Rocky Forge Wind Project

Botetourt County, Virginia

WSSI #22766.01

Ecological Community Group – Vegetation Assessment

October 17, 2016

Prepared by:

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Ecological Community Group – Vegetation Assessment
Rocky Forge Wind Project
(± 562 acres)
WSSI #22766.01

Introduction

Wetland Studies and Solutions, Inc. (WSSI) conducted ecological community surveys at the Rocky Forge Wind Project (hereafter referred to as the "Project"). The Project is proposed in Botetourt County, Virginia, approximately 0.5 miles northeast of the intersection of Dagger Springs Road and Blue Grass Trail (Figure 1). As discussed in this report, a total of six natural ecological communities were identified and include: Acidic Cove Forests, Eastern White Pine-Hardwood Forests, Montane Mixed Oak Forests, Northern Red Oak Forests, Oak/Heath Forests, and Pine-Oak/Heath Woodlands. Disturbed areas (e.g., mowed/maintained fields and access roads) were also documented within the Project area. Our findings are depicted on the Ecological Community Group Map (Appendix A) and are discussed briefly below.

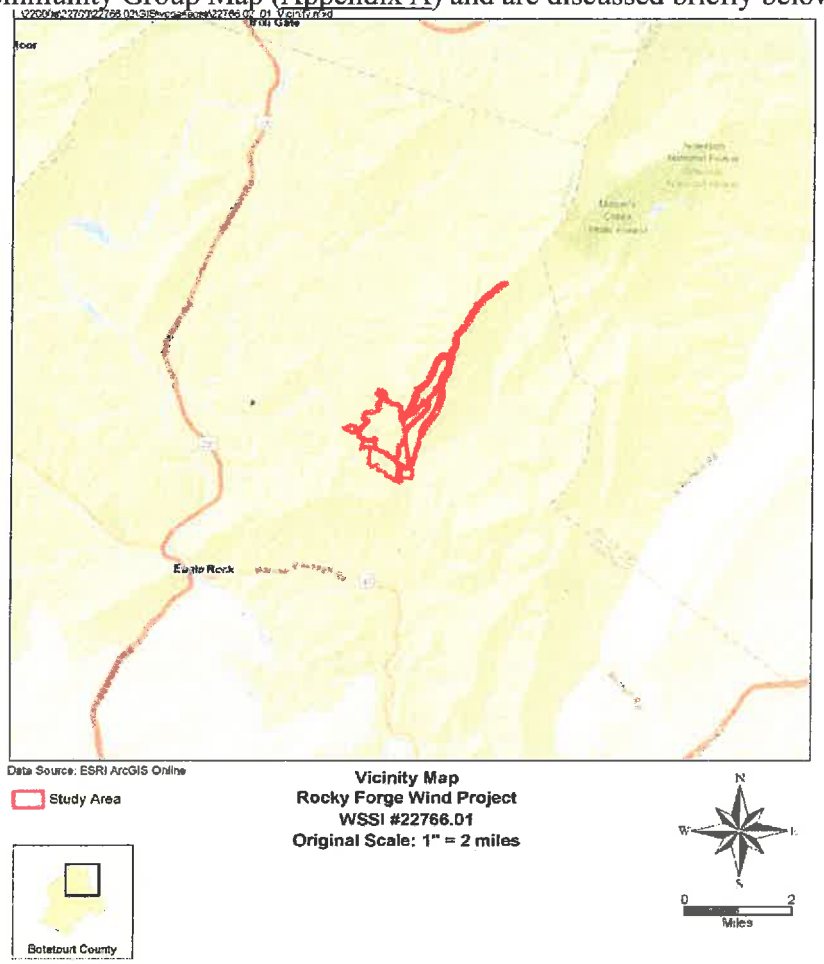

Figure 1. Vicinity Map

Methodology

Studies were completed from November 16 through 19, 2015, with a follow up visits on February 22, 2016 and September 27 and 28, 2016 to include additional plots and changes to the Study area boundary, in accordance with approval from the Virginia Department of Conservation and Recreation (DCR). Per DCR's protocol, vegetation assessments should be conducted between May 1 and September 30, unless otherwise noted in the guidance document. Permission was obtained from Karen Patterson of DCR via phone call on November 12, 2015 to conduct the vegetation survey for this site outside the survey window. The ecological community assessment was performed pursuant to the "Rapid Assessment Field Surveys for Ecological Community Groups within Proposed Wind Energy Project Areas" (May 9, 2011; herein referred to as "Rapid Assessment Protocol"), the Natural Communities of Virginia: Ecological Groups and Community Types Technical Report[i], and the Natural Communities of Virginia: Classification of Ecological Community Groups[ii] website.

Field work was performed by Jennifer D. Feese, ISA Certified Arborist, PWS, PWD, CT[iii], Beth A. Clements, ISA Certified Arborist, PWS, PWD, CT[iv], and Caitlin L. Homan on November 16 through 19, 2015. Follow up fieldwork was performed by Lauren L. Shaffer, WPIT, CT[v], and Caitlin L. Homan on February 22, 2016, and additionally on September 27 through 28, 2016 by Neil Gutherman WPIT, and Michael C. Smith.

Prior to conducting field work, relevant background information was reviewed, including site topography, the Sugarloaf Mountain, VA 1986 and Eagle Rock, VA 1985 USGS quadrangle (Appendix B: Exhibit 1) and Digital National Wetlands Inventory (Appendix B: Exhibit 2; downloaded September 2014) maps, Botetourt County Soils Map data (Appendix B: Exhibit 3), and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Panel 51163C0350C (Appendix B: Exhibit 4; Effective 4/6/2000). A spring 2011 natural color aerial photograph from VARGIS, LLC (Appendix B: Exhibit 5), was also examined to identify vegetation blocks of similar structure and composition in order to determine potential sampling locations.

According to DCR's Rapid Assessment Protocol, the minimum number of observations per vegetation block is:

less than 10 acres: ≥1 observation
10 acres to 100 acres: ≥2 observations
100-500 acres: ≥3 observations
greater than 500 acres: ≥5 observations

As outlined in the Rapid Assessment Protocol, a 17.8 meter radius circle was established within the most representative portion of the pre-selected sampling locations and away from disturbed areas (e.g., access roads, maintained fields). The plot center was demarcated in the field with orange flagging and given an alphanumeric code (e.g., A-1, B-1, etc.). Representative photos of each plot as well as other site conditions are included in Appendix C. Additionally, the latitude/longitude and altitude of the plot center was collected for every sampling point using a GETAC F110 Tablet GPS unit.

As outlined on the Virginia DCR Rapid Vegetation Assessment Form, the following information was collected at each sample plot: slope, aspect, soil moisture regime, hydrologic regime, soil texture, rock types, cover by unvegetated rock, evidence of disturbance, landscape

context, and tree diameter and height. Species composition and abundance were also measured according to strata (herb, shrub, subcanopy, canopy) for those species that occupied a minimum cover area of one square meter. Abundance was recorded for each species within a given strata as dominant, locally dominant, common, rare or present. Additionally, the ecological integrity of each vegetation community described was ranked on a scale of A to D (A=excellent, B=Good, C=Fair, D=Poor). Data forms for each sampling plot are included in Appendix D. The approximate locations of the ecological community boundaries, sample plots, and photographs are included on the Ecological Community Group Map (Appendix A).

Ecological Community Group Assessment Findings

A total of six ecological community groups were observed within the Study area. These groups include: Acidic Cove Forests, Eastern White Pine-Hardwood Forests, Montane Mixed Oak Forest, Northern Red Oak Forests, Oak/Heath Forest, and Pine-Oak/Heath Woodlands and were classified as such based on the descriptions provided on DCR-NHR's "The Natural Communities of Virginia: Classification of Ecological Community Groups" website.

The Oak-Heath Forest community was the largest community group observed throughout the Study area (approximately 219 acres) and was represented by six sampling plots (Plots A-1 through A-6). This community received an ecological integrity rating of B (Good) due to the large stand size, the relatively large size of the canopy trees, minimal presence of invasive species, and the presence of dirt access roads. The invasive species and access roads precluded this community from an integrity rating of A. Dominant and common species throughout the six sampling plots included white oak (*Quercus alba*), black oak (*Quercus velutina*), chestnut oak (*Quercus montana*), mockernut hickory (*Carya tomentosa*), pignut hickory (*Carya glabra*), black gum (*Nyssa sylvatica*), tulip poplar (*Liriodendron tulipifera*), northern red oak (*Quercus rubra*), flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), striped wintergreen (*Chimaphila macalata*), cat brier (*Smilax glauca*), and a blueberry species (*Vaccinium spp.*). Invasive species included multiflora rose (*Rosa multiflora*), which was documented as rare in the herbaceous layer of Plot A-3.

The Northern Red Oak Forest community comprised approximately 3 acres in the northeastern portion of the Study area and was represented by a single sampling plot (Plot B-1). This community received an overall ecological integrity rating of B (Good) due to the relatively large size of the trees, minimal anthropogenic disturbances (dirt access road) and the absence of invasive species. Dominant and common species observed included: northern red oak, chestnut oak, sweet birch (*Betula lenta*), blueberry species, striped maple (*Acer pensylvanicum*), and striped wintergreen.

