planting.

Orient tree and shrub plantings on the contour, when possible, to minimize water erosion risks during the fallow period and subsequent planting and maintenance operations.

Avoid deep tillage (greater than 2 inches deep) immediately prior to planting to prevent drying the seedbed.

Firm the seedbed prior to planting, if needed, to reduce soil moisture loss and aid in proper plant placement. A firm seedbed for tree planting should be similar to a firm seedbed for grass seeding where adult human footprints are barely visible and planting equipment leaves a minimal trench (see Figure 4).

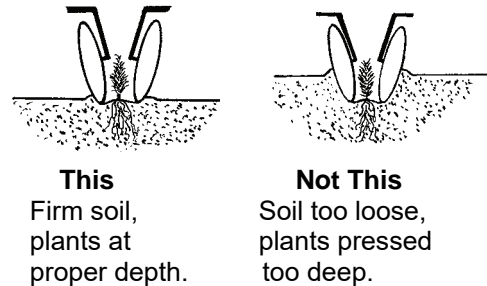


Figure 4: Effects of Seedbed Firmness

Tillage Site Preparation on Cropland Sites

Shallow tillage immediately prior to planting to remove sprouted annual weeds and grasses is appropriate. Shallow tillage between harvest and freeze up the year before planting is permitted, if needed. Be alert to potential wind and water erosion risks during the fallow period. If needed, seed an annual cover crop of oats or small grains to control erosion while minimizing water usage. Oats or small grains will die over winter but must be seeded early enough to attain a 4-6 inch height prior to freeze up to provide soil protection.

Avoid excessive tillage prior to planting. Tillage is not needed or effective if there are no weeds present. Avoid drying the site with deep tillage.

Prior to planting, firm the seedbed, if needed, to reduce drying and to aid in proper depth placement of the plant and natural moisture movement within the soil. A firm seedbed for tree planting should be similar to a firm seedbed for grass seeding where adult human footprints are barely visible and planting equipment leaves a minimal trench (see Figure 4).

All precautions concerning erosion and sand blasting on sod-covered sites apply on cropland sites.

Consider tilling only 5-6 foot strips where the trees/shrubs will be planted (8-10 foot strips, if weed control fabric is to be installed after planting), thereby, allowing the standing stubble between the rows to act as temporary wind protection for new seedlings.

Scalp Planting Site Preparation

Scalp planting is a method that places plant material in an area cleared of competing vegetation. The area cleared is usually a foot or more wide on each side of the planted row. This operation is usually performed by attachments to the planting machine. It can also be done by other machines in a separate operation, or by hand immediately prior to planting.

Do not scalp plant into aggressive sods such as smooth brome, reed canarygrass, Kentucky bluegrass or quackgrass without additional weed control and site preparation treatments. Follow guidelines under “Chemical Site Preparation” and instructions found on the herbicide label before planting into sites with existing aggressive sods.

Scalping tends to encourage a rapid flush of annual weeds on the freshly exposed soil that will require a post-plant weed control effort.

When scalping on native range sites, orient plantings in locations that are most conducive to tree/shrub growth. Best tree growing sites are often found in toeslope positions, north facing slopes, or in swales and draws. Evaluate alternative locations to avoid establishing trees and shrubs on native range.

When possible, orient rows on a true contour to harvest runoff moisture and reduce erosion. Do not scalp into tilled sites.

Chemical Site Preparation

Chemical Site Preparation on Soddy Sites (or Sites With Perennial Herbaceous Cover)

Site preparation by herbicides on soddy sites should be initiated the growing season before planting. Troublesome species such as smooth brome, Kentucky bluegrass, reed canarygrass or quackgrass, thistle, spurge, etc. may require multiple years of site prep before planting.

Follow label instructions so that application technique and timing of herbicide application will lead to a complete control of the vegetation.

Repeated applications throughout the fallow year(s) are usually necessary. To improve herbicide coverage and effectiveness, bale or burn the area and allow fresh succulent regrowth. Apply herbicides at the proper time and rate to this regrowth.

For sites with rhizomatous grasses, (brome, bluegrass, canarygrass, or quackgrass) completely spray the entire area where the trees/shrubs will be planted, including a 10-foot wide band around the outside of the planting.

On very erosive sites without rhizomatous grasses, (brome, bluegrass, canarygrass, or quackgrass) and no plans for cover crops, completely spray out 5-6 foot wide strips where the trees/shrubs will be planted (8-10 feet where fabric will be applied) while leaving existing vegetation between rows. This will reduce potential erosion, sandblasting, provide easier access, and provide wildlife benefits.

Undisturbed dead sod often provides a season's weed control or suppression after the trees or shrubs have been planted.

Herbicides vary as to their risk of leaching or runoff. Avoid using herbicides with high runoff or leaching potential on sites where there is increased risk of polluting surface or ground water sources.

Chemical Site Preparation on Crop Fields

Apply appropriate burndown chemicals according to label directions prior to planting trees and shrubs, if needed.

Natural Regeneration Site Preparation

This procedure should only be attempted on sites within the 10-50 year floodplain of stream systems where adequate native seed trees or shrubs are within 200 yards of every part of the planting site and soils are suitable for tree planting. A healthy stand of cottonwoods or willows may be as far away as 1/4 mile from the seeding area. Stream systems where this could be attempted with a reasonable chance of success include:

- All perennial streams in counties bordering the Red River.
- Scattered segments of the Souris, James, and Sheyenne Rivers that meet flooding, soil, and seed tree requirements.

Perennial grasses should be controlled with herbicides and/or tillage prior to attempting this method of tree and shrub establishment. Riparian forest natural regeneration sites will tend to be very weedy due to large weed seed banks and high nutrient levels until tree canopies become thick enough to shade out the herbaceous vegetation.

Once herbaceous vegetation has been controlled, the site should be tilled to expose bare mineral soil just prior to seed dispersal from the tree species desired. Seed dispersal may occur from mid spring to late fall depending upon the species. During planning phases, determine dispersal times of the desired species to ensure timely site preparation. Besides direct on-site observation, the following source, "[Woody Plant Seed Manual](#)", can be used to determine likely seed dispersal times.

Consider leaving strips of vegetation perpendicular to flood flows to reduce scour erosion.

Installed Fabric Site Preparation

Fabric Site Preparation, All Sites

All instructions concerning fabric installation for weed control after planting apply when fabric is used for site preparation. Refer to "Synthetic Mulch (Fabric) Weed Control" under the maintenance section of this reference.

Installation of weed control fabrics as a form of site preparation can be very effective. When properly applied, it can effectively kill vegetation and store seasonal moisture ahead of planting.

Currently, planting trees/shrubs through the fabric must be done by hand; therefore, planting stock with compact root systems is most appropriate. Installing fabric the summer before planting, as a site preparation method, and using container-grown stock, can extend the planting season by 2-4 weeks.

Minimum fabric widths should be 6 feet (about 4 feet of weed control following installation by machine).

Rocks, staples, and/or soil must hold down fabric edges. It is essential that wind not be allowed under the fabric or it will be torn out of the ground. Staples or rocks should be spaced in the center of the fabric close to where the trees/shrubs will be planted the following spring.

When not using soil to anchor the fabric edges, staples, pins, or rocks must be placed every 3-5 feet along the edge. Do not use soil to hold down the fabric centers, as weeds will quickly become established on the soil spots, reducing or ruining the effectiveness of the fabric.

Fabric may be hand placed by anchoring the edges every 3-5 feet with staples, pins, or rocks. Every 10-15 feet a staple, pin, or rock should be placed in the middle of the fabric to prevent "billowing" by the wind.

After installation, fabric should be taut against the soil surface, reasonably level, and well anchored.

Fabric Site Preparation, Tilled Sites

The area to be tilled should be 2-4 feet wider than the width of the fabric, for those sites where fabric will be installed by machine. If the fabric will be hand placed, tillage need only be as wide as the fabric.

To facilitate hand planting, tillage should be deep enough to accommodate roots of the species to be planted the following spring.

Fabric Site Preparation, No Till Sites

Large amounts of grass and other herbaceous cover should be mowed and removed from the site before fabric installation to reduce the risks of rodent damage to the newly planted trees and shrubs.

Equipment modifications may be necessary if installing fabric by machine. Fabric laying machines may need to be "beefed up" in order to get good fabric placement and soil coverage on the fabric edges.

Tools used for planting must be able to easily penetrate untilled soils to the proper depth under the fabric. If easy penetration is not likely, use the "Fabric Site Preparation, Tilled Sites" method.

Native Grass Cover

Warm-season native grass species of blue grama, and/or sideoats grama may be seeded between tree/shrub rows to reduce erosion and runoff, prevent sandblasting, and improve wildlife cover.

When using native grasses between rows, it is essential a weed-free zone of at least 6 feet be maintained around each tree or shrub (3-foot radius around the trunk) for the first 3 years after planting. In areas with annual precipitation less than 16 inches, it is best to maintain the weed free zone for the entire life of the planting.

Warm-season native grass species sideoats grama and blue grama initiate growth after trees and shrubs have leafed out, reducing early season competition for water. These warm-season grass species are shade intolerant and will be suppressed as growing tree and shrub canopies shade the ground. In no case should a sod-forming cool-season grass such as smooth brome, canarygrass, bluegrass, or quackgrass be substituted for these species.



Warm-season grasses seeded between rows to control erosion and provide habitat. Note the chemical weed control within the rows.

Refer to [Warm-Season Grass Cover Between Tree Rows](#) fact sheet for detailed instruction on establishing the grass cover. Seeding grass during the prior year fallow period or seeding between rows after tree and shrub planting or fabric installation can minimize the potential conflict between grass seeding and tree planting dates.

Short warm season grasses are particularly effective between fabric strips. Without tillage between fabric strips, there is no risk of the fabric being hooked by a tillage implement and torn out. The following pure stand, drilled, seeding rates are to be used for designing the between row grass seeding

Blue grama 2.5# PLS (Pure Live Seed) per acre

Sideoats grama 7.5# PLS per acre

Broadcast rates must be 1.5 times drilled seeding rates.

USDA-NRCS—North Dakota

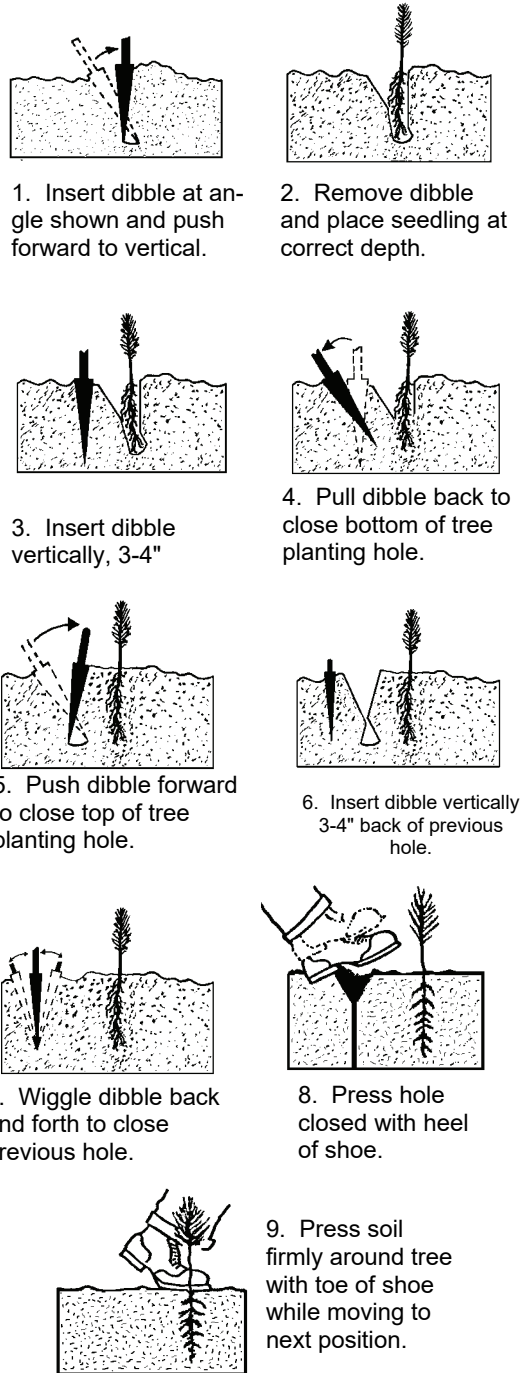


Figure 5: Hand Planting

PLANTING

Planting - All Sites Except Natural Regeneration and Direct Seeding

Plant only in the spring of the year after frost is out of the ground. All stock, except as noted, will be planted by May 31.

Extensions of these planting dates by 10 days may be made by the district conservationist, if local soil moisture and temperature conditions justify it and are documented. Before granting an extension, consider the cooperators ability and willingness to address the greater need for supplemental watering, wind protection, and/or shade that may be necessary in the weeks immediately following a later planting.

Container-grown stock planted through fabric that has been properly placed a year in advance may be planted up to June 30. Refer to "Installed Fabric Site Preparation" for details. Before initiating a late June planting through fabric (past the cutoff date for all other plantings), ensure a minimum 2-foot depth field capacity soil moisture is present beneath the installed fabric and herbaceous wind barriers are at an effective height to protect the new planting.

Fall planting of trees and shrubs, excluding direct seeding, should not be attempted since consistent survival across the State has never been demonstrated.

Immediately after, or during planting of all stock, whether by hand or machine, pack soil firmly around each plant to eliminate air pockets. Proper adjustment and operation of the tree-planting machine will eliminate the need to pack the edges of tree rows with tractor tires or feet.

Planting - Bare Root Stock (Seedlings, Transplants, Rooted Cuttings)

Rooted stock will be planted in a vertical position with the root collars approximately 1/2-inch below the soil surface (see Figures 1, 4, 5, and 6).

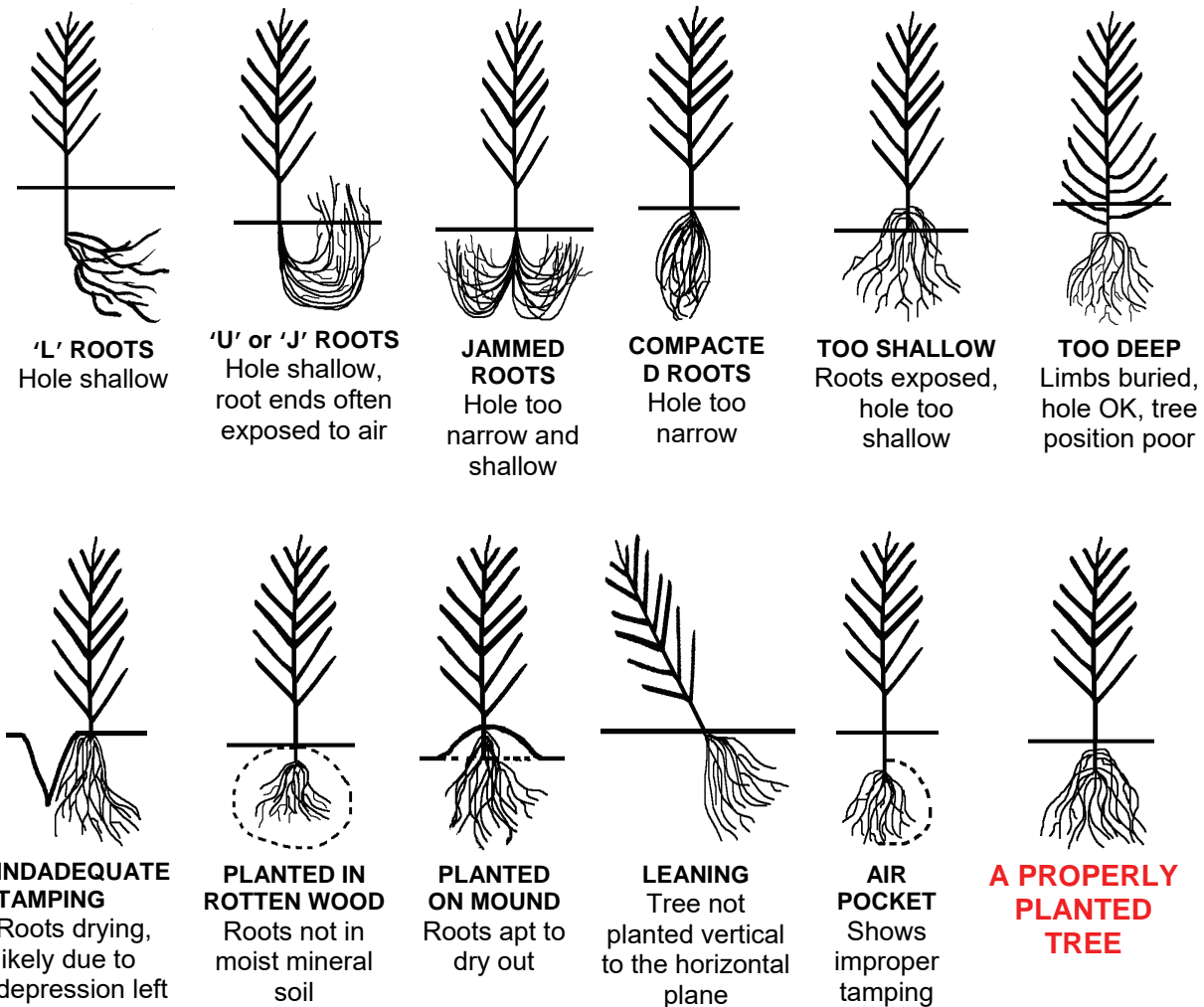


Figure 6: Examples of improperly planted trees.

The planting trench or hole must be deep and wide enough to permit roots to spread out and down without J-rooting or L-rooting. Trim straggly roots of bare-root stock as needed to prevent J-roots, L-roots, broken roots, or wadded roots that may result from "stuffing" too many roots into the planting shoe. Do not over trim roots (see Figure 6).

Planting - Unrooted Cuttings (Willow, Poplar and Dogwood Species)

Base ends of longer cuttings, or the entire cutting if smaller, should be soaked for 10-24 hours before planting. If cuttings have been stored for more than one week, recut the base end at a 45 degree angle to maximize water uptake. Cut back until the cut is in green tissue.

Planting may be by hydraulic jetting, hand dibbles, shovels, tree planters, or probes.

Insert cuttings to the depth required to reach adequate soil moisture with one to two buds sticking above the soil surface. (Note: Depth to growing season water table must be determined before obtaining cuttings to ensure cuttings are

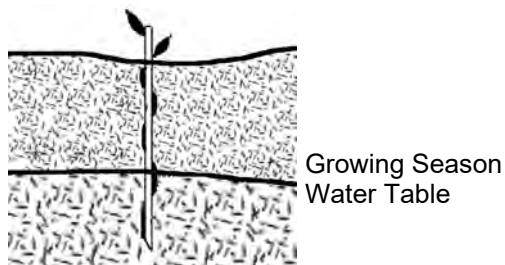


Figure 7: Unrooted Cutting

sufficiently long enough to reach the water table.) Make sure that the base end is planted down (see Figure 7).

When using shorter cuttings through a traditional tree-planting machine, ensure the soil is firmly packed against the cutting. Shorter cuttings may require supplemental watering to ensure survival and establishment during the first year.

When planting by hand, ensure the planting hole is large enough to prevent stripping or damaging the bark and buds.

Once the cutting is in the hole, ensure that voids are eliminated either by packing around the cutting or by using hydraulic jetting to prepare the planting hole.

When planting by hand, avoid excessive force that may kink or break the cutting.

Planting - Container-grown Stock

Remove container stock from the pots, blocks, wire baskets, etc. in which they were grown, if not already done by the nursery. Balled and burlap (B&B) stock can remain in the burlap ball but all ties must be removed from around the trunk and the burlap rolled back off the top of the ball, once placed at the proper depth in the planting hole.

Some potted or B&B stock may have developed girdling roots. If so, the root ball should be gently manipulated and the roots spread radially from the trunk of the tree. In essence, this becomes a bare root planting.

Container-grown stock should be planted so the

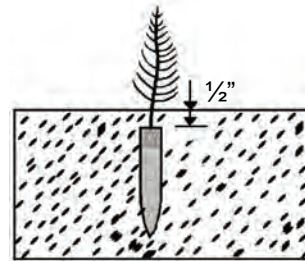


Figure 8: Container-grown planting depth

top of the root ball or plug is covered with just 1/2 inch of soil (see Figure 8). Some nursery practices result in several inches of soil covering the top roots in the pot. This excess soil should be removed so that proper root planting depths can be achieved. Planting too deep is detrimental to tree health for most species.

During planting, ensure the root ball stays moist. Do not soak in water.

Planting - Natural Regeneration

This method should only be attempted within the 10-50 year floodplain of the following stream systems.

- All perennial streams and tributaries of the Red River in the counties bordering the Red River.
- Scattered segments of the Souris, James, and Sheyenne Rivers.

At least 2 seed producing (nearly mature or mature) trees within 200 yards of the planting site are needed for species producing seeds with samara (wings). Healthy seed producing cottonwoods or willows may be as far as ¼ mile from the planting site. Species that have seeds with no samara (wings) or fluff, shall be within 50 yards of the planting site. Wildlife or floodwaters may bring in other species of trees and shrubs.

Natural regeneration sites, especially riparian sites, will be quite weedy for several years after seeding. High stem counts per acre (in excess of 10,000 trees per acre on some sites) will eventually shade out the weeds. Stem counts of 500-700 stems per acre will satisfactorily capture the site, if not browsed by wildlife, but weed pressures will last longer. High stem counts compensate for heavy deer browse.

Success of this method is dependent upon a good seedbed and seed crop at the appropriate time.

Refer to Natural Regeneration - Site Preparation for guidance in preparing the planting site prior to seed dispersal.

Planting - Direct Seeding

Until more data on the viability of this planting method in North Dakota becomes available, review and approval of each site, planting plan and maintenance schedule shall be obtained from the NRCS State forester.

This method should only be attempted:

- On high water table, run-on, or floodplain sites in the counties bordering the Red River.
- Between the 10 and 50-year flood elevations on scattered segments of the Souris, James, and Sheyenne Rivers. Each site's eligibility will have to be determined individually.

When using this method, it is best to utilize as many species as are available and suited to the site. Mortality and predation of seed will be extremely high with this method, so the amount of seed needs to be increased accordingly.

To determine the amount of seed needed, strive for 15,000 emerging seedlings per acre by the end of the first growing season.

Determine the percentage of each species to be in the mix.

Using purity of seed, amount of hard seed, and percent germination (usually available in seed production manuals), determine how much seed is needed. Example: For basswood to be 20 percent of a mix: 15,000 emerging plants x 20 percent of the stand / 80 percent purity / 2 percent germination / 3,000 seeds per pound = 62.5 pounds bulk seed per acre.

Tree seeds are very particular with respect to depth of planting. Tree seeds generally respond best when seeded to a depth of 1-3 times the diameter of the seed. For species such as quaking aspen or birch, this means they should be placed on the soil surface. For hackberry, basswood, ironwood, etc. plant 1/4 to 3/8 inch deep. Oak, walnut, and similar-sized seed should be planted 1-2 inches deep.

Understand the requirements of each species to know the best time to seed. Some species need a warm-cold-warm stratification period while others need a cold-warm stratification period. Some species such as white oak begin sprouting within days after falling from the tree in natural conditions. In other words, some species are planted in the summer, some in the fall, and some in the spring. For specific information about each species, look in the "[Woody Plant Seed Manual](#)".

MAINTENANCE AFTER PLANTING Weed Control, All Methods

Competitive vegetation will be controlled for a 3-foot minimum radius around each plant for at least 3 years after planting.

To minimize erosion risks and to improve conservation and wildlife benefits, consider leaving, or planting non-sod-forming grasses such as blue grama or sideoats grama, outside the 3-foot minimum weed-free area. Utilize "patch" weed control methods to maintain a 6-foot diameter weed free zone around each plant or a 3-foot wide weed-free band along each side of each row. As the planting matures, the herbaceous vegetation strips will get narrower as the tree and shrub rows get wider, shading out the warm-season grass.

Only a few herbicides are available for controlling weeds on natural regeneration and direct seeding sites. Effective weed control on

these sites usually does not begin until the large number of tree seedlings form a canopy that will suppress the herbaceous weeds. Landowners should be made aware that these two planting methods will look weedy for five years or more.

Aggressive sod-forming grasses such as smooth brome grass, Kentucky bluegrass, canarygrass, quackgrass, or deep rooted legumes such as alfalfa or sweet clover should be kept from the tree or shrub area for the life of the planting.

Provide a 10-foot wide weed-free zone around the entire planting to serve as a fire break, aid in weed control, and reduce perennial sod encroachment. In areas prone to erosion or to meet owner's wishes, this area could be planted to a fuel break of non-competitive grass and kept short with regular mowing. Fuel breaks provide excellent access for fire fighting personnel and equipment; however, by themselves, they usually don't stop wildfires during extremely dry and windy conditions.

For firebreak and fuel break design, refer to the [Firebreak Design and Installation Guide](#) in the North Dakota Field Office Technical Guide.

Where overland water flow may create a scour erosion hazard, orient the weed-free zones as nearly perpendicular as possible to the water flow.

Utilize mowing, herbicides, or tillage to prevent invasion of aggressive sod-forming grasses and weeds, throughout the planting, and until tree canopies begin to close. A sparse cover of annual weeds or grasses, outside the 3-foot wide weed-free zone, may actually benefit the windbreak by trapping snow, cooling the soil surface, and controlling erosion.

Weed control may be by tillage, herbicides, or fabric. When using herbicides, follow label instructions. Control of unwanted vegetation should continue until weeds do not threaten the growth and function of the trees and shrubs.

Damage to roots, trunks, and branches from herbicides, tillage, or animals can significantly reduce the vigor of the planting and make it more susceptible to disease and insect damage thereby shortening the life of the planting.

Mechanical Weed Control

Use caution when tilling around trees and shrubs. Poor tillage techniques (too deep, too

close to the trunk) can damage trunks, limbs, and roots. Erosion that may result from indiscriminate tillage may remove several inches of soil exposing roots to severe damage by future tillage operations.

Use tillage only when needed to maintain or improve the health and vigor of the windbreak. Tillage, when weeds are not growing, wastes moisture and fuel and increases the risk of mechanical injury to trees.

Chemical Weed Control

Follow label directions when applying the appropriate herbicide to control weeds. Adhere to State or local rules that apply to herbicide applications on tree and shrub plantings.

Some approved herbicides are nonselective and will kill most weeds but must not come in contact with any part of the tree or shrub. Other approved herbicides prevent weeds from germinating or kill newly germinated weed sprouts but will not harm specific trees or shrubs.

Effectiveness of most herbicides used to control weeds in tree and shrub plantings is very sensitive to different application rates, considerably more so than the common herbicides used to kill weeds in lawns. Too little herbicide applied will not provide adequate weed control. Applying too much of some herbicides, or on the wrong soils, may damage or kill trees and shrubs.

Use herbicides only when needed to maintain or improve the health and vigor of the windbreak.

Organic Mulches

Organic mulches may include straw, wood chips, sawdust, chopped corn cobs, grass clippings, or other organic byproducts. Mulches are most effective when maintained to the dripline of the tree or beyond. For newly planted stock, they should be placed in a 6-foot diameter circle around each plant to a depth of 2-4 inches. (Finer mulches should be placed to a settled depth of about 2 inches. Coarser mulches require a 3-4 inch depth.) When mulching shrub rows, mulch can be applied in a contiguous 6-foot wide band (3 feet each side of the plants).

Established perennial weeds and sods, must be killed through tillage or chemical prior to mulching. These weeds will grow through most mulches. Small annual weeds can be killed by

applying mulch. Rhizomatous grasses adjacent to the mulch will require regular maintenance as they will usually root into the mulch from the edges.

In situations of higher precipitation, frequent irrigation, or on tighter wetter soils, it may be appropriate to maintain a 4-6 inch mulch-free circle around each trunk to minimize potential trunk problems. In high moisture situations, mulch against the trunk may hold moisture and encourage bacterial growth resulting in bark injury, which could shorten the life of the tree.

Avoid mulches that may contain weed seeds and/or grain as they may attract rodents. In some situations, seeds and grain in mulch will germinate and become a thick mat of competing weeds.

Lighter and finer mulches are prone to blowing away. Packing firmly with feet or water will increase resistance to blowing. On exposed sites with strong winds, this will still not be adequate. For extremely windy sites, use mulches with large-sized chips or a high proportion of long (10-16") twigs to "tie" mulch together and resist blowing.

Coarse shredded wood mulches such as those produced in tub grinders have ragged ends and tend to interlock. Though not as decorative, as wood chips or the fine shredded mulches, they tend to stay in place. On extremely windy sites mulch may have to be anchored with netting, or select an alternative form of weed control.

Maintaining standing small grain stubble, herbaceous wind barriers, or a growing crop immediately adjacent to the weed free zone prevents mulch blowout, transpiration losses, and harvests snow moisture.

Organic mulches should be reapplied as necessary to maintain weed control. As trees and shrubs mature, organic mulches should be expanded to the drip line. The larger area of weed control benefits the tree and mulch to the drip line reduces tree injuries from maintenance activities.

Synthetic Mulch (Fabric) Weed Control
Synthetic Mulch (Fabric) Quality - All Methods

Fabric shall be of such quality that the manufacturer warrants complete weed control for at least five years.

Fabric must be black or capable of preventing underlying plant growth. Ideally, it should be resistant to penetration by animal hooves.

Fabric may be pin-punched plastic, solid polyethylene, woven polypropylene, or some other rot-resistant material. It must prevent plant shoots from pushing through from below.

Fabrics prone to puncture from hooves (pin-punched plastic, solid polyethylene, etc.) can be used only if approved through the ND-NRCS variance process. This is to evaluate effectiveness of this material over time.

The minimum width for continuous rolls of fabric applied by machine will be 6 feet, nominal 4-5 feet weed control width after installation. Individual fabric pieces shall be 6 foot square or 6 feet in diameter. (Research studies have shown that fabric squares less than 4 feet x 4 feet improve growth and survival of trees no more than if no fabric was applied.)

Consider not using fabric on suckering shrubs where a dense thicket is desired or enlarge fabric openings, as illustrated in Figure 12, once plants are established (in or about the third year after planting).

Consider searing or sizing fabric edges on home-cut individual squares of woven fabric to prevent fabric edges from running or being hooked by maintenance equipment.

Fabric Installation - All Methods

Tilled sites should be firmed and leveled in such a way that the fabric will lie flat against the ground across the entire area covered by fabric. Sites should be firmed to barely show an adult foot print, prior to planting.

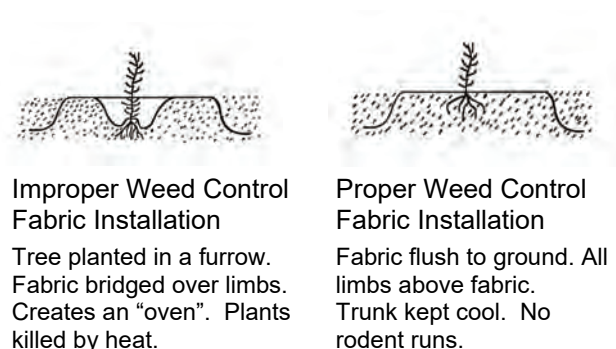


Figure 9: Improper and Proper Fabric Installation

Fabric should not be bridged over ridges or valleys left by planting operations. Fabric not

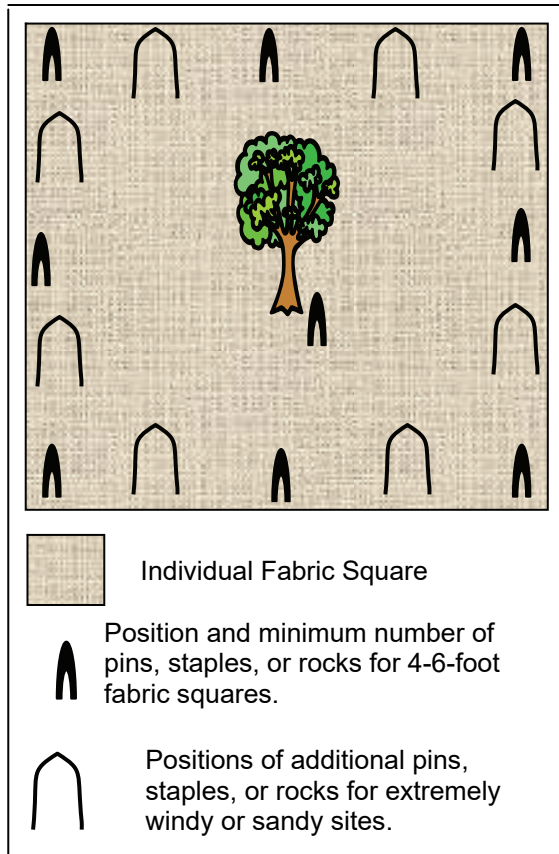


Figure 10: Positions of Pins, Staples, or Rocks for Individual Fabric Squares

flush to the ground around the tree can provide a runway for rodents and trap summer heat sufficient to damage or kill the young plant (see Figure 9).

If a planting trench exists at fabric installation, ensure that the fabric is weighted, pinned or stapled to the bottom of the trench at each tree. The fabric lined trench will funnel runoff to the individual trees in some situations.

If fabric is installed under a no-till situation, excessive vegetation should be removed from the area where fabric will be placed, to reduce rodent habitat and to allow fabric to lie flat against the soil surface.

Openings for trees or shrubs shall be cut with a sharp instrument to avoid tearing of fabric or "running" of individual fabric fibers.

Openings shall be X, C, L or J-shaped. Length of slit should not exceed 12 inches. Do not use I-shaped (straight) slits as abrasion of tree bark can occur.

When fabric is placed over plants before openings are made, use care to avoid cutting the plant when making the opening. Trees and shrubs must be pulled through the fabric within minutes after installation to avoid damaging temperatures created by the fabric "oven."

Ensure fabric edges are firmly anchored.

Fabric is not recommended within floodplains. One flood event could cover the fabric with silt, eliminating its effectiveness, or flood flows could tear out the fabric and trees caught in the fabric.

Do not cover weed control fabrics or plastics with organic mulches. These materials will delay the breakdown of the fabric or plastic, possibly causing damage to the plant, and provide a medium in which weeds can flourish.

Installation of Individual Fabric Pieces

Individual fabric pieces shall be at least 6-foot square or 6-foot in diameter.

Use landscape fabric staples, pins, or rocks to anchor fabric. Do not use soil to anchor individual fabric pieces. Individual rocks should weigh at least 5 pounds to resist being moved by wind or water.

Six-foot squares shall have each corner and the midpoint of each side anchored, as well as a point near the tree or shrub (see Figure 10).

Pins or staples shall be of sufficient length to resist movement, based on soil textures. Follow manufacturer recommendations for staple length.

Installation of Continuous Fabric Strips

Site preparation, if tilled, shall be at least 10 feet wide to allow enough loose soil to properly anchor fabric.

Fabric strip splices shall be anchored with staples, pins, or rocks. Staples and pins shall be of a length recommended by the manufacturer for the particular soil texture. Rocks must weigh at least 5 pounds. Do not anchor splices with soil. When splices are made with field-cut fabric ends, consider tucking a few inches of the cut end under itself to reduce the risk of snagging the fabric with maintenance equipment.

In lighter soils, or in high wind areas, pins, staples, or rocks may be needed to anchor the fabric at each opening. On extremely vulnerable

sites, an additional pin, staple or rock may be needed every 10 feet or between each tree, whichever is greater (see Figure 11).

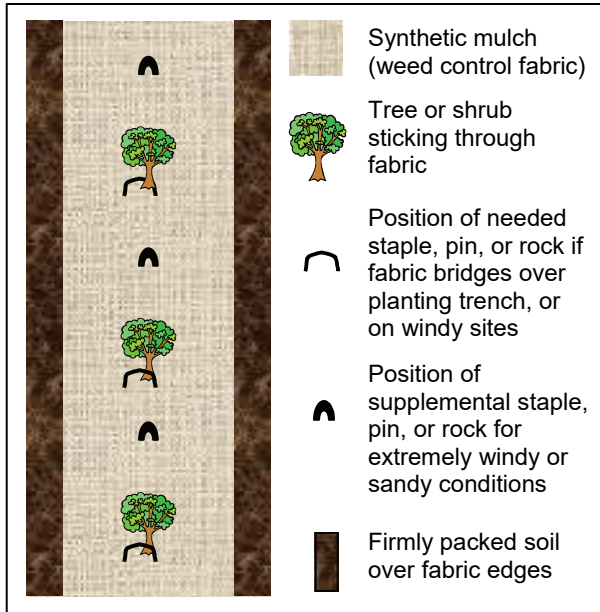


Figure 11: Positions of staples, pins, or rocks for continuous fabric strips.

Machines must be adjusted to ensure 10-12 inches of fabric edge is firmly anchored in the soil (see Figure 9). After installation, it is often necessary to run a tractor or truck wheel over the edge of the fabric to get a firm seal.

Check-dams across the furrow or slight grading of the site may be necessary on sloping land to prevent water from running along the edge of, and uncovering the fabric.

Where fabric crosses larger waterways or areas of concentrated flows, the fabric shall be spliced on either side of the waterway. This is to prevent heavy runoff events from washing out an entire strip of fabric and potentially damaging 300-500 feet of tree row. The smaller spliced section may still wash out, but only a small amount will have to be repaired or replaced.