The Pine-Oak/Heath Woodlands community comprised approximately 95 acres in the central, southern, and western portions of the Study area, and was represented by three sampling plots (Plots C-1 through C-3). This community received an overall ecological integrity rating of B (Good) due to the relatively large size and condition of the canopy trees, minimal presence of invasive species and the presence of dirt access roads. The invasive species and access roads precluded this community from an integrity rating of A. Dominant and common species included table mountain pine (*Pinus pungens*), pitch pine (*Pinus rigida*), mountain laurel (*Kalmia latifolia*), chestnut oak, bear oak (*Quercus ilicifolia*), cat brier, American chestnut (*Castanea dentata*), and black gum. The invasive species included multiflora rose, which was documented as rare in the herbaceous layer of Plot C-1.

The Acidic Cove Forest community comprised approximately 48 acres in the southern portion of the Study area and was represented by three sampling plots (Plots D-1 through D-3). This community received an ecological integrity rating of C (Fair) due to the presence of invasive species, the young age of the stand, evidence of disease, and its close proximity to Dagger Springs Road and other disturbed areas. Dominant and common species within the plot included tulip poplar, black cherry (*Prunus serotina*), eastern redbud (*Cercis canadensis*), black locust (*Robinia pseudoacacia*), red maple (*Acer rubrum*), eastern white pine (*Pinus strobus*), Christmas fern (*Polystichum acrostichoides*) and grape (*Vitis* sp.). Cucumber magnolia (*Magnolia acuminata*) and white ash (*Fraxinus americana*) were also present in the tree canopy but were considered rare. Invasive species within these stands included garlic mustard (*Alliaria petiolata*), wineberry (*Rubus phoenicolasius*), Japanese honeysuckle (*Lonicera japonica*), and autumn olive (*Elaeagnus umbellata*).

The Eastern White Pine – Hardwood Forest community comprised approximately 46 acres in the southern portion of the Study area and was represented by three sampling plots (Plots E-1 through E-3). This community received an ecological integrity rating of C (Fair) due to evidence of past logging, the presence of invasive species, and the close proximity of the stand to Dagger Springs Road. Dominant and common species present at the site included eastern white pine, tulip poplar, black cherry, black locust, Christmas fern, northern spicebush (*Lindera benzoin*), coralberry (*Symphoricarpos orbiculatus*), grape, greenbriar (*Smilax rotundifolia*), and lady fern (*Athyrium filix-femina*). The invasive tree of heaven (*Ailanthus altissima*) was documented as rare in the subcanopy.

The Montane Mixed Oak Forest community comprised approximately 57 acres in the southern portion of the Study area and was represented by two sampling plots (Plots G-1 and G-2). This community received an overall ecological integrity rating of C (Fair) due to the presence of invasive species, the young age of the stand, and its close proximity to Dagger Springs Road. Dominant and common species within the plot include chestnut oak, tulip poplar, mockernut hickory, sweet birch, red maple, striped maple, white oak, northern red oak, black gum, eastern white pine, cucumber magnolia, mountain laurel (*Kalmia latifolia*), and witch hazel (*Hamamelis virginiana*). American beech (*Fagus grandifolia*) was also present in the subcanopy, but was considered rare. Invasive species within these stands include garlic mustard.

In addition to the aforementioned vegetation community groups, rock outcrops, streams and disturbed areas were also observed within the Study area. The disturbed areas consisted of maintained/ mowed areas and the dirt access roads.

Limitations

This study is based on the examination of the vegetation, site characteristics, and available reference documents. Our review and report have been prepared in accordance with generally accepted guidelines for the conduct of a survey for vegetation communities. We make no other warranties, either expressed or implied, and our report is not a recommendation to buy, sell, or develop the property.

WETLAND STUDIES AND SOLUTIONS, INC.

Michael C. Smith,
Environmental Technician

Benjamin N. Rosner, PWS, PWD, CT, CE[i]
Manager – Environmental Science

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[i] *Fleming, Gary P. and Karen D. Patterson 2013. Natural Communities of Virginia: Ecological Groups and Community Types. Natural Heritage Technical Report 13-16. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. 36 pages.*

[ii] *Fleming, G.P., K.D. Patterson, K. Taverna, and P.P. Coulling. 2013. The natural communities of Virginia: classification of ecological community groups. Second approximation. Version 2.6. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, VA. <http://www.dcr.virginia.gov/natural-heritage/natural-communities/ncintro.shtml>*

[iii] *International Society of Arborculture (ISA) Certified Arborist, MA-5134A; Professional Wetland Scientist #1871, Society of Wetlands Scientists Certification Program, Inc.; VA Certified Professional Wetland Delineator #3402-000095; Society for Freshwater Science (SFS) Certified Family Level Taxonomist: All Phyla;*

[iv] *International Society of Arboriculture (ISA) Certified Arborist, MA-5101A; Professional Wetland Scientist #2350, Society of Wetland Scientists Certification Program, Inc.; VA Certified Professional Wetland Delineator #3402-0000146; and Society for Freshwater Science (SFS) Certified Family Level Taxonomist: All Phyla*

[v] *Wetland Professional in Training, Society of Wetland Scientists Certification Program, Inc.; Society for Freshwater Science (SFS) Certified Family Level Taxonomist: All Phyla.*

ECOLOGICAL COMMUNIT GROUP – VEGETATION ASSESSMENT

ROCKY FORGE WIND PROJECT

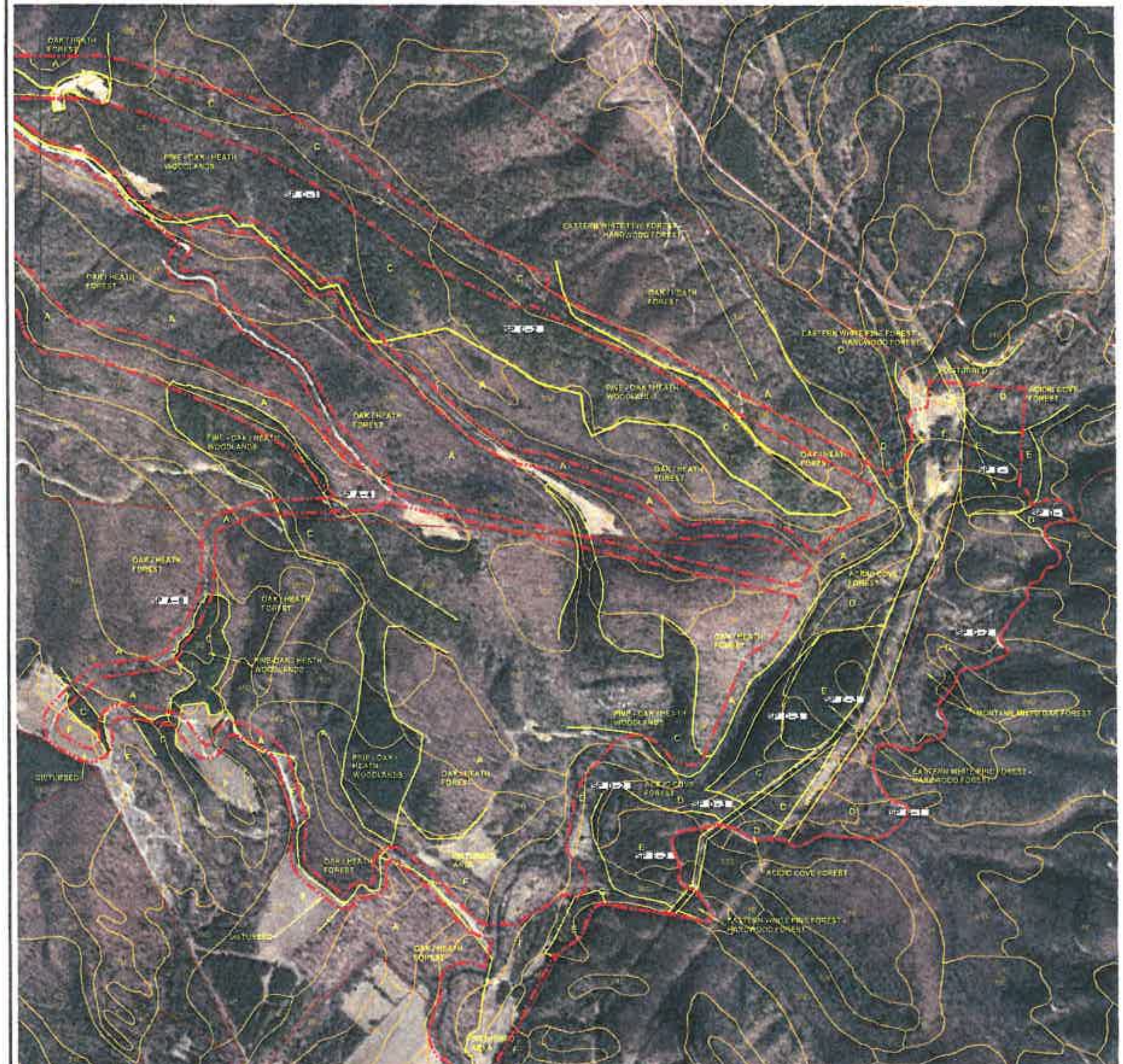
APPENDIX

A. ECOLOGICAL COMMUNITY GROUP MAP

B. EXHIBITS
   1. USGS Quad Maps
   2. Digital National Wetland Inventory Map
   3. Soils Map
   4. Digital FEMA Flood Insurance Rate Map
   5. Spring 2011 Natural Color Imagery

C. STUDY AREA PHOTOGRAPHS

D. DATA FORMS



NOTES:

1. This map has been oriented to The Virginia Coordinate System of 1983, South Zone. Sample Plots were located in the field using a GETAC F110 Tablet GPS unit, in Geographic Latitude and Longitude. GPS data was converted to The Virginia Coordinate System of 1983, South Zone using Copracon 6.0.1. Site conditions, such as forest cover and terrain, can hinder accuracy. For that reason, Mapping grade GPS locations are depicted for a graphical representation only and it does not constitute a survey. The accuracy of the aforementioned plots preclude their use for design purposes. Field locations were completed on November 19, 2015.

2. Wetland Studies and Solutions, Inc. (WSSI) conducted an ecological community group assessment for the Apex Clean Energy Site in Botetourt County, Virginia. Field work was performed by Jennifer D. Fease, PWS, PWD, Beth A. Clements PWS, PWD, and Caitlin L. Homan from November 16 to the 19th, 2015. Additional fieldwork was performed by Neil Gutherman WPIT and Michael C. Smith from September 27 to the 28th, 2016. Per DCR's Rapid Assessment Protocol, vegetation assessments should be conducted between May 1 and September 30, unless otherwise noted in the guidance document. Permission was obtained from DCR to conduct the vegetation survey for the Apex Clean Energy study area outside the survey window. However, because the survey was conducted outside the recommended window, some species may have been absent or unidentifiable during the field work.

3. Boundary information was obtained from Apex Clean Energy, Inc, and a Spring 2011 Natural Color Imagery aerial photograph from Virginia Base Mapping Program was used as a base for this Attachment.

4. Five major forest stand types were identified within the study area. Ecological community group descriptions are provided on DCR-NHR's "The Natural Communities of Virginia: Classification of Ecological Community Groups" website. These stand types are as follows:

Forest Stand A: Oak/Heath Forest. The Oak-Heath Forest community was the largest community group observed throughout the study area (approximately 219 acres) and was represented by six sampling plots (Plots A-1 through A-6). This community received an ecological integrity rating of B (Good), due to the large stand size, the relatively large size of the canopy trees, minimal presence of invasive species, and the presence of dirt access roads. Dominant and common species throughout the six sampling plots included white oak (*Quercus alba*), black oak (*Quercus velutina*), chestnut oak, mockernut hickory (*Carya tomentosa*), pignut hickory (*Carya glabra*), black gum, tulip poplar, red oak, flowering dogwood (*Cornus florida*), sassafras (*Sassafras albidum*), striped wintergreen, cat brier, and a blueberry species. Multiflora rose was documented as rare in the herbaceous layer of Plot A-3.

Forest Stand B: Northern Red Oak Forest. The Northern Red Oak Forest community comprised approximately 2 acres in the northeastern portion of the study area and was represented by a single sampling plot (Plot B-1). This community received an overall ecological integrity rating of B (Good) due to the relatively large size of the trees, minimal anthropogenic disturbances (dirt access road) and the absence of invasive species. Dominant and common species observed included: northern red oak (*Quercus rubra*), chestnut oak (*Quercus montana*), sweet birch (*Betula lenta*), blueberry species (*Vaccinium* sp.), striped maple (*Acer pensylvanicum*), and striped wintergreen (*Chimaphila maculata*).

Forest Stand C: Pine - Oak/Heath Woodlands. The Pine-Oak/Heath Woodlands community comprised approximately 95 acres, is located in the central, southern, and western portions of the study area, and was represented by three sampling plots (Plots C-1 through C-3). This community received an overall ecological integrity rating of B (Good) due to the relatively large size and condition of the canopy trees, minimal presence of invasive species and the presence of dirt access roads. Dominant and common species included table mountain pine (*Pinus pungens*), pitch pine (*Pinus rigida*), mountain laurel (*Kalmia latifolia*), chestnut oak, bear oak (*Quercus ilicifolia*), cat brier (*Smilax glauca*), American chestnut (*Castanea dentata*), and black gum (*Nyssa sylvatica*). The invasive species included multiflora rose (*Rosa multiflora*), which was documented as rare in the herbaceous layer of Plot C-1.

Forest Stand D: Acidic Cove Forest. The Acidic Cove Forest community comprised approximately 48 acres in the southern portion of the study area and was represented by a three sampling plots (Plots D-1 through D-3) This community received an ecological integrity rating of C (Fair) due to the presence of invasive species, the young age of the stand, evidence of disease, and its close proximity to Dagger Springs Road. Dominant and common species within the plot included tulip poplar (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), eastern redbud (*Cercis canadensis*), black locust (*Robinia pseudoacacia*), red maple (*Acer rubrum*), eastern white pine (*Pinus strobus*), Christmas fern (*Polystichum acrostichoides*) and grape (*Vitis* sp.). Cucumber magnolia (*Magnolia acuminata*) and white ash (*Fraxinus americana*) were also present in the tree canopy but were considered rare. Invasive species within this stand included garlic mustard (*Alliaria petiolata*), wineberry (*Rubus phoenicolasius*), Japanese honeysuckle (*Lonicera japonica*), and autumn olive (*Elaeagnus umbellata*).

Forest Stand E: Eastern White Pine - Hardwood Forest. The Eastern White Pine - Hardwood Forest community comprised approximately 46 acres in the southern portion of the study area and was represented by three sampling plot (Plot E-1 through E3). This community received an ecological integrity rating of C (Fair) due to evidence of past logging, the presence of invasive species, and the close proximity of the stand to Dagger Springs Road. Dominant and common species present at the site included eastern white pine, tulip poplar, black cherry, black locust, Christmas fern, northern spicebush (*Lindera benzoin*), coralberry (*Symphoricarpos orbiculatus*), grape, greenbrier (*Smilax rotundifolia*), and lady fern (*Athyrium filix-femina*). The invasive tree of heaven (*Ailanthus altissima*) was documented as rare in the subcanopy.

Forest Stand G: Montane Mixed Oak Forest.The Montane Mixed Oak Forest community comprised approximately 57 acres in the southern portion of the Facility Impact Area and was represented by two sampling plots (Plots G-1 and G-2). This community received an overall ecological integrity rating of C (Fair) due to the presence of invasive species, the young age of the stand and its close proximity to Dagger Springs Road. Dominant and common species within the plot include chestnut oak (*Quercus montana*), tulip poplar (*Liriodendron tulipifera*), mockernut hickory (*Carya tomentosa*), sweet birch (*Betula lenta*) red maple (*Acer rubrum*), striped maple (*Acer pensylvanicum*), white oak (*Quercus alba*), red oak (*Quercus rubra*), black gum (*Nyssa sylvatica*), eastern white pine (*Pinus strobus*), cucumber magnolia (*Magnolia acuminata*), mountain laurel (*Kalmia latifolia*), and witch hazel (*Hamamelis virginiana*). American beech (*Fagus grandifolia*) was also present in the subcanopy, but was considered rare. Invasive species within these stands include garlic mustard (*Alliara petiolata*).

5. Non-Forest Communities:

Disturbed Areas (F) - This category comprises ±85 acres located throughout the study area. Disturbed areas consisted primarily of maintained / mowed fields and access roads.

MAPPED SOILS		
Mapping Unit Number	Soils Series Name	Slope
3D	Ballegap cobbly fine sandy loam	15-30%
4E	Berks-Weikert complex	30-60%
5B	Botetourt loam	2-7%
12C	Dekalb channery fine sandy loam	2-15%
12D	Dekalb channery fine sandy loam	15-30%
12E	Dekalb channery fine sandy loam	30-60%
13E	Dekalb-Rock outcrop complex	10-35%
13F	Dekalb-Rock outcrop complex	35-80%
14A	Derroc cobbly loam	0-4%
17C	Ernest silt loam	7-15%
33C	Laidig fine sandy loam	7-15%
34C	Laidig cobbly fine sandy loam	7-15%
35C	Laidig cobbly fine sandy loam	2-15%
35D	Laidig cobbly fine sandy loam	15-30%
36E	Lehew-Dekalb complex	30-60%
37C	Lily gravelly sandy loam	2-15%
37D	Lily gravelly sandy loam	15-30%
37E	Lily gravelly sandy loam	30-60%

SCALE: 1" = 5000'

VCS 1983 SOUTH ZONE

GRAPHIC SCALE

(IN FEET)
1 inch = 800 ft.

LEGEND

STUDY AREA BOUNDARY

SOIL SERIES BOUNDARY AND SYMBOL

ECOLOGICAL COMMUNITY BOUNDARY

SP A-1 APPROXIMATE SAMPLE PLOT LOCATION/NUMBER (orange glo) (NOTE #1)

Appendix A:
Ecological Community Group Map

Rocky Forge Wind Project
Botetourt County, Virginia

REVISIONS

No.	Date	Description	Rev. By	App. By

DATE: October 2016 | SCALE: As Noted | C.I.: N/A

Horizontal Datum: VCS NAD 83
Vertical Datum: N/A
Boundary and Topo Source: Apex Clean Energy, Inc.

Design	Draft	Approved
MCS	JDF	BNE

Sheet #
1 of 2

Computer File Name:

VCS 1983 SOUTH ZONE

SEE SHEET 1 FOR NOTES AND LEGEND

GRAPHIC SCALE

(IN FEET)
1 inch = 600 ft.