Pins or staples, instead of soil, may be used to anchor fabric edges. The fabric must lay flat against the soil and the pins or staples must be placed every 3 feet, along the fabric edge. On sites exposed to extremely high winds or on loose soil, pins or staples may need to be closer than 3 feet.

When installing fabric on curves, use extra care to

ensure that 10-12 inches along each edge gets covered and packed with soil. Ensure the fabric is not so tight that temperature changes pull the fabric loose. Use pins, staples, or rocks to tack excessively large "puckers" to prevent wind damage. Even when covered with soil, outside edges of curves may need to be pinned or stapled.

Where fabric is desired on a curved planting with a short radius, it may be better to break the curve into short, straighter segments to ensure better quality and easier fabric installation.

Management of Fabric Following Installation

While annually checking the survival, vigor, and form of trees and shrubs, inspect the fabric to:

- Ensure all fabric edges are firmly anchored.
- Ensure openings in fabric are not damaging trunks. Enlarge as needed (see Figure 12).

Remove weeds, soil, or clippings that may have accumulated on the fabric before they become a rooting medium for weeds.

If tilling between fabric pieces, use extreme caution to avoid hooking fabric with tillage tools. Damage to trees and/or fabric may result. Control erosion in tilled areas to prevent silt from accumulating on fabric.

If mowing between fabric pieces, do not allow herbaceous matter (grass clippings) to accumulate on the fabric. Such accumulations will initiate germination of weeds and grasses, reducing the usefulness of the woven types of fabric.

Strongly rhizomatous grasses, such as bromegrass, quackgrass, or canarygrass along the perimeter of the fabric piece should be suppressed or controlled with mowing or herbicides. If not controlled, their extensive root systems will suppress tree growth, even with fabric. They will also crowd over the fabric edge, eventually covering most or all of the fabric.

Edges of fabric could be seeded to nonaggressive warm-season grasses such as blue grama, or side oats grama to help anchor the edge of the fabric and to control annual weeds immediately adjacent to the fabric. Refer to "Native Grass Cover," pages 7 and 8 of this reference, for warm-season grass establishment details.

Every few years, closely examine the areas where plants grow through the openings to ensure the fabric is not girdling the plant. Fabric in the shade of the plants will last much longer than the manufacturer's minimum life span. Fabric openings may have to be enlarged as tree stem diameters increase to prevent girdling and death of the tree. A sharp knife on a long handle, or a similar tool, will work well to enlarge openings. Four slits regularly spaced and radiating from the existing opening will expose additional growing

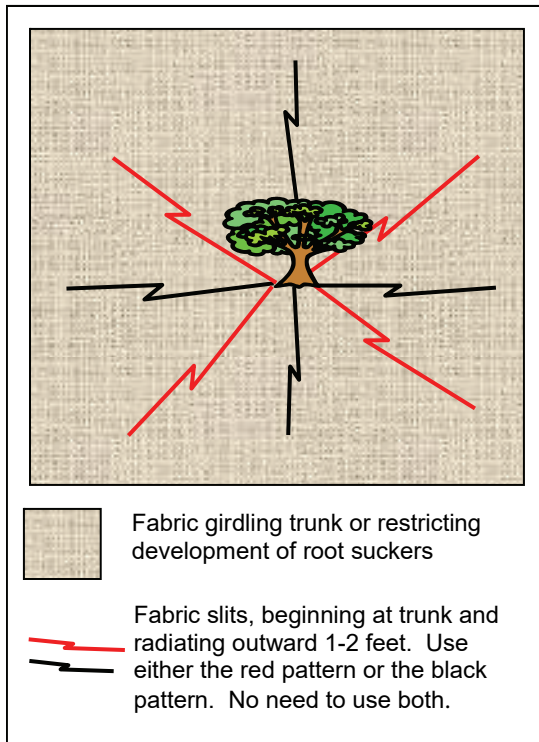


Figure 12: Enlarging fabric openings to prevent girdling or encourage root sprouts

space (see figure 12). This method is also effective in encouraging profuse suckering from suckering shrubs.

Partial or complete removal of fabric after 5-7 years may be appropriate, subject to rules of financial assistance programs. If removed, regular mowing or chemical weed control should be applied to the area of the removed fabric. Do not use tillage weed control methods after fabric removal as severe root damage is likely.

REPLANTING

Any tree or shrub that fails within the first 3 years should be replaced with a similar plant.

USDA-NRCS—North Dakota

Replanting is essential to maintain the intended function of the planting and should be compatible with soils and climate. Growth rates of most replants (when replanted within 3 years of the original planting date) are usually such that little if any size difference is noted, across the planting, after 10 years. Delays in replanting of longer than 3 years will allow adjacent established tree roots to create greater competition to the replants, resulting in slower growth. On some sites with older established plantings (over 15 years old), replants rarely put on substantive growth nor function as desired.

PREVENTING AND REPAIRING DAMAGE

For All Plantings

Inspect planting annually to spot weather and animal damage needing repair, plants needing replacement, fabric or mulches needing repair, weeds needing treatment, or insect and disease threats that may be developing. Time of the inspection will depend upon the potential for a particular threat, but early spring is a good time to spot most problems.

Supplemental Watering

Tree and shrub plantings should be planned for specific site and soil conditions. During the first three years after planting, supplemental water may be beneficial. In the absence of timely rains add 5 gallons per week to each plant. For year 2 and 3 after planting, apply 10 gallons to each plant every other week. For extreme drought conditions after year 3, add 10 gallons per stem diameter inch, measured 1 foot above the ground, once to twice per month. For more details, refer to the [Tree Water Management Fact Sheet](#).

Weeds

Controlling weeds reduces plant stress and makes the plant less susceptible to certain types of insect and disease damage and better able to withstand weather extremes. Pay particular attention to aggressive sod-forming grasses and State listed noxious weeds. For more detailed information, see:

[Weed Control in Tree Plantings](#)

[Herbicide Weed Control in Windbreaks and Shelterbelts](#)

[Synthetic Mulch \(Fabric\) Management](#)

August 2002, revised March 2011

[Tillage for Weed Control in Windbreaks and Shelterbelts](#)

[Warm-Season Grass Cover Between Tree Rows](#)

Insects and Diseases

Inspect plantings at least annually to determine if insects or diseases are threatening the planting. The following texts (links) provide diagnostic and treatment options for many of the disease and insect pests found in North Dakota. Further assistance is available from county extension directors or urban foresters.

[Insect and Disease Management Guide for Woody Plants in North Dakota](#)

[Deciduous Tree Diseases](#)

[Common Insect Pests of Trees and Shrubs in North Dakota](#)

[Common Insect Pests of Trees in the Great Plains](#)

[Diseases and Related Problems of Evergreens](#)

Animal Damage

In parts of North Dakota, deer, beaver, moose, and porcupines have devastated tree and shrub plantings. Hunting, dogs, fences, repellents, and protective shelters have all been used with varying amounts of success. Methods of control vary considerably depending upon the plant species being damaged, the pest causing the damage, and the value of the woody plants. Contact your county extension agent or your local soil conservation district office for specific control measures that may have worked locally.

The following document summarizes the control methods for deer in North Dakota:

[Protecting Trees and Shrubs From Deer](#)

For the most complete reference on wildlife damage and control in North America, refer to [Prevention and Control of Wildlife Damage](#) by Hygnstrom, Timm, and Larson, and published by the University of Nebraska Cooperative Extension Service.

Yard and Agricultural Pesticides

Many yard and agricultural pesticides are damaging to trees and shrubs. Misapplication of pesticides may not initially kill trees or shrubs. Depending upon the concentration, the product may kill the plant a few months later, or stress the plant so that it is not able to withstand

stresses such as drought or frost several years after the misapplication. Regular sub-lethal doses of pesticides to trees and shrubs, as often happens to field windbreaks, make trees and shrubs even less able to withstand stresses of frost, drought, or weeds. When applying these products adjacent to woody plantings, be alert to wind and temperature conditions and be fully knowledgeable of the label restrictions and precautions for each product applied. Second only to weeds, misapplied pesticides damage more trees than any other cause.

Weather

Other than keeping the plant healthy, there is not much one can do to prevent weather problems, however, when weather damage is swiftly corrected, subsequent storms are less likely to cause further damage. Proper selection of species for the site and individual plant placement within a planting may reduce weather-related problems such as snow and ice breakage, wind throw, or drought. See details on pruning below for correction of weather damage.

Protective Tree Shelters

A wide assortment of tree shelters exists in the market place. They range from 1 foot tall to 6 feet tall, from solid tubes, to flat sheets that fold into tubes, to plastic meshes. All are effective in preventing certain kinds of damage.

One of the more common tree shelters in North Dakota consist of tubes, or flat sheets that fold into tubes, that range from 2-6 feet in height and form a 3-5 inch cylinder around the tree. These shelters protect the tree from wind, sun, small mammals, rodents, and deer, encourage faster initial growth, and provide an opportunity for much easier herbicide applications. Five-foot or taller shelters are most effective at preventing deer browse. Deer may still browse plants at the top of the 5-foot tubes, but trees can usually grow past the browse risk.

Tubes are usually tied to wood stakes with plastic ties. Tubes should not be removed for several years after the tree has emerged from the top of the tube. This period of time is needed for the tree to develop adequate stem diameter to withstand wind. Removal of the tree shelter just as the tree reaches the top of the tube will often result in a tree that "lays on the ground" or is broken off at the first strong wind.

There may or may not be merit in raising the tubes a few inches off the ground in the fall to help the tree "harden off." There is no conclusive evidence to indicate one way or the other. If there were value to raising tubes in the fall, it would probably be most beneficial on tree species planted outside their native range of occurrence. If there is a desire to assist tubed trees in hardening off for the winter, lift the tubes about 6" at the first of October, and return them to the soil surface at the end of October. Some manufacturers offer vented tubes that eliminate the need to raise and lower tubes.

Manufacturers should warrant the tubes for at least 3 years before they start breaking down from ultraviolet light. Follow the manufacturer's instructions for installing specific brands of tubes.

After tubes have served their purpose, the tubes, ties, and stakes must be removed to prevent mechanical injury to the growing tree trunk.

Pruning

When applied in a timely manner and properly completed, pruning can greatly improve the life and function of trees and tree plantings. As explained in the references below, there are certain times of the season that are more beneficial for pruning certain species. Generally, pruning is best for the tree when conducted during the dormant season (after leaves fall.)

For most homeowners, however, if the desire to conduct a quality-pruning job has struck, it is best to prune at that moment rather than wait for the "best" time to prune. Quite often, the desire to prune may not strike for another decade and the size of the pruning job and the stress to the tree will have grown exponentially.

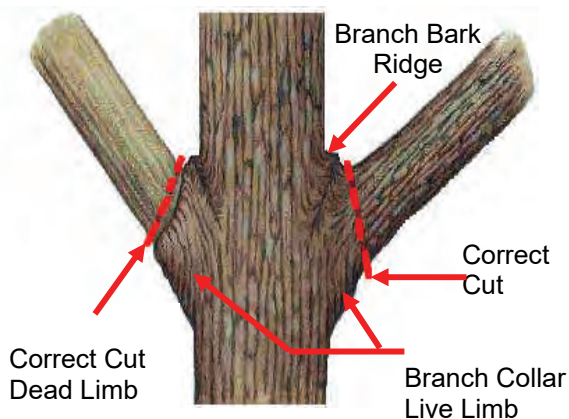


Figure 13

For pruning storm damage, it is best to prune soon after the storm to reduce the area of jagged open scars and potential for disease or insect attack. Another reason to prune storm damage immediately is to reduce hazards to life and property from weakened and damaged trees. Attempt only those pruning jobs commensurate with skills, experience, and equipment of the person doing the pruning. Pruning can be hazardous to those not properly prepared.

The branch bark ridge (see Figure 13) is a raised ridge on top of the limb between the main trunk and the limb. It is a good indicator of the proper pruning position. The branch collar is a slightly swollen area around the base of the limb where it attaches to the trunk. The branch collar contains specialized cells that help the wound to close after a pruning cut. The branch-bark ridge and the branch collar are excellent guides for properly locating pruning cuts. Avoid damaging the branch collar or branch-bark ridge, as the wound will take much longer to callus over.

In most cases, weather and animal damage resulting in broken, scarred or twisted limbs, along with double leaders can be easily corrected with a hand pruner (see Figure 13). Generally, trees should be trained to have a single main stem without v-shaped branch angles on the main trunk. Double leaders and weak branch angles leave a tree susceptible to subsequent breakage, loss of function, and decreased life.

More detailed instructions can be found in: "[Pruning Trees and Shrubs](#)"

"Tree Shrub Pruning," conservation practice in Section IV, North Dakota Field Office Technical Guide

Staking

Most newly planted trees shorter than 5 feet in height do not need staking. For those with smaller root balls or those greater than 5 feet in height, the following diagrams illustrate 2 staking methods. Trees should not be staked for more than 2 years, in most situations. Tree trunks need to develop wind hardiness, which is not possible when tightly staked for longer periods of time.

Figures 14a and 14b illustrate two different ways of staking trees. Wires and ties used in staking should not be so tight that the tree can not move

at all. Some movement is desirable. Stakes are to restrict movement during high winds that could uproot the tree.

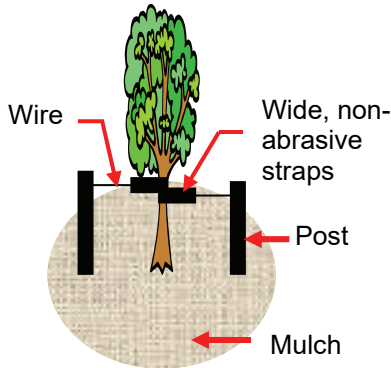


Figure 14a: Staking With Two Posts

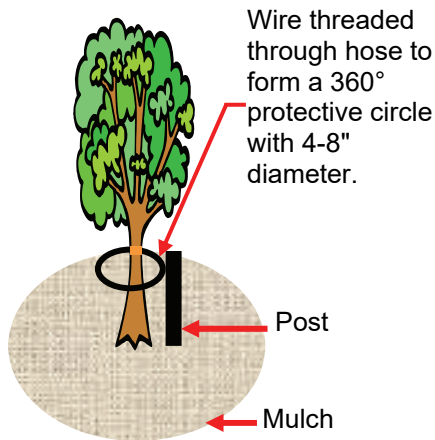


Figure 14b: Staking With One Post

Tipped Trees

Trees older than 5-10 years that have been tipped due to high winds and saturated soils can rarely be pulled back straight. If most of the main roots have not been broken or torn, the trees may stabilize at their new “angle” and continue to grow well. Many will appear straighter with time, but part of the trunk will likely still have a crook.

If roots have been broken and torn, or root balls have been tipped from the soil, establish a new windbreak or tree planting and remove the damaged trees when the new planting becomes effective. If the damaged trees are a hazard, or mostly dead, then immediate removal is appropriate.

Younger trees that have been tipped in saturated soils can be guyed immediately after the storm while the soil is still saturated. Use wide, nonabrasive straps around the trunk and do not pull so much that trunk damage occurs. It may be necessary to complete the straightening over several months.

In short, if the tree is healthy on the right site, they rarely tip. If the tree is unhealthy on a poor site, tipping and other storm damage is more likely and the ability to repair storm damage is greatly diminished.

REQUIRED SURVIVAL PERCENTAGE

To determine when a planting can be labeled a success, refer to **Table 1**. Required survivability of individual plants will vary as the purpose of the planting varies. Wildlife plantings can function perfectly well with considerably more missing trees and shrubs than can a windbreak.

Table 1 - Required Survival Percentages For a Successful Tree Planting	
Inventoried after "leaf out" during spring or summer of the second year (% of number planted)	
Practice	Percent Survival
380 - Windbreaks / Shelterbelt Establishment	85% of all trees or shrubs planted with no two adjacent plants missing
Sound Barrier	
Visual Screen	
Airborne chemical drift	
Wind borne dust barrier	
Living snow fence	
311 Alley Cropping	75% of all trees or shrubs planted
391 Riparian Forest Buffer	
612 Tree / Shrub Establishment	50% of all trees or shrubs planted, unless specific sites require a higher survival percentage
580 Streambank/Shoreline Protection	
644 Wetland Wildlife Habitat Management	
645 Upland Wildlife Habitat Management	

Additional Information:

Please note that all links in this document were current at publication. If you find a broken link contact North Dakota NRCS at 701-530-2082.

Most tree care and management is the same as it was decades ago. However, the science is constantly changing. Newer styles of weed control fabric are being researched and tried. Herbicides are constantly changing. New species are being released on a fairly regular basis.

For now we face the continuing battle with Dutch Elm Disease. Gypsy moth is a constant threat to our hardwoods, if it ever becomes established in the state. Emerald ash borer looms big on the immediate horizon and is likely to have a serious detrimental effect on urban and rural forests. Other insects and diseases exist and can have devastating effects on individual forest resources.

Keep abreast of changing conditions by attending workshops given by agencies, universities, and nurseries. Direct forestry concerns and questions to foresters with the State Forestry Agencies, State Universities, US Forest Service, Urban and Community Forestry Departments or the Natural Resources Conservation Service.

Acknowledgements:

Rachel Bergsagel, Biological Science Technician,
Plant Materials Center, NRCS, Bismarck, ND

Arlene Deutscher, State Public Affairs Specialist,
NRCS, Bismarck, ND

Robert Logar, Forester, NRCS, Bozeman,
Montana

Jodean Nichols, Economist, NRCS, Bismarck, ND

Joe Sciana, Agronomist, Plant Materials Center,
NRCS, Bridger, MT

Dwight Tober, Plant Materials Specialist, NRCS,
Bismarck, ND

Greg Yapp, Forester, NRCS, Huron, South
Dakota

Bruce Wight, National Agroforester, NRCS,
Lincoln, NE

Dr. Joe Zeleznik, Extension Forester, North
Dakota State University, Fargo, ND

Other Resources

Riparian/Wetland Project Information Series No. 17, "[Waterjet Stinger](#): A tool to plant dormant unrooted cuttings of cottonwoods, dogwoods and other species."

[Weed Control in Tree Plantings](#)

[Windbreak Establishment](#), University of Nebraska Extension EC 91-1764-B

[Windbreak Management](#), University of Nebraska Cooperative Extension EC 96-1768-X

[Windbreak Renovation](#), University of Nebraska Cooperative Extension EC.98-1777-X

[North Dakota Tree Handbook](#)

[Synthetic Weed Control Fabric Advantages and Disadvantages](#)

[Emerald Ash Borer](#)



[Tree and Shrub Characteristics](#)

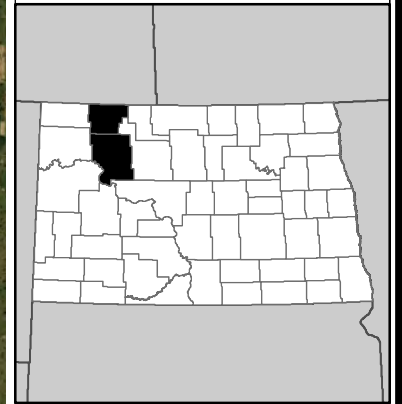
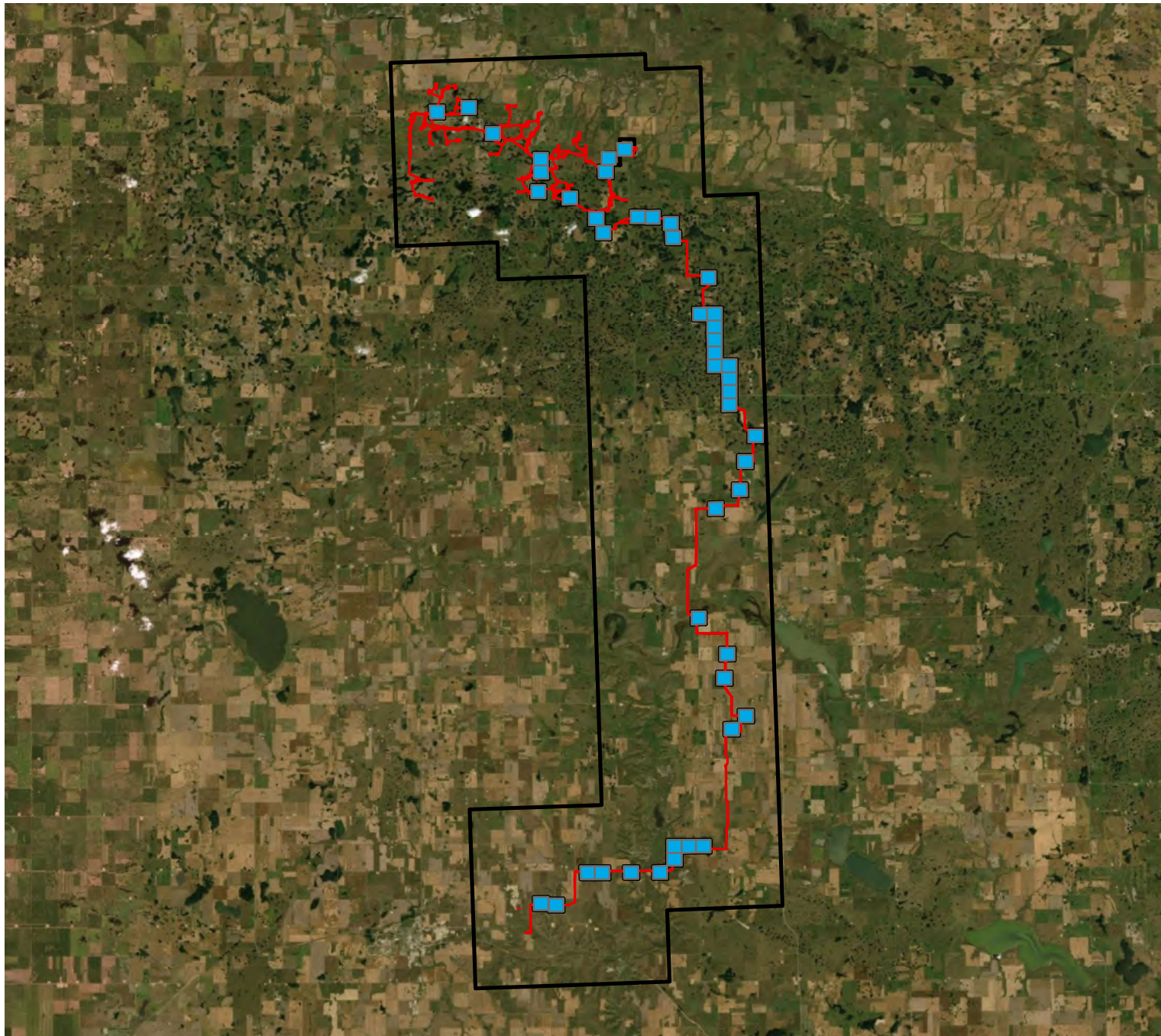
[Expected 20-Year Tree Heights and Windbreak Suitability Group Descriptions](#)

APPENDIX C: FIGURES

APPENDIX C - SITE OVERVIEW
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Construction Easement
-  Areas of Removal








0 14,500 29,000 Feet

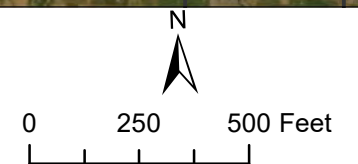
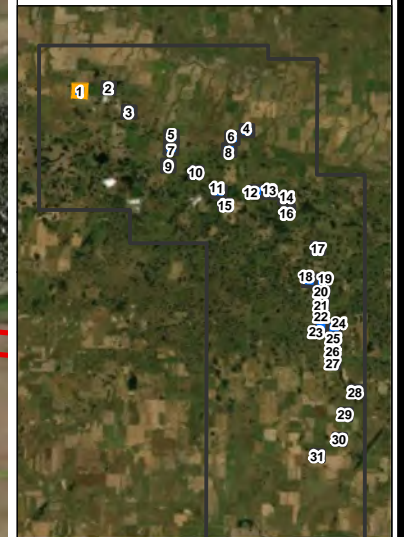
Sources: ECT, 2021.



APPENDIX C - PAGE 1 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed








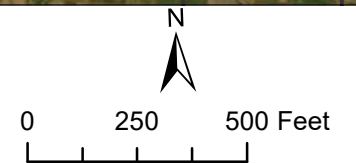
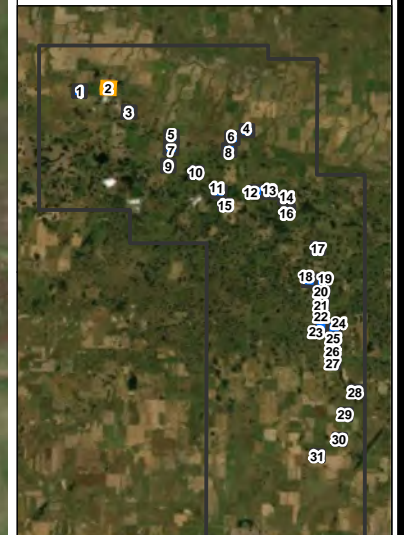
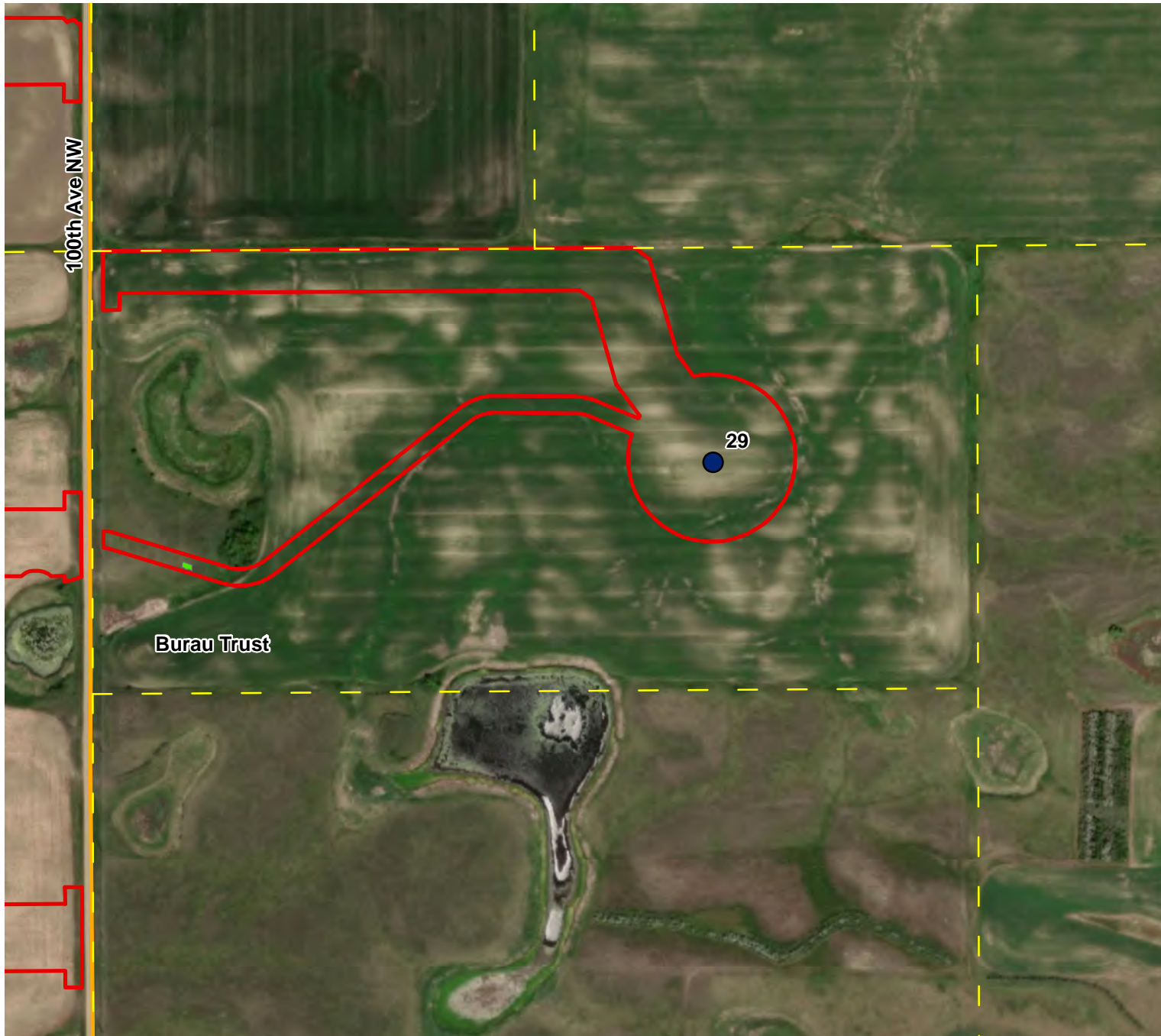
Sources: ECT, 2021.



APPENDIX C - PAGE 2 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed








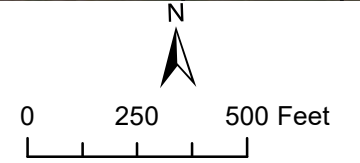
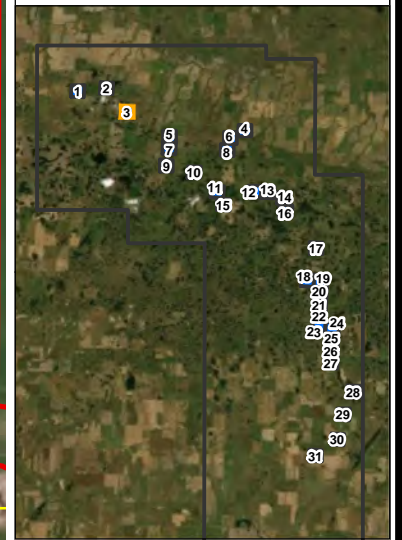
Sources: ECT, 2021.



APPENDIX C - PAGE 3 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed








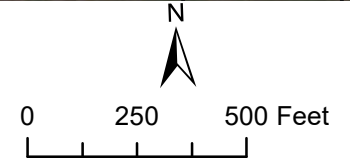
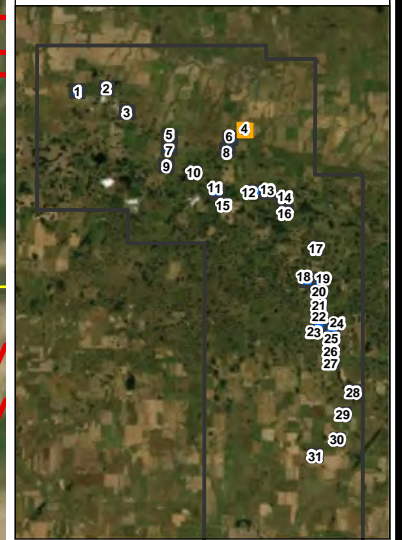
Sources: ECT, 2021.



APPENDIX C - PAGE 4 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed








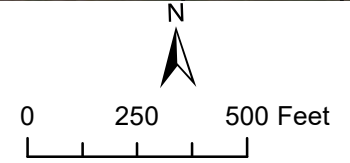
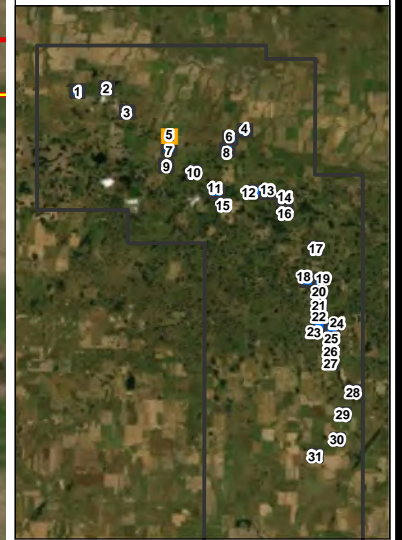
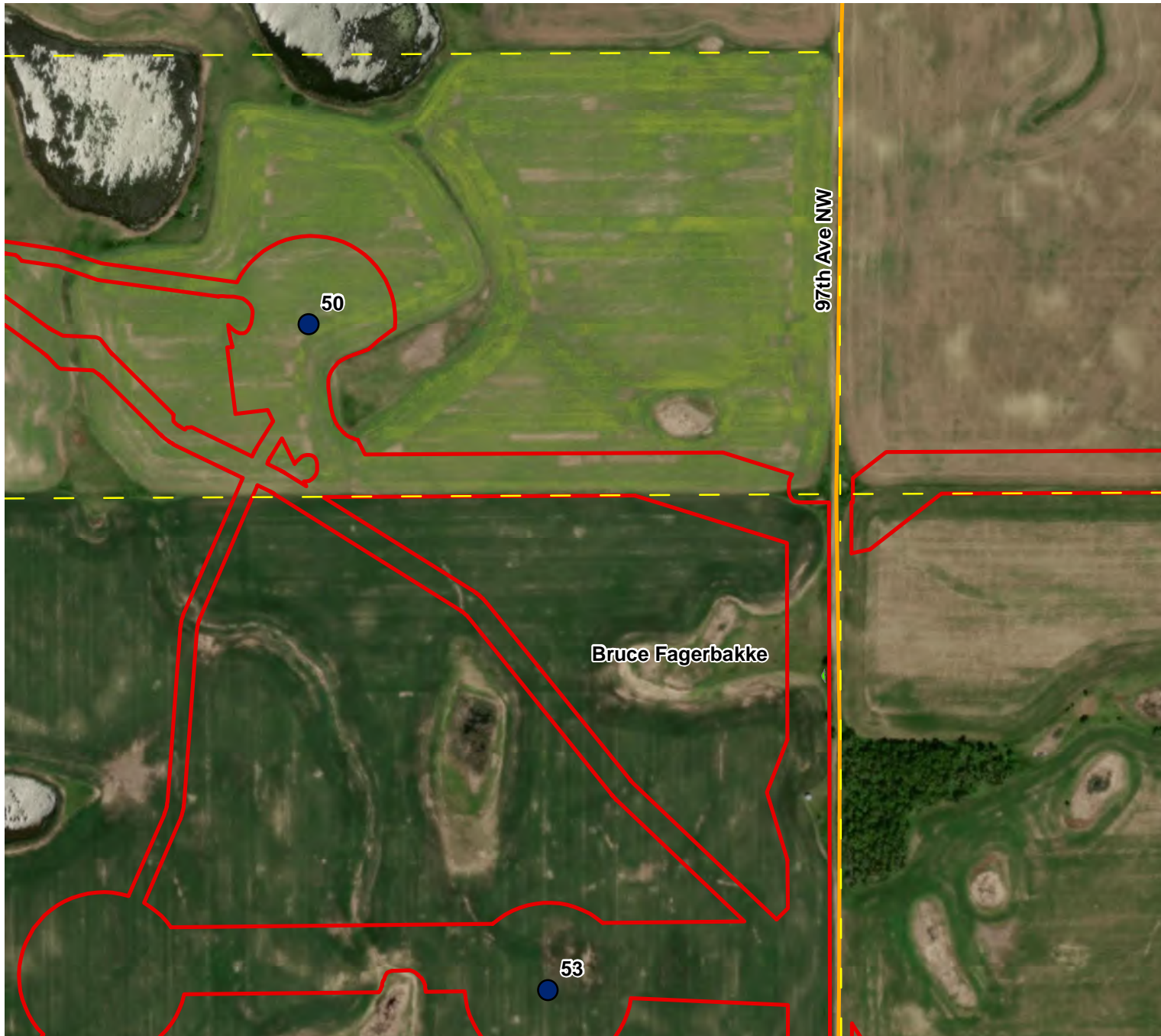
Sources: ECT, 2021.



APPENDIX C - PAGE 5 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:






-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed

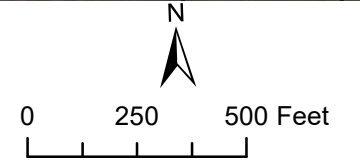
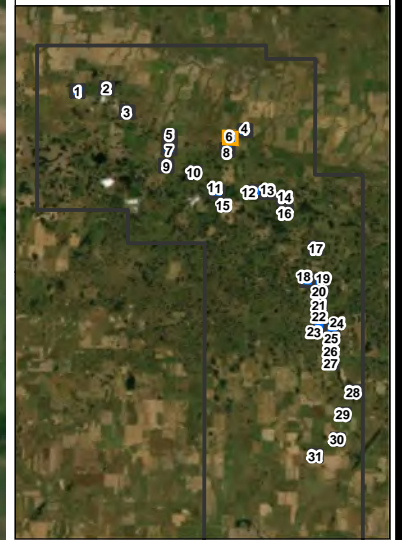


Sources: ECT, 2021.



Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed








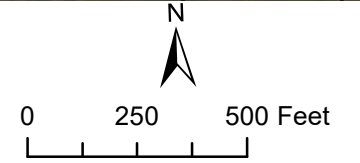
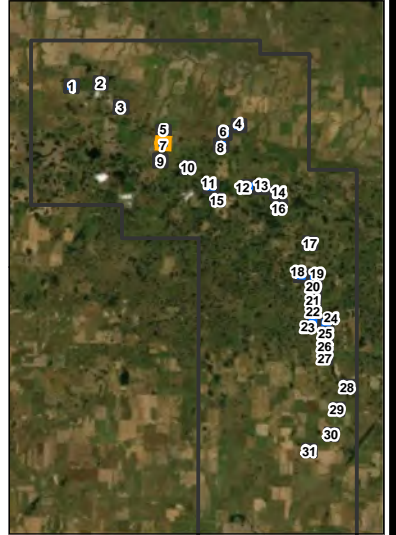
Sources: ECT, 2021.