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Appendix A:
Ecological Community Group Map

Rocky Forge Wind Project
Botetourt County, Virginia

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REVISIONS				
No.	Date	Description	By	App. By

DATE: October 2016 | SCALE: 1" = 500' | C.I.: N/A

Horizontal Datum: VCS NAD 83

Vertical Datum:

Boundary and Topo Sources:
Apex Clean Energy, Inc.
USGS

Design	Draft	Approved
MCS	JDF	BNR

Sheet #
2 of 2

Computer File Name:

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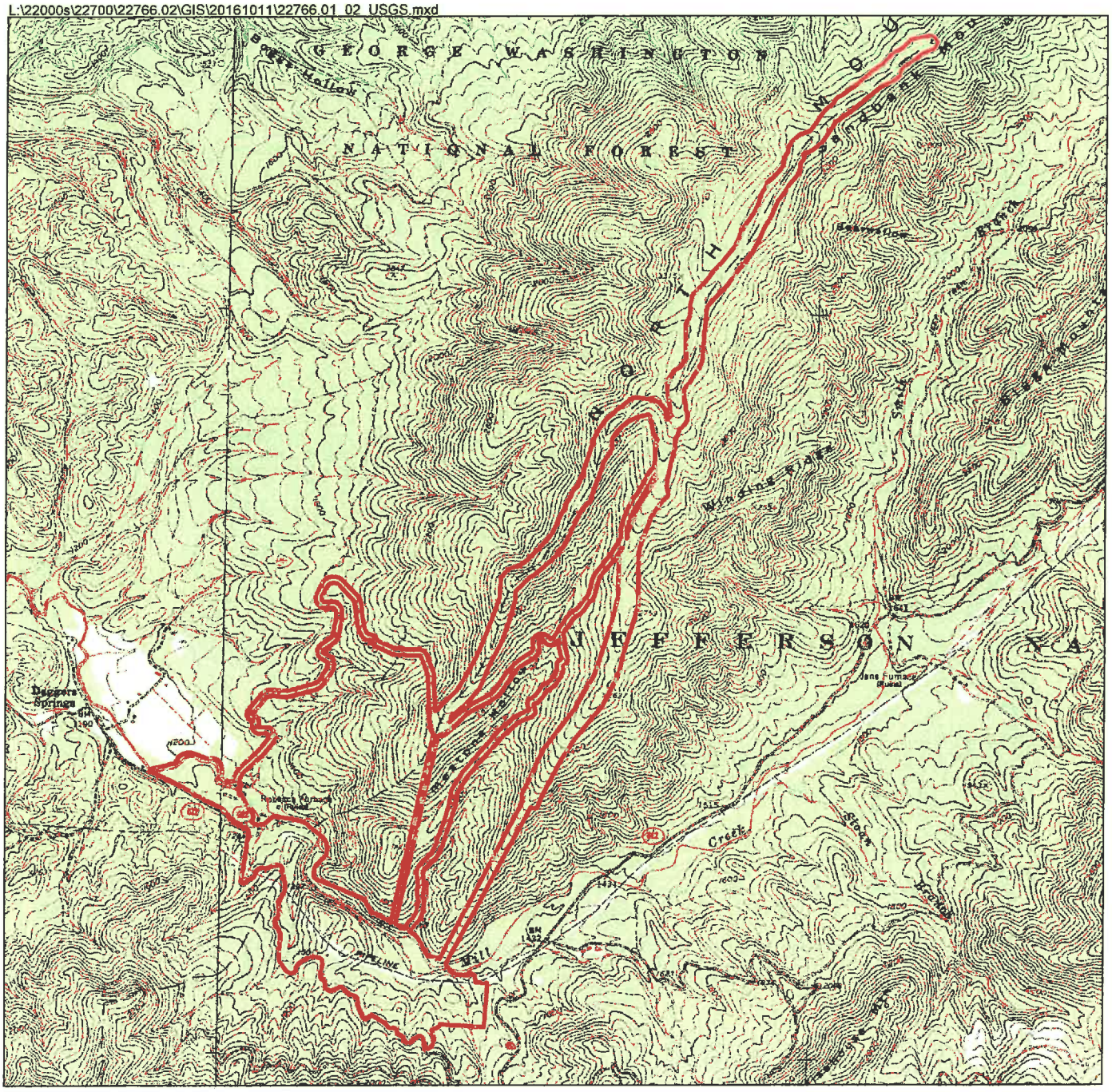

USGS Quad Maps
Sugarloaf Mountain, VA 1986 & Eagle Rock, VA 1985
Rocky Forge Wind Project
WSSI #22766.01
Original Scale: 1" = 3000'

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Study Area
Latitude: 37°41'33" N
Longitude: 79°43'40" W
Hydrologic Unit Code (HUC): 020802010902, 020802010903
Name of Watershed: Sinking Creek, Mill Creek-Smith Branch
COE Region: Eastern Mountains and Piedmont

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Exhibit 1

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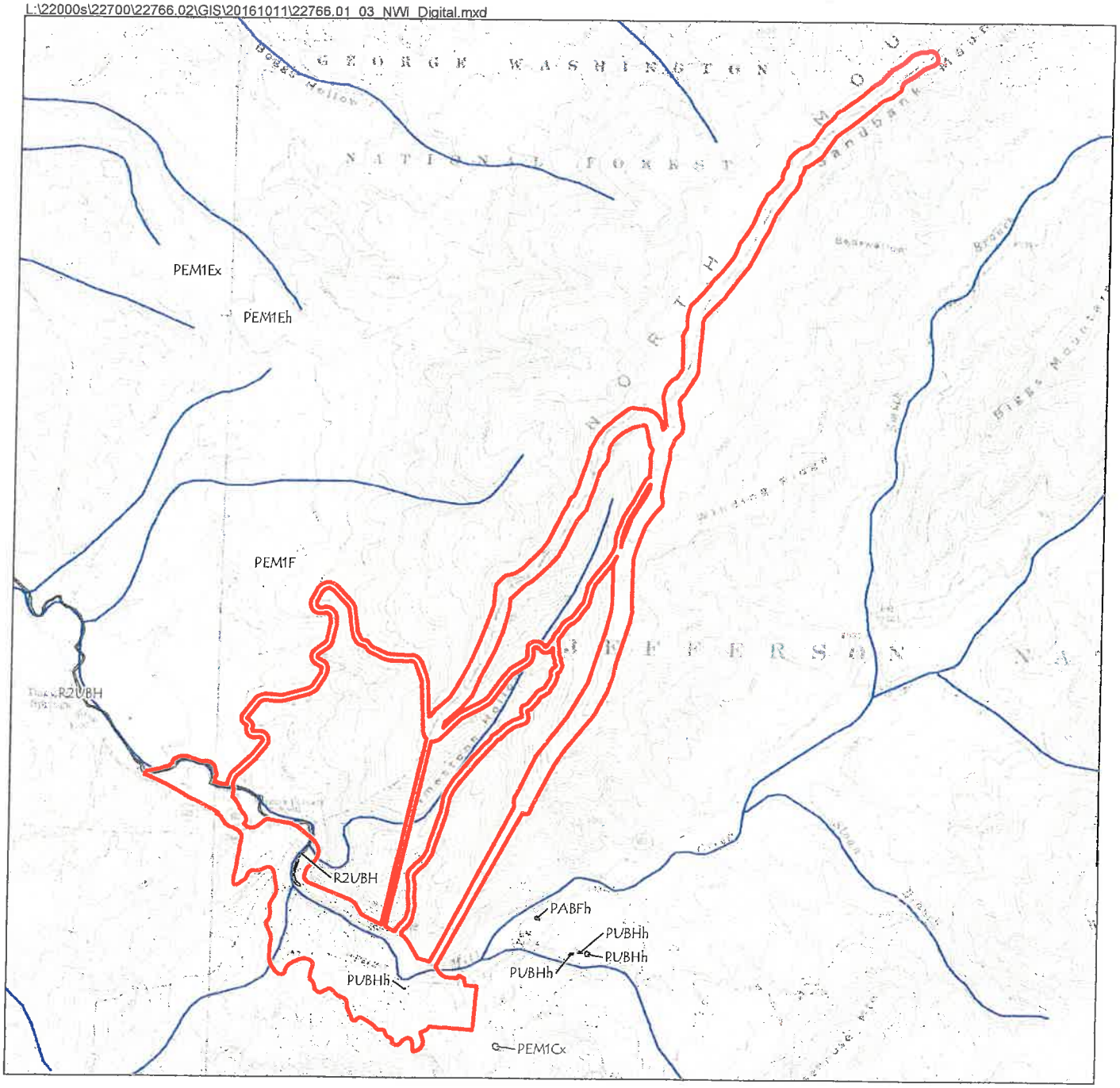

Digital National Wetlands Inventory Map
Rocky Forge Wind Project
WSSI #22766.01
Original Scale: 1" = 3000'

- Study Area
- Open Water
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other Wetland

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Data Updated: October 2015
Source: http://www.fws.gov/wetlands/Data/State-Downloads.html