APPENDIX C - PAGE 7 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed








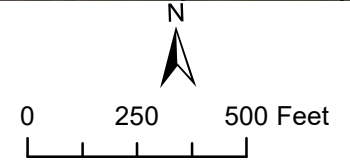
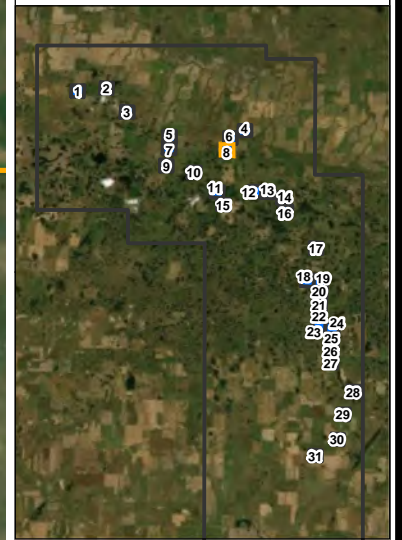
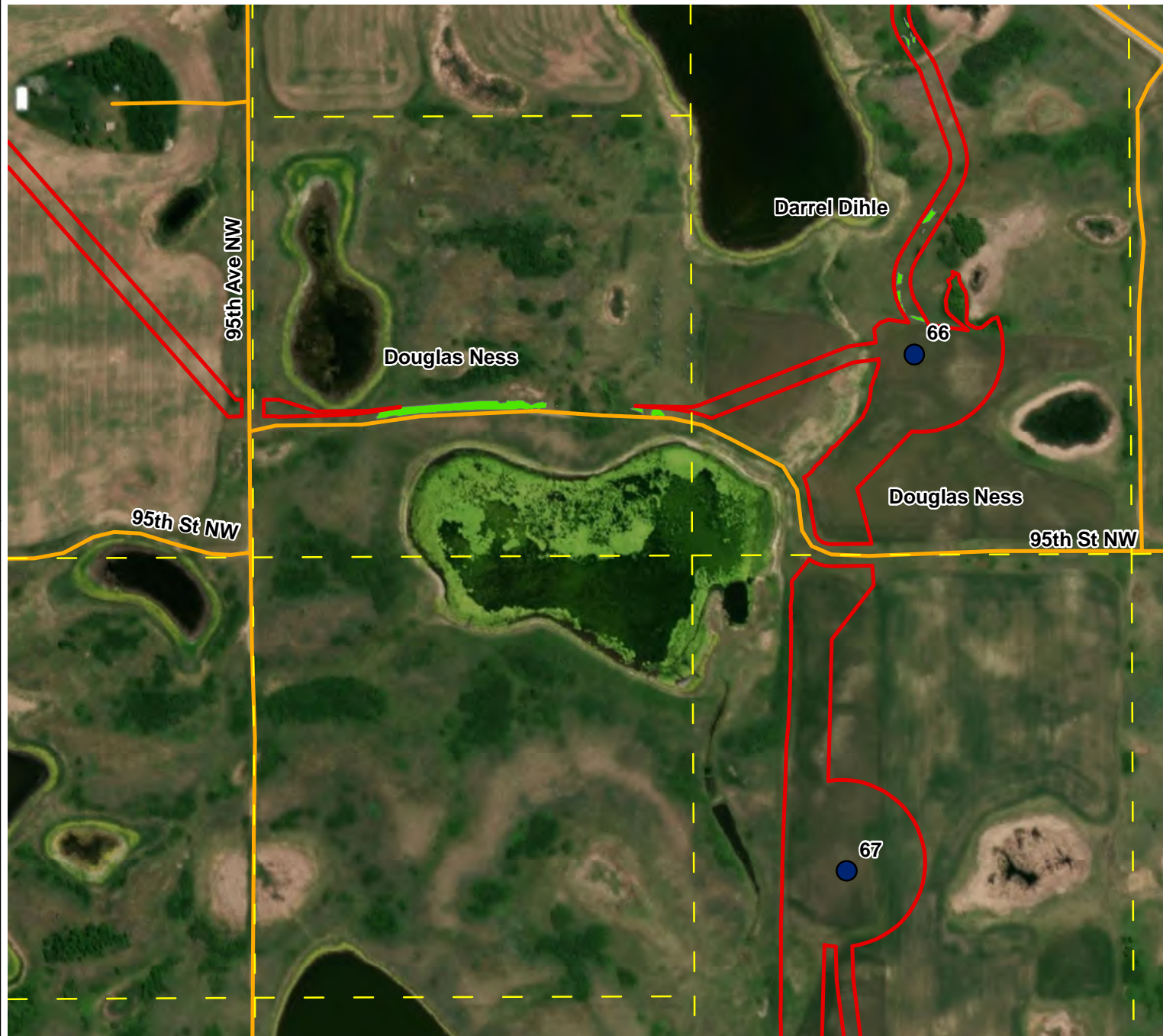
Sources: ECT, 2021.



APPENDIX C - PAGE 8 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



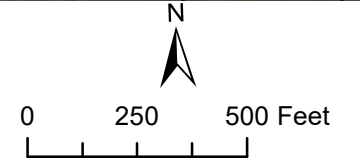
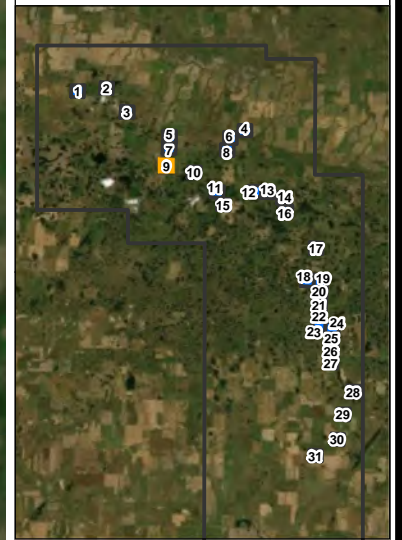
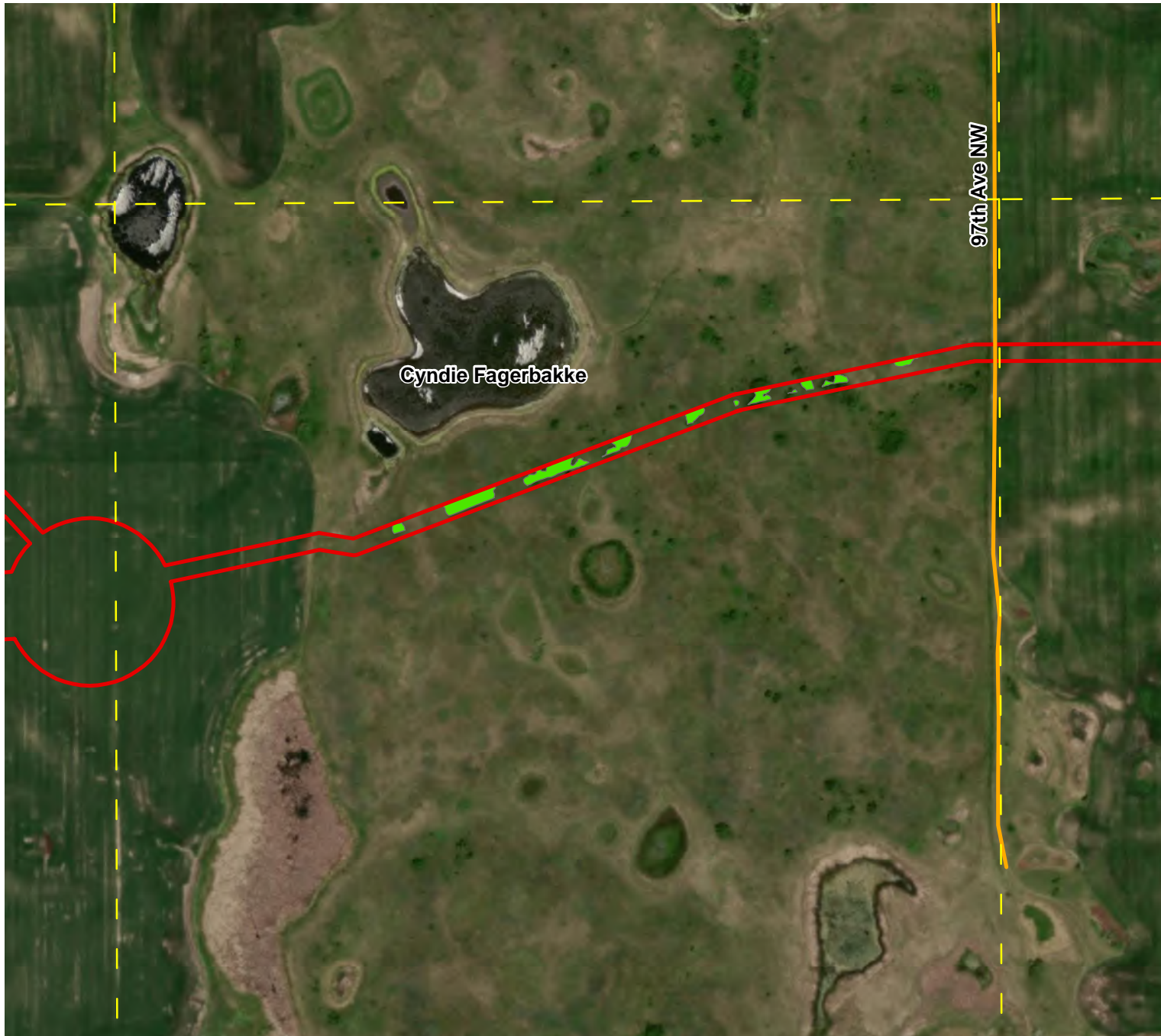
Sources: ECT, 2021.



APPENDIX C - PAGE 9 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed








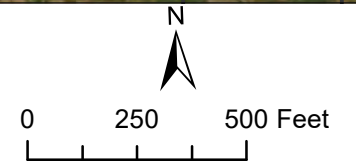
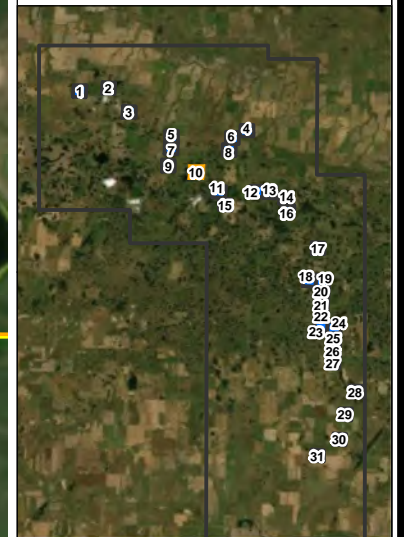
Sources: ECT, 2021.



APPENDIX C - PAGE 10 OF 46
 Removed Trees and Shrubs Map
 Tree and Shrub Mitigation Plan
 NextEra Energy Resources, LLC

Legend:

-  Turbines
-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



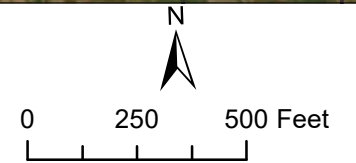
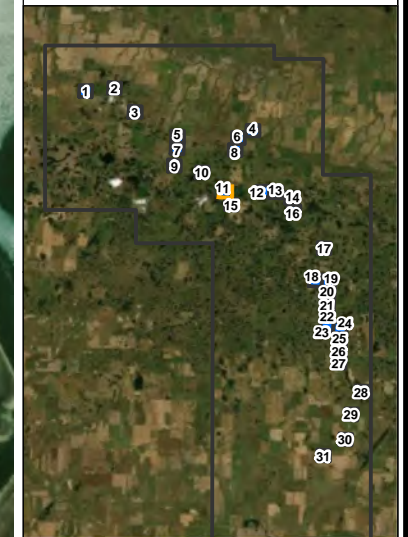
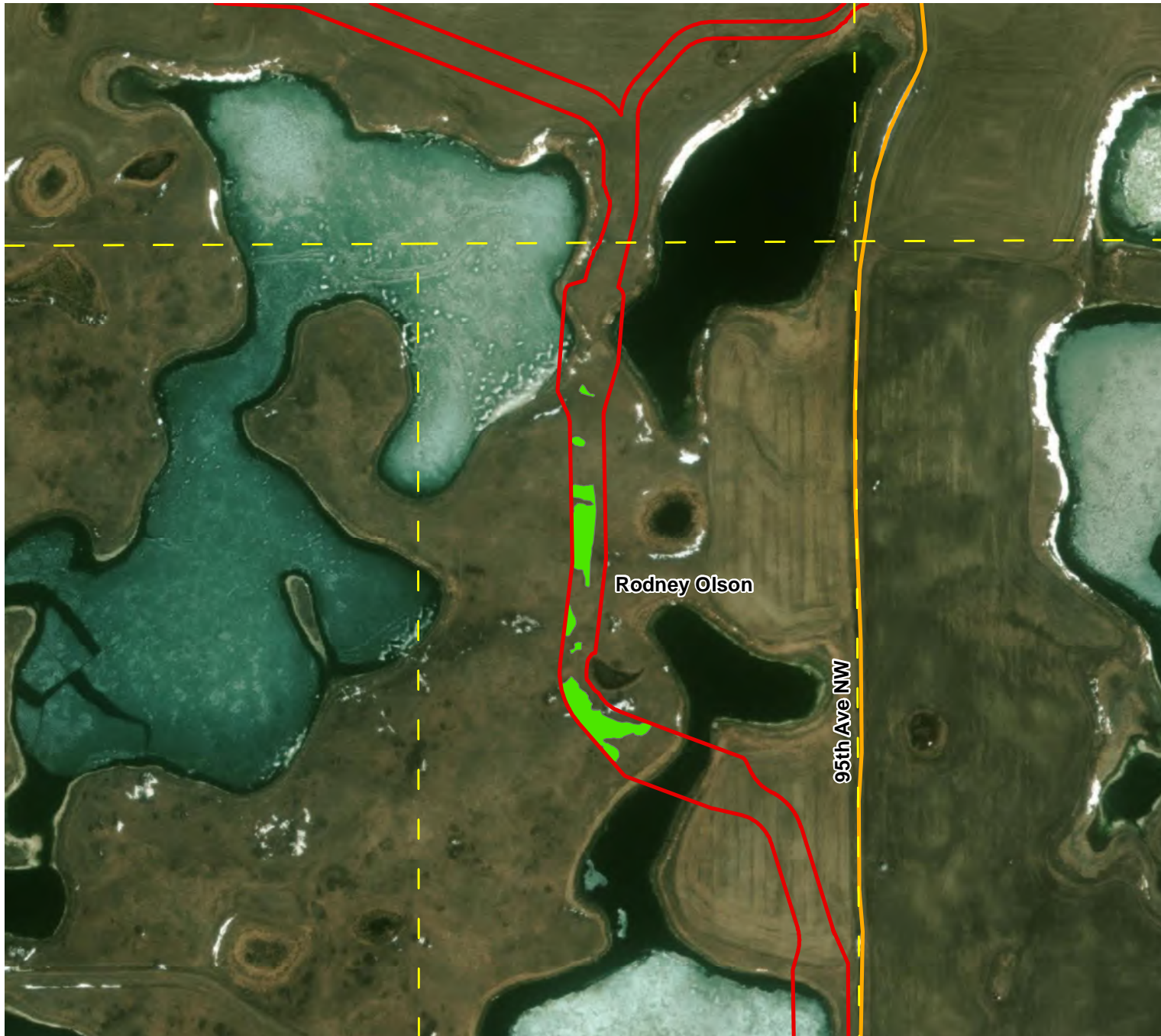
Sources: ECT, 2021.



APPENDIX C - PAGE 11 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed

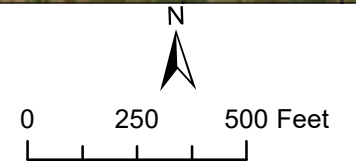
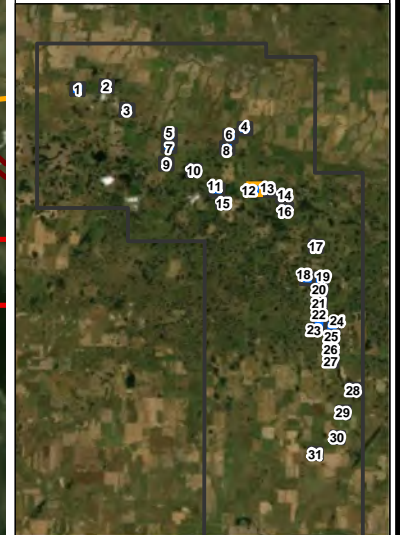
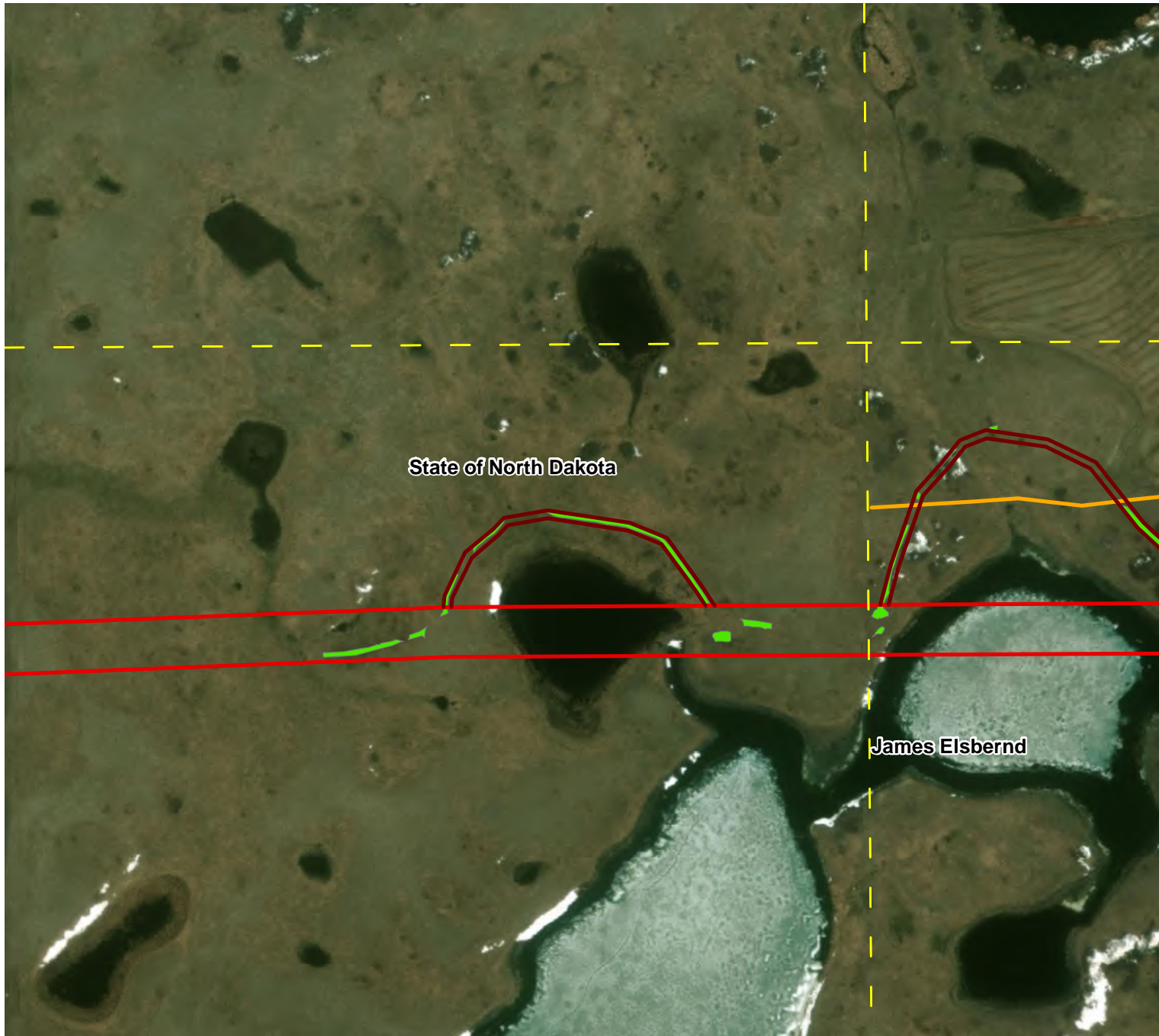


Sources: ECT, 2021.



Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



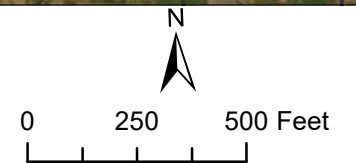
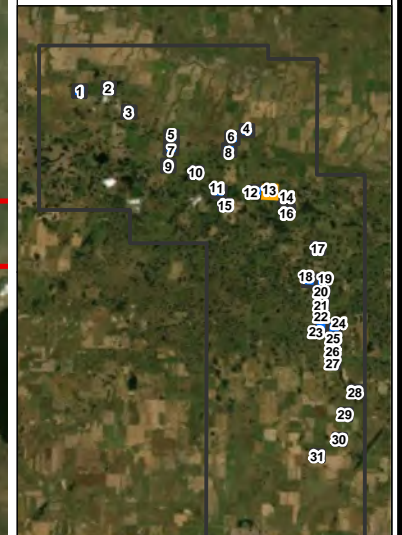
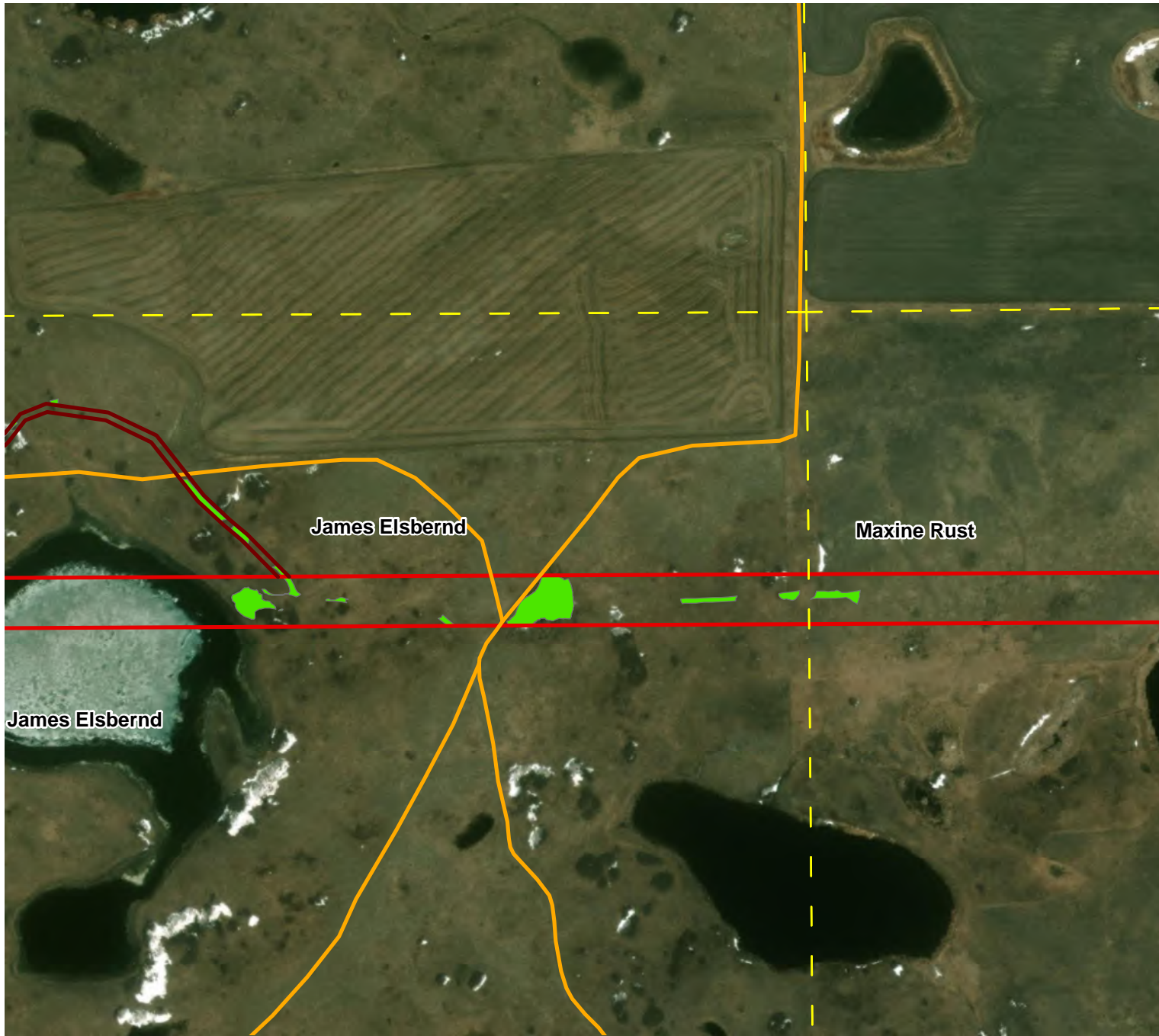
Sources: ECT, 2021.



APPENDIX C - PAGE 13 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



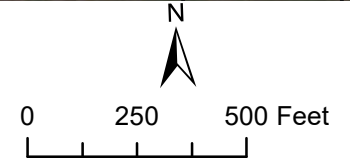
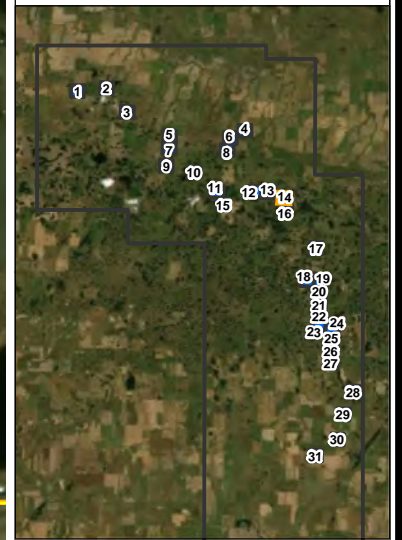
Sources: ECT, 2021.



APPENDIX C - PAGE 14 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



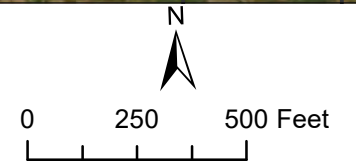
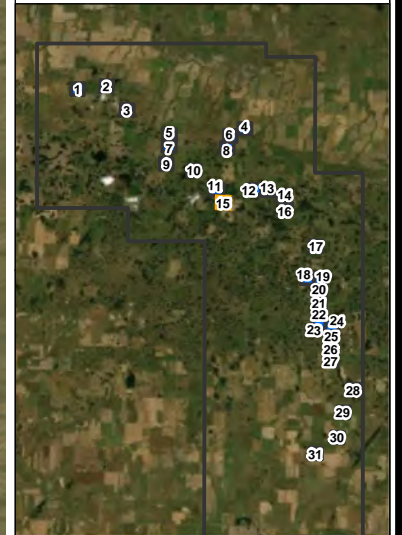
Sources: ECT, 2021.



APPENDIX C - PAGE 15 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



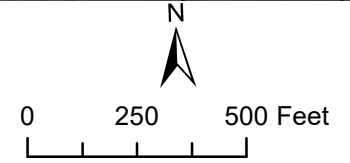
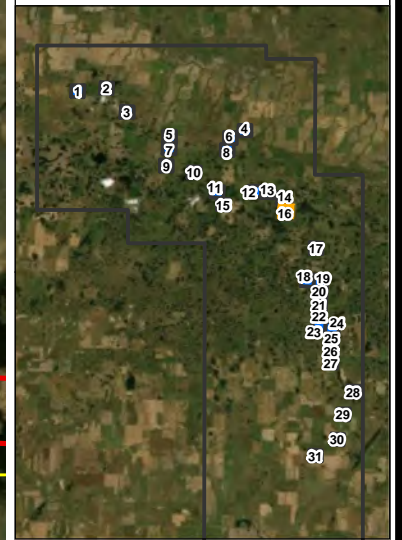
Sources: ECT, 2021.



APPENDIX C - PAGE 16 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed

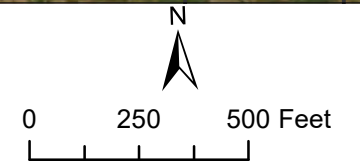
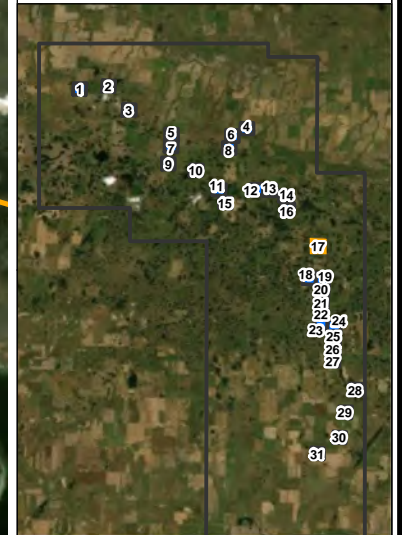


Sources: ECT, 2021.



Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



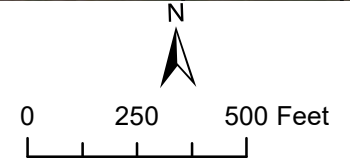
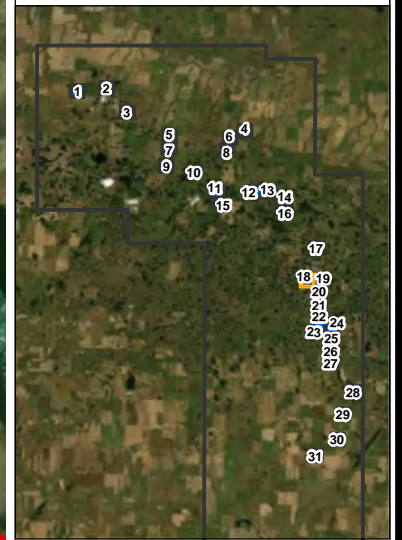
Sources: ECT, 2021.



APPENDIX C - PAGE 18 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed







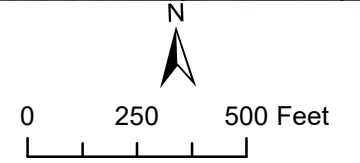
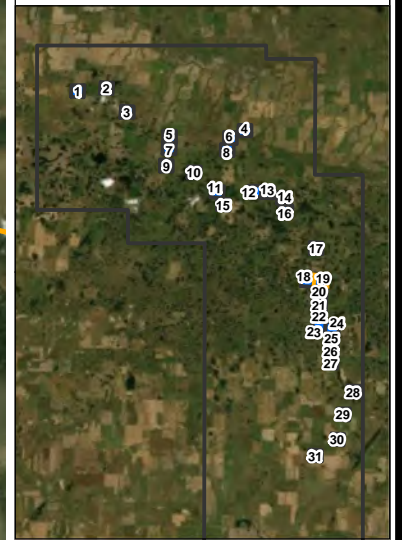
Sources: ECT, 2021.



APPENDIX C - PAGE 19 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed







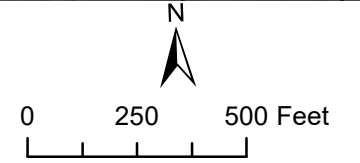
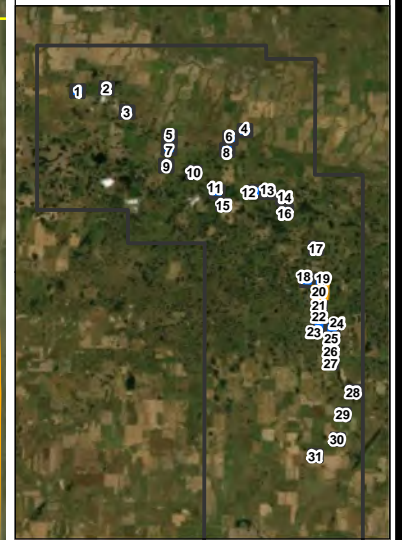
Sources: ECT, 2021.



APPENDIX C - PAGE 20 OF 46
 Removed Trees and Shrubs Map
 Tree and Shrub Mitigation Plan
 NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



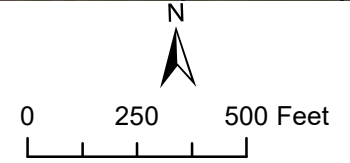
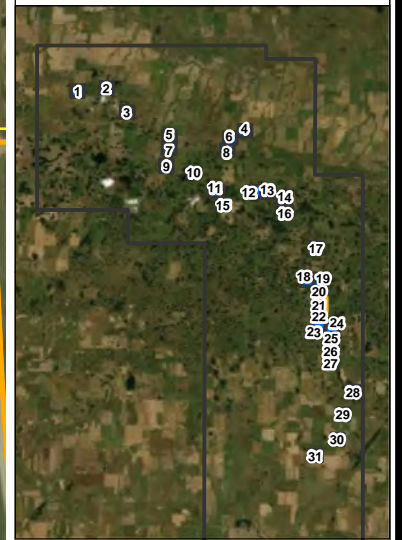
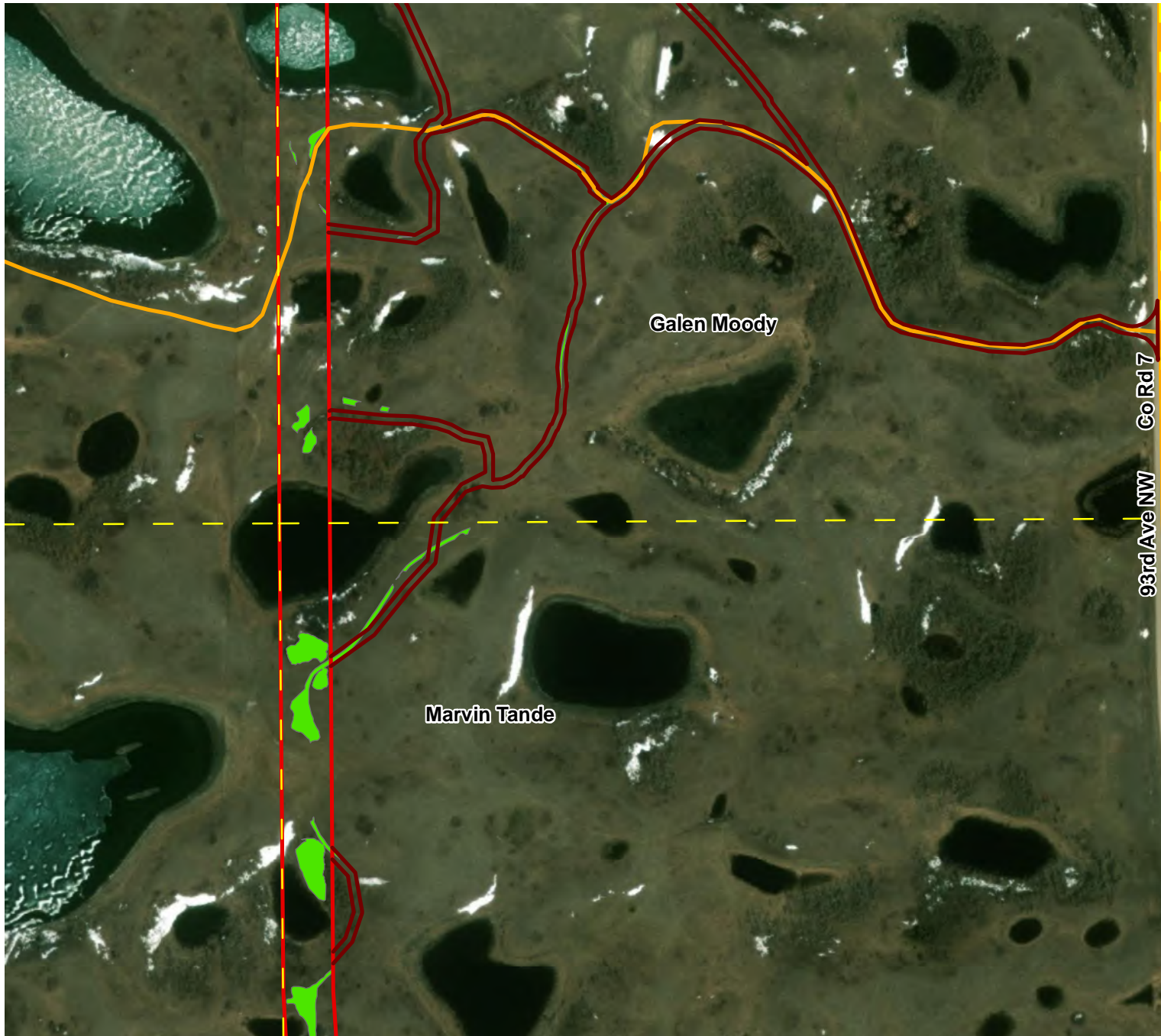
Sources: ECT, 2021.



APPENDIX C - PAGE 21 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



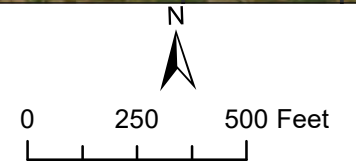
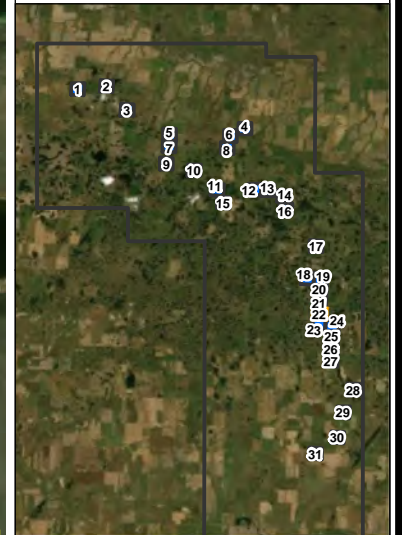
Sources: ECT, 2021.



APPENDIX C - PAGE 22 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Construction Easement
- Tree or Shrub Removed



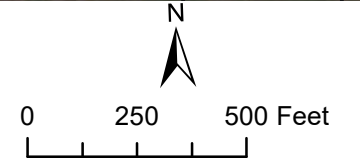
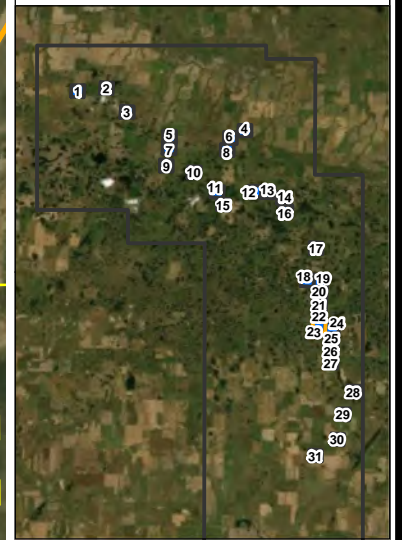
Sources: ECT, 2021.

ECT Environmental Consulting & Technology, Inc.

APPENDIX C - PAGE 23 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed







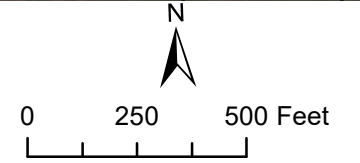
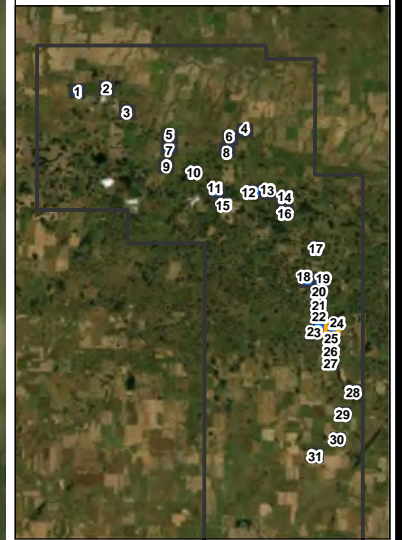
Sources: ECT, 2021.



APPENDIX C - PAGE 24 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



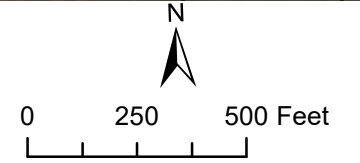
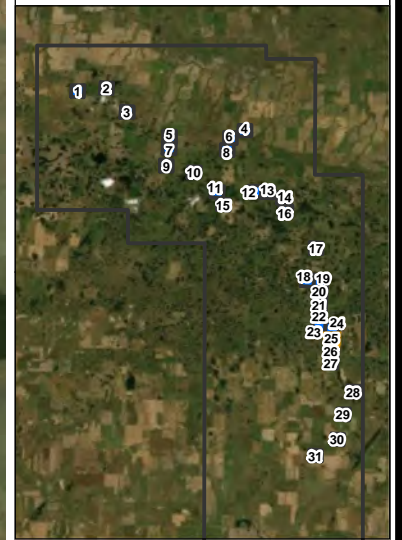
Sources: ECT, 2021.



APPENDIX C - PAGE 25 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed

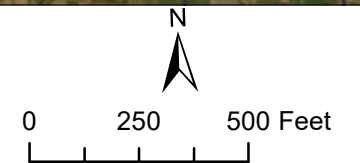
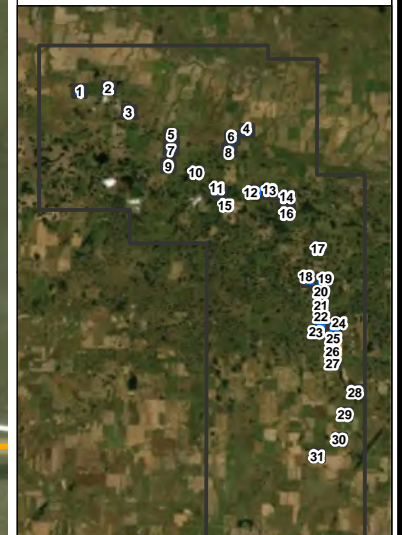


Sources: ECT, 2021.



Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



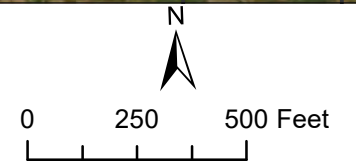
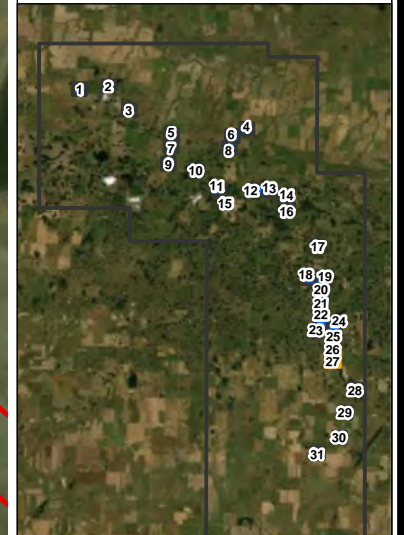
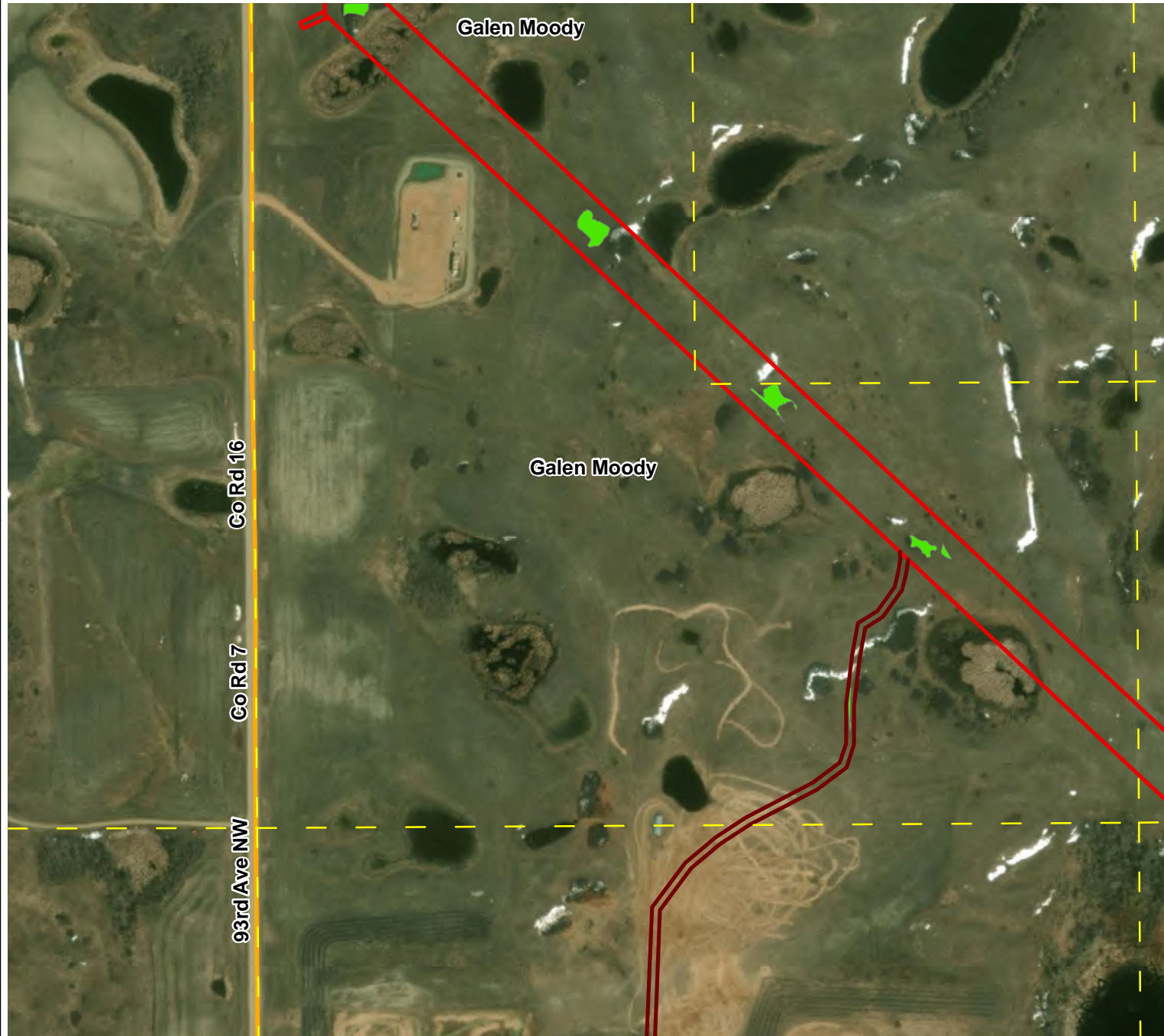
Sources: ECT, 2021.



APPENDIX C - PAGE 27 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



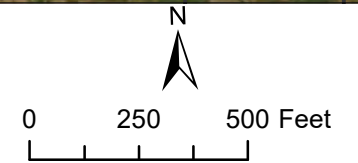
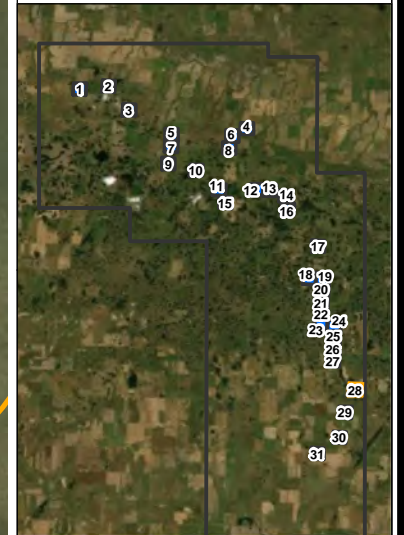
Sources: ECT, 2021.



APPENDIX C - PAGE 28 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



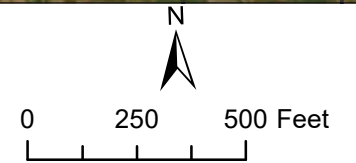
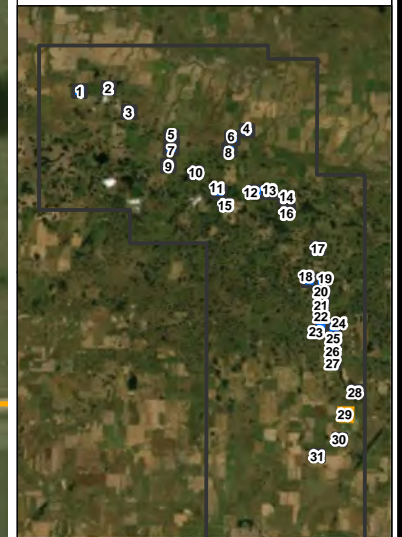
Sources: ECT, 2021.



APPENDIX C - PAGE 29 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed






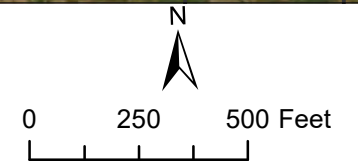
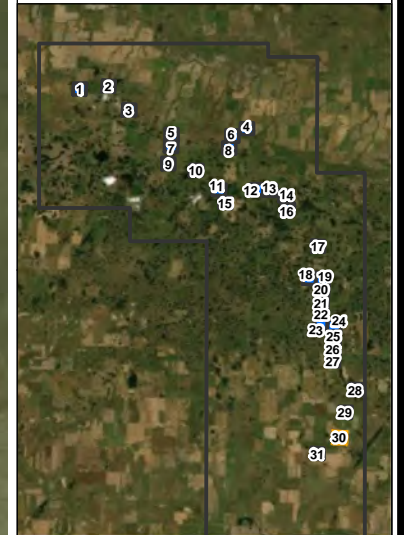
Sources: ECT, 2021.



APPENDIX C - PAGE 30 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Construction Easement
-  Tree or Shrub Removed



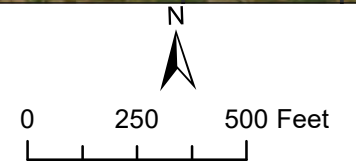
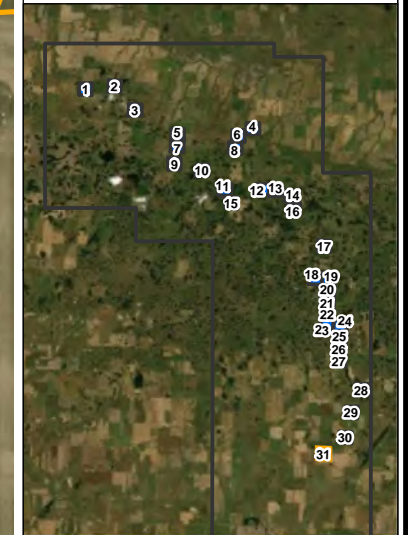
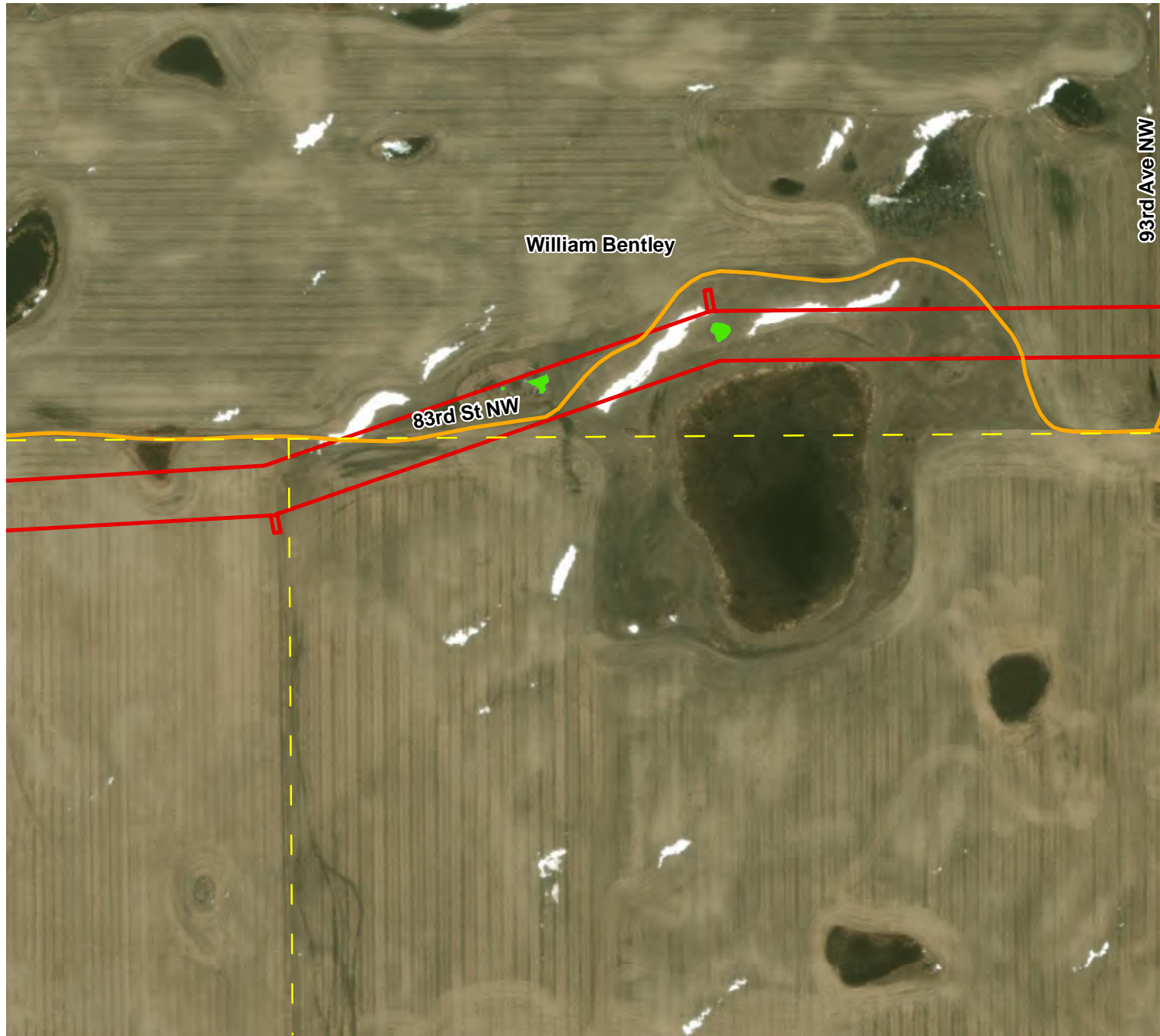
Sources: ECT, 2021.



APPENDIX C - PAGE 31 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed

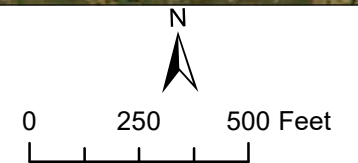
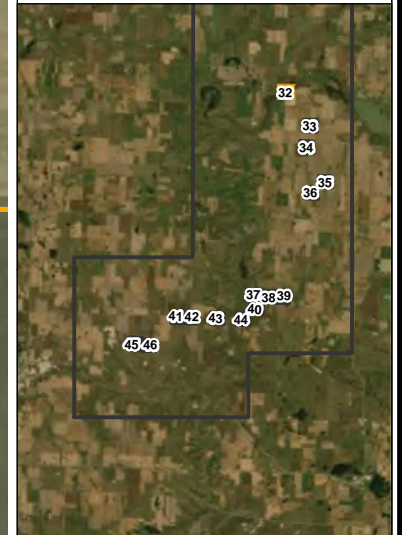


Sources: ECT, 2021.



Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



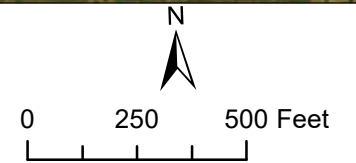
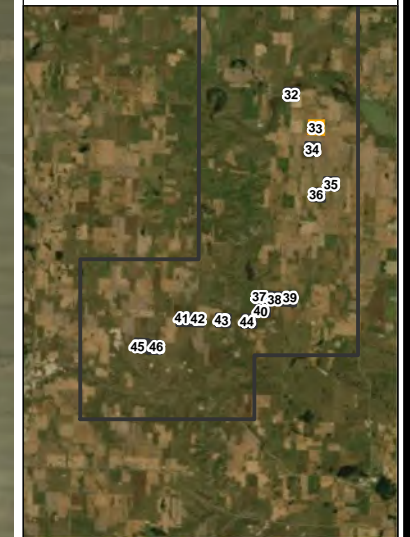
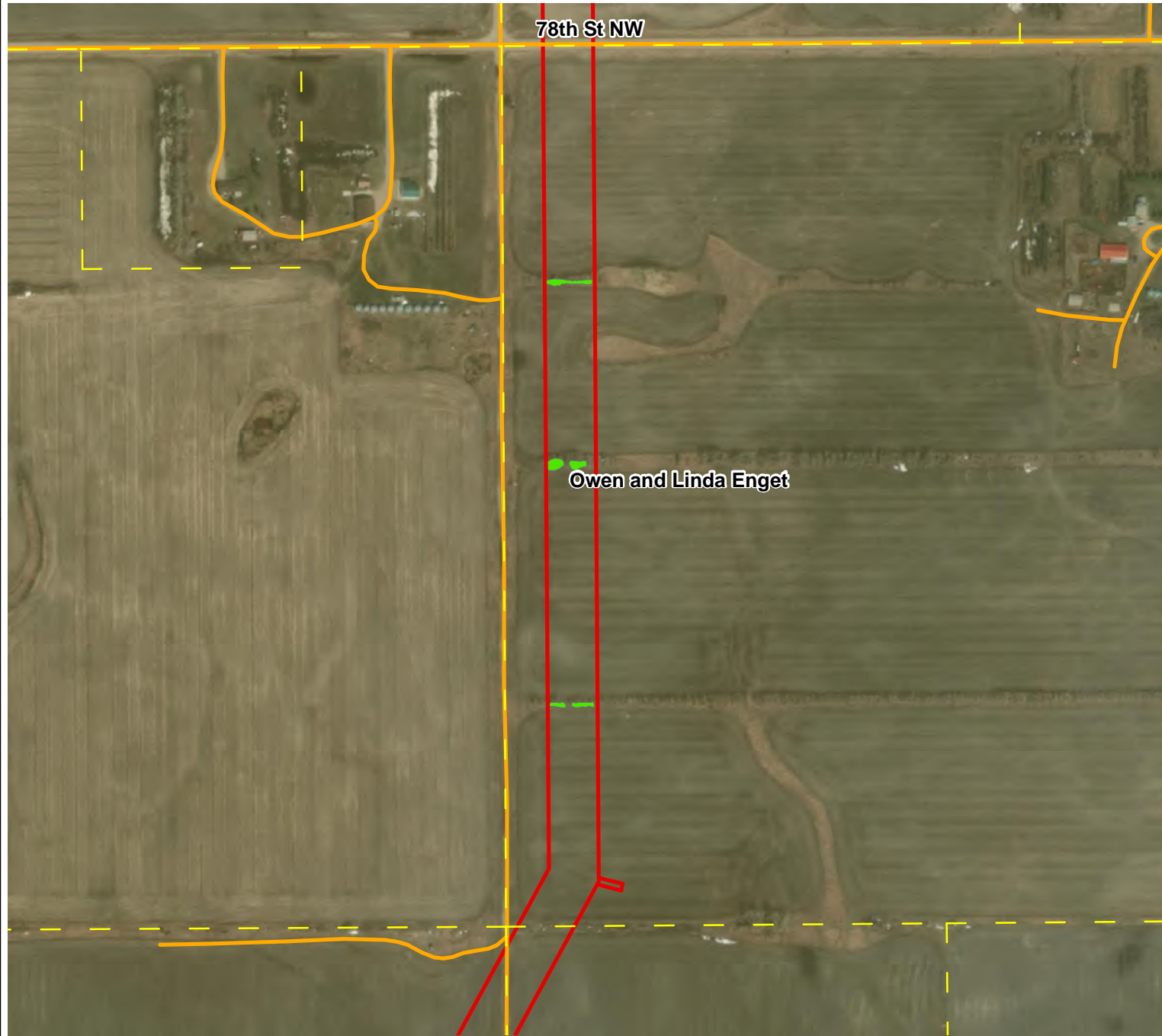
Sources: ECT, 2021.



APPENDIX C - PAGE 33 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed







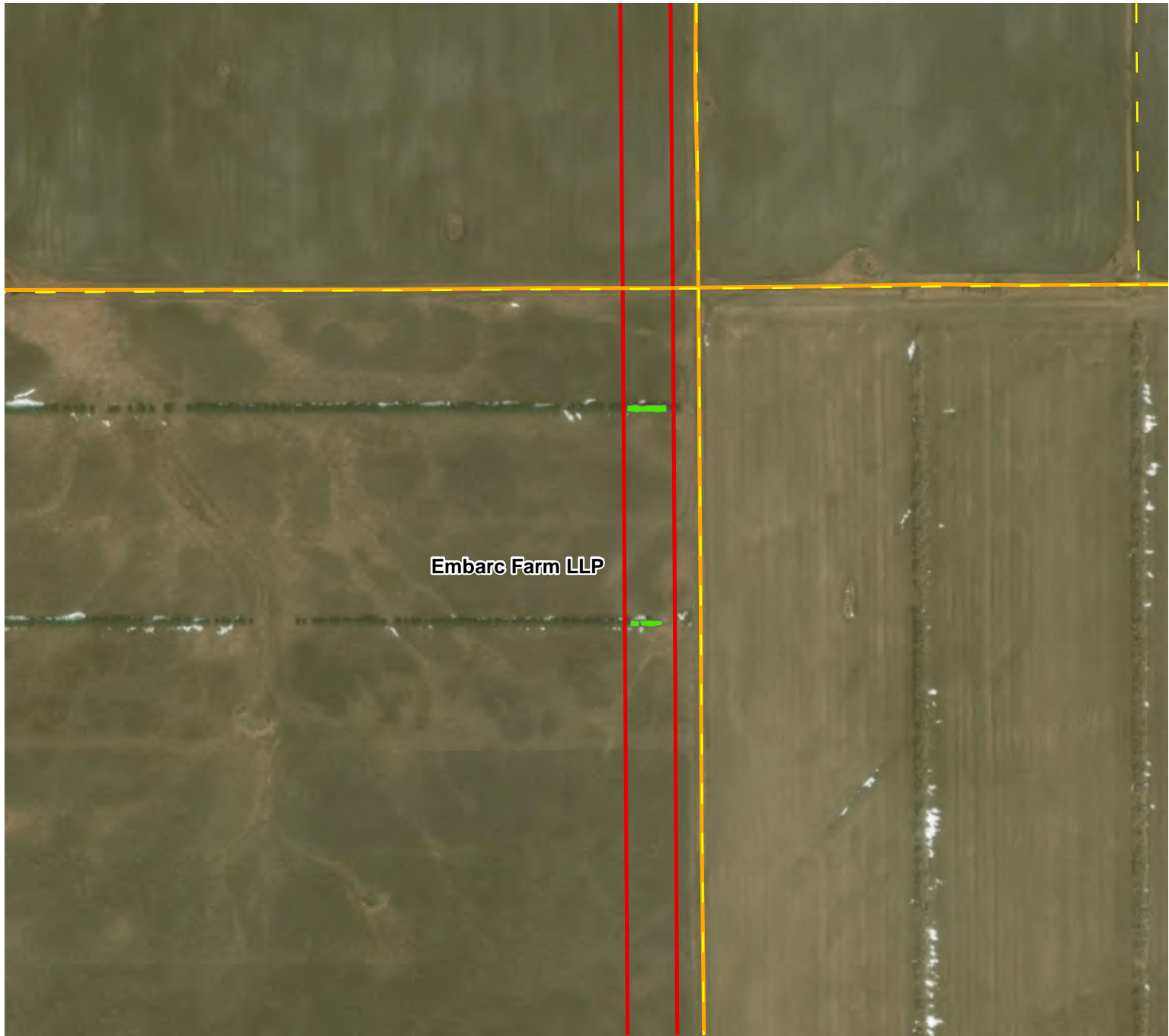
Sources: ECT, 2021.



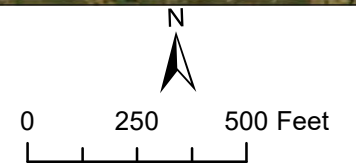
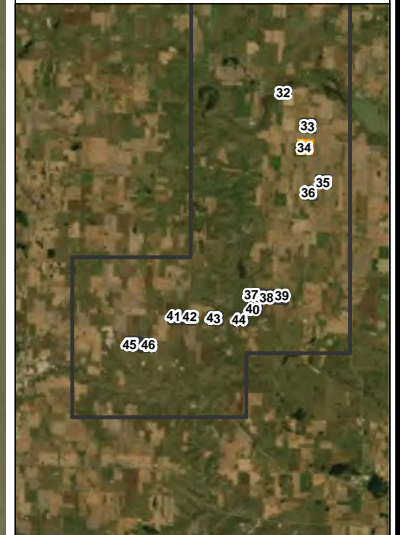
APPENDIX C - PAGE 34 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



Embarc Farm LLP



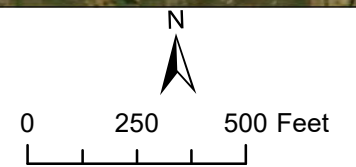
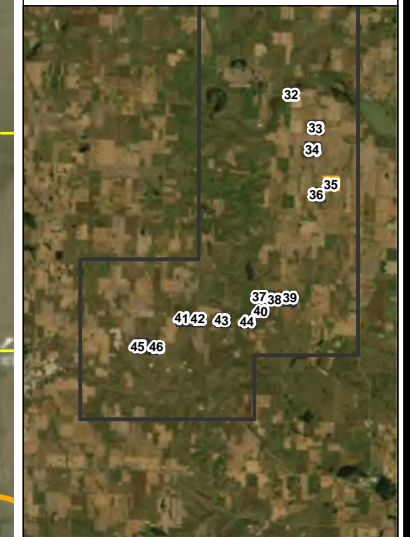
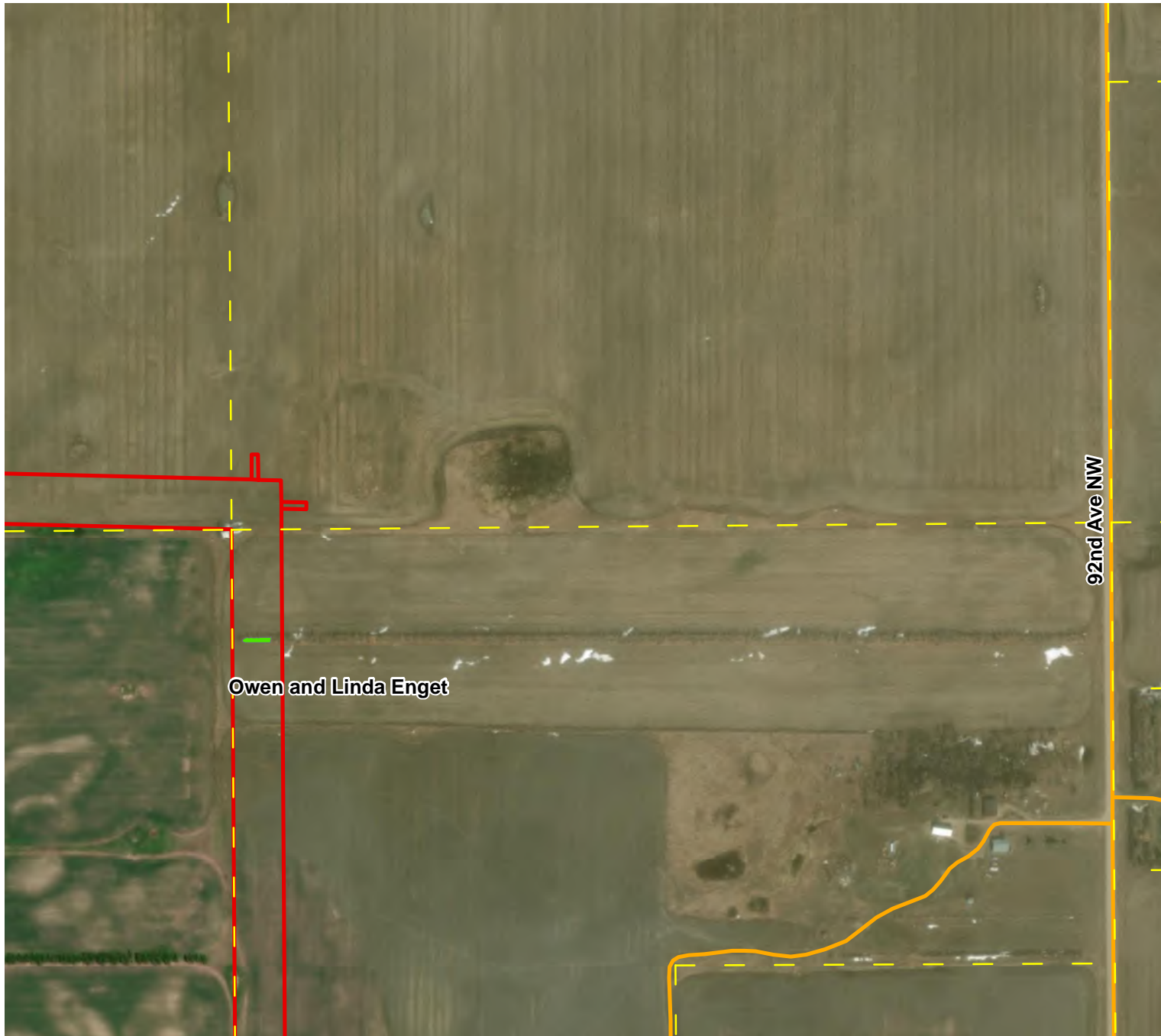
Sources: ECT, 2021.

ECT Environmental Consulting & Technology, Inc.

APPENDIX C - PAGE 35 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



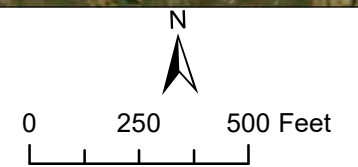
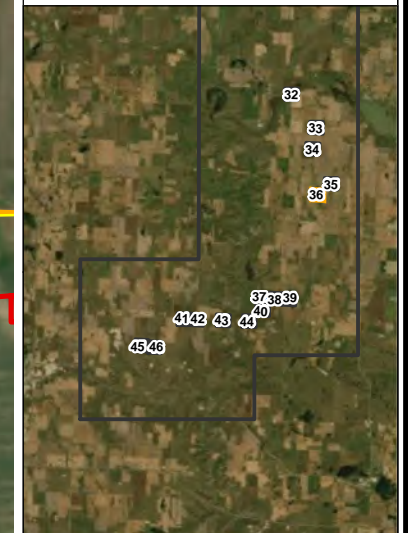
Sources: ECT, 2021.



APPENDIX C - PAGE 36 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



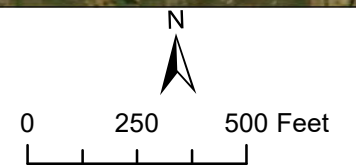
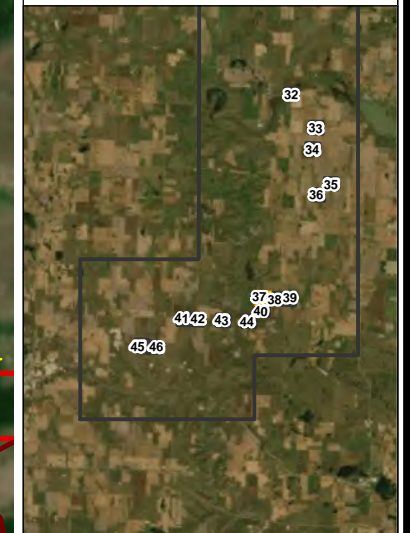
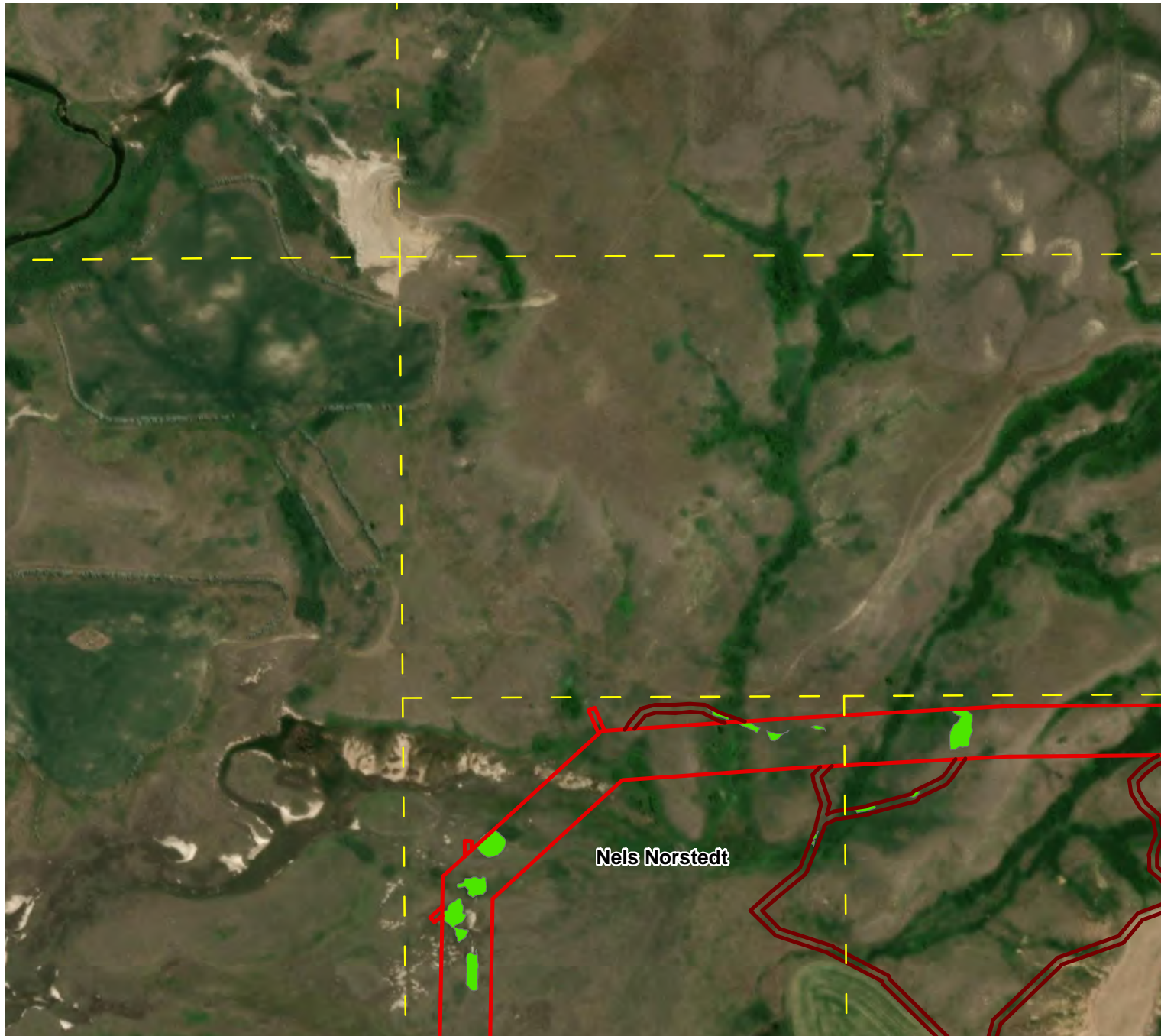
Sources: ECT, 2021.