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Exhibit 2

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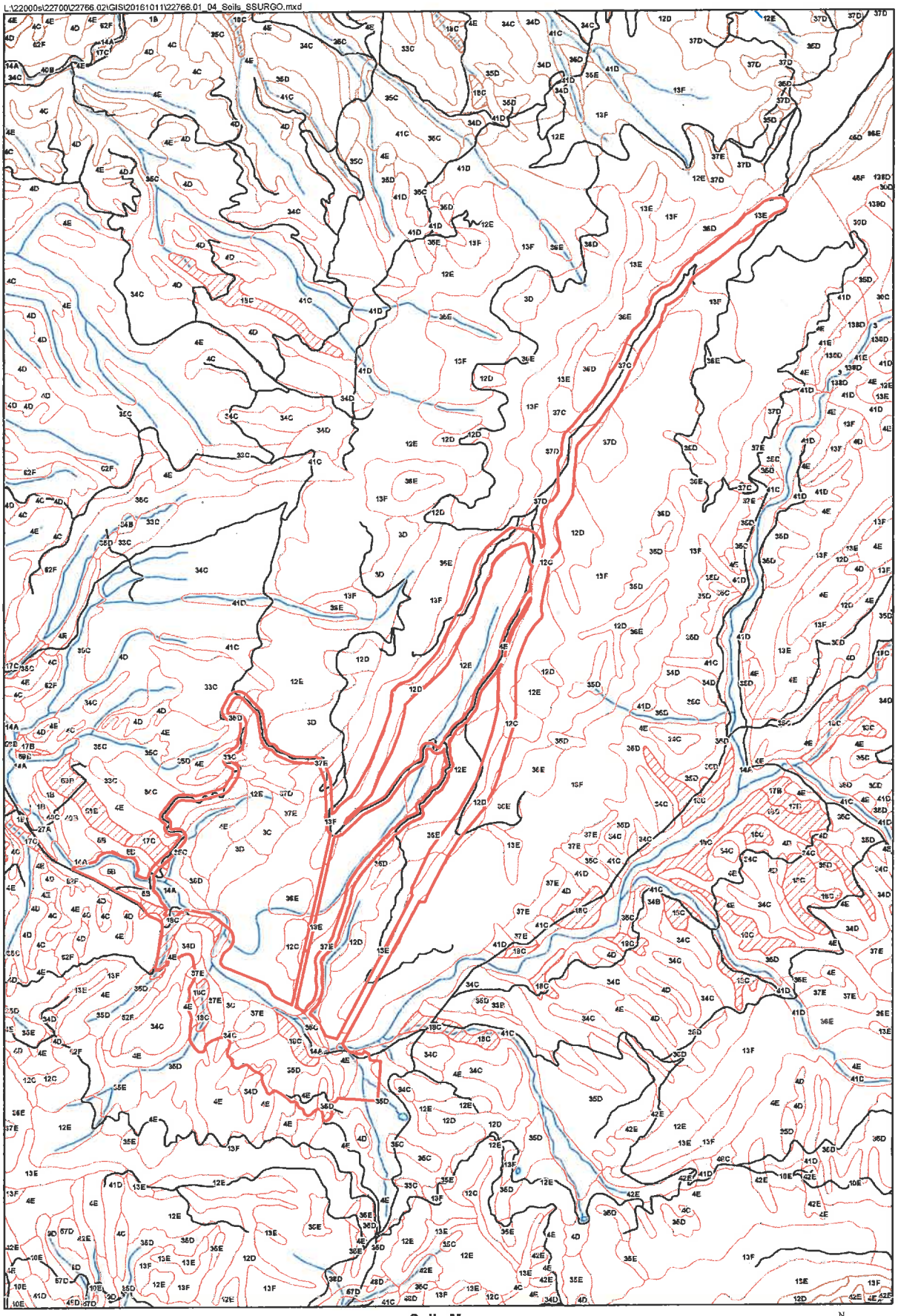

Study Area

Soils with Hydric Inclusions

Non-hydric Soils

Soils Map
SSURGO Digital Data
Rocky Forge Wind Project
WSSI #22766.01 Original
Scale: 1" = 2000'

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Wetland Studies and Solutions, Inc.
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Exhibit 3

Rocky Forge Wind Project Soils—Botetourt County, Virginia

Map Unit Legend

Botetourt County, Virginia	
Map Unit Symbol	**Map Unit Name**
3D	Bailegap cobbly fine sandy loam, 15 to 30 percent slopes
4E	Berks-Weikert complex, 30 to 60 percent slopes
5B	Botetourt loam, 2 to 7 percent slopes, rarely flooded
12C	Dekalb channery fine sandy loam, 2 to 15 percent slopes, very stony
12D	Dekalb channery fine sandy loam, 15 to 30 percent slopes, very stony
12E	Dekalb channery fine sandy loam, 30 to 60 percent slopes, very stony
13E	Dekalb-Rock outcrop complex, 10 to 35 percent slopes
13F	Dekalb-Rock outcrop complex, 35 to 80 percent slopes
14A	Derroc cobbly loam, 0 to 4 percent slopes, occasionally flooded
17C	Ernest silt loam, 7 to 15 percent slopes
33C	Laidig fine sandy loam, 7 to 15 percent slopes
34C	Laidig cobbly fine sandy loam, 7 to 15 percent slopes
35C	Laidig cobbly fine sandy loam, 2 to 15 percent slopes, very stony
35D	Laidig cobbly fine sandy loam, 15 to 30 percent slopes, very stony
36E	Lehew-Dekalb complex, 30 to 60 percent slopes, extremely stony
37C	Lily gravelly sandy loam, 2 to 15 percent slopes, very stony
37D	Lily gravelly sandy loam, 15 to 30 percent slopes, very stony
37E	Lily gravelly sandy loam, 30 to 60 percent slopes, very stony

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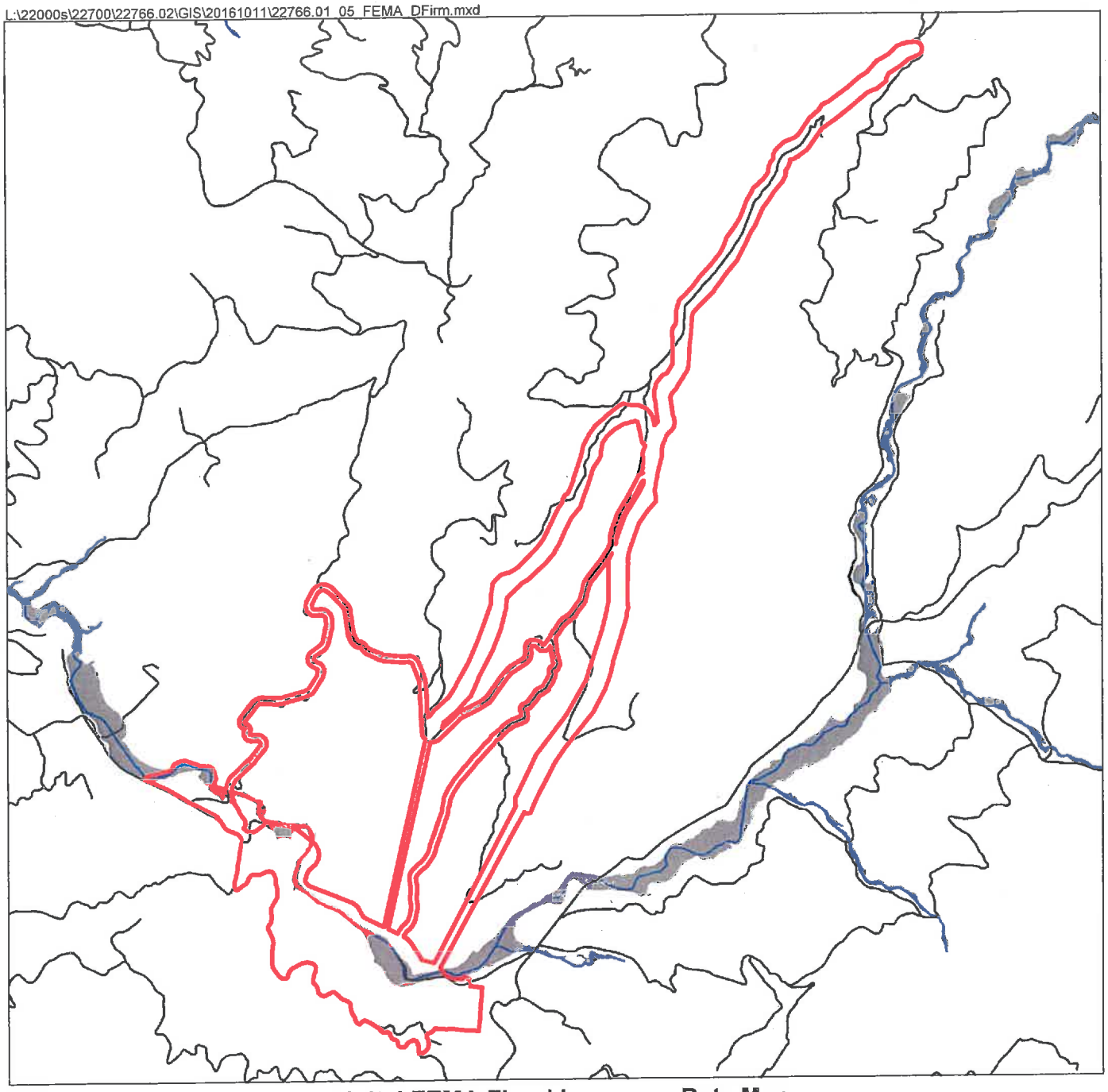

Digital FEMA Flood Insurance Rate Map
Panel 51163C0350C Revised 4/6/2000
Rocky Forge Wind Project
WSSI #22766.01
Original Scale: 1" = 3000'

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W E
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0 3,000
Feet

Study Area

Special Flood Hazard Areas Subject to
Inundation by the 1% Annual Chance Flood Event
Zone A - No base flood elevations determined.
Zone AE - Base flood elevations determined.