APPENDIX C - PAGE 37 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- - - Property Boundary
- Construction Easement
- Tree or Shrub Removed






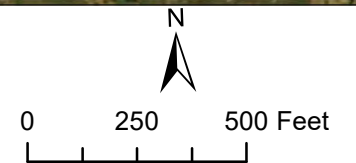
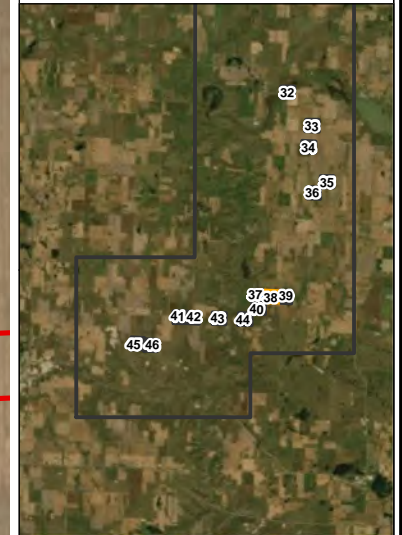
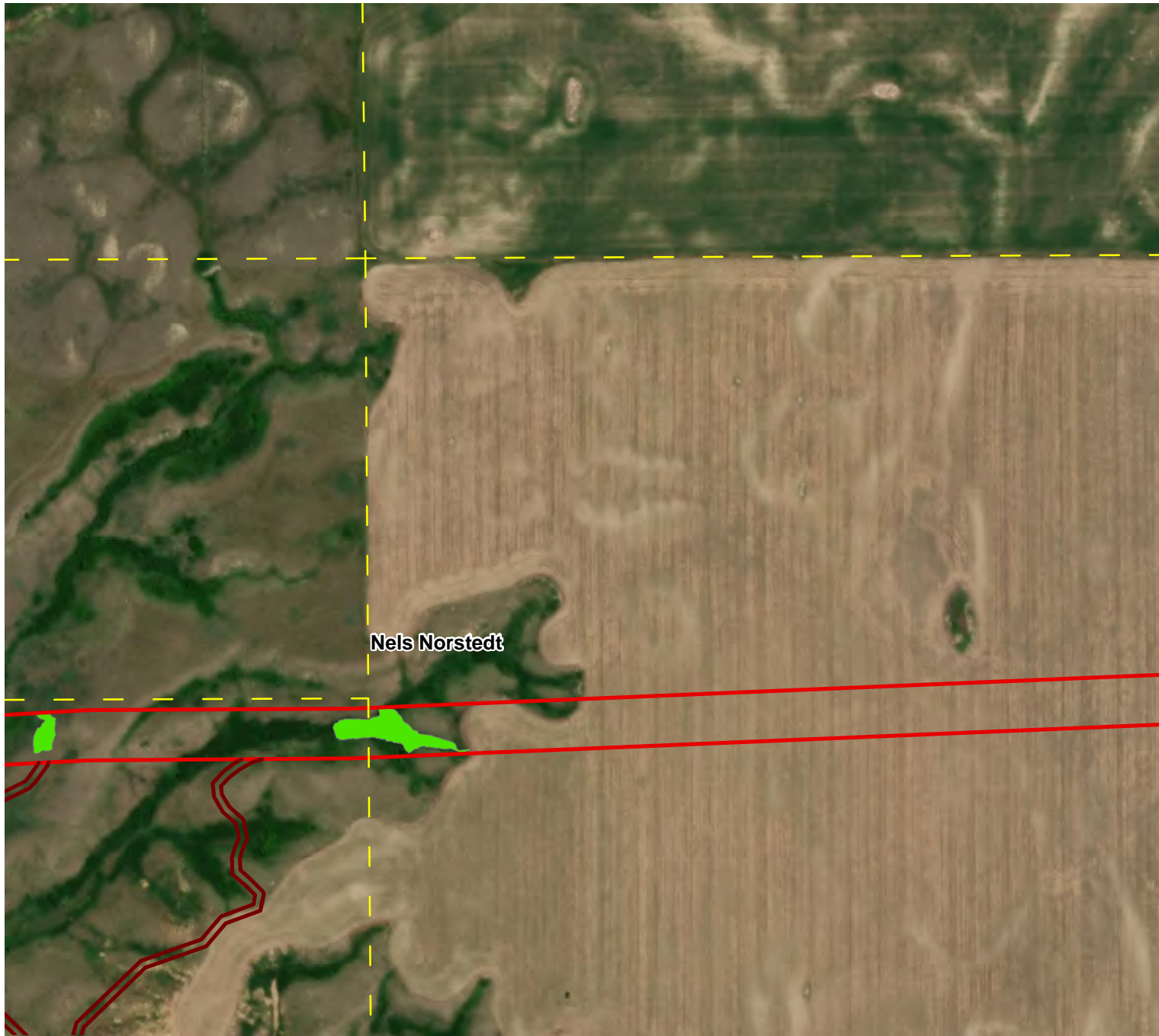
Sources: ECT, 2021.

ECT Environmental Consulting & Technology, Inc.

APPENDIX C - PAGE 38 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Construction Easement
-  Tree or Shrub Removed







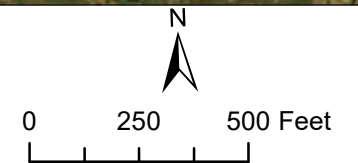
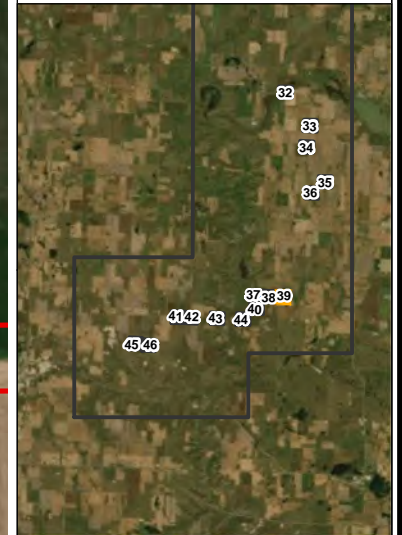
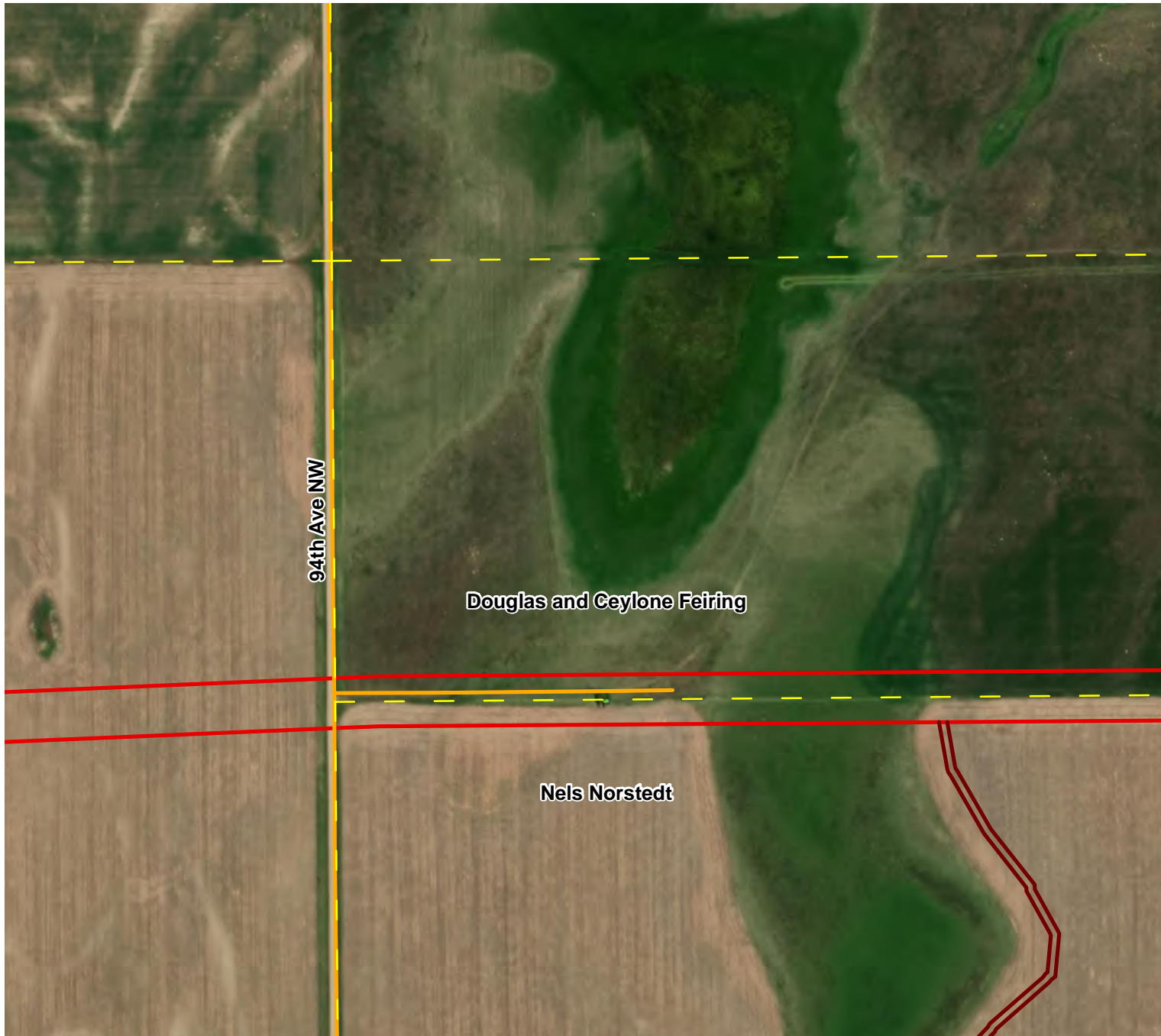
Sources: ECT, 2021.



APPENDIX C - PAGE 39 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



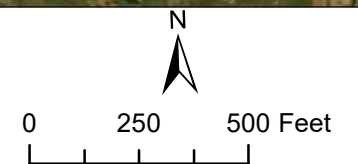
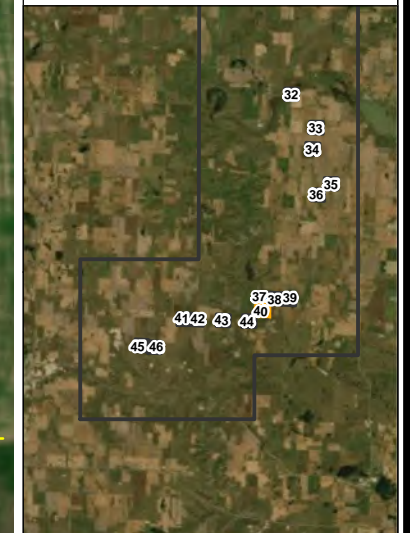
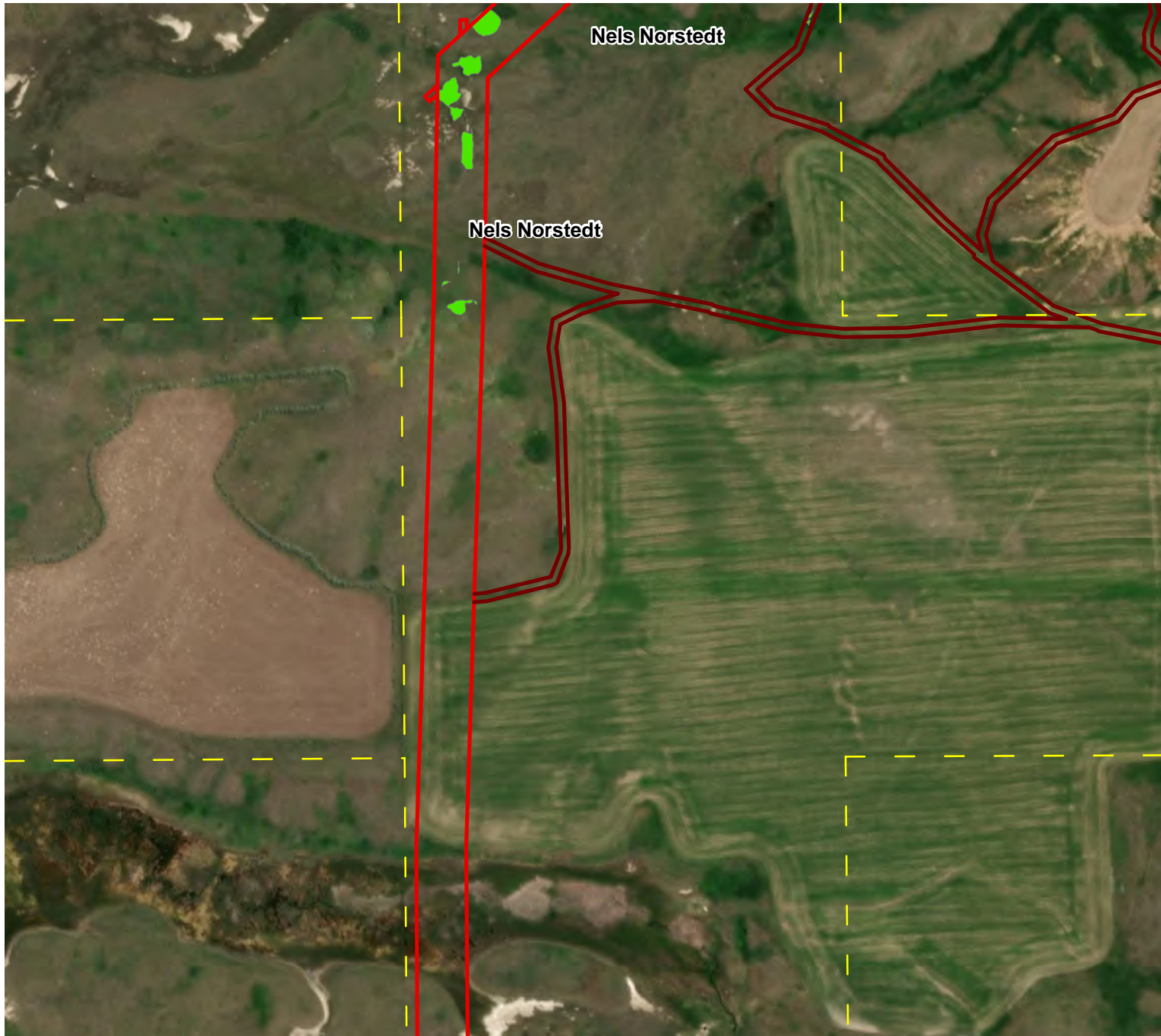
Sources: ECT, 2021.



APPENDIX C - PAGE 40 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- - - Property Boundary
- Construction Easement
- Tree or Shrub Removed



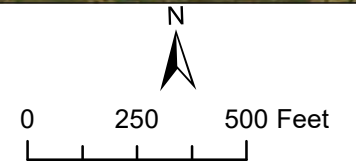
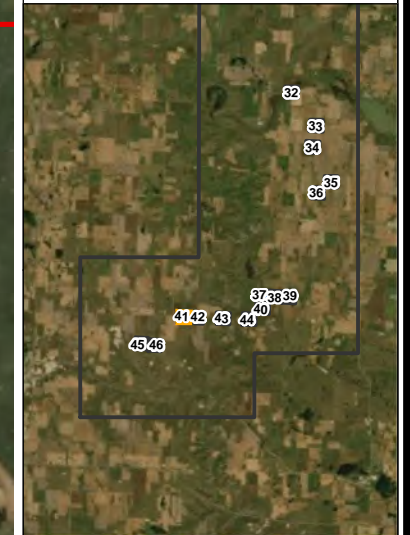
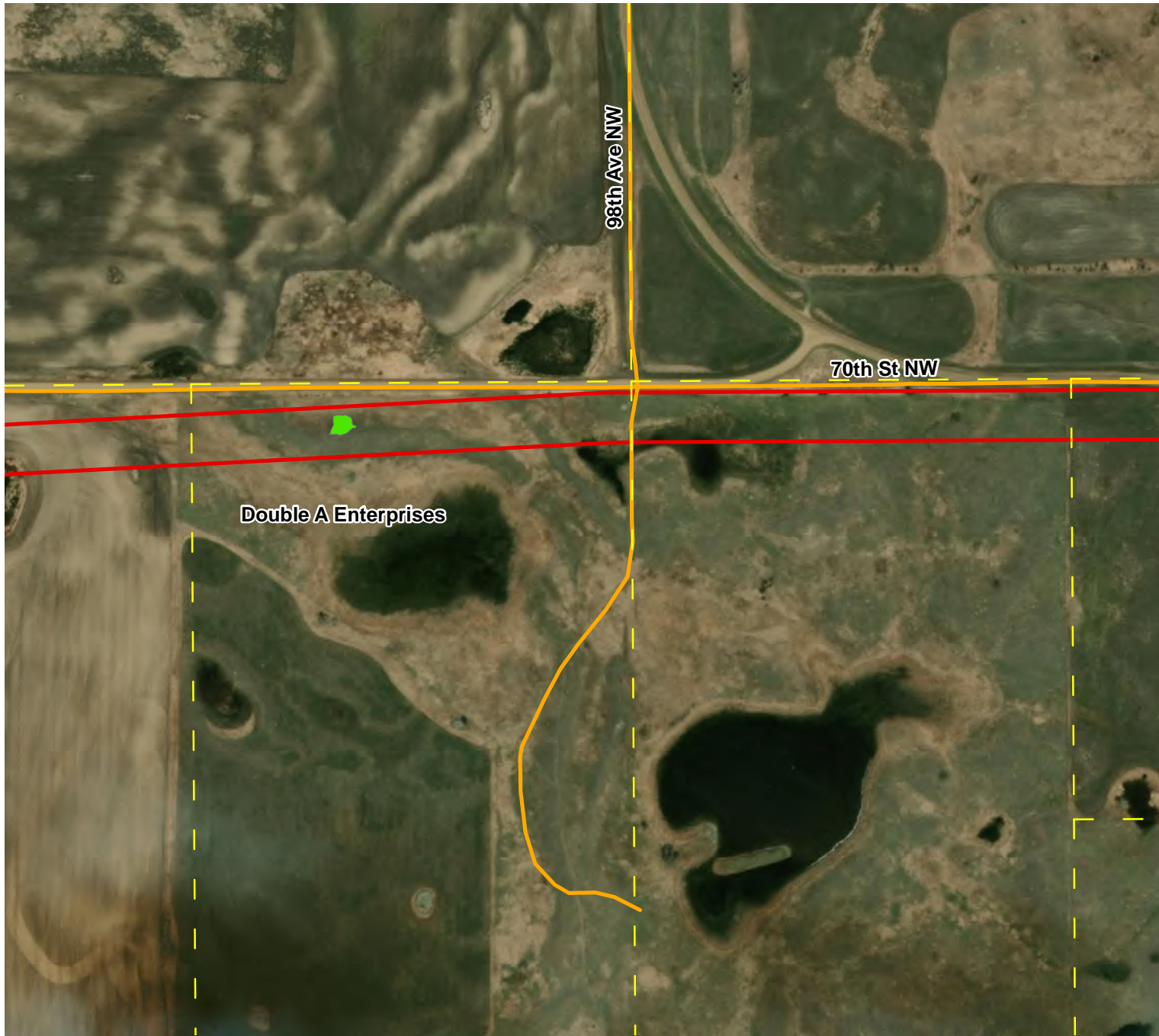
Sources: ECT, 2021.



APPENDIX C - PAGE 41 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed







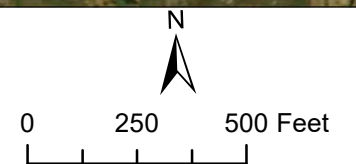
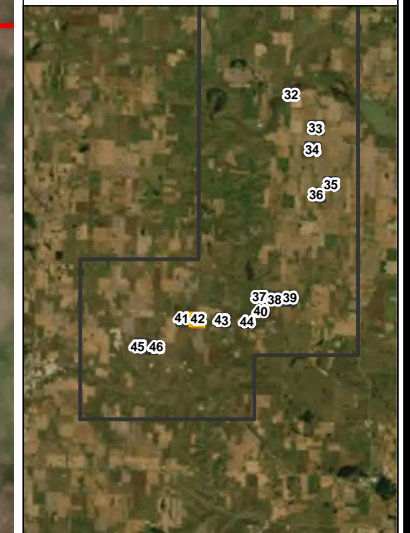
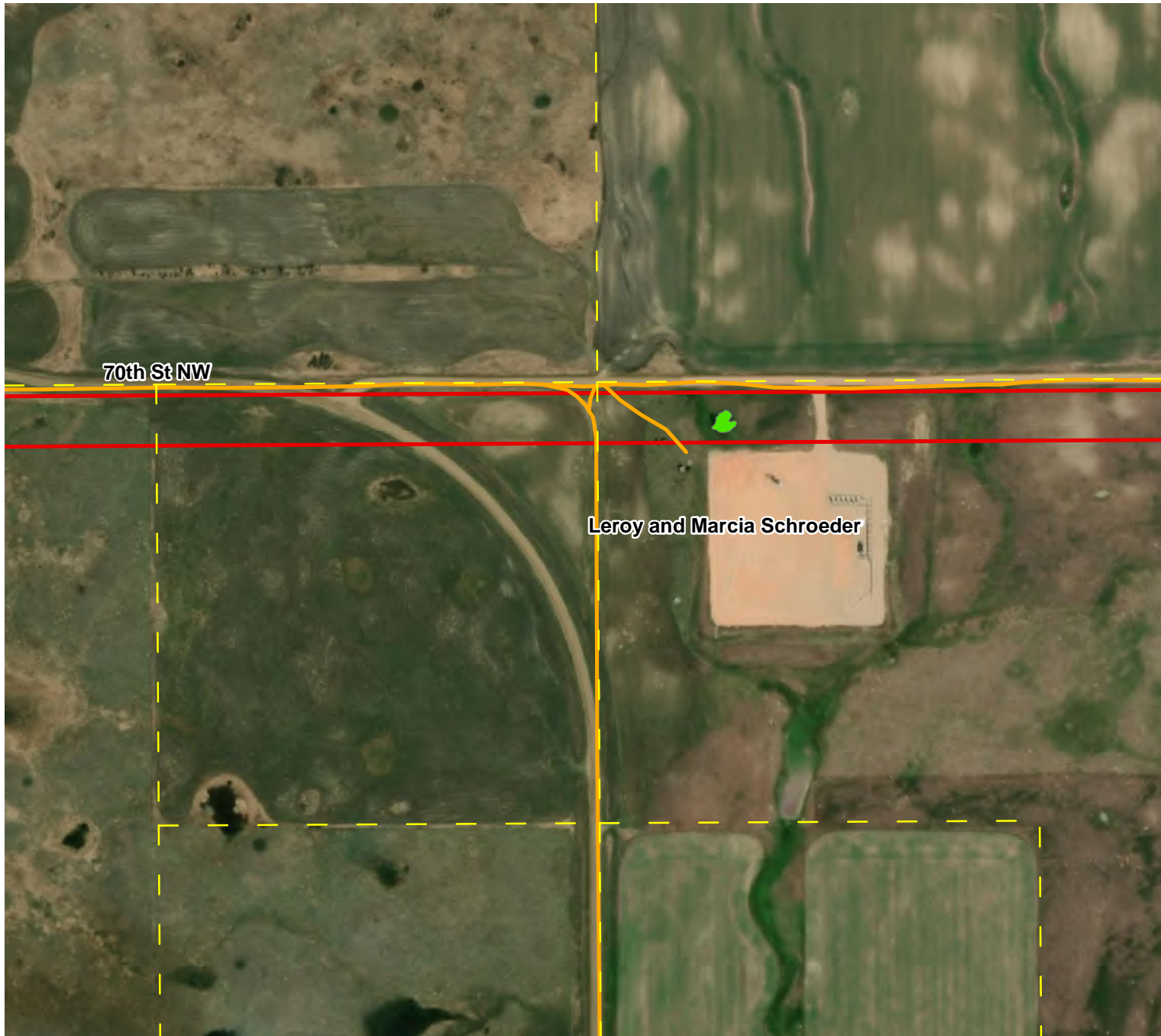
Sources: ECT, 2021.

ECT Environmental Consulting & Technology, Inc.

APPENDIX C - PAGE 42 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed







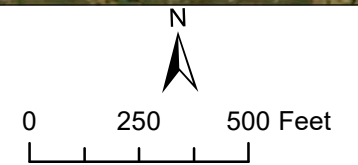
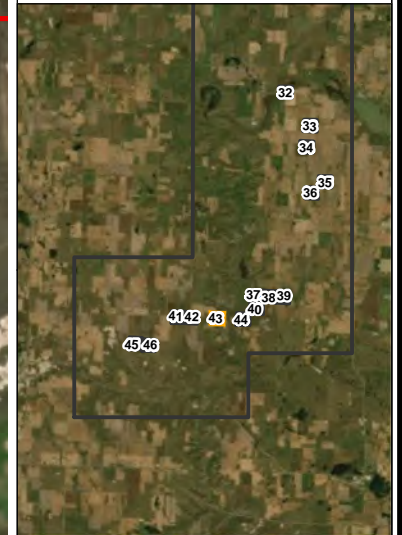
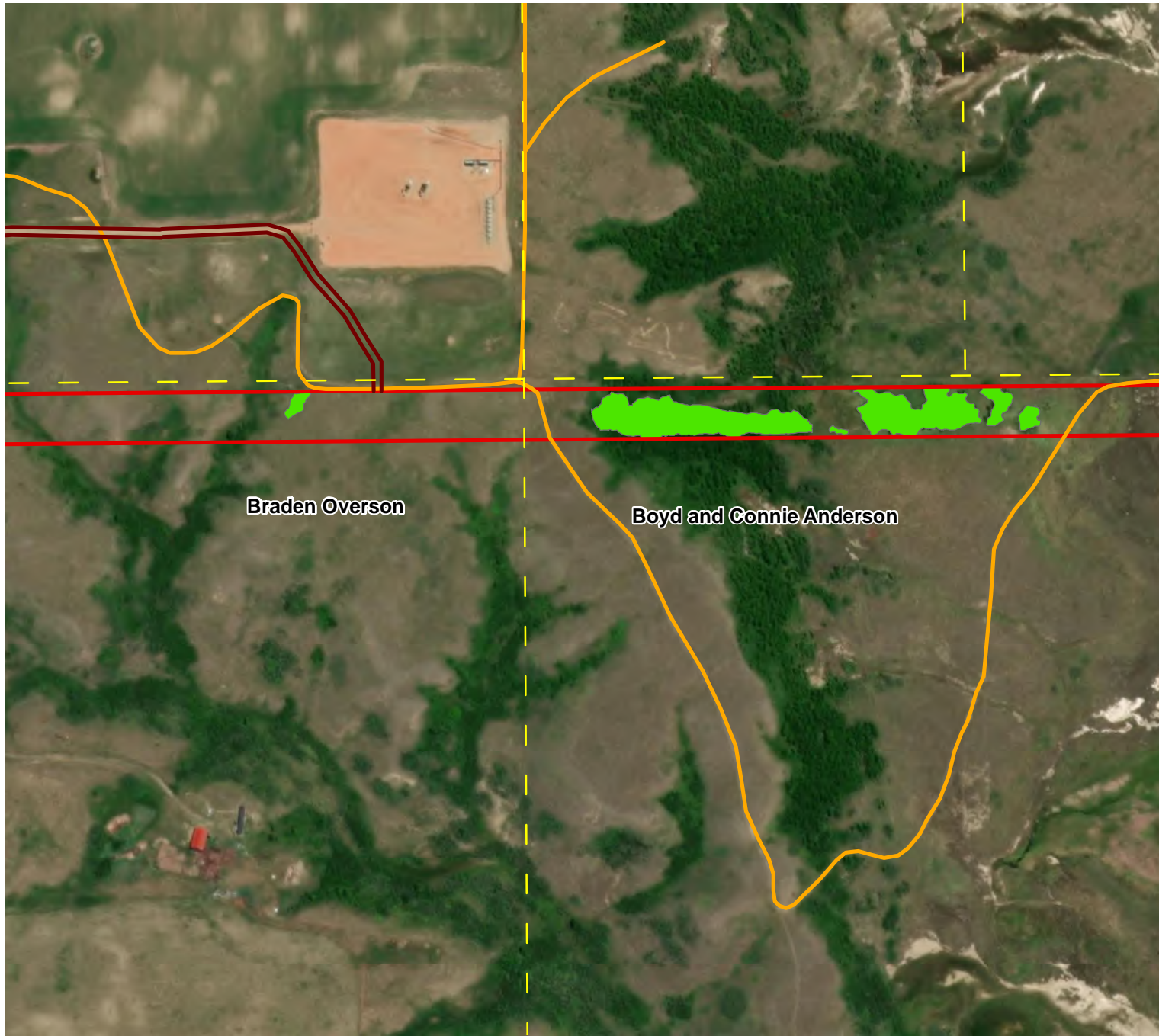
Sources: ECT, 2021.



APPENDIX C - PAGE 43 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

-  Property Boundary
-  Street
-  Construction Easement
-  Tree or Shrub Removed



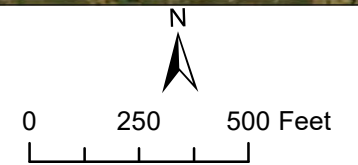
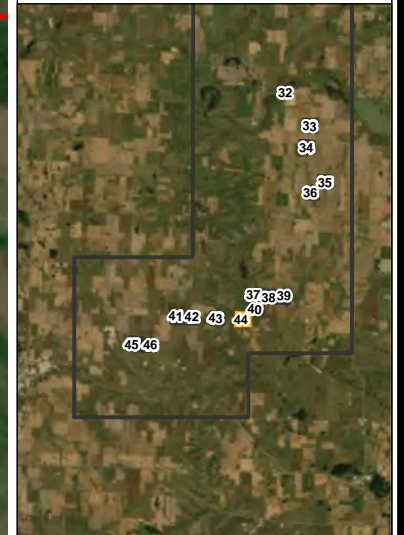
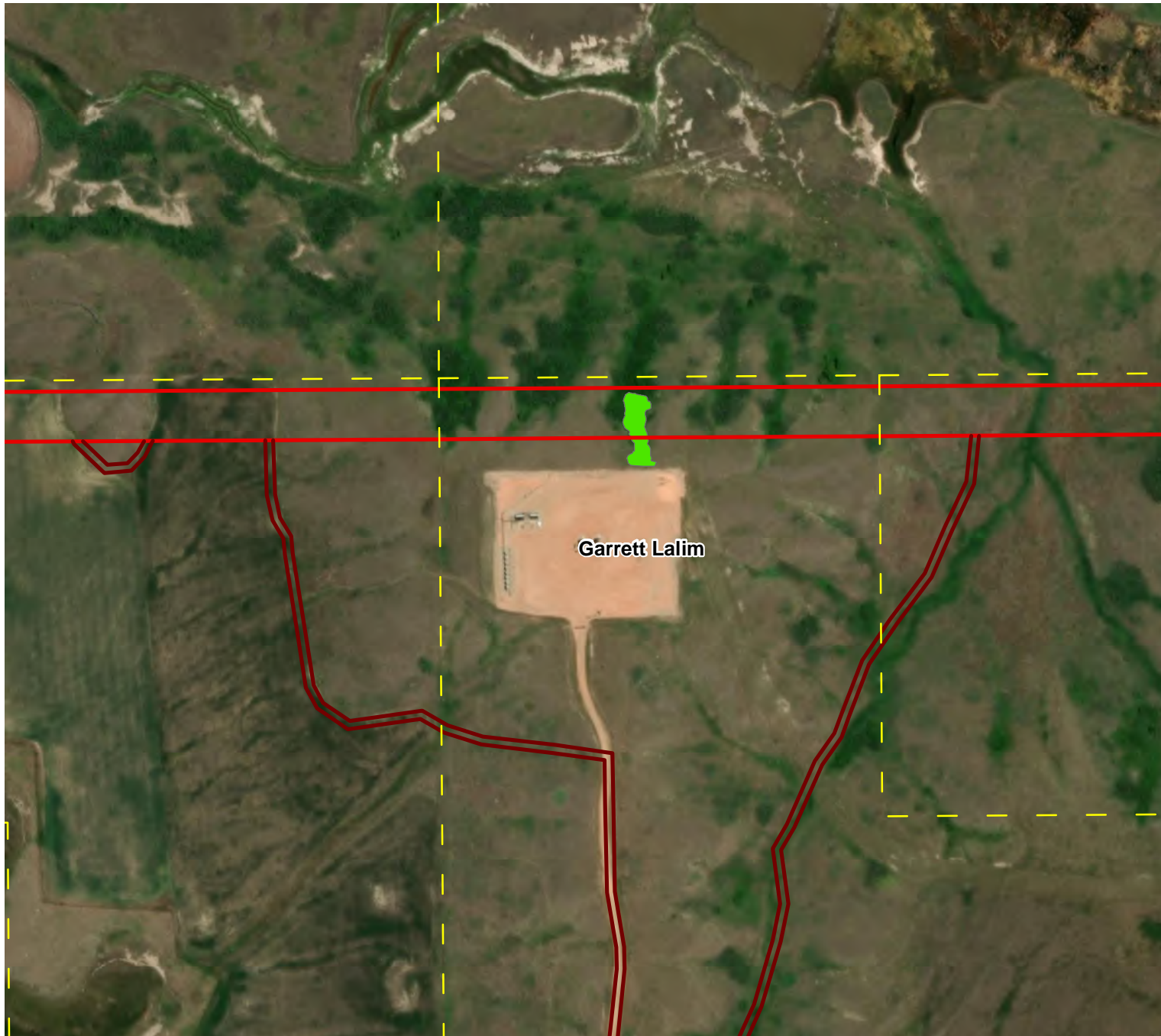
Sources: ECT, 2021.



APPENDIX C - PAGE 44 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Construction Easement
- Tree or Shrub Removed



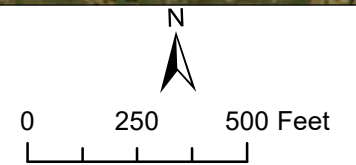
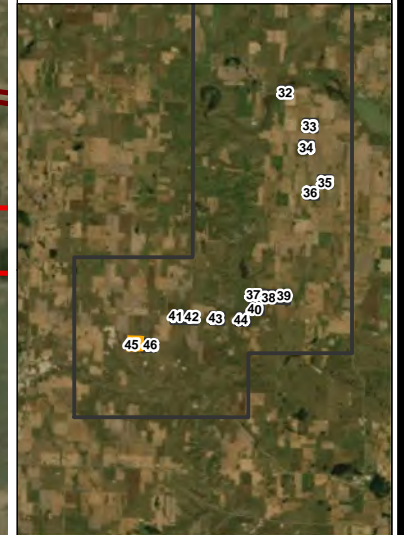
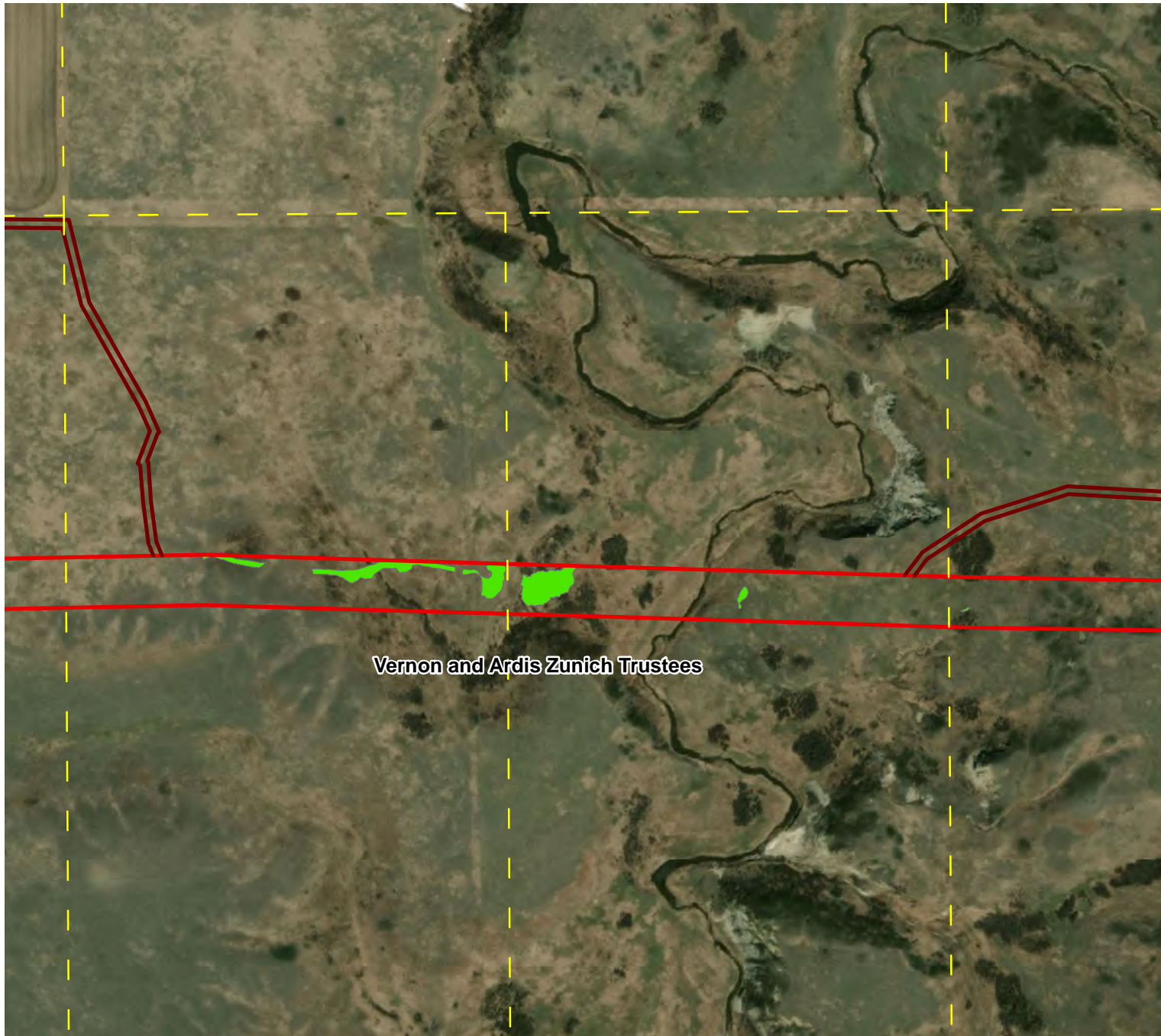
Sources: ECT, 2021.