Other Areas
Zone X - Areas determined to be outside the 0.2% annual chance floodplain

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Exhibit 4

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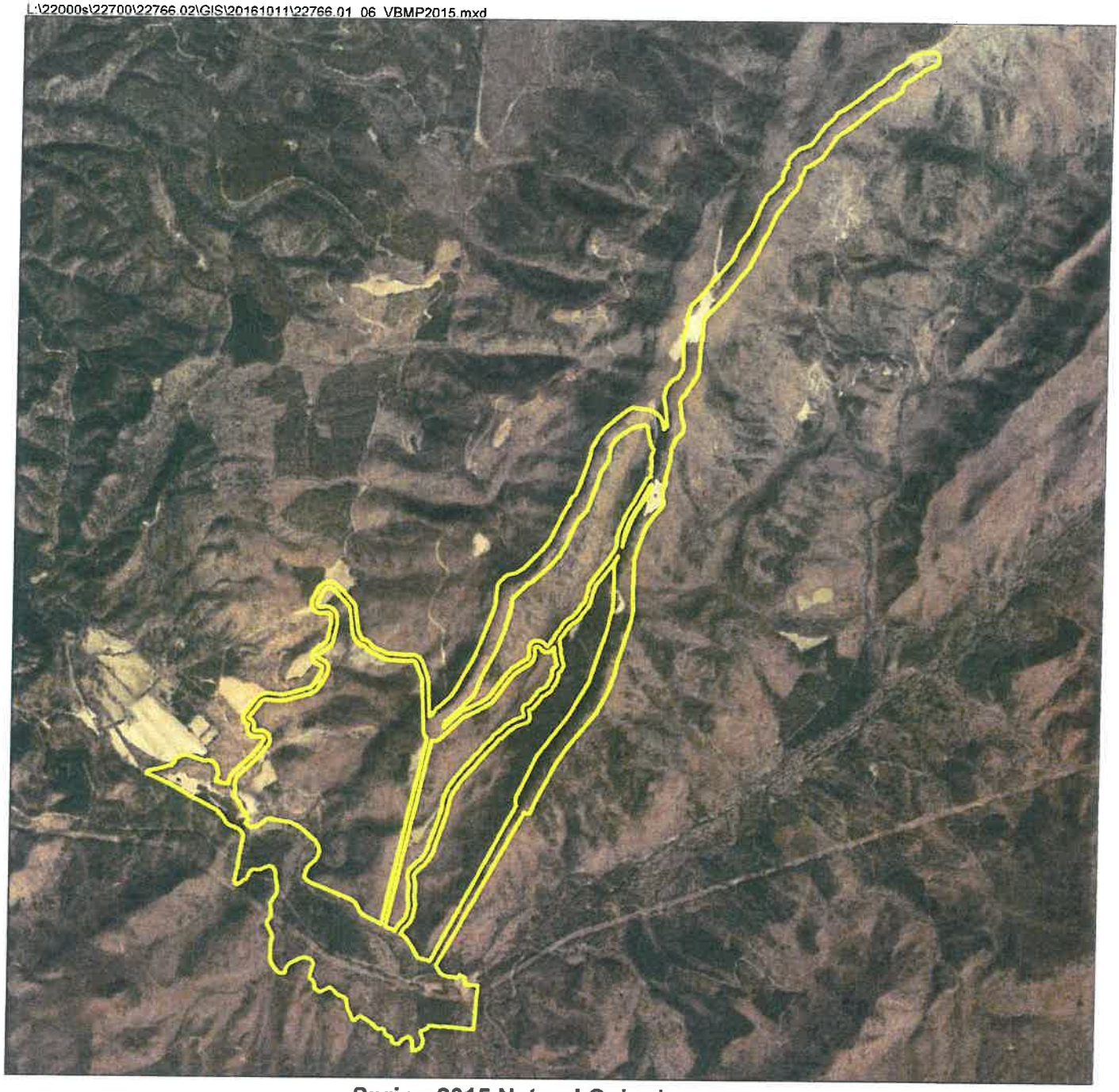
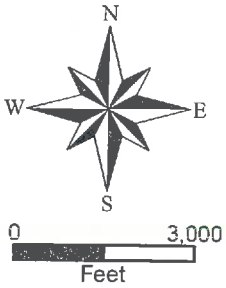


Spring 2015 Natural Color Imagery
Rocky Forge Wind Project
WSSI #22766.01
Original Scale: 1" = 3000'



Study Area

Photo Source: Virginia Base Mapping Program (VBMP)

Wetland Studies and Solutions, Inc.
a DAVEY company

Exhibit 5

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

1. **Looking east at Sample Plot A-1, which characterizes the Oak/Heath Forest community in the northeastern portion of the Study Area.**

2. **Looking north at Sample Plot A-2, which characterizes the Oak/Heath Forest community in the northeastern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

3. **Looking south at Sample Plot A-5, which characterizes the Oak/Heath Forest community in the northeastern portion of the Study Area.**

4. **Looking north at Sample Plot A-3, which characterizes the Oak/Heath Forest community in the central portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

5. **Looking south at Sample Plot A-4, which characterizes the Oak-Heath Forest community in the central portion of the Study Area.**

6. **Looking south at Sample Plot A-6, which characterizes the Oak/Heath Forest community in the western portion of the StudyArea.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

7. **Looking west at Sample Plot B-1, which characterizes the Northern Red Oak Forest community in the northeastern portion of the StudyArea.**

8. **Looking south at Sample Plot C-1, which characterizes the Pine-Oak/Heath Woodlands community in the central portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

9. **Looking east at Sample Plot C-2, which characterizes the Pine-Oak/Heath Woodlands community in the central portion of the Study Area.**

10. **Looking north at Sample Plot C-3, which characterizes the Pine-Oak/Heath Woodlands Community in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

11. **Looking north at Sample Point D-1, which characterizes the Acidic Cove Forest community in the southern portion of the Study Area.**

12. **Looking east at Sample Plot D-2, which characterizes the Acidic Cove Forest community in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

13. **Looking west at Sample Plot D-3, which characterizes the Eastern White Pine-Hardwood Forest community in the southern portion of the Study Area.**

14. **Looking north at Sample Plot E-1, which characterizes the Eastern White Pine-Hardwood Forest community in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

15. **Looking south at Sample Plot E-2, which characterizes the Eastern White Pine-Hardwood Forest community in the southern portion of the Study Area.**

16. **Looking west at Sample Plot E-3, which characterizes the Eastern White Pine-Hardwood Forest community in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

17. **Looking south at Sample Plot G-1, which characterizes the Montane Mixed Oak Forest community in the southern portion of the Study Area.**

18. **Looking west at Sample Plot G-2, which characterizes the Montane Mixed Oak Forest community in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

19. **Looking southwest at a maintained area in the northeastern portion of the Study Area.**

20. **Looking north at a maintained area in the northeastern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

21. **Looking southwest at a maintained area in the western portion of the Study Area.**

22. **Looking southwest at a maintained area in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

23. **Looking north at a maintained area in the southern portion of the Study Area.**

24. **Looking southeast at a maintained pipeline easement in the southern portion of the Study Area.**

APPENDIX C
STUDY AREA PHOTOGRAPHS
ROCKY FORGE WIND PROJECT
WSSI #22766.01

25. **Looking northwest at maintained powerline easement bisecting the southern portion of Study Area.**

L:\22000s\22700\22766.01\Admin\05-ENVR\Photos.docx

GENERAL INFORMATION

Plot code / identifer: A-1 Project: Rocky Forge Wind Project

Date: 11/17/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Oak/Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Jennifer Feese ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

8621 N

8622 E

8623 S

8624 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 42' 44" N LONG 79° 42' 45" W

Altitude: 948 meters

Estimated stand size

x extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) ____ °

single measure ☐ or: avg of ____

☐ 0-3% (level or nearly so)

☐ 3-8% (gentle/undulating)

☐ 8-16% (sloping/rolling)

☐ 16-30% (moderate/hilly)

x 30-65% (steep)

☐ 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): ____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

x aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

x xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Lichen covered sandstone

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

____ % boulders/stones

20 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads x wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Quercus velutina	*13.0 in*	*~55ft*
Quercus velutina	*12.9in*	*~50ft*
Quercus montana	*12.5in*	*~40ft*

Average tree diameter for stand:

5-6 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		P	✓	132
Quercus montana				D		
Quercus velutina				D		
Vaccinium sp.	P					
Gaylussacia sp.	P					
Chimaphila maculata	C					
Smilax glauca	C					
Kalmia latifolia	R					
Carex sp.	R					
Unknown sp.	P					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: A-2 Project: Rocky Forge Wind Project

Date: 11/17/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Oak/Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Jennifer Feese ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

8632 N

8633 E

8634 S

8635 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Table GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 43' 19" N LONG 79° 42' 12" W

Altitude: 906 meters

Estimated stand size

X extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ °

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

☐ 3-8% (gentle/undulating) ☐ 30-65% (steep)

☐ 8-16% (sloping/rolling) X 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

X aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: X magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

X xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand X Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Lichen covered sandstone

Cover by unvegetated rock (bare rock or lichen covered):

_____ % bedrock

10 % boulders/stones

10 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads X wind/ice damage ☐ hemlock adelgid X fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Unknown fungus on dead trees

Charred trees

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Moderate amount of coarse woody debris
Large rock outcrop

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Quercus montana	*20.0 in*	*~70 ft*
Quercus alba	*24.8 in*	*~85 ft*
Quercus velutina	*18.6 in*	*~65 ft*

Average tree diameter for stand:

9-13 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Quercus alba				D		
Quercus velutina				D		
Carya glabra		C	C			
Poaceae sp. 1	P					
Chimaphila maculata	C					
Dichanthelium clandestinum	C					
Vaccinium sp.	P					
Poaceae sp. 2	P					
Smilax rotundifolia	R					
Acer pensylvanicum		R				
Viola sp.	P					
Robinia pseudoacacia		R				
Smilax glauca	P					
Quercus montana				C		

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: A-3 Project: Rocky Forge Wind Project

Date: 11/17/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Oak/Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Beth Clements ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

339 N

340 E

341 S

342 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___,___ ___ ___ E Y ___,___ ___ ___,___ ___ ___ N

LAT 37° 42' 03" N LONG 79° 43' 25" W

Altitude: 889 meters

Estimated stand size

X extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ °

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

☐ 3-8% (gentle/undulating) ☐ 30-65% (steep)

☐ 8-16% (sloping/rolling) X 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

X aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: X magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

X xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand X Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Lichen covered sandstone

Cover by unvegetated rock (bare rock or lichen covered):

___ % bedrock

___ % boulders/stones

5 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads X wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

A small amount of multiflora rose (Rosa multiflora) present within the sampling plot.

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Quercus velutina	*17.6 in*	*~60 ft*
Quercus velutina	*15.7in*	*~60 ft*
Quercus velutina	*18.3 in*	*~60 ft*

Average tree diameter for stand:

9-13 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Quercus velutina	C	C		D		
Carya glabra			C			
Quercus montana				C		
Pinus rigida	P					
Carex sp.	P					
Vaccinium sp.	P					
Chimaphila maculata	C					
Poaceae sp.	P					
Rosa multiflora	R					
Smilax glauca	R					
Unknown sp.	P					
Quercus alba				R		
Kalmia latifolia	R					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: A-4 Project: Rocky Forge Wind Project

Date: 11/18/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Oak/Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Beth Clements ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

347 N

348 E

349 S

350W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X _ _ _ _ _ _ _ E Y _ _ _ _ _ _ _ N

LAT 37° 41' 08" N LONG 79° 44' 04" W

Altitude: 664 meters

Estimated stand size

X extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ °

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so)

☐ 3-8% (gentle/undulating)

☐ 8-16% (sloping/rolling)

☐ 16-30% (moderate/hilly)

X 30-65% (steep)

☐ 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

X aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: X magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

X xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand X Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Sandstone

Cover by unvegetated rock (bare rock or lichen covered):

_____ % bedrock

_____ % boulders/stones

5 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads ☐ wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Quercus montana	*20.8 in*	*~80 ft*
Quercus montana	*23.5 in*	*~80 ft*
Quercus montana	*20.8 in*	*~80 ft*

Average tree diameter for stand:

10-14 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Quercus montana	D		C	D		
Carya tomentosa			D			
Quercus velutina				R		
Chimaphila maculata	C					
Smilax glauca	C					
Rubus sp.	P					
Vaccinium sp.	P					
Carex sp.	P					
Dicanthelium clandestinum	P					
Poaceae sp.	P					
Pinus pungens	R					
Scutellaria sp.	P					
Sassafras albidum	C	C				
Cornus florida	R					
Pinus rigida	R					
Vitis sp.			C			
Prunus sp.	P					
Unknown sp. 1	P					
Galium sp.	P					
Unknown sp. 2	P					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: A-5 Project: Rocky Forge Wind Project

Date: 11/17/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Oak Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Beth Clements ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

335 N

336 E

337 S

338 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 42' 18" N LONG 79° 43' 03" W

Altitude:959 meters

Estimated stand size

X extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ ° ridge top

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

X 3-8% (gentle/undulating) ☐ 30-65% (steep)

☐ 8-16% (sloping/rolling) ☐ 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

X aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

☐ xeric (moist for brief time)

X somewhat xeric (moist for short time)

☐submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand X Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: None

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

____ % boulders/stones

____ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads X wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Moderate amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Quercus velutina	*15.0 in*	*~70 ft*
Quercus alba	*14.5 in*	*~80 ft*
Quercus alba	*12.8 in*	*~80 ft*

Average tree diameter for stand:

6-12 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Quercus alba				D		
Quercus velutina				D		
Carya glabra			R			
Vaccinium sp.	P					
Poaceae sp.	P					
Smilax glauca	P					
Rosa sp.	P					
Carex sp.	P					
Acer pensylvanicum		R				
Rubus sp.	P					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: A-6 Project: Rocky Forge Wind Project

Date: 11/18/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Oak/Heath Forest

Observation area:

Circle of radius _____ m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Jennifer Feese ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

8656 N

8657 E

8659 S

8660 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 41' 24" N LONG 79° 44' 16" W

Altitude: 565 meters

Estimated stand size

X extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ °

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

☐ 3-8% (gentle/undulating) ☐ 30-65% (steep)

☐ 8-16% (sloping/rolling) X 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

X aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

X xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand ☐ Loam ☐ Clay

X Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Sandstone

Cover by unvegetated rock (bare rock or lichen covered):

_____ % bedrock

_____ % boulders/stones

5 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads ☐ wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing x logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Appears to have been recently logged

Young stand

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Moderate amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Liriodendron tulipifera	*12.4 in*	*~70 ft*
Quercus rubra	*12.0 in*	*~70 ft*
Liriodendron tulipifera	*10.4 in*	*~60 ft*

Average tree diameter for stand:

5-6 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Liriodendron tulipifera			D	D		
Quercus montana	P		D	D		
Quercus rubra			C	C		
Nyssa sylvatica			C			
Acer rubrum				R		
Smilax glauca	P					
Chimaphila maculata	P					
Vitis sp.			C			
Vaccinium sp.	P					
Carex sp.	P					
Dicanthelium clandestinum	P					
Aster sp.	P					
Plantago sp.	P					
Cornus florida			C			
Mentha sp.	P					
Dichanthelium acuminatum	P					
Poaceae sp.	P					
Unknown sp.	P					
Galium sp.	P					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: B-1 Project: Rocky Forge Wind Project

Date: 11/17/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Northern Red Oak Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Jennifer Feese ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

8628 N

8629 E

8630 S

8631 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __ __ __ __ E Y __ __ __ __ __ __ __ N

LAT 37° 43' 06" N LONG 79° 42' 36" W

Altitude: 965 meters

Estimated stand size

☐ extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

x small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ °

single measure ☐ or: avg of _____ ☐

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

☐ 3-8% (gentle/undulating) x 30-65% (steep)

☐ 8-16% (sloping/rolling) ☐ 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

aspect is variable over stand

N 338-22 °	W 248-292 °	SW 203-247 °
E 68-112 °	NE 23-67 °	NW 293-337 °
S 158-202 °	SE 113-157 °	

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

x xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland)

Tidal

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded) ☐

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Sandstone

Cover by unvegetated rock (bare rock or lichen covered):

___ % bedrock

50 % boulders/stones

___ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation	☐ trails/roads	x wind/ice damage	☐ hemlock adelgid	☐ fire
☐ dogwood anthracnose	☐ clearing	☐ logging	☐ gypsy moth	☐ erosion
☐ exotic plants	☐ grazing/browsing	☐ oak decline	☐ spruce decline	☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Moderate amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Quercus rubra	*18.2 in*	*~80 ft*
Quercus rubra	*24.1 in*	*~80 ft*
Betula lenta	*17.9 in*	*~70 ft*

Average tree diameter for stand:

9-10 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Quercus rubra				D		
Quercus montana				D		
Betula lenta			C	C		
Vaccinium sp.	C					
Chimaphila maculata	C					
Carex sp.	R					
Acer rubrum			R			
Poaceae sp.	R					
Carya glabra		R				
Acer pensylvanicum		C				

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: C-1 Project: Rocky Forge Wind Project

Date: 11/18/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Pine-Oak/Heath Woodlands

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Beth Clements ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

8649 N

8650 E

8651 S

8652 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 41' 52" N LONG 79° 43' 34" W

Altitude: 660 meters

Estimated stand size

☐ extensive (greater than 100 acres (> 40 hectares))

X large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____ °

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

☐ 3-8% (gentle/undulating) ☐ 30-65% (steep)

☐ 8-16% (sloping/rolling) X 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____ °

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

☐ aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

X xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand X Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Lichen covered sandstone

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

75 % boulders/stones

____ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads X wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

A small amount of multiflora rose (Rosa multiflora) present within the sampling plot.