ECT Environmental Consulting & Technology, Inc.

APPENDIX C - PAGE 45 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Construction Easement
- Tree or Shrub Removed



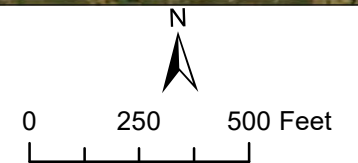
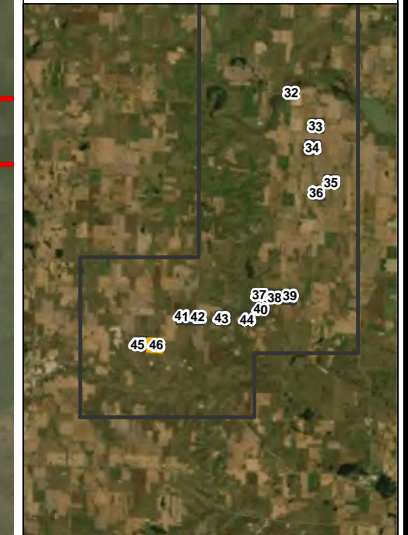
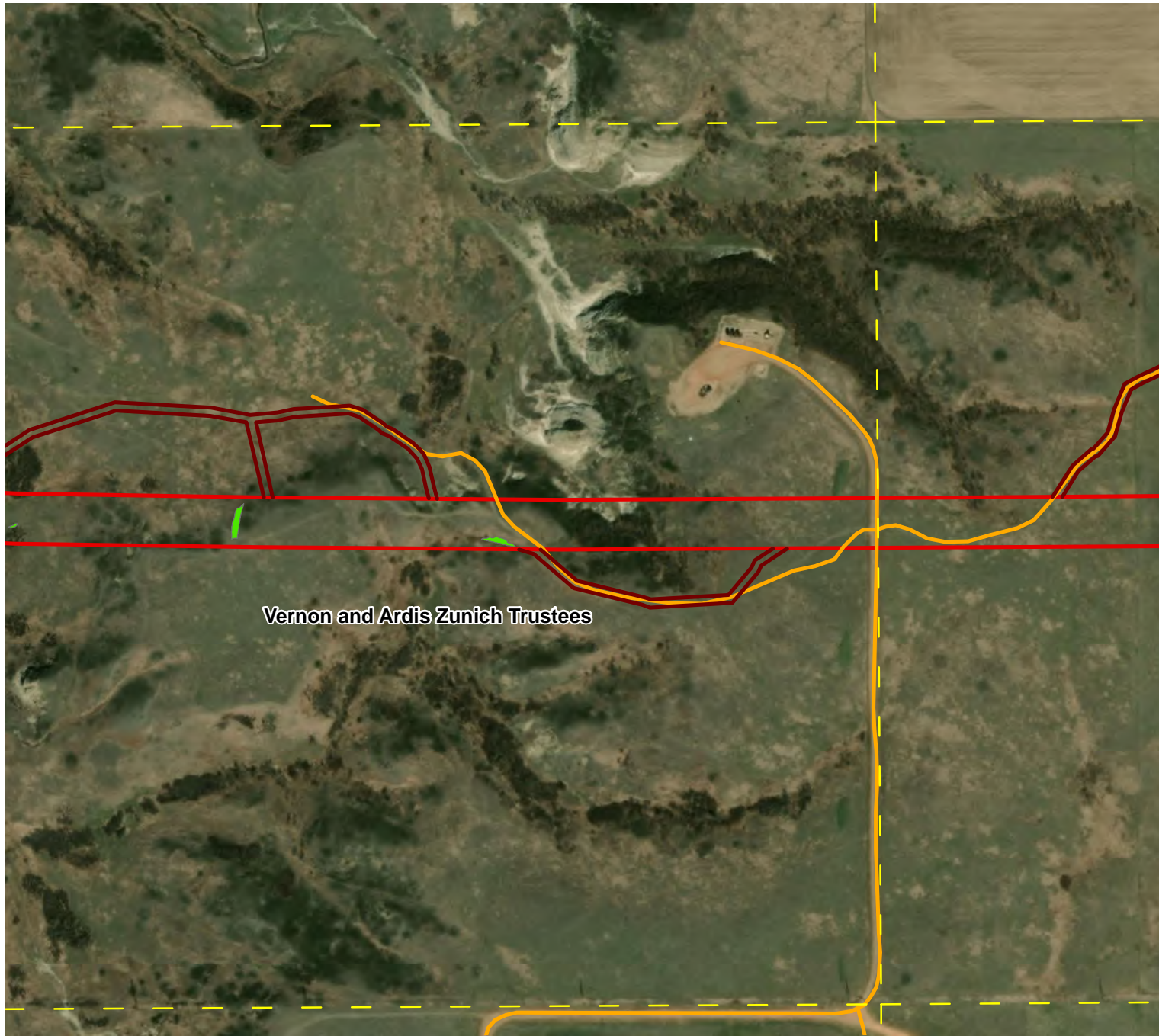
Sources: ECT, 2021.



APPENDIX C - PAGE 46 OF 46
Removed Trees and Shrubs Map
Tree and Shrub Mitigation Plan
NextEra Energy Resources, LLC

Legend:

- Property Boundary
- Street
- Construction Easement
- Tree or Shrub Removed



Sources: ECT, 2021.

ECT Environmental Consulting & Technology, Inc.

APPENDIX D: REMOVED TREE AND SHRUB INVENTORY

Latitude	Longitude	Count		Total removed	Common name	Scientific name	Project
		Pre	Post				
48.794158	-102.781731	10	0	10	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.794168	-102.782168	26	18	8	Sandbar willow	<i>Salix interior</i>	Wind Energy Center
48.794228	-102.782942	40	36	4	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.7942	-102.78427	68	0	68	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.797283	-102.77853	32	26	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.797152	-102.778594	12	10	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.795693	-102.77832	52	42	10	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.824752	-102.918023	4	0	4	Boxelder	<i>Acer negundo</i>	Wind Energy Center
48.824752	-102.918023	3	0	3	Caragana	<i>Caragana arborescens</i>	Wind Energy Center
48.825075	-102.918227	142	118	24	Caragana	<i>Caragana arborescens</i>	Wind Energy Center
48.825075	-102.918227	10	9	1	Hybrid poplar	<i>Populus hybrids</i>	Wind Energy Center
48.825075	-102.918227	4	2	2	Tatarian honeysuckle	<i>Lonicera tatarica</i>	Wind Energy Center
48.813374	-102.875816	38	8	30	Caragana	<i>Caragana arborescens</i>	Wind Energy Center
48.813374	-102.875816	13	0	13	Green ash	<i>Fraxinus pennsylvanica</i>	Wind Energy Center
48.810932	-102.871942	30	14	16	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.810932	-102.871942	16	6	10	American plum	<i>Prunus americana</i>	Wind Energy Center
48.810441	-102.871078	4	3	1	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.810441	-102.871078	4	3	1	Juneberry	<i>Amelanchier alnifolia</i>	Wind Energy Center
48.81077	-102.866002	68	64	4	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.798762	-102.830504	36	30	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.801298	-102.76096	1	0	1	Green ash	<i>Fraxinus pennsylvanica</i>	Wind Energy Center
48.803656	-102.770395	8	0	8	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.790623	-102.836336	23	3	20	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.790623	-102.836336	5	0	5	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.790404	-102.836338	26	0	26	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.790404	-102.836338	6	0	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.790138	-102.835942	188	138	50	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.790138	-102.835942	52	27	25	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.790138	-102.835942	22	12	10	Juneberry	<i>Amelanchier alnifolia</i>	Wind Energy Center
48.777098	-102.808158	74	4	70	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.777098	-102.808158	32	2	30	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.777098	-102.808158	22	2	20	Juneberry	<i>Amelanchier alnifolia</i>	Wind Energy Center

Latitude	Longitude	Count		Total removed	Common name	Scientific name	Project
		Pre	Post				
48.767346	-102.789977	208	0	208	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.767346	-102.789977	110	0	110	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.767346	-102.789977	38	0	38	Juneberry	<i>Amelanchier alnifolia</i>	Wind Energy Center
48.767938	-102.790267	22	0	22	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.767938	-102.790267	4	0	4	Juneberry	<i>Amelanchier alnifolia</i>	Wind Energy Center
48.768861	-102.79013	68	28	40	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.768861	-102.79013	62	22	40	Juneberry	<i>Amelanchier alnifolia</i>	Wind Energy Center
48.768861	-102.79013	18	6	12	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Wind Energy Center
48.770038	-102.790156	24	0	24	Chokecherry	<i>Prunus virginiana</i>	Wind Energy Center
48.412972	-102.838229	72	57	15	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.412920	-102.836289	208	38	170	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.412682	-102.831300	40	38	2	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.412585	-102.825441	20	15	5	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.412585	-102.825441	2	0	2	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.430179	-102.786531	14	0	14	Caragana	<i>Caragana arborescens</i>	Transmission line
48.430179	-102.786531	7	0	7	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.430179	-102.786531	6	0	6	Common lilac	<i>Syringa vulgaris</i>	Transmission line
48.430179	-102.786531	5	0	5	Boxelder	<i>Acer negundo</i>	Transmission line
48.430267	-102.764271	625	215	410	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.430267	-102.764271	550	40	510	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.430267	-102.764271	60	40	20	Red osier dogwood	<i>Cornus sericea</i>	Transmission line
48.430267	-102.764271	28	8	20	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.430267	-102.764271	18	6	12	Tatarian honeysuckle	<i>Lonicera tatarica</i>	Transmission line
48.430193	-102.760132	10	5	5	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.430193	-102.760132	2	0	2	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.430324	-102.760535	36	10	26	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.430324	-102.760535	20	5	15	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.430324	-102.760535	12	3	9	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.430324	-102.760535	4	0	4	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.430267	-102.761524	168	0	168	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.430267	-102.761524	154	14	140	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.430267	-102.761524	72	0	72	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line

Latitude	Longitude	Count		Total removed	Common name	Scientific name	Project
		Pre	Post				
48.430267	-102.761524	8	0	8	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.430267	-102.761524	6	0	6	Tatarian honeysuckle	<i>Lonicera tatarica</i>	Transmission line
48.430132	-102.762476	6	1	5	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.430132	-102.762476	2	0	2	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.430248	-102.742018	218	178	40	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.430248	-102.742018	182	147	35	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.430248	-102.742018	58	46	12	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.436070	-102.731967	32	26	6	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.439887	-102.733104	52	0	52	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.439887	-102.733104	10	0	10	Bebb's willow	<i>Salix bebbiana</i>	Transmission line
48.440285	-102.732811	68	36	32	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.441068	-102.730208	76	66	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.441043	-102.729743	34	26	8	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.441111	-102.723636	288	228	60	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.441111	-102.723636	190	154	36	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.441111	-102.723636	118	90	28	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.441111	-102.723636	78	62	16	Tatarian honeysuckle	<i>Lonicera tatarica</i>	Transmission line
48.441111	-102.723636	42	22	20	Silver buffaloberry	<i>Shepherdia argentea</i>	Transmission line
48.441111	-102.723636	34	32	2	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.440496	-102.728286	32	16	16	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.440252	-102.728887	52	42	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.441397	-102.708867	3	0	3	Cottonwood	<i>Populus deltoides</i>	Transmission line
48.509302	-102.679181	16	5	11	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.502234	-102.687681	10	3	7	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.530933	-102.691084	15	4	11	Black Hills spruce	<i>Picea glauca var. densata</i>	Transmission line
48.529167	-102.691176	11	2	9	Black Hills spruce	<i>Picea glauca var. densata</i>	Transmission line
48.540987	-102.689837	5	2	3	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.540991	-102.689492	10	1	9	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.542968	-102.689846	4	0	4	Siberian elm	<i>Ulmus pumila</i>	Transmission line
48.542964	-102.689561	4	0	4	Siberian elm	<i>Ulmus pumila</i>	Transmission line
48.544466	-102.689661	15	1	14	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.544466	-102.689661	3	0	3	Chokecherry	<i>Prunus virginiana</i>	Transmission line

Latitude	Longitude	Count		Total removed	Common name	Scientific name	Project
		Pre	Post				
48.619013	-102.699152	2	0	2	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.619068	-102.698896	5	0	5	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.619165	-102.698817	1	0	1	Tatarian honeysuckle	<i>Lonicera tatarica</i>	Transmission line
48.619124	-102.698706	2	0	2	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.619230	-102.698373	28	16	12	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.619627	-102.696112	46	0	46	American plum	<i>Prunus americana</i>	Transmission line
48.630272	-102.678292	2	0	2	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.629787	-102.677834	3	2	1	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.629673	-102.677800	13	7	6	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.629430	-102.677775	1	0	1	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.629302	-102.677857	4	2	2	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.629174	-102.677915	8	2	6	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.642417	-102.674932	76	6	70	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.642417	-102.674932	26	11	15	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.670469	-102.683253	18	15	3	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.670469	-102.683253	12	9	3	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.671763	-102.682380	32	4	28	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.671763	-102.682380	10	2	8	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.676169	-102.689266	102	77	25	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.685398	-102.689815	88	8	80	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.685398	-102.689815	8	0	8	Boxelder	<i>Acer negundo</i>	Transmission line
48.689837	-102.689952	520	500	20	American plum	<i>Prunus americana</i>	Transmission line
48.689837	-102.689952	485	435	50	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.689837	-102.689952	10	8	2	Bebb's willow	<i>Salix bebbiana</i>	Transmission line
48.693320	-102.689565	118	30	88	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.693320	-102.689565	20	14	6	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.693733	-102.691125	76	16	60	Quaking aspen	<i>Crataegus arnoldiana</i>	Transmission line
48.699273	-102.701030	92	74	18	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.699273	-102.701030	42	30	12	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.699273	-102.701030	18	10	8	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.700483	-102.699783	28	24	4	American plum	<i>Prunus americana</i>	Transmission line
48.700483	-102.699783	10	6	4	Tatarian honeysuckle	<i>Lonicera tatarica</i>	Transmission line

Latitude	Longitude	Count		Total removed	Common name	Scientific name	Project
		Pre	Post				
48.699838	-102.699761	18	12	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.699838	-102.699761	16	12	4	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.702183	-102.701172	156	111	45	American plum	<i>Prunus americana</i>	Transmission line
48.702183	-102.701172	62	40	22	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.702183	-102.701172	60	15	45	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.704499	-102.701137	225	180	45	American plum	<i>Prunus americana</i>	Transmission line
48.704499	-102.701137	36	24	12	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.704499	-102.701137	18	16	2	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.706330	-102.701085	54	46	8	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.715625	-102.700828	315	275	40	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.715625	-102.700828	58	48	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.715625	-102.700828	46	38	8	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.713886	-102.701291	82	68	14	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.735665	-102.698947	1	0	1	American elm	<i>Ulmus Americana</i>	Transmission line
48.737004	-102.698830	14	4	10	Bebb's willow	<i>Salix bebbiana</i>	Transmission line
48.738844	-102.703362	38	32	6	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.739068	-102.706044	512	334	178	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.739068	-102.706044	208	142	66	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.739068	-102.706044	32	17	15	American plum	<i>Prunus americana</i>	Transmission line
48.739068	-102.706044	6	0	6	Boxelder	<i>Acer negundo</i>	Transmission line
48.758014	-102.732378	878	766	112	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.758014	-102.732378	318	272	46	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.758014	-102.732378	124	92	32	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.761407	-102.732632	310	290	20	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.761407	-102.732632	76	68	8	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.761407	-102.732632	52	42	10	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.768856	-102.755534	26	6	20	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.766586	-102.732846	78	62	16	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.767977	-102.732885	9	7	2	Bebb's willow	<i>Salix bebbiana</i>	Transmission line
48.768242	-102.732843	28	27	1	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.768782	-102.736058	47	37	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.768782	-102.736058	16	12	4	Sandbar willow	<i>Salix interior</i>	Transmission line

Latitude	Longitude	Count		Total removed	Common name	Scientific name	Project
		Pre	Post				
48.768782	-102.736058	9	7	2	Bebb's willow	<i>Salix bebbiana</i>	Transmission line
48.768979	-102.743373	32	28	4	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.768844	-102.746312	208	23	185	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.768844	-102.746312	70	15	55	Quaking aspen	<i>Populus tremuloides</i>	Transmission line
48.768844	-102.746312	36	8	28	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.768844	-102.746312	1	0	1	Green ash	<i>Fraxinus pennsylvanica</i>	Transmission line
48.768839	-102.748878	66	60	6	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.768839	-102.748878	22	20	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.769030	-102.749547	20	18	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.768810	-102.749807	164	99	65	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.768810	-102.749807	156	96	60	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.769436	-102.750112	12	10	2	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.769714	-102.750559	32	26	6	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.769714	-102.750559	5	1	4	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.770478	-102.752390	17	10	7	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.770246	-102.752996	58	48	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.770246	-102.752996	28	20	8	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.770246	-102.752996	18	10	8	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.769976	-102.753361	20	10	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.769299	-102.753703	84	74	10	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.769299	-102.753703	18	16	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>	Transmission line
48.768797	-102.753925	28	0	28	Chokecherry	<i>Prunus virginiana</i>	Transmission line
48.768797	-102.753925	14	0	14	Juneberry	<i>Amelanchier alnifolia</i>	Transmission line
48.561904	-102.713693	68	60	8	American plum	<i>Prunus americana</i>	Transmission line
TOTAL		12451	7379	5072			

APPENDIX E: WAIVERS

WAIVER AND REFUSAL

Upon execution of this form I/We, Thomas + Jude Burau hereby exercise my/our right to **waive and refuse** my/our option to have the trees and shrubs on my/our property (described below) and on my/our right-of-way replaced pursuant to *North Dakota Public Service Commission Order, Case No. PU-19-376/377*. Instead, I opt to have the replacement trees and shrubs planted off my/our property and right of way. The referenced North Dakota Public Service Commission Order is attached to this Waiver and Refusal.

I/We fully understand the terms set forth in this form, and I/we hereby waive and refuse the replacement of the trees and shrubs as described in the preceding paragraph freely and voluntarily, without any inducement, assurance, or guarantee being made to me to the fullest extent allowed by law.

Property Owner(s) Legal Names Thomas F. Burau, Jude A. Burau

Address of Property in Question SE/4 33-162-94
Columbus, North Dakota 58727

WAIVER AND REFUSAL

Upon execution of this form I/We, Myrna Wilty - Julie Severson POA, hereby exercise my/our right to **waive and refuse** my/our option to have the trees and shrubs on my/our property (described below) and on my/our right-of-way replaced pursuant to *North Dakota Public Service Commission Order, Case No. PU-19-376/377*. Instead, I opt to have the replacement trees and shrubs planted off my/our property and right of way. The referenced North Dakota Public Service Commission Order is attached to this Waiver and Refusal.

I/We fully understand the terms set forth in this form, and I/we hereby waive and refuse the replacement of the trees and shrubs as described in the preceding paragraph freely and voluntarily, without any inducement, assurance, or guarantee being made to me to the fullest extent allowed by law.

Property Owner(s) Legal Names Myrna Wilty - Julie Severson attorney in fact
Spilman.

Address of Property in Question _____

WAIVER AND REFUSAL

Upon execution of this form I/We, Vernon O Zunich, on behalf of V & A Zunich Trust hereby exercise my/our right to **waive and refuse** my/our option to have the trees and shrubs on my/our property (described below) and on my/our right-of-way replaced pursuant to *North Dakota Public Service Commission Order, Case No. PU-19-376/377*. Instead, I opt to have the replacement trees and shrubs planted off my/our property and right of way. The referenced North Dakota Public Service Commission Order is attached to this Waiver and Refusal.

I/We fully understand the terms set forth in this form, and I/we hereby waive and refuse the replacement of the trees and shrubs as described in the preceding paragraph freely and voluntarily, without any inducement, assurance, or guarantee being made to me to the fullest extent allowed by law.

Property Owner(s) Legal Names Vernon & Ardis Zunich Trust
Vernon O Zunich & Ardis H. Zunich
Address of Property in Question Rural Tioga, ND (deceased)

New ^{mailing} address is:

717 S. Strevell Ave.
Miles City, MT 59301

Kimberly Blunt, POA, daughter
(406) 951-2435

APPENDIX F: PLANTING PLANS

ND - NRCS

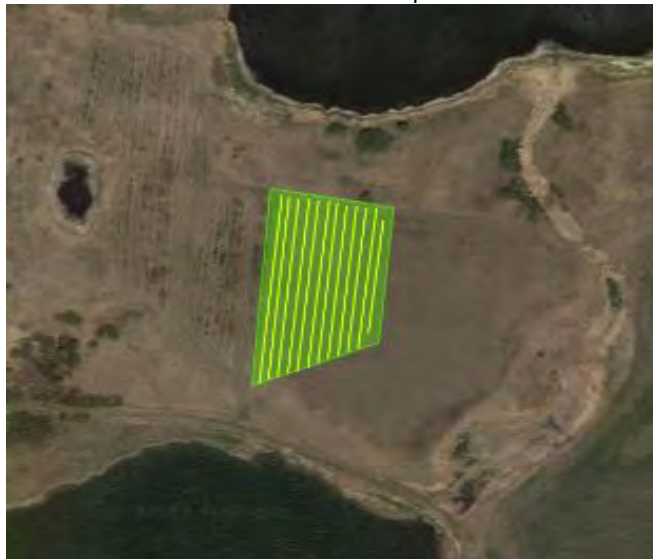
WESTERN ND - TREE AND SHRUB PLANTING WORKSHEET

ND-CPA-4, Rev. 03-2017

Name Douglas Ness Address 1905 2nd Avenue E, Williston, ND 58801 Phone # 612-501-6878 Date: 3/12/2021



Plan Sketch Map



Quarter Section 5 Twnshp 161N Range 93W
 Planned Soil Mapunit / name component(s) Williams-Zahl loams, 3 to 6 percent slopes Planned by: Reed Scott Date: 3/12/2021
 Approved by: Date:
 Conservation Tree & Shrub Group 3 Select MLRA 53B
 Type of Planting New
 Landuse Field Program None
 Site Preparation Tilled/Herbicide Protected from livestock? Yes
 Spacing between rows: 10 feet Site conditions at planting time:
 Distance from Windward row to roads or bldgs.: ~165 feet
 (Minimum 200' on N & W, and 100' on S & E) Planted by:

Remarks on site prep, conditions and management (Weed Cor Date:)
 Planting area #1, row #9 total length: 240 ft; average spacing between each plant in the third row: 6 ft
 Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by: <u> </u>		Date: <u> </u>		Certified By: <u> </u>		Date: <u> </u>								
Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability
1	300		15	0.10	1	Lilac, Common			6		50		suitable	
	293				2	Lilac, Common			6.11		48		suitable	
	284				3	Buffaloberry			6.05		47		suitable	
	278				4	Buffaloberry			6.05		46		suitable	
	275				5	Buffaloberry			6.12		45		suitable	
	267				6	Buffaloberry			6.07		44		suitable	
	256				7	Buffaloberry			6.1		42		suitable	
	245				8	Buffaloberry			6.13		40		suitable	
	120				9	Buffaloberry			3.34		36		suitable	
	120				9	Lilac, Common			30		4		suitable	
	230				10	Lilac, Common			6.06		38		suitable	
	225				11	Lilac, Common			6.09		37		suitable	
	180				12	Lilac, Common			7.83		23		suitable	

3073 15 0.10 **Totals** 500 WEST-TREEPLAN

ND - NRCS

WESTERN ND - TREE AND SHRUB PLANTING WORKSHEET

ND-CPA-4, Rev. 03-2017

Name Douglas Ness Address 1905 2nd Avenue E, Williston, ND 58801 Phone # 612-501-6878 Date: 3/12/2021



Plan Sketch Map



Quarter Section 8 Twnshp 161N Range 93W

Planned Soil Mapunit / name component(s) Planned by: Reed Scott Date: 3/12/2021

Williams-Zahl-Parnell complex, 0 to 9 percent slo Approved by: Date:

Conservation Tree & Shrub Group 8K Select MLRA 53B

Type of Planting New

Landuse Field Program None

Site Preparation Tilled/Herbicide

Protected from livestock? Yes

Site conditions at planting time:

Spacing between rows: 10 feet

Distance from Windward row to roads or bldgs.: ~1120 feet

(Minimum 200' on N & W, and 100' on S & E)

Planted by:

Remarks on site prep, conditions and management (Weed Cor Date:)

Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by: Date: Certified By: Date:

Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability
2	208		15	0.07	1	Buffaloberry			6.12		34		suitable	
	205				2	Buffaloberry			6.03		34		suitable	
	205				3	Buffaloberry			6.03		34		suitable	
	208				4	Buffaloberry			6.12		34		suitable	
	209				5	Buffaloberry			6.15		34		suitable	
	207				6	Buffaloberry			6.09		34		suitable	
	205				7	Buffaloberry			6.03		34		suitable	
	205				8	Buffaloberry			6.03		34		suitable	
	205				9	Buffaloberry			6.03		34		suitable	
	206				10	Buffaloberry			6.25		33		suitable	
	204				11	Buffaloberry			6.19		33		suitable	
	204				12	Buffaloberry			6.19		33		suitable	
	205				13	Buffaloberry			6.22		33		suitable	
	206				14	Buffaloberry			6.25		33		suitable	
	208				15	Buffaloberry			6.31		33		suitable	

3090		15	0.07	Totals							504			
------	--	----	------	---------------	--	--	--	--	--	--	-----	--	--	--

Name Douglas Ness Address 1905 2nd Avenue E, Williston, ND 58801 Phone # 612-501-6878 Date: 3/12/2021

Quarter Section 8 Twnshp 161N Range 93W
 Planned Soil Mapunit / name component(s) Planned by: Reed Scott Date: 3/12/2021
hl-Williams-Zahill complex, 6 to 9 percent slop Approved by: Date:
 Conservation Tree & Shrub Group 8K Select MLRA 53B
 Type of Planting New
 Landuse Field Program None
 Site Preparation Fallow Protected from livestock? Yes
 Site conditions at planting time:



Spacing between rows: 10 feet
 Distance from Windward row to roads or bldgs.: ~3350 feet
 (Minimum 200' on N & W, and 100' on S & E)
 Planted by: Date:

Remarks on site prep, conditions and management (Weed Cor Date:
 Planting area #5, row #4 total length: 600 ft; average spacing between each plant in the third row: 6 ft
 Planting area #5, row #5 total length: 600 ft; average spacing between each plant in the third row: 6 ft
 Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by: <u> </u>		Date: <u> </u>		Certified By: <u> </u>		Date: <u> </u>									
Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability	
5	601		15	0.21	1	Currant, Golden			6.01		100		suitable		
	600				2	Currant, Golden			6		100		suitable		
	600				3	Buffaloberry			6		100		suitable		
	300				4	Lilac, Common			4.84		62		suitable		
	300				4	Buffaloberry			7.9		38		suitable		
	300				5	Currant, Golden			3.71		81		suitable		
	300				5	Buffaloberry			15.79		19		suitable		
	600				6	Lilac, Common			6		100		suitable		
						Totals						600			

Name James Elsbernd Address 10320 117TH AVE NW, CROSBY, ND 58730 Phone # 701-965-6190 Date: 3/17/21



Quarter Section 22 Twnshp 161N Range 93W
 Planned Soil Mapunit / name component(s) Planned by: Reed Scott Date: 3/17/21
ahli-Max-Parnell complex, 0 to 35 percent slope Approved by: Date:
 Conservation Tree & Shrub Group 10 Select MLRA 53B
 Type of Planting New
 Landuse Field Program None
 Site Preparation Fallow Protected from livestock? Yes
 Spacing between rows: 10 feet Site conditions at planting time:
 Distance from Windward row to roads or bldgs.: ~140 feet
 (Minimum 200' on N & W, and 100' on S & E) Planted by:
 Remarks on site prep, conditions and management (Weed Cor Date:

Planting area #2, row #6 total length: 280 ft; average spacing between each plant in the third row: 12.17 ft
 Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by: Date: Certified By: Date:

Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability
2	310		15	0.11	1	Willow, Sandbar			6.08		51		NR	
	310				2	Dogwood			6.08		51		NR	
	311				3	Buffaloberry			6.1		51		NR	
	310				4	Cherry, Nanking			6.08		51		NR	
	310				5	Juneberry			6.08		51		NR	
	93.33				6	Cherry, Black			11.67		8		NR	
	93.33				6	Spruce, Blue			13.34		7		NR	
	93.33				6	Willow, Peachleaf			13.34		7		NR	
		22												

1831	22	15	0.11	Totals					277						
------	----	----	------	---------------	--	--	--	--	-----	--	--	--	--	--	--

Name Embarc Farm Address 2727 SHANNON FOREST CT, KATY, TX 77494 Phone # 303-579-2267 Date: 3/17/21



Plan Sketch Map



Quarter Section 27 Twnshp 159N Range 93W
 Planned Soil Mapunit / name component(s) Williams-Zahl loams, 3 to 6 percent slopes Planned by: Reed Scott Date: 3/17/21
 Approved by: Date:
 Conservation Tree & Shrub Group 3 Select MLRA 53B
 Type of Planting New
 Landuse Field Program None
 Site Preparation Fallow Protected from livestock? Yes
 Spacing between rows: 10 feet Site conditions at planting time:
 Distance from Windward row to roads or bldgs.: ~1400 feet
 (Minimum 200' on N & W, and 100' on S & E) Planted by:

Remarks on site prep, conditions and management (Weed Cor Date:
 Planting area #1, row #3 total length: 1000 ft; average spacing between each plant in the third row: 15.16 ft
 Planting area #1, row #4 total length: 500 ft; average spacing between each plant in the third row: 5.38 ft
 Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by: <u> </u>		Date: <u> </u>		Certified By: <u> </u>		Date: <u> </u>								
Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability
1	1100		15	0.38	1	Lilac, Common			6.67		165		suitable	
	1050				2	Spruce, Blue			12.5		84		suitable	
	500				3	Poplar, hybrid species			15.16		33		NR	
	500				3	Cottonwood			15.16		33		NR	
	100				4	Crabapple, species			3.04		33		suitable	
	100				4	Juneberry			6.67		15		suitable	
	100				4	Chokecherry, commo			6.67		15		suitable	
	100				4	Buffaloberry			6.67		15		suitable	
	100				4	Cherry, Nanking			6.67		15		suitable	
	500				5	Maple, Amur			6.67		75		suitable	
	1400				6	Maple, Amur			6.58		213		suitable	
	1400				7	Spruce, Blue			12.62		111		suitable	
	1400				8	Lilac, Common			6.64		211		suitable	

8350 15 0.38 **Totals** 1018 WEST-TREEPLAN

ND - NRCS

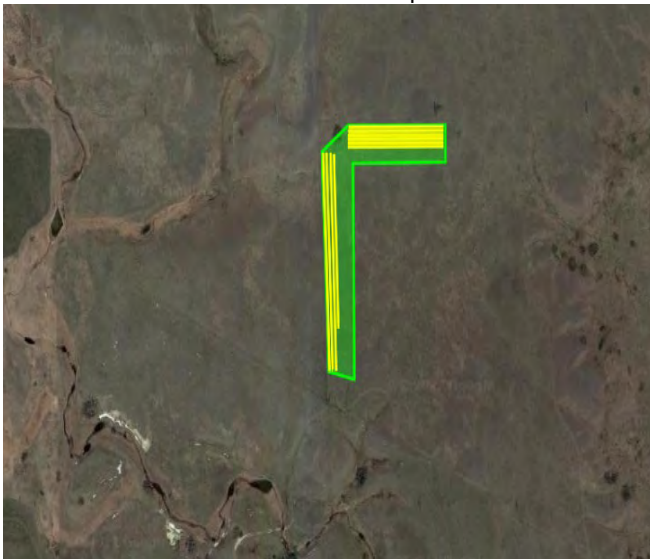
WESTERN ND - TREE AND SHRUB PLANTING WORKSHEET

ND-CPA-4, Rev. 03-2017

Name Jeffrey Larson Address 6568 103rd Ave NW, Tioga ND 58852 Phone # 701-664-5250 Date: 3/16/21



Plan Sketch Map



Quarter Section 20 Twnshp 157N Range 94W

Planned Soil Mapunit / name component(s) Planned by: Reed Scott Date: 3/16/21

 bek-Lehr-Appam complex, 9 to 25 percent slop Approved by: Date:

Conservation Tree & Shrub Group 10 Select MLRA 53B

Type of Planting New

Landuse Other Program None

Site Preparation (describe in Remark) Protected from livestock? Yes

Site conditions at planting time:

Spacing between rows: 10 feet

Distance from Windward row to roads or bldgs.: 2,833 feet

(Minimum 200' on N & W, and 100' on S & E)

Planted by:

Remarks on site prep, conditions and management (Weed Cor Date:)

Site Prep- land appears to be untouched grassland. Row #10 total planned length 620ft
Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by: Date: Certified By: Date:

Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability
1	511		15	0.18	1	Lilac, Common			6.07		85		NR	
	511				2	Buffaloberry			6.07		85		NR	
	511				3	Caragana			6.07		85		NR	
	511				4	Caragana			6.07		85		NR	
	510				5	Buffaloberry			6.06		85		NR	
	510				6	Lilac, Common			6.06		85		NR	
	775				7	Lilac, Common			6.05		129		NR	
	775				8	Buffaloberry			6.05		129		NR	
	777				9	Caragana			6.06		129		NR	
	206.67				10	Buffaloberry			6		35		NR	
	206.67				10	Caragana			6.1		34		NR	
	206.67				10	Lilac, Common			6.1		34		NR	

6011 15 0.18 **Totals** 1000 WEST-TREEPLAN

Name Norman Westerness Address 9029 County Rd 7, Columbus ND 58727 Phone # 701-939-5467 Date: 3/16/21



Plan Sketch Map



Quarter Section 35 Twnshp T161 Range R93
 Planned Soil Mapunit / name component(s) Zahl-Williams loams, 9 to 15 percent slopes Planned by: Reed Scott Date: 3/16/21
 Approved by: Date:
 Conservation Tree & Shrub Group 10 Select MLRA 53B
 Type of Planting New
 Landuse Farmstead Program None
 Site Preparation her (describe in Remark) Protected from livestock? Yes
 Site conditions at planting time:
 Spacing between rows: 10 feet
 Distance from Windward row to roads or bldgs.: 180 feet
 (Minimum 200' on N & W, and 100' on S & E) Planted by:
 Date:
Remarks on site prep, conditions and management (Weed Cor
 Date:
 Site prep- Area looks to be short grass within landowners yard. Row #4 has a total length of 51ft
 Shrub protection tubes and stakes will be utilized to increase survivability

This practice installation **MEETS** / **DOES NOT MEET** the ND FOTG standards and specifications. (circle one)

Checkout by:		Date:		Certified By:				Date:							
Planting No.	Planned Length	Planted Length	Planned Width	Acres	Row #	Primary Species of Tree or Shrub	Type or Variety	Alternating Specie	Planned Spacing in row	Row Spacing (installed)	Number Planned (est)	Number Planted (installed)	Primary Specie / CTSG Suitability	Alternating Specie / CTSG Suitability	
1	145		15	0.05	1	Juneberry			6.3		24		NR		
	145				2	Cherry, Nanking			6.3		24		NR		
	52				3	Juneberry			6.5		8		NR		
	25.5				4	Juneberry			6.5		4		NR		
	25.5				4	Cherry, Nanking			6.5		4		NR		
	50				5	Cherry, Nanking			6.4		8		NR		
						Totals						72			

Attachment 1 – AECOM NDWEC Tree and Shrub Inventory

Memorandum

To	Northern Divide Wind, LLC
Subject	Northern Divide Wind Energy Center Tree and Shrub Inventory
From	AECOM
Date	December 18, 2020

On December 11, 2020, Northern Divide Wind, LLC (Northern Divide Wind), a wholly owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER) completed tree and shrub removal for the Northern Divide Wind Energy Center (Project). Northern Divide Wind retained AECOM to conduct the tree and shrub inventory in support of the Project. According to the Tree and Shrub Mitigation Specifications, prior to cutting or clearing trees and shrubs for construction all trees one-inch or greater in diameter at breast height and all shrubs and coniferous trees of any diameter must be inventoried to record the location, number, and species.

Trees and shrubs were inventoried in the spring and summer of 2020 prior to Project construction. The inventory documented the location, number, and species of trees and shrubs. The tree and shrub inventory was completed within the areas where Project construction easements intersected trees and shrubs. The inventory included silverberry (*Elaeagnus commutata*), a fast-growing shrub with a rhizomatous root system that forms dense colonies. The species has a high coppice regeneration potential as indicated by the Natural Resources Conservation Service (NRCS) North Dakota Field Office Technical Guide (NRCS 2020) and silverberry have biological mechanisms that allow them to compete with grasses and other native plants. Replacement of the species is not recommended due to the species high probability of regrowth and the rhizomatous root system will allow for natural regrowth in reclaimed areas adjacent to existing colonies. Furthermore, silverberry has been found to invade native grasslands in North Dakota leading to an overabundance of shrub species in grasslands and a reduction in diversity of grassland-dependent species (Grant and Murphy 2005, Grant et al. 2009).

The inventory documented a total of 12,022 trees and shrubs within the Project construction easement (**Table 1**). A total of 23 different tree and shrub species were identified including boxelder (*Acer negundo*), juneberry (*Amelanchier alnifolia*), caragana (*Caragana arborescens*), redosier dogwood (*Cornus sericea*), Arnold hawthorn (*Crataegus arnoldiana*), Russian olive (*Elaeagnus angustifolia*), silverberry, green ash (*Fraxinus pennsylvanica*), Rocky Mountain juniper (*Juniperus scopulorum*), tatarian honeysuckle (*Lonicera tatarica*), Black Hills spruce (*Picea glauca var. densata*), balsam poplar (*Populus balsamifera*), eastern cottonwood (*Populus deltoides*), hybrid poplar (*Populus hybrids*), quaking aspen (*Populus tremuloides*), American plum (*Prunus americana*), chokecherry (*Prunus virginiana*), buckthorn (*Rhamnus cathartica*), Bebb’s willow (*Salix bebbiana*), sandbar willow (*Salix interior*), silver buffaloberry (*Shepherdia argentea*), American elm (*Ulmus Americana*), and Siberian elm (*Ulmus pumila*). Based on the results of the inventory, a total of 992 trees and shrubs are recommended for replacement.

References

Grant, T.A. and R.K. Murphy. 2005. Changes in Woodland Cover on Prairie Refuges in North Dakota, USA. Natural Areas Journal 25(4): 359-368.

Grant, T.A., B. Flanders-Wanner, T.L. Shaffer, R.K. Murphy, and G.A. Knutsen. 2009. An Emerging Crisis across Northern Prairie Refuges: Prevalence of Invasive Plants and a Plan for Adaptive Management. *Ecological Restoration* 27(1): 58-65.

Natural Resources Conservation Service (NRCS). 2020. Field Office Technical Guide – Section I – Reference Subjects – Windbreaks and Woodlands. Accessed: December 18, 2020. Available online here: https://efotg.sc.egov.usda.gov/references/public/ND/Tree_and_Shrub_Characteristics_.pdf

Table 1. Inventory of Trees and Shrubs

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.778493	-102.765996	89	0	Silverberry	<i>Elaeagnus commutata</i>
48.778381	-102.766290	115	0	Silverberry	<i>Elaeagnus commutata</i>
48.778458	-102.766399	122	0	Chokecherry	<i>Prunus virginiana</i>
48.778458	-102.766399	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.778482	-102.766655	108	0	Silverberry	<i>Elaeagnus commutata</i>
48.778494	-102.766985	1	0	Bebb's willow	<i>Salix bebbiana</i>
48.778494	-102.766985	20	0	Sandbar willow	<i>Salix interior</i>
48.778494	-102.766985	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.778494	-102.766985	4	0	Bebb's willow	<i>Salix bebbiana</i>
48.778485	-102.767938	230	0	Silverberry	<i>Elaeagnus commutata</i>
48.778485	-102.767938	25	0	Chokecherry	<i>Prunus virginiana</i>
48.778565	-102.767188	105	0	Chokecherry	<i>Prunus virginiana</i>
48.778552	-102.769080	20	0	Chokecherry	<i>Prunus virginiana</i>
48.778554	-102.769252	35	0	Chokecherry	<i>Prunus virginiana</i>
48.779752	-102.772914	4	0	Rocky Mountain juniper	<i>Juniperus scopulorum</i>
48.779752	-102.772914	3	0	Hybrid poplar	<i>Populus hybrids</i>
48.779752	-102.772914	3	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.779349	-102.773016	6	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.779698	-102.774381	40	0	Sandbar willow	<i>Salix interior</i>
48.779698	-102.774381	20	0	Bebb's willow	<i>Salix bebbiana</i>
48.780662	-102.775714	200	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.780662	-102.775714	37	0	Russian olive	<i>Elaeagnus angustifolia</i>
48.781720	-102.775709	50	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.781720	-102.775709	2	0	Russian olive	<i>Elaeagnus angustifolia</i>
48.789867	-102.780179	48	0	Silverberry	<i>Elaeagnus commutata</i>
48.788687	-102.780416	74	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.788687	-102.780416	60	0	Chokecherry	<i>Prunus virginiana</i>
48.788054	-102.780289	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.794158	-102.781731	36	36	Silverberry	<i>Elaeagnus commutata</i>
48.794158	-102.781731	10	10	Chokecherry	<i>Prunus virginiana</i>
48.794053	-102.781736	62	0	Chokecherry	<i>Prunus virginiana</i>
48.794053	-102.781736	14	0	Sandbar willow	<i>Salix interior</i>
48.794053	-102.781736	10	5	Silverberry	<i>Elaeagnus commutata</i>

Northern Divide Wind Energy Center
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.794110	-102.783050	208	0	Silverberry	<i>Elaeagnus commutata</i>
48.794110	-102.783050	66	0	Chokecherry	<i>Prunus virginiana</i>
48.794110	-102.783050	24	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.794110	-102.783050	6	0	Bebb's willow	<i>Salix bebbiana</i>
48.794168	-102.782168	26	8	Sandbar willow	<i>Salix interior</i>
48.794168	-102.782168	12	0	Chokecherry	<i>Prunus virginiana</i>
48.794168	-102.782168	8	0	Bebb's willow	<i>Salix bebbiana</i>
48.794168	-102.782168	2	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.794195	-102.782644	32	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.794195	-102.782644	32	0	Chokecherry	<i>Prunus virginiana</i>
48.794228	-102.782942	40	4	Chokecherry	<i>Prunus virginiana</i>
48.794200	-102.784270	520	387	Silverberry	<i>Elaeagnus commutata</i>
48.794200	-102.784270	68	68	Chokecherry	<i>Prunus virginiana</i>
48.794115	-102.784684	106	0	Silverberry	<i>Elaeagnus commutata</i>
48.794115	-102.784684	52	0	Chokecherry	<i>Prunus virginiana</i>
48.794171	-102.786309	112	0	Silverberry	<i>Elaeagnus commutata</i>
48.794171	-102.786309	52	0	Chokecherry	<i>Prunus virginiana</i>
48.794211	-102.786946	15	0	Silverberry	<i>Elaeagnus commutata</i>
48.794211	-102.786946	10	0	Chokecherry	<i>Prunus virginiana</i>
48.794211	-102.786946	2	0	Bebb's willow	<i>Salix bebbiana</i>
48.800324	-102.781343	20	0	Silverberry	<i>Elaeagnus commutata</i>
48.801319	-102.781471	32	0	Chokecherry	<i>Prunus virginiana</i>
48.801483	-102.781302	34	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.801483	-102.781302	28	0	Chokecherry	<i>Prunus virginiana</i>
48.802278	-102.779499	440	240	Silverberry	<i>Elaeagnus commutata</i>
48.802278	-102.779499	42	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.802278	-102.779499	4	0	Bebb's willow	<i>Salix bebbiana</i>
48.800352	-102.776181	52	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.800352	-102.776181	20	0	Boxelder	<i>Acer negundo</i>
48.800352	-102.776181	18	0	Chokecherry	<i>Prunus virginiana</i>
48.800017	-102.776640	54	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.800017	-102.776640	36	0	Silverberry	<i>Elaeagnus commutata</i>
48.800017	-102.776640	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.800017	-102.776640	8	0	Boxelder	<i>Acer negundo</i>
48.799228	-102.777372	136	66	Silverberry	<i>Elaeagnus commutata</i>
48.799228	-102.777372	6	0	Chokecherry	<i>Prunus virginiana</i>
48.799608	-102.777149	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.798968	-102.777519	72	0	Silverberry	<i>Elaeagnus commutata</i>
48.798602	-102.777807	58	20	Silverberry	<i>Elaeagnus commutata</i>
48.798119	-102.778361	68	28	Silverberry	<i>Elaeagnus commutata</i>
48.797761	-102.778577	48	25	Silverberry	<i>Elaeagnus commutata</i>
48.797283	-102.778530	32	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.797152	-102.778594	12	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.797001	-102.778471	18	0	Chokecherry	<i>Prunus virginiana</i>
48.796141	-102.777935	36	0	Chokecherry	<i>Prunus virginiana</i>

Northern Divide Wind Energy Center
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.795693	-102.778320	52	10	Chokecherry	<i>Prunus virginiana</i>
48.795693	-102.778320	24	20	Silverberry	<i>Elaeagnus commutata</i>
48.795246	-102.778711	10	8	Silverberry	<i>Elaeagnus commutata</i>
48.794997	-102.778586	28	7	Silverberry	<i>Elaeagnus commutata</i>
48.794856	-102.777550	122	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.794856	-102.777550	92	0	Chokecherry	<i>Prunus virginiana</i>
48.794856	-102.777550	18	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.794856	-102.777550	14	0	Boxelder	<i>Acer negundo</i>
48.839218	-102.914560	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.838210	-102.899603	66	0	Caragana	<i>Caragana arborescens</i>
48.838585	-102.899837	38	0	Chokecherry	<i>Prunus virginiana</i>
48.838411	-102.901037	8	0	Chokecherry	<i>Prunus virginiana</i>
48.826619	-102.894944	34	6	Silverberry	<i>Elaeagnus commutata</i>
48.826575	-102.894303	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.826590	-102.894493	2	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.823289	-102.907185	24	0	Chokecherry	<i>Prunus virginiana</i>
48.823409	-102.907128	52	0	Silverberry	<i>Elaeagnus commutata</i>
48.824752	-102.918023	4	4	Boxelder	<i>Acer negundo</i>
48.824752	-102.918023	3	3	Caragana	<i>Caragana arborescens</i>
48.825075	-102.918227	142	24	Caragana	<i>Caragana arborescens</i>
48.825075	-102.918227	10	1	Hybrid poplar	<i>Populus hybrids</i>
48.825075	-102.918227	6	0	Chokecherry	<i>Prunus virginiana</i>
48.825075	-102.918227	4	0	Boxelder	<i>Acer negundo</i>
48.825075	-102.918227	4	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.825075	-102.918227	4	2	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.824133	-102.923395	45	0	Silverberry	<i>Elaeagnus commutata</i>
48.824133	-102.923395	44	0	Chokecherry	<i>Prunus virginiana</i>
48.824133	-102.923395	10	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.824133	-102.923395	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.824239	-102.922501	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.824167	-102.922107	6	0	Chokecherry	<i>Prunus virginiana</i>
48.824037	-102.921810	16	0	Chokecherry	<i>Prunus virginiana</i>
48.808047	-102.919693	62	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.808047	-102.919693	54	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.808047	-102.919693	40	0	Black Hills spruce	<i>Picea glauca var. densata</i>
48.814625	-102.875822	12	0	Caragana	<i>Caragana arborescens</i>
48.814625	-102.875822	4	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.813374	-102.875816	38	30	Caragana	<i>Caragana arborescens</i>
48.813374	-102.875816	13	13	Green ash	<i>Fraxinus pennsylvanica</i>
48.811430	-102.872449	66	10	Silverberry	<i>Elaeagnus commutata</i>
48.810932	-102.871942	332	60	Silverberry	<i>Elaeagnus commutata</i>
48.810932	-102.871942	30	16	Chokecherry	<i>Prunus virginiana</i>
48.810932	-102.871942	16	10	American plum	<i>Prunus americana</i>

Northern Divide Wind Energy Center
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.810441	-102.871078	4	1	Chokecherry	<i>Prunus virginiana</i>
48.810441	-102.871078	4	1	Juneberry	<i>Amelanchier alnifolia</i>
48.828345	-102.859343	1	0	American elm	<i>Ulmus americana</i>
48.828345	-102.859636	2	0	Eastern cottonwood	<i>Populus deltoides</i>
48.828303	-102.859913	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.828303	-102.859913	1	0	Boxelder	<i>Acer negundo</i>
48.828303	-102.859913	1	0	American elm	<i>Ulmus americana</i>
48.827188	-102.858916	27	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.827188	-102.858916	10	0	Chokecherry	<i>Prunus virginiana</i>
48.827439	-102.858238	22	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.827439	-102.858238	2	0	Balsam poplar	<i>Populus balsamifera</i>
48.817730	-102.851214	26	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.817730	-102.851214	18	0	Chokecherry	<i>Prunus virginiana</i>
48.817730	-102.851214	12	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.817666	-102.850757	42	0	Chokecherry	<i>Prunus virginiana</i>
48.817666	-102.850757	14	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.817666	-102.850757	8	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.817666	-102.850757	4	0	Redosier dogwood	<i>Cornus sericea</i>
48.817666	-102.850757	1	0	Rocky Mountain juniper	<i>Juniperus scopulorum</i>
48.810405	-102.853088	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.810405	-102.853088	10	0	Chokecherry	<i>Prunus virginiana</i>
48.810405	-102.853088	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.810352	-102.853402	22	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.810428	-102.853682	40	0	Chokecherry	<i>Prunus virginiana</i>
48.810428	-102.853682	34	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.810428	-102.853682	2	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.809422	-102.855406	16	0	Juneberry	<i>Amelanchier alnifolia</i>
48.809307	-102.855118	34	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.810528	-102.867367	34	0	Quaking aspen	<i>Populus tremuloides</i>
48.810528	-102.867367	32	0	Chokecherry	<i>Prunus virginiana</i>
48.810770	-102.866002	68	4	Chokecherry	<i>Prunus virginiana</i>
48.810770	-102.866002	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.811096	-102.865671	12	0	Chokecherry	<i>Prunus virginiana</i>
48.811096	-102.865671	2	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.811099	-102.865023	18	0	Juneberry	<i>Amelanchier alnifolia</i>
48.806067	-102.804570	32	0	Chokecherry	<i>Prunus virginiana</i>
48.806067	-102.804570	28	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.806067	-102.804570	24	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.806067	-102.804570	6	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>

Northern Divide Wind Energy Center
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.806067	-102.804570	1	0	Buckthorn	<i>Rhamnus cathartica</i>
48.805983	-102.804287	28	0	Chokecherry	<i>Prunus virginiana</i>
48.805983	-102.804287	16	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.805983	-102.804287	6	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.805983	-102.804287	2	0	Buckthorn	<i>Rhamnus cathartica</i>
48.805983	-102.804287	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.802843	-102.807697	212	0	Silverberry	<i>Elaeagnus commutata</i>
48.802843	-102.807697	118	0	Chokecherry	<i>Prunus virginiana</i>
48.802843	-102.807697	62	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.802843	-102.807697	26	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.802843	-102.807697	10	0	Buckthorn	<i>Rhamnus cathartica</i>
48.803094	-102.809210	132	0	Chokecherry	<i>Prunus virginiana</i>
48.803094	-102.809210	92	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.803094	-102.809210	68	0	Silverberry	<i>Elaeagnus commutata</i>
48.803094	-102.809210	36	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.803094	-102.809210	14	0	Juneberry	<i>Amelanchier alnifolia</i>
48.803094	-102.809210	10	0	Redosier dogwood	<i>Cornus sericea</i>
48.803094	-102.809210	8	0	Buckthorn	<i>Rhamnus cathartica</i>
48.807219	-102.819348	40	0	Chokecherry	<i>Prunus virginiana</i>
48.807219	-102.819348	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.807219	-102.819348	4	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.807311	-102.819011	72	0	Silverberry	<i>Elaeagnus commutata</i>
48.804773	-102.819135	8	0	Siberian elm	<i>Ulmus pumila</i>
48.804568	-102.819366	24	0	Chokecherry	<i>Prunus virginiana</i>
48.800278	-102.830123	28	0	Chokecherry	<i>Prunus virginiana</i>
48.800278	-102.830123	16	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.799152	-102.830477	10	0	Chokecherry	<i>Prunus virginiana</i>
48.798762	-102.830504	36	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.798762	-102.830504	10	0	Chokecherry	<i>Prunus virginiana</i>
48.798762	-102.830504	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.798370	-102.830475	2	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.801412	-102.764635	6	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.801965	-102.764776	10	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.801663	-102.764162	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.801298	-102.760960	1	1	Green ash	<i>Fraxinus pennsylvanica</i>
48.801163	-102.760979	76	0	Silverberry	<i>Elaeagnus commutata</i>
48.804668	-102.768412	108	0	Silverberry	<i>Elaeagnus commutata</i>
48.804088	-102.768789	72	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.804088	-102.768789	22	0	Chokecherry	<i>Prunus virginiana</i>
48.804088	-102.768789	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.804088	-102.768789	18	0	Juneberry	<i>Amelanchier alnifolia</i>
48.804088	-102.768789	4	0	Boxelder	<i>Acer negundo</i>
48.803767	-102.769561	30	10	Silverberry	<i>Elaeagnus commutata</i>

Northern Divide Wind Energy Center
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.803656	-102.770395	46	46	Silverberry	<i>Elaeagnus commutata</i>
48.803656	-102.770395	8	8	Chokecherry	<i>Prunus virginiana</i>
48.789703	-102.852165	78	0	Silverberry	<i>Elaeagnus commutata</i>
48.790623	-102.836336	23	20	Chokecherry	<i>Prunus virginiana</i>
48.790623	-102.836336	5	5	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.790404	-102.836338	26	26	Chokecherry	<i>Prunus virginiana</i>
48.790404	-102.836338	6	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.790138	-102.835942	216	60	Silverberry	<i>Elaeagnus commutata</i>
48.790138	-102.835942	188	50	Chokecherry	<i>Prunus virginiana</i>
48.790138	-102.835942	52	25	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.790138	-102.835942	22	10	Juneberry	<i>Amelanchier alnifolia</i>
48.790530	-102.836146	18	0	Chokecherry	<i>Prunus virginiana</i>
48.790530	-102.836146	9	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.790613	-102.835996	38	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.790613	-102.835996	18	0	Chokecherry	<i>Prunus virginiana</i>
48.784414	-102.831555	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.784232	-102.832418	48	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.784232	-102.832418	22	0	Chokecherry	<i>Prunus virginiana</i>
48.784228	-102.832763	28	0	Chokecherry	<i>Prunus virginiana</i>
48.784228	-102.832763	4	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.784143	-102.832945	32	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.784122	-102.833350	22	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.784122	-102.833350	18	0	Chokecherry	<i>Prunus virginiana</i>
48.784083	-102.833647	12	0	Chokecherry	<i>Prunus virginiana</i>
48.783977	-102.834174	58	0	Silverberry	<i>Elaeagnus commutata</i>
48.783977	-102.834174	16	0	Chokecherry	<i>Prunus virginiana</i>
48.783731	-102.835363	48	0	Silverberry	<i>Elaeagnus commutata</i>
48.783731	-102.835363	14	0	Chokecherry	<i>Prunus virginiana</i>
48.783731	-102.835363	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.783522	-102.835906	190	0	Silverberry	<i>Elaeagnus commutata</i>
48.783522	-102.835906	22	0	Chokecherry	<i>Prunus virginiana</i>
48.783522	-102.835906	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.783522	-102.835906	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.783278	-102.836941	124	0	Silverberry	<i>Elaeagnus commutata</i>
48.783278	-102.836941	10	0	Chokecherry	<i>Prunus virginiana</i>
48.783278	-102.836941	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.783053	-102.837835	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.782918	-102.838092	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.782888	-102.838409	86	0	Silverberry	<i>Elaeagnus commutata</i>
48.786387	-102.808562	28	0	Silverberry	<i>Elaeagnus commutata</i>
48.786139	-102.808525	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.786139	-102.808525	16	0	Chokecherry	<i>Prunus virginiana</i>
48.786139	-102.808525	12	0	Sandbar willow	<i>Salix interior</i>
48.786139	-102.808525	4	0	Bebb's willow	<i>Salix bebbiana</i>
48.777098	-102.808158	198	190	Silverberry	<i>Elaeagnus commutata</i>

Northern Divide Wind Energy Center
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.777098	-102.808158	74	70	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.777098	-102.808158	32	30	Chokecherry	<i>Prunus virginiana</i>
48.777098	-102.808158	22	20	Juneberry	<i>Amelanchier alnifolia</i>
48.777611	-102.808901	64	64	Silverberry	<i>Elaeagnus commutata</i>
48.777826	-102.809266	34	34	Silverberry	<i>Elaeagnus commutata</i>
48.778209	-102.809955	28	28	Silverberry	<i>Elaeagnus commutata</i>
48.778474	-102.810352	20	20	Silverberry	<i>Elaeagnus commutata</i>
48.776848	-102.807507	136	136	Silverberry	<i>Elaeagnus commutata</i>
48.767346	-102.789977	208	208	Chokecherry	<i>Prunus virginiana</i>
48.767346	-102.789977	112	112	Silverberry	<i>Elaeagnus commutata</i>
48.767346	-102.789977	110	110	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.767346	-102.789977	38	38	Juneberry	<i>Amelanchier alnifolia</i>
48.767938	-102.790267	22	22	Chokecherry	<i>Prunus virginiana</i>
48.767938	-102.790267	4	4	Juneberry	<i>Amelanchier alnifolia</i>
48.768149	-102.790365	48	48	Silverberry	<i>Elaeagnus commutata</i>
48.768861	-102.790130	240	200	Silverberry	<i>Elaeagnus commutata</i>
48.768861	-102.790130	68	40	Chokecherry	<i>Prunus virginiana</i>
48.768861	-102.790130	62	40	Juneberry	<i>Amelanchier alnifolia</i>
48.768861	-102.790130	18	12	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.769625	-102.790249	52	52	Silverberry	<i>Elaeagnus commutata</i>
48.770038	-102.790156	24	24	Chokecherry	<i>Prunus virginiana</i>
48.770038	-102.790156	3	3	Silverberry	<i>Elaeagnus commutata</i>
48.763834	-102.787096	48	0	Silverberry	<i>Elaeagnus commutata</i>
48.763619	-102.787015	36	0	Silverberry	<i>Elaeagnus commutata</i>
48.762793	-102.786622	84	0	Sandbar willow	<i>Salix interior</i>
48.762793	-102.786622	16	0	Chokecherry	<i>Prunus virginiana</i>
48.762810	-102.782831	118	118	Silverberry	<i>Elaeagnus commutata</i>
48.826614	-102.894379	2	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.826653	-102.894149	6	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.826653	-102.894149	1	0	Boxelder	<i>Acer negundo</i>
48.816078	-102.918045	2	0	Boxelder	<i>Acer negundo</i>
48.816078	-102.918045	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.822962	-102.857255	3	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.799675	-102.776770	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.804740	-102.768678	210	0	Silverberry	<i>Elaeagnus commutata</i>
48.804238	-102.769396	80	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.804238	-102.769396	24	0	Chokecherry	<i>Prunus virginiana</i>
48.804238	-102.769396	22	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.804238	-102.769396	20	0	Juneberry	<i>Amelanchier alnifolia</i>
48.804238	-102.769396	8	0	Boxelder	<i>Acer negundo</i>
48.778493	-102.765996	89	0	Silverberry	<i>Elaeagnus commutata</i>

Attachment 2 – AECOM TLine Tree and Shrub Inventory

Memorandum

To	Northern Divide Wind, LLC
Subject	Northern Divide 345-kV Transmission Line Tree and Shrub Inventory
From	AECOM
Date	December 18, 2020

On December 11, 2020, Northern Divide Wind, LLC (Northern Divide Wind), a wholly owned, indirect subsidiary of NextEra Energy Resources, LLC (NEER) completed tree and shrub removal for the Northern Divide Wind Energy Center (Project). Northern Divide Wind retained AECOM to conduct the tree and shrub inventory in support of the Project. According to the Tree and Shrub Mitigation Specifications, prior to cutting or clearing trees and shrubs for construction all trees one-inch or greater in diameter at breast height and all shrubs and coniferous trees of any diameter must be inventoried to record the location, number, and species.

Trees and shrubs were inventoried in the spring and summer of 2020 prior to Project construction. The inventory documented the location, number, and species of trees and shrubs. The tree and shrub inventory was completed within the areas where Project construction easements intersected trees and shrubs. The inventory included silverberry (*Elaeagnus commutata*), a fast-growing shrub with a rhizomatous root system that forms dense colonies. The species has a high coppice regeneration potential as indicated by the Natural Resources Conservation Service (NRCS) North Dakota Field Office Technical Guide (NRCS 2020) and silverberry have biological mechanisms that allow them to compete with grasses and other native plants. Replacement of the species is not recommended due to the species high probability of regrowth and the rhizomatous root system will allow for natural regrowth in reclaimed areas adjacent to existing colonies. Furthermore, silverberry has been found to invade native grasslands in North Dakota leading to an overabundance of shrub species in grasslands and a reduction in diversity of grassland-dependent species (Grant and Murphy 2005, Grant et al. 2009).

The inventory documented a total of 52,061 trees and shrubs within the Project construction easement. A total of 21 different tree and shrub species were identified including boxelder (*Acer negundo*), juneberry (*Amelanchier alnifolia*), caragana (*Caragana arborescens*), redosier dogwood (*Cornus sericea*), Arnold hawthorn (*Crataegus arnoldiana*), silverberry, green ash (*Fraxinus pennsylvanica*), Rocky Mountain juniper (*Juniperus scopulorum*), tatarian honeysuckle (*Lonicera tatarica*), Black Hills spruce (*Picea glauca var. densata*), eastern cottonwood (*Populus deltoides*), quaking aspen (*Populus tremuloides*), American plum (*Prunus americana*), chokecherry (*Prunus virginiana*), peach leaf willow (*Salix amygdaloides*), Bebb's willow (*Salix bebbiana*), sandbar willow (*Salix interior*), silver buffaloberry (*Shepherdia argentea*), common lilac (*Syringa vulgaris*), American elm (*Ulmus Americana*), and Siberian elm (*Ulmus pumila*). Based on the results of the inventory, a total of 4,080 trees and shrubs are recommended for replacement.

References

Grant, T.A. and R.K. Murphy. 2005. Changes in Woodland Cover on Prairie Refuges in North Dakota, USA. *Natural Areas Journal* 25(4): 359-368.

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Grant, T.A., B. Flanders-Wanner, T.L. Shaffer, R.K. Murphy, and G.A. Knutsen. 2009. An Emerging Crisis across Northern Prairie Refuges: Prevalence of Invasive Plants and a Plan for Adaptive Management. *Ecological Restoration* 27(1): 58-65.

Natural Resources Conservation Service (NRCS). 2020. Field Office Technical Guide – Section I – Reference Subjects – Windbreaks and Woodlands. Accessed: December 18, 2020. Available online here: https://efotg.sc.egov.usda.gov/references/public/ND/Tree_and_Shrub_Characteristics_.pdf

Table 1. Inventory of Trees and Shrubs

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.400328	-102.844108	38	0	Chokecherry	<i>Prunus virginiana</i>
48.400328	-102.844108	36	0	Silverberry	<i>Elaeagnus commutata</i>
48.400328	-102.844108	20	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.400328	-102.844108	10	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.400107	-102.843429	42	0	Chokecherry	<i>Prunus virginiana</i>
48.400057	-102.843368	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.400521	-102.843124	222	0	Silverberry	<i>Elaeagnus commutata</i>
48.400521	-102.843124	58	0	Chokecherry	<i>Prunus virginiana</i>
48.400521	-102.843124	4	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.400521	-102.843124	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.400774	-102.843490	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.400774	-102.843490	4	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.400796	-102.843556	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.400754	-102.843834	162	0	Chokecherry	<i>Prunus virginiana</i>
48.400754	-102.843834	32	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.400754	-102.843834	5	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.400720	-102.844034	3	0	Chokecherry	<i>Prunus virginiana</i>
48.402035	-102.844073	318	0	Silverberry	<i>Elaeagnus commutata</i>
48.402320	-102.843993	110	0	Silverberry	<i>Elaeagnus commutata</i>
48.403225	-102.844671	12	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.413150	-102.840325	262	30	Silverberry	<i>Elaeagnus commutata</i>
48.412972	-102.838229	850	50	Silverberry	<i>Elaeagnus commutata</i>
48.412972	-102.838229	72	15	Chokecherry	<i>Prunus virginiana</i>
48.412972	-102.838229	34	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.412920	-102.836289	875	2	Silverberry	<i>Elaeagnus commutata</i>
48.412920	-102.836289	208	170	Green ash	<i>Fraxinus pennsylvanica</i>
48.412920	-102.836289	52	0	Silverberry	<i>Elaeagnus commutata</i>
48.412920	-102.836289	8	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.412824	-102.835140	58	0	Silverberry	<i>Elaeagnus commutata</i>
48.412824	-102.835140	32	0	Chokecherry	<i>Prunus virginiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.412824	-102.835140	28	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412824	-102.835140	24	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.413057	-102.834824	74	0	Silverberry	<i>Elaeagnus commutata</i>
48.412948	-102.834053	312	5	Silverberry	<i>Elaeagnus commutata</i>
48.412948	-102.834053	12	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.413042	-102.832866	6	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412719	-102.831945	18	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412682	-102.831300	40	2	Silver buffaloberry	<i>Shepherdia argentea</i>
48.413000	-102.831228	16	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412822	-102.830113	210	0	Silverberry	<i>Elaeagnus commutata</i>
48.412822	-102.830113	152	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412661	-102.829060	50	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412790	-102.828549	84	20	Silverberry	<i>Elaeagnus commutata</i>
48.412597	-102.826098	66	0	Chokecherry	<i>Prunus virginiana</i>
48.412585	-102.825441	146	35	Silverberry	<i>Elaeagnus commutata</i>
48.412585	-102.825441	20	5	Chokecherry	<i>Prunus virginiana</i>
48.412585	-102.825441	2	2	Green ash	<i>Fraxinus pennsylvanica</i>
48.412741	-102.823317	560	0	Silverberry	<i>Elaeagnus commutata</i>
48.412741	-102.823317	164	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412741	-102.823317	44	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.412741	-102.823317	24	0	Chokecherry	<i>Prunus virginiana</i>
48.412741	-102.823317	3	0	Rocky Mountain juniper	<i>Juniperus scopulorum</i>
48.413339	-102.831448	18	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.412868	-102.819253	102	0	Chokecherry	<i>Prunus virginiana</i>
48.412868	-102.819253	64	0	Silverberry	<i>Elaeagnus commutata</i>
48.412868	-102.819253	35	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.416129	-102.809602	15	0	Chokecherry	<i>Prunus virginiana</i>
48.429924	-102.802862	78	0	Silverberry	<i>Elaeagnus commutata</i>
48.430209	-102.802746	66	5	Silverberry	<i>Elaeagnus commutata</i>
48.430022	-102.800576	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.430263	-102.800298	72	0	Silverberry	<i>Elaeagnus commutata</i>
48.430033	-102.799747	22	0	Silverberry	<i>Elaeagnus commutata</i>
48.430418	-102.797037	24	0	Silverberry	<i>Elaeagnus commutata</i>
48.430416	-102.797972	14	0	Chokecherry	<i>Prunus virginiana</i>
48.430427	-102.796574	6	0	American plum	<i>Prunus americana</i>
48.430427	-102.795500	8	0	Chokecherry	<i>Prunus virginiana</i>
48.430427	-102.795500	6	0	American plum	<i>Prunus americana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.430233	-102.794940	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430412	-102.786920	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430051	-102.787335	4	0	Chokecherry	<i>Prunus virginiana</i>
48.430184	-102.786835	1	0	Caragana	<i>Caragana arborescens</i>
48.430179	-102.786531	14	14	Caragana	<i>Caragana arborescens</i>
48.430179	-102.786531	7	7	Green ash	<i>Fraxinus pennsylvanica</i>
48.430179	-102.786531	6	6	Common lilac	<i>Syringa vulgaris</i>
48.430179	-102.786531	5	5	Boxelder	<i>Acer negundo</i>
48.430179	-102.786531	4	0	Chokecherry	<i>Prunus virginiana</i>
48.795763	-102.778328	8	0	Chokecherry	<i>Prunus virginiana</i>
48.430125	-102.772882	64	0	Silverberry	<i>Elaeagnus commutata</i>
48.430126	-102.771680	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.430126	-102.771680	23	0	Chokecherry	<i>Prunus virginiana</i>
48.430058	-102.770950	35	0	Silverberry	<i>Elaeagnus commutata</i>
48.430058	-102.770950	12	0	Chokecherry	<i>Prunus virginiana</i>
48.430111	-102.770476	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.430111	-102.770476	36	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430111	-102.770476	8	0	Chokecherry	<i>Prunus virginiana</i>
48.430111	-102.770476	4	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430239	-102.769477	58	0	Chokecherry	<i>Prunus virginiana</i>
48.430239	-102.769477	58	5	Silverberry	<i>Elaeagnus commutata</i>
48.430239	-102.769477	32	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430239	-102.769477	22	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430239	-102.769477	8	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.430239	-102.769477	6	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.430069	-102.767101	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.430267	-102.764271	625	410	Chokecherry	<i>Prunus virginiana</i>
48.430267	-102.764271	550	510	Green ash	<i>Fraxinus pennsylvanica</i>
48.430267	-102.764271	60	20	Redosier dogwood	<i>Cornus sericea</i>
48.430267	-102.764271	28	20	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430267	-102.764271	20	10	Silverberry	<i>Elaeagnus commutata</i>
48.430267	-102.764271	18	12	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.430193	-102.760132	10	5	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430193	-102.760132	2	2	Green ash	<i>Fraxinus pennsylvanica</i>
48.430324	-102.760535	36	26	Chokecherry	<i>Prunus virginiana</i>
48.430324	-102.760535	20	15	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430324	-102.760535	12	9	Green ash	<i>Fraxinus pennsylvanica</i>
48.430324	-102.760535	4	4	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430267	-102.761524	168	168	Chokecherry	<i>Prunus virginiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.430267	-102.761524	154	140	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430267	-102.761524	72	72	Green ash	<i>Fraxinus pennsylvanica</i>
48.430267	-102.761524	8	8	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430267	-102.761524	6	6	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.430132	-102.762476	6	5	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430132	-102.762476	3	0	Redosier dogwood	<i>Cornus sericea</i>
48.430132	-102.762476	2	2	Green ash	<i>Fraxinus pennsylvanica</i>
48.430341	-102.744891	212	0	Chokecherry	<i>Prunus virginiana</i>
48.430341	-102.744891	162	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430341	-102.744891	76	0	Silverberry	<i>Elaeagnus commutata</i>
48.430341	-102.744891	6	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.430313	-102.743601	180	0	Silverberry	<i>Elaeagnus commutata</i>
48.430313	-102.743601	88	0	Chokecherry	<i>Prunus virginiana</i>
48.430313	-102.743601	40	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430313	-102.743601	4	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.430248	-102.742018	218	40	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430248	-102.742018	186	0	Silverberry	<i>Elaeagnus commutata</i>
48.430248	-102.742018	182	35	Chokecherry	<i>Prunus virginiana</i>
48.430248	-102.742018	58	12	Green ash	<i>Fraxinus pennsylvanica</i>
48.430277	-102.740591	98	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430277	-102.740591	74	0	Chokecherry	<i>Prunus virginiana</i>
48.430277	-102.740591	6	0	Rocky Mountain juniper	<i>Juniperus scopulorum</i>
48.430330	-102.739915	84	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430330	-102.739915	3	0	Rocky Mountain juniper	<i>Juniperus scopulorum</i>
48.430111	-102.739441	58	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.424158	-102.741601	144	0	American plum	<i>Prunus americana</i>
48.424158	-102.741601	32	0	Chokecherry	<i>Prunus virginiana</i>
48.424158	-102.741601	26	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.424158	-102.741601	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.425149	-102.741110	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.425149	-102.741110	10	0	Chokecherry	<i>Prunus virginiana</i>
48.425367	-102.740934	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.425367	-102.740934	4	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.425507	-102.740913	8	0	Chokecherry	<i>Prunus virginiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.429495	-102.738473	7	0	Chokecherry	<i>Prunus virginiana</i>
48.429697	-102.735841	242	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430086	-102.734964	28	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430086	-102.734964	4	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.430021	-102.734688	10	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430454	-102.734479	74	0	Chokecherry	<i>Prunus virginiana</i>
48.430454	-102.734479	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430454	-102.734479	14	0	Juneberry	<i>Amelanchier alnifolia</i>
48.430771	-102.733991	18	0	Juneberry	<i>Amelanchier alnifolia</i>
48.430826	-102.733679	68	0	Chokecherry	<i>Prunus virginiana</i>
48.431575	-102.733328	92	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.431696	-102.733354	62	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.436070	-102.731967	32	6	Chokecherry	<i>Prunus virginiana</i>
48.437372	-102.733141	64	0	Silverberry	<i>Elaeagnus commutata</i>
48.437849	-102.733246	118	15	Silverberry	<i>Elaeagnus commutata</i>
48.438190	-102.733430	98	5	Silverberry	<i>Elaeagnus commutata</i>
48.439120	-102.733256	278	0	Silverberry	<i>Elaeagnus commutata</i>
48.439120	-102.733256	28	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.439624	-102.733348	42	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.439887	-102.733104	52	52	Quaking aspen	<i>Populus tremuloides</i>
48.439887	-102.733104	28	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.439887	-102.733104	10	10	Bebb's willow	<i>Salix bebbiana</i>
48.440285	-102.732811	68	32	Silver buffaloberry	<i>Shepherdia argentea</i>
48.440285	-102.732811	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.441001	-102.731061	66	0	Chokecherry	<i>Prunus virginiana</i>
48.441133	-102.731591	20	0	Chokecherry	<i>Prunus virginiana</i>
48.441068	-102.730208	88	16	Silverberry	<i>Elaeagnus commutata</i>
48.441068	-102.730208	76	10	Chokecherry	<i>Prunus virginiana</i>
48.441068	-102.730208	2	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.441043	-102.729743	34	8	Chokecherry	<i>Prunus virginiana</i>
48.441043	-102.729743	1	0	Juneberry	<i>Amelanchier alnifolia</i>
48.441182	-102.729083	106	5	Silverberry	<i>Elaeagnus commutata</i>
48.440858	-102.729120	15	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.441115	-102.727469	950	65	Silverberry	<i>Elaeagnus commutata</i>
48.441115	-102.727469	156	0	Chokecherry	<i>Prunus virginiana</i>
48.441115	-102.727469	42	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.441297	-102.725822	34	0	Juneberry	<i>Amelanchier alnifolia</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.441111	-102.723636	518	24	Silverberry	<i>Elaeagnus commutata</i>
48.441111	-102.723636	288	60	Chokecherry	<i>Prunus virginiana</i>
48.441111	-102.723636	190	36	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.441111	-102.723636	118	28	Juneberry	<i>Amelanchier alnifolia</i>
48.441111	-102.723636	78	16	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.441111	-102.723636	42	20	Silver buffaloberry	<i>Shepherdia argentea</i>
48.441111	-102.723636	34	2	Green ash	<i>Fraxinus pennsylvanica</i>
48.440426	-102.724807	44	0	Chokecherry	<i>Prunus virginiana</i>
48.440426	-102.724807	32	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.440192	-102.724694	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.440192	-102.724694	38	0	Chokecherry	<i>Prunus virginiana</i>
48.439978	-102.724754	15	0	Chokecherry	<i>Prunus virginiana</i>
48.440621	-102.727691	22	10	Silverberry	<i>Elaeagnus commutata</i>
48.440496	-102.728286	32	16	Chokecherry	<i>Prunus virginiana</i>
48.440252	-102.728887	52	10	Chokecherry	<i>Prunus virginiana</i>
48.437472	-102.721429	38	0	Silverberry	<i>Elaeagnus commutata</i>
48.437472	-102.721429	16	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.437546	-102.721413	30	0	Silverberry	<i>Elaeagnus commutata</i>
48.437546	-102.721413	14	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.441397	-102.708867	3	3	Cottonwood	<i>Populus deltoides</i>
48.488709	-102.690451	16	0	American plum	<i>Prunus americana</i>
48.488709	-102.690451	3	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.488979	-102.690531	22	0	Chokecherry	<i>Prunus virginiana</i>
48.489139	-102.690273	6	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.489335	-102.690491	12	0	American plum	<i>Prunus americana</i>
48.489941	-102.690559	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.510223	-102.679553	32	0	Chokecherry	<i>Prunus virginiana</i>
48.509302	-102.679181	16	11	Green ash	<i>Fraxinus pennsylvanica</i>
48.502234	-102.687681	10	7	Green ash	<i>Fraxinus pennsylvanica</i>
48.530933	-102.691084	15	11	Black Hills spruce	<i>Picea glauca</i> var. <i>densata</i>
48.529167	-102.691176	11	9	Black Hills spruce	<i>Picea glauca</i> var. <i>densata</i>
48.540987	-102.689837	5	3	Green ash	<i>Fraxinus pennsylvanica</i>
48.540991	-102.689492	10	9	Green ash	<i>Fraxinus pennsylvanica</i>
48.542968	-102.689846	4	4	Siberian elm	<i>Ulmus pumila</i>
48.542964	-102.689561	4	4	Siberian elm	<i>Ulmus pumila</i>
48.544466	-102.689661	15	14	Green ash	<i>Fraxinus pennsylvanica</i>
48.544466	-102.689661	3	3	Chokecherry	<i>Prunus virginiana</i>
48.556127	-102.712270	8	0	Chokecherry	<i>Prunus virginiana</i>
48.561148	-102.713070	158	0	Silverberry	<i>Elaeagnus commutata</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.561148	-102.713070	6	0	Juneberry	<i>Amelanchier alnifolia</i>
48.577275	-102.720082	194	0	Silverberry	<i>Elaeagnus commutata</i>
48.577275	-102.720082	64	0	Chokecherry	<i>Prunus virginiana</i>
48.577275	-102.720082	48	0	Juneberry	<i>Amelanchier alnifolia</i>
48.589756	-102.713718	14	0	Chokecherry	<i>Prunus virginiana</i>
48.783981	-102.834195	3	0	Peachleaf willow	<i>Salix amygdaloides</i>
48.619013	-102.699152	2	2	Quaking aspen	<i>Populus tremuloides</i>
48.619068	-102.698896	5	5	Quaking aspen	<i>Populus tremuloides</i>
48.619165	-102.698817	1	1	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.619124	-102.698706	2	2	Quaking aspen	<i>Populus tremuloides</i>
48.619230	-102.698373	28	12	Quaking aspen	<i>Populus tremuloides</i>
48.619627	-102.696112	46	46	American plum	<i>Prunus americana</i>
48.619706	-102.694210	18	0	Chokecherry	<i>Prunus virginiana</i>
48.619706	-102.694210	12	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.622248	-102.679708	3	0	Quaking aspen	<i>Populus tremuloides</i>
48.633163	-102.678162	48	0	Silverberry	<i>Elaeagnus commutata</i>
48.630272	-102.678292	2	2	Quaking aspen	<i>Populus tremuloides</i>
48.629787	-102.677834	3	1	Quaking aspen	<i>Populus tremuloides</i>
48.629673	-102.677800	13	6	Quaking aspen	<i>Populus tremuloides</i>
48.629430	-102.677775	1	1	Quaking aspen	<i>Populus tremuloides</i>
48.629473	-102.677735	26	0	Silverberry	<i>Elaeagnus commutata</i>
48.629840	-102.677750	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.629302	-102.677857	4	2	Quaking aspen	<i>Populus tremuloides</i>
48.629174	-102.677915	8	6	Chokecherry	<i>Prunus virginiana</i>
48.629174	-102.677915	3	0	Quaking aspen	<i>Populus tremuloides</i>
48.628880	-102.678095	38	0	Silverberry	<i>Elaeagnus commutata</i>
48.628801	-102.678879	3	0	Bebb's willow	<i>Salix bebbiana</i>
48.628541	-102.678715	36	5	Silverberry	<i>Elaeagnus commutata</i>
48.628541	-102.678715	3	0	Bebb's willow	<i>Salix bebbiana</i>
48.628505	-102.679005	30	0	Quaking aspen	<i>Populus tremuloides</i>
48.626705	-102.678777	48	0	Silverberry	<i>Elaeagnus commutata</i>
48.626245	-102.678815	4	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.625761	-102.678713	90	30	Silverberry	<i>Elaeagnus commutata</i>
48.625160	-102.679242	74	0	Silverberry	<i>Elaeagnus commutata</i>
48.624832	-102.679412	62	0	Silverberry	<i>Elaeagnus commutata</i>
48.633405	-102.678203	68	0	Silverberry	<i>Elaeagnus commutata</i>
48.633405	-102.678203	7	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.642417	-102.674932	180	0	Sandbar willow	<i>Salix interior</i>
48.642417	-102.674932	76	70	Quaking aspen	<i>Populus tremuloides</i>
48.642417	-102.674932	26	15	Chokecherry	<i>Prunus virginiana</i>
48.652447	-102.668393	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.652447	-102.668393	10	0	Chokecherry	<i>Prunus virginiana</i>
48.666195	-102.684503	3	0	Peachleaf willow	<i>Salix amygdaloides</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.659311	-102.674020	44	0	Silverberry	<i>Elaeagnus commutata</i>
48.658755	-102.672437	66	0	Silverberry	<i>Elaeagnus commutata</i>
48.656497	-102.668117	608	0	Silverberry	<i>Elaeagnus commutata</i>
48.656497	-102.668117	2	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.656782	-102.667638	74	0	Silverberry	<i>Elaeagnus commutata</i>
48.657291	-102.667426	82	0	Silverberry	<i>Elaeagnus commutata</i>
48.655578	-102.668213	925	0	Silverberry	<i>Elaeagnus commutata</i>
48.670469	-102.683253	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.670469	-102.683253	18	3	Chokecherry	<i>Prunus virginiana</i>
48.670469	-102.683253	12	3	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.671763	-102.682380	32	28	Chokecherry	<i>Prunus virginiana</i>
48.671763	-102.682380	10	8	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.671974	-102.682730	32	0	Chokecherry	<i>Prunus virginiana</i>
48.671382	-102.682064	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.671371	-102.681321	2	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.671525	-102.681501	5	0	Chokecherry	<i>Prunus virginiana</i>
48.671525	-102.681501	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.670918	-102.680737	12	0	Chokecherry	<i>Prunus virginiana</i>
48.670918	-102.680737	4	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.669422	-102.678806	46	0	Silverberry	<i>Elaeagnus commutata</i>
48.671740	-102.681961	76	0	Silverberry	<i>Elaeagnus commutata</i>
48.671987	-102.682236	20	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.672528	-102.683726	46	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.672695	-102.683415	38	0	Silverberry	<i>Elaeagnus commutata</i>
48.672659	-102.684054	4	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.672954	-102.684196	144	20	Silverberry	<i>Elaeagnus commutata</i>
48.672954	-102.684196	48	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.672954	-102.684196	10	0	Chokecherry	<i>Prunus virginiana</i>
48.673194	-102.684156	26	0	Chokecherry	<i>Prunus virginiana</i>
48.673240	-102.684819	6	0	Chokecherry	<i>Prunus virginiana</i>
48.673521	-102.685289	108	0	Silverberry	<i>Elaeagnus commutata</i>
48.673521	-102.685289	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.674162	-102.686121	350	20	Silverberry	<i>Elaeagnus commutata</i>
48.674162	-102.686121	46	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.674162	-102.686121	32	0	Chokecherry	<i>Prunus virginiana</i>
48.674710	-102.687268	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.675236	-102.687650	38	0	Silverberry	<i>Elaeagnus commutata</i>
48.675236	-102.687650	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.676169	-102.689266	102	25	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.675594	-102.688746	22	0	Silverberry	<i>Elaeagnus commutata</i>
48.675594	-102.688746	178	0	Silverberry	<i>Elaeagnus commutata</i>
48.675594	-102.688746	146	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.675594	-102.688746	18	0	Silverberry	<i>Elaeagnus commutata</i>
48.676886	-102.689542	178	0	Silverberry	<i>Elaeagnus commutata</i>
48.677337	-102.689420	146	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.677337	-102.689420	18	0	Silverberry	<i>Elaeagnus commutata</i>
48.677614	-102.689240	36	0	Silverberry	<i>Elaeagnus commutata</i>
48.678545	-102.689531	920	60	Silverberry	<i>Elaeagnus commutata</i>
48.678545	-102.689531	218	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.678545	-102.689531	4	0	Quaking aspen	<i>Populus tremuloides</i>
48.679367	-102.689475	26	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.679718	-102.689737	108	0	Silverberry	<i>Elaeagnus commutata</i>
48.679718	-102.689737	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.680214	-102.689454	176	35	Silverberry	<i>Elaeagnus commutata</i>
48.680214	-102.689454	28	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.681338	-102.689163	26	0	Silverberry	<i>Elaeagnus commutata</i>
48.681558	-102.689437	4	0	American plum	<i>Prunus americana</i>
48.682008	-102.689782	74	12	Silverberry	<i>Elaeagnus commutata</i>
48.685398	-102.689815	88	80	Quaking aspen	<i>Populus tremuloides</i>
48.685398	-102.689815	8	8	Boxelder	<i>Acer negundo</i>
48.685713	-102.690078	12	0	Chokecherry	<i>Prunus virginiana</i>
48.685713	-102.690078	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.686726	-102.690078	284	0	Silverberry	<i>Elaeagnus commutata</i>
48.686726	-102.690078	42	0	American plum	<i>Prunus americana</i>
48.686726	-102.690078	6	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.687593	-102.689925	18	0	American plum	<i>Prunus americana</i>
48.688102	-102.690021	134	0	Silverberry	<i>Elaeagnus commutata</i>
48.689837	-102.689952	520	20	American plum	<i>Prunus americana</i>
48.689837	-102.689952	485	50	Chokecherry	<i>Prunus virginiana</i>
48.689837	-102.689952	282	125	Silverberry	<i>Elaeagnus commutata</i>
48.689837	-102.689952	10	2	Bebb's willow	<i>Salix bebbiana</i>
48.689837	-102.689952	8	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.693320	-102.689565	388	20	Silverberry	<i>Elaeagnus commutata</i>
48.693320	-102.689565	118	88	Quaking aspen	<i>Populus tremuloides</i>
48.693320	-102.689565	28	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.693320	-102.689565	20	6	Chokecherry	<i>Prunus virginiana</i>
48.693320	-102.689565	10	0	Common lilac	<i>Syringa vulgaris</i>
48.694057	-102.692170	45	0	Silverberry	<i>Elaeagnus commutata</i>
48.693733	-102.691125	76	60	Quaking aspen	<i>Crataegus arnoldiana</i>
48.693252	-102.690625	210	0	Silverberry	<i>Elaeagnus commutata</i>
48.693252	-102.690625	12	0	Chokecherry	<i>Prunus virginiana</i>
48.693507	-102.691378	88	0	Silverberry	<i>Elaeagnus commutata</i>
48.693507	-102.691378	26	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.693653	-102.691618	8	0	Juneberry	<i>Amelanchier alnifolia</i>
48.694376	-102.693129	220	0	Silverberry	<i>Elaeagnus commutata</i>
48.694376	-102.693129	8	0	Juneberry	<i>Amelanchier alnifolia</i>
48.694205	-102.693492	180	0	Silverberry	<i>Elaeagnus commutata</i>
48.694205	-102.693492	4	0	Chokecherry	<i>Prunus virginiana</i>
48.694772	-102.694370	66	0	Silverberry	<i>Elaeagnus commutata</i>
48.696461	-102.699361	66	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.696706	-102.700898	512	0	Silverberry	<i>Elaeagnus commutata</i>
48.696706	-102.700898	10	0	Juneberry	<i>Amelanchier alnifolia</i>
48.699273	-102.701030	92	18	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.699273	-102.701030	88	16	Silverberry	<i>Elaeagnus commutata</i>
48.699273	-102.701030	42	12	Chokecherry	<i>Prunus virginiana</i>
48.699273	-102.701030	35	0	Quaking aspen	<i>Populus tremuloides</i>
48.699273	-102.701030	18	8	Juneberry	<i>Amelanchier alnifolia</i>
48.700100	-102.701366	6	0	Quaking aspen	<i>Populus tremuloides</i>
48.700100	-102.701366	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.700100	-102.701366	2	0	Chokecherry	<i>Prunus virginiana</i>
48.700851	-102.700105	12	0	Chokecherry	<i>Prunus virginiana</i>
48.700851	-102.700105	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.700483	-102.699783	32	6	Silverberry	<i>Elaeagnus commutata</i>
48.700483	-102.699783	28	4	American plum	<i>Prunus americana</i>
48.700483	-102.699783	10	4	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.699838	-102.699761	42	10	Silverberry	<i>Elaeagnus commutata</i>
48.699838	-102.699761	38	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.699838	-102.699761	18	6	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.699838	-102.699761	16	4	Chokecherry	<i>Prunus virginiana</i>
48.702183	-102.701172	630	0	Silverberry	<i>Elaeagnus commutata</i>
48.702183	-102.701172	156	45	American plum	<i>Prunus americana</i>
48.702183	-102.701172	62	22	Chokecherry	<i>Prunus virginiana</i>
48.702183	-102.701172	60	45	Quaking aspen	<i>Populus tremuloides</i>
48.704499	-102.701137	712	24	Silverberry	<i>Elaeagnus commutata</i>
48.704499	-102.701137	225	45	American plum	<i>Prunus americana</i>
48.704499	-102.701137	36	12	Chokecherry	<i>Prunus virginiana</i>
48.704499	-102.701137	18	2	Juneberry	<i>Amelanchier alnifolia</i>
48.705691	-102.699543	270	0	Silverberry	<i>Elaeagnus commutata</i>
48.705691	-102.699543	116	0	Chokecherry	<i>Prunus virginiana</i>
48.706511	-102.700401	7	0	Quaking aspen	<i>Populus tremuloides</i>
48.706330	-102.701085	54	8	Quaking aspen	<i>Populus tremuloides</i>
48.706874	-102.701334	146	20	Silverberry	<i>Elaeagnus commutata</i>
48.706874	-102.701334	38	0	Juneberry	<i>Amelanchier alnifolia</i>
48.706874	-102.701334	26	0	Chokecherry	<i>Prunus virginiana</i>
48.706874	-102.701334	6	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.707075	-102.698047	76	0	Silverberry	<i>Elaeagnus commutata</i>
48.708318	-102.697562	96	0	Silverberry	<i>Elaeagnus commutata</i>
48.708904	-102.698618	58	0	Silverberry	<i>Elaeagnus commutata</i>
48.708015	-102.699873	128	0	Silverberry	<i>Elaeagnus commutata</i>
48.708078	-102.700689	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.708553	-102.701310	308	0	Silverberry	<i>Elaeagnus commutata</i>
48.708553	-102.701310	18	0	Chokecherry	<i>Prunus virginiana</i>
48.707906	-102.701029	18	0	American plum	<i>Prunus americana</i>
48.707906	-102.701029	16	0	Chokecherry	<i>Prunus virginiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.708796	-102.695157	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.709192	-102.695592	28	0	Chokecherry	<i>Prunus virginiana</i>
48.709192	-102.695592	18	0	Silverberry	<i>Elaeagnus commutata</i>
48.709715	-102.696184	12	0	Chokecherry	<i>Prunus virginiana</i>
48.712302	-102.700973	28	0	Chokecherry	<i>Prunus virginiana</i>
48.712302	-102.700973	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.712302	-102.700973	1	0	Boxelder	<i>Acer negundo</i>
48.712700	-102.701141	3	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.712783	-102.701383	15	0	Chokecherry	<i>Prunus virginiana</i>
48.712783	-102.701383	15	0	Juneberry	<i>Amelanchier alnifolia</i>
48.712783	-102.701383	1	0	Boxelder	<i>Acer negundo</i>
48.718131	-102.704466	26	0	Silverberry	<i>Elaeagnus commutata</i>
48.717507	-102.703827	44	0	Sandbar willow	<i>Salix interior</i>
48.715625	-102.700828	982	60	Silverberry	<i>Elaeagnus commutata</i>
48.715625	-102.700828	315	40	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.715625	-102.700828	58	10	Chokecherry	<i>Prunus virginiana</i>
48.715625	-102.700828	46	8	Juneberry	<i>Amelanchier alnifolia</i>
48.714346	-102.701259	86	0	Silverberry	<i>Elaeagnus commutata</i>
48.713886	-102.701291	228	26	Silverberry	<i>Elaeagnus commutata</i>
48.713886	-102.701291	82	14	Chokecherry	<i>Prunus virginiana</i>
48.713886	-102.701291	56	0	Juneberry	<i>Amelanchier alnifolia</i>
48.713886	-102.701291	34	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.720711	-102.705981	178	0	Silverberry	<i>Elaeagnus commutata</i>
48.720711	-102.705981	28	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.721624	-102.706177	218	14	Silverberry	<i>Elaeagnus commutata</i>
48.721624	-102.706177	126	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.721947	-102.706050	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.722181	-102.706110	112	0	Silverberry	<i>Elaeagnus commutata</i>
48.722181	-102.706110	10	0	Juneberry	<i>Amelanchier alnifolia</i>
48.721210	-102.706384	26	0	Silverberry	<i>Elaeagnus commutata</i>
48.735023	-102.700356	48	0	Silverberry	<i>Elaeagnus commutata</i>
48.735182	-102.700241	52	0	Silverberry	<i>Elaeagnus commutata</i>
48.735429	-102.699652	46	0	Silverberry	<i>Elaeagnus commutata</i>
48.735506	-102.698995	146	10	Silverberry	<i>Elaeagnus commutata</i>
48.735665	-102.698947	1	1	American elm	<i>Ulmus Americana</i>
48.736036	-102.699014	6	0	Bebb's willow	<i>Salix bebbiana</i>
48.736174	-102.698125	284	0	Silverberry	<i>Elaeagnus commutata</i>
48.736174	-102.698125	8	0	Chokecherry	<i>Prunus virginiana</i>
48.736174	-102.698125	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.736177	-102.697556	84	0	Silverberry	<i>Elaeagnus commutata</i>
48.736177	-102.697556	16	0	Chokecherry	<i>Prunus virginiana</i>
48.736490	-102.697633	155	0	Silverberry	<i>Elaeagnus commutata</i>
48.736536	-102.698992	68	0	Silverberry	<i>Elaeagnus commutata</i>
48.737004	-102.698830	52	10	Silverberry	<i>Elaeagnus commutata</i>
48.737004	-102.698830	14	10	Bebb's willow	<i>Salix bebbiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.737462	-102.698860	156	16	Silverberry	<i>Elaeagnus commutata</i>
48.738327	-102.698989	52	0	Silverberry	<i>Elaeagnus commutata</i>
48.739122	-102.699088	112	0	Silverberry	<i>Elaeagnus commutata</i>
48.739005	-102.699566	56	0	Silverberry	<i>Elaeagnus commutata</i>
48.738865	-102.701860	72	0	Silverberry	<i>Elaeagnus commutata</i>
48.738859	-102.702176	16	0	Chokecherry	<i>Prunus virginiana</i>
48.738836	-102.702395	1	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.738844	-102.703362	464	10	Silverberry	<i>Elaeagnus commutata</i>
48.738844	-102.703362	38	6	Chokecherry	<i>Prunus virginiana</i>
48.738924	-102.704086	8	0	Juneberry	<i>Amelanchier alnifolia</i>
48.738924	-102.704086	6	0	Chokecherry	<i>Prunus virginiana</i>
48.738924	-102.704086	4	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.739051	-102.704815	8	0	Chokecherry	<i>Prunus virginiana</i>
48.739051	-102.704815	110	20	Silverberry	<i>Elaeagnus commutata</i>
48.739141	-102.704014	74	0	Silverberry	<i>Elaeagnus commutata</i>
48.739141	-102.704014	14	0	Chokecherry	<i>Prunus virginiana</i>
48.739141	-102.704014	10	0	Juneberry	<i>Amelanchier alnifolia</i>
48.739068	-102.706044	512	178	Chokecherry	<i>Prunus virginiana</i>
48.739068	-102.706044	208	66	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.739068	-102.706044	32	15	American plum	<i>Prunus americana</i>
48.739068	-102.706044	6	6	Boxelder	<i>Acer negundo</i>
48.757743	-102.733810	28	0	Silverberry	<i>Elaeagnus commutata</i>
48.758014	-102.732378	964	34	Silverberry	<i>Elaeagnus commutata</i>
48.758014	-102.732378	878	112	Chokecherry	<i>Prunus virginiana</i>
48.758014	-102.732378	318	46	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.758014	-102.732378	124	32	Juneberry	<i>Amelanchier alnifolia</i>
48.757359	-102.728626	176	0	Silverberry	<i>Elaeagnus commutata</i>
48.757163	-102.728459	8	0	Juneberry	<i>Amelanchier alnifolia</i>
48.757269	-102.728138	32	0	Chokecherry	<i>Prunus virginiana</i>
48.757432	-102.727810	38	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.757170	-102.726056	62	10	Silverberry	<i>Elaeagnus commutata</i>
48.757771	-102.727325	108	5	Silverberry	<i>Elaeagnus commutata</i>
48.761407	-102.732632	815	10	Silverberry	<i>Elaeagnus commutata</i>
48.761407	-102.732632	310	20	Juneberry	<i>Amelanchier alnifolia</i>
48.761407	-102.732632	76	8	Chokecherry	<i>Prunus virginiana</i>
48.761407	-102.732632	52	10	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.762518	-102.732698	176	0	Silverberry	<i>Elaeagnus commutata</i>
48.762518	-102.732698	6	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.763383	-102.732708	108	0	Silverberry	<i>Elaeagnus commutata</i>
48.760100	-102.733552	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.760100	-102.733552	10	0	Juneberry	<i>Amelanchier alnifolia</i>
48.759726	-102.733877	18	0	Juneberry	<i>Amelanchier alnifolia</i>
48.768855	-102.759865	585	0	Silverberry	<i>Elaeagnus commutata</i>
48.768855	-102.759865	24	0	Juneberry	<i>Amelanchier alnifolia</i>
48.769656	-102.758704	45	0	Silverberry	<i>Elaeagnus commutata</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.769607	-102.756874	338	0	Silverberry	<i>Elaeagnus commutata</i>
48.769607	-102.756874	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768856	-102.755534	244	18	Silverberry	<i>Elaeagnus commutata</i>
48.768856	-102.755534	26	20	Chokecherry	<i>Prunus virginiana</i>
48.763990	-102.733343	52	0	Silverberry	<i>Elaeagnus commutata</i>
48.763990	-102.733343	8	0	Juneberry	<i>Amelanchier alnifolia</i>
48.765135	-102.732818	514	20	Silverberry	<i>Elaeagnus commutata</i>
48.765135	-102.732818	12	0	Juneberry	<i>Amelanchier alnifolia</i>
48.765941	-102.732679	446	0	Silverberry	<i>Elaeagnus commutata</i>
48.765941	-102.732679	16	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.766250	-102.732671	12	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.766586	-102.732846	215	0	Silverberry	<i>Elaeagnus commutata</i>
48.766586	-102.732846	78	16	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.767690	-102.733021	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.767977	-102.732885	9	2	Bebb's willow	<i>Salix bebbiana</i>
48.768242	-102.732843	28	1	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768388	-102.733064	6	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768462	-102.732834	16	0	Chokecherry	<i>Prunus virginiana</i>
48.768429	-102.732618	14	0	Chokecherry	<i>Prunus virginiana</i>
48.769522	-102.732676	226	0	Silverberry	<i>Elaeagnus commutata</i>
48.769674	-102.732993	62	0	Silverberry	<i>Elaeagnus commutata</i>
48.769674	-102.732993	10	0	Chokecherry	<i>Prunus virginiana</i>
48.769146	-102.733114	68	0	Silverberry	<i>Elaeagnus commutata</i>
48.769146	-102.733114	6	0	Chokecherry	<i>Prunus virginiana</i>
48.768789	-102.734745	182	0	Silverberry	<i>Elaeagnus commutata</i>
48.768782	-102.736058	188	16	Silverberry	<i>Elaeagnus commutata</i>
48.768782	-102.736058	47	10	Chokecherry	<i>Prunus virginiana</i>
48.768782	-102.736058	16	4	Sandbar willow	<i>Salix interior</i>
48.768782	-102.736058	9	2	Bebb's willow	<i>Salix bebbiana</i>
48.768968	-102.736879	76	0	Silverberry	<i>Elaeagnus commutata</i>
48.768729	-102.737978	26	0	Bebb's willow	<i>Salix bebbiana</i>
48.768797	-102.739845	318	0	Silverberry	<i>Elaeagnus commutata</i>
48.768752	-102.740664	1	0	Bebb's willow	<i>Salix bebbiana</i>
48.768757	-102.741675	18	0	Quaking aspen	<i>Populus tremuloides</i>
48.768771	-102.742298	28	0	Silverberry	<i>Elaeagnus commutata</i>
48.768881	-102.742757	608	16	Silverberry	<i>Elaeagnus commutata</i>
48.768979	-102.743373	38	0	Silverberry	<i>Elaeagnus commutata</i>
48.768979	-102.743373	32	4	Juneberry	<i>Amelanchier alnifolia</i>
48.768979	-102.743373	24	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768840	-102.744126	684	0	Silverberry	<i>Elaeagnus commutata</i>
48.768840	-102.744126	108	0	Chokecherry	<i>Prunus virginiana</i>
48.768735	-102.745416	22	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768960	-102.745375	26	0	Juneberry	<i>Amelanchier alnifolia</i>
48.768960	-102.745375	24	0	Chokecherry	<i>Prunus virginiana</i>
48.768844	-102.746312	208	185	Chokecherry	<i>Prunus virginiana</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.768844	-102.746312	70	55	Quaking aspen	<i>Populus tremuloides</i>
48.768844	-102.746312	36	28	Juneberry	<i>Amelanchier alnifolia</i>
48.768844	-102.746312	1	1	Green ash	<i>Fraxinus pennsylvanica</i>
48.768717	-102.748036	256	0	Silverberry	<i>Elaeagnus commutata</i>
48.768717	-102.748036	38	0	Chokecherry	<i>Prunus virginiana</i>
48.768717	-102.748036	27	0	Juneberry	<i>Amelanchier alnifolia</i>
48.768717	-102.748036	24	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768877	-102.748194	18	0	Silverberry	<i>Elaeagnus commutata</i>
48.769048	-102.748033	18	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768839	-102.748878	66	6	Chokecherry	<i>Prunus virginiana</i>
48.768839	-102.748878	22	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.769030	-102.749547	816	0	Silverberry	<i>Elaeagnus commutata</i>
48.769030	-102.749547	20	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.769066	-102.750234	18	0	Chokecherry	<i>Prunus virginiana</i>
48.769066	-102.750234	10	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768810	-102.749807	164	65	Chokecherry	<i>Prunus virginiana</i>
48.768810	-102.749807	156	60	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.769436	-102.750112	32	0	Silverberry	<i>Elaeagnus commutata</i>
48.769436	-102.750112	12	2	Chokecherry	<i>Prunus virginiana</i>
48.769714	-102.750559	74	0	Silverberry	<i>Elaeagnus commutata</i>
48.769714	-102.750559	32	6	Chokecherry	<i>Prunus virginiana</i>
48.769714	-102.750559	5	4	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.770412	-102.752030	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.770412	-102.752030	1	0	American elm	<i>Ulmus Americana</i>
48.770478	-102.752390	17	7	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.770246	-102.752996	58	10	Chokecherry	<i>Prunus virginiana</i>
48.770246	-102.752996	28	8	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.770246	-102.752996	18	8	Juneberry	<i>Amelanchier alnifolia</i>
48.769976	-102.753361	20	10	Chokecherry	<i>Prunus virginiana</i>
48.769299	-102.753703	266	0	Silverberry	<i>Elaeagnus commutata</i>
48.769299	-102.753703	84	10	Chokecherry	<i>Prunus virginiana</i>
48.769299	-102.753703	18	2	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.768797	-102.753925	28	28	Chokecherry	<i>Prunus virginiana</i>
48.768797	-102.753925	14	14	Juneberry	<i>Amelanchier alnifolia</i>
48.764368	-102.735957	62	0	Silverberry	<i>Elaeagnus commutata</i>
48.765172	-102.735841	24	0	Silverberry	<i>Elaeagnus commutata</i>
48.765360	-102.735531	22	0	Silverberry	<i>Elaeagnus commutata</i>
48.766221	-102.733746	112	0	Silverberry	<i>Elaeagnus commutata</i>
48.680875	-102.689235	36	0	Silverberry	<i>Elaeagnus commutata</i>
48.68132	-102.689109	46	0	Silverberry	<i>Elaeagnus commutata</i>
48.706154	-102.698585	38	0	Silverberry	<i>Elaeagnus commutata</i>
48.705546	-102.699452	60	0	Silverberry	<i>Elaeagnus commutata</i>
48.705153	-102.700183	98	0	Silverberry	<i>Elaeagnus commutata</i>
48.705153	-102.700183	15	0	Juneberry	<i>Amelanchier alnifolia</i>
48.706605	-102.700279	24	0	Silverberry	<i>Elaeagnus commutata</i>

Northern Divide 345-kV Transmission Line
Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.706665	-102.700707	28	0	Silverberry	<i>Elaeagnus commutata</i>
48.709052	-102.699258	52	0	Silverberry	<i>Elaeagnus commutata</i>
48.75899	-102.734792	20	0	Silverberry	<i>Elaeagnus commutata</i>
48.759234	-102.734653	12	0	Silverberry	<i>Elaeagnus commutata</i>
48.759637	-102.734153	8	0	Silverberry	<i>Elaeagnus commutata</i>
48.760088	-102.733735	42	0	Juneberry	<i>Amelanchier alnifolia</i>
48.760088	-102.733735	28	0	Silverberry	<i>Elaeagnus commutata</i>
48.398157	-102.844181	72	0	Silverberry	<i>Elaeagnus commutata</i>
48.398007	-102.843895	23	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.398007	-102.843895	7	0	Silverberry	<i>Elaeagnus commutata</i>
48.398660	-102.843010	276	0	Silverberry	<i>Elaeagnus commutata</i>
48.430050	-102.734610	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.430152	-102.734195	104	0	Chokecherry	<i>Prunus virginiana</i>
48.430152	-102.734195	14	0	Juneberry	<i>Amelanchier alnifolia</i>
48.430152	-102.734195	10	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430228	-102.733761	45	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430465	-102.733385	141	0	Chokecherry	<i>Prunus virginiana</i>
48.430465	-102.733385	126	0	Juneberry	<i>Amelanchier alnifolia</i>
48.430465	-102.733385	28	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.430465	-102.733385	21	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.430827	-102.733297	43	0	Juneberry	<i>Amelanchier alnifolia</i>
48.430827	-102.733297	15	0	Chokecherry	<i>Prunus virginiana</i>
48.431467	-102.732717	322	0	Silverberry	<i>Elaeagnus commutata</i>
48.431467	-102.732717	310	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.431467	-102.732717	84	0	Chokecherry	<i>Prunus virginiana</i>
48.431467	-102.732717	1	0	Green ash	<i>Fraxinus pennsylvanica</i>
48.441329	-102.731619	10	0	Silverberry	<i>Elaeagnus commutata</i>
48.441314	-102.731829	24	0	Tatarian honeysuckle	<i>Lonicera tatarica</i>
48.441314	-102.731829	12	0	Chokecherry	<i>Prunus virginiana</i>
48.441314	-102.731829	8	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.466394	-102.690391	16	0	American plum	<i>Prunus americana</i>
48.510199	-102.678451	8	0	Chokecherry	<i>Prunus virginiana</i>
48.539177	-102.68944	1	0	Chokecherry	<i>Prunus virginiana</i>
48.561904	-102.713693	68	8	American plum	<i>Prunus americana</i>
48.561904	-102.713693	31	0	Silver buffaloberry	<i>Shepherdia argentea</i>
48.562425	-102.713522	68	0	American plum	<i>Prunus americana</i>
48.562425	-102.713522	42	0	Chokecherry	<i>Prunus virginiana</i>
48.618853	-102.713385	6	0	Chokecherry	<i>Prunus virginiana</i>
48.659284	-102.674225	18	0	Silverberry	<i>Elaeagnus commutata</i>
48.659043	-102.674260	16	0	Silverberry	<i>Elaeagnus commutata</i>
48.660141	-102.675090	2	0	Peachleaf willow	<i>Salix amygdaloides</i>

Northern Divide 345-kV Transmission Line
 Tree and Shrub Inventory

Location		Number		Species of Trees and Shrubs	
Latitude	Longitude	Initial Inventory	Removed by Construction	Common Name	Scientific Name
48.669372	-102.679175	2	0	Bebb's willow	<i>Salix bebbiana</i>
48.669362	-102.678952	98	0	Silverberry	<i>Elaeagnus commutata</i>
48.676569	-102.690352	42	0	Silverberry	<i>Elaeagnus commutata</i>
48.716288	-102.701352	128	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.715228	-102.700296	318	0	Arnold hawthorn	<i>Crataegus arnoldiana</i>
48.715228	-102.700296	86	0	Silverberry	<i>Elaeagnus commutata</i>
48.715228	-102.700296	25	0	Chokecherry	<i>Prunus virginiana</i>
48.735344	-102.698671	160	0	Silverberry	<i>Elaeagnus commutata</i>