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Pinus rigida	*17.4 in*	*~50 ft*
Quercus montana (hollow/in decline)	*19.0 in*	*~30 ft*
Quercus montana	*19.3 in*	*~40 ft*
Quercus montana	*20.7 in*	*~40 ft*

Average tree diameter for stand:

7-10 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Pinus pungens				LD		
Pinus rigida		R	C	D		
Kalmia latifolia	D		D			
Rhododendron sp.			C			
Quercus montana			C	D		
Nyssa sylvatica			C			
Acer rubrum		C				
Vaccinium sp.	C					
Hamamelis virginiana		C				
Rosa multiflora	R					
Pinus strobus		R				
Castanea dentata		R				
Amelanchier sp.		R				

Strata

- **H:** herbaceous or woody under 0.5 m tall
- **S:** shrub 0.5 - 6 m tall
- **SC:** subcanopy; trees 6 - 20 m tall
- **TC:** canopy; trees over 20 m tall

Abundance

- **D =** Dominant
- **LD =** Locally dominant
- **C =** Common
- **R =** Rare
- **P =** Present

GENERAL INFORMATION

Plot code / identifer: C-2 Project: Rocky Forge Wind Project

Date: 11/18/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Pine-Oak/Heath Woodlands

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Beth Clements ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: ____

Description of image(s):

344 N

346 E

345 S

3543 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___ ___ E Y ___ ___ ___ ___ N

LAT 37° 40' 55" N LONG 79° 43' 45" W

Altitude: 591 meters

Estimated stand size

☐ extensive (greater than 100 acres (> 40 hectares))

x large (greater than 10, but less than 100 acres (4 - 40 hectares))

☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) ____ °

single measure ☐ or: avg of ____

☐ 0-3% (level or nearly so) ☐ 16-30% (moderate/hilly)

☐ 3-8% (gentle/undulating) ☐ 30-65% (steep)

☐ 8-16% (sloping/rolling) ☐ 65-75% (very steep)

x 75+% (extremely steep)

Slope Aspect (N = 0 degrees): ____ °

single measure ☐ avg. of ____

☐ area is flat, no slope (e.g. ridgetops or flat plains)

☐ aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

x xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

☐ submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland)

Tidal

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Sandstone

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

10 % boulders/stones

____ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads ☐ wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Pinus pungens	*13.2 in*	*~60 ft*
Quercus montana	*12.1 in*	*~40 ft*
Pinus rigida	*14.4 in*	*~60 ft*

Average tree diameter for stand:

6-10 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Pinus rigida			C	D		
Pinus pungens			C	D		
Quercus montana			C			
Lycopodium sp.	P					
Pteridium aquilinum	P					
Vaccinium sp.	P					
Kalmia latifolia		D				
Nyssa sylvatica		C	C			
Quercus ilicifolia		C				
Smilax glauca	C					
Castanea dentata		C				
Rubus sp.	P					
Sassafras albidum		R				

Strata

- **H:** herbaceous or woody under 0.5 m tall
- **S:** shrub 0.5 - 6 m tall
- **SC:** subcanopy; trees 6 - 20 m tall
- **TC:** canopy; trees over 20 m tall

Abundance

- **D =** Dominant
- **LD =** Locally dominant
- **C =** Common
- **R =** Rare
- **P =** Present

GENERAL INFORMATION

Plot code / identifer: C-3 Project: Rocky Forge Wind Project

Date: 09/27/2016 Surveyors: Neil Gutherman and Michael C. Smith

Community name (DCR-DNH Ecological Community Group): Pine - Oak/Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Neil Gutherman ☐ NO photos taken

Camera Nikon Cool Pix S7000

File / frame #s: _____

Description of image(s):

1129 N
1130 E
1131 S
1132 W

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: _____

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 40' 29.1" N LONG 79° 44' 35.5" W

Altitude: 447 meters

Estimated stand size

- extensive (greater than 100 acres (> 40 hectares))
- x large (greater than 10, but less than 100 acres (4 - 40 hectares))
- ☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
- ☐ very small (less than 1 acre; less than 0.4 hectare)
- ☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area

SITE CHARACTERISTICS

Slope (degrees) 20.30 °

single measure x or: avg of _____

- ☐ 0-3% (level or nearly so)
- ☐ 3-8% (gentle/undulating)
- 8-16% (sloping/rolling)
- 16-30% (moderate/hilly)
- x 30-65% (steep)
- ☐ 65-75% (very steep)
- ☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): 268 °

single measure x avg. of _____

- ☐ area is flat, no slope (e.g. ridgetops or flat plains)
- ☐ aspect is variable over stand

N 338-22 ° x W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

- ☐ very xeric (moist for a negligible time after precipitation)
- x xeric (moist for brief time)
- ☐ somewhat xeric (moist for short time)
- ☐ submesic (moist for moderately short time)
- ☐ mesic (moist for significant time)
- ☐ subhygric (wet for signicant part of growing season; mottles <20cm)
- ☐ hygric (wet for most of growing season; permanent seepage/mottling)
- ☐ subhydric (water table at or near surface for most of the year)
- ☐ hydric (water table at or above surface year round)

Hydrologic Regime

_x Site is terrestrial (i.e. not a wetland) **tidal**

- ☐ Irregularly exposed (< daily)
- ☐ Regularly flooded (>=daily)
- ☐ Irregularly flooded (< daily, but >=once/yr)
- ☐ Wind tidally flooded
- ☐ Subtidal (permanently flooded)

Non-Tidal

- ☐ Permanently flooded
- ☐ Semipermanently flooded
- ☐ Seasonally flooded
- ☐ Intermittently flooded
- ☐ Temporarily flooded
- ☐ Saturated

Salinity/Halinity

- ☐ Saltwater
- ☐ Brackish
- ☐ Oligohaline
- ☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

- ☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay

Sandy Loam Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Several sandstone cobbles were observed.

Cover by unvegetated rock (bare rock or lichen covered):

_____ % bedrock

_____ % boulders/stones

3 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation	x trails/roads	☐ wind/ice damage	☐ hemlock adelgid	☐ fire
☐ dogwood anthracnose	☐ clearing	logging	☐ gypsy moth	☐ erosion
☐ exotic plants	☐ grazing/browsing	☐ oak decline	☐ spruce decline	☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Minimal evidence of of disturbance was observed
Utility easement adjacent to stand

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Moderate amount of coarse wood debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Quercus falcata	12.5 *in*	34.8 *ft*
Pinus strobus	12.0 *in*	52.8 *ft*
Pinus rigida	10.8 *in*	53.5 *ft*

Average tree diameter for stand:

7.7inch dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Acer rubrum	R	R				
Athyrium filix-femina	R					
Carya sp.	C		C			
Cornus florida	R					
Kalmia latifolia	C	C				
Fagus grandifolia		R				
Gleditsia triacanthos		R				
Kalmia latifolia	C	C				
Nyssa sylvatica		C				
Oxydendrum arboreum	C	C				
Pinus rigida			D			
Pinus strobus			D			
Quercus falcata			R			
Quercus marilandica			R			
Quercus Montana			R			
Quercus rubra			C			
Sassafras albidum	C					
Smilax glauca	C		C			
Smilax rotundifolia	C					
Tsuga canadensis		R				
Vaccinium angustifolium	C					
Vaccinium stamineum	R					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: D-1 Project: Rocky Forge Wind Project

Date: 11/18/2015 Surveyors: Beth A. Clements, Jennifer D. Feese, and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Acidic Cove Forest

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Jennifer Feese ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: ____

Description of image(s):

8676 N

8677 E

8678 S

8679 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Table GPS Datum: geographic

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___ ___ E Y ___ ___ ___ ___ ___ N

LAT 37° 40' 04" N LONG 79° 44' 04" W

Altitude: 664 meters

Estimated stand size

☐ extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

x small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) ____ °

single measure ☐ or: avg of ____

☐ 0-3% (level or nearly so)

☐ 3-8% (gentle/undulating)

☐ 8-16% (sloping/rolling)

☐ 16-30% (moderate/hilly)

x 30-65% (steep)

☐ 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): ____ °

single measure ☐ avg. of ____

☐ area is flat, no slope (e.g. ridgetops or flat plains)

x aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

☐ xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

x submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland)

Tidal

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Sandstone

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

____ % boulders/stones

10 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads ☐ wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing x logging ☐ gypsy moth ☐ erosion

x exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline x Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Appears to have been recently logged

Young stand

Galls present on dead oaks

Unidentified black fungus on dead trees

Some invasive species present: garlic mustard (Alliaria petiolata) and autumn olive (Elaeagnus umbellata).

Dirt access roads and adjacent to Dagger Springs Road

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Liriodendron tulipifera	*8.5 in*	*~70 ft*
Liriodendron tulipifera	*8.8 in*	*~60 ft*
Liriodendron tulipifera	*7.3 in*	*~60ft*

Average tree diameter for stand:

3-5 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Liriodendron tulipifera		C	D	D		
Prunus serotina			C			
Polystichum acrostichoides	C					
Juniperus virginiana	R					
Vitis sp.			C			
Carex sp.	P					
Smilax glauca	P					
Cercis canadensis	C		C			
Dicanthelium clandestinum	P					
Euonymus americanus	P					
Magnolia acuminata				R		
Robinia pseudoacacia			C			
Acer rubrum			C			
Elaeagnus umbellata	R					
Smilax rotundifolia	R					
Pinus strobus		C				
Poaceae sp.	P					
Quercus rubra	P					
Unknown sp.	P					
Nyssa sylvatica		R				
Alliaria petiolata	P					
Fraxinus americana				R		
Rubus sp.	P					

Strata

- **H :** herbaceous or woody under 0.5 m tall
- **S:** shrub 0.5 - 6 m tall
- **SC:** subcanopy; trees 6 - 20 m tall
- **TC:** canopy; trees over 20 m tall

Abundance

- **D =** Dominant
- **LD =** Locally dominant
- **C =** Common
- **R =** Rare
- **P =** Present

GENERAL INFORMATION

Plot code / identifer: D-2 Project: Rocky Forge Wind Project

Date: 2/22/2016 Surveyors: Lauren Shaffer and Caitlin L. Homan

Community name (DCR-DNH Ecological Community Group): Acidic Cove Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Lauren Shaffer ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: _____

Description of image(s):

7162 N

7163 E

7164 S

7165 W

(photo # and direction)

GPS DATA

GPS Unit: iPhone GPS Datum: geographic

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___.___ ___ ___ E Y ___.___ ___ ___.___ ___ ___ N

LAT 37° 47' 43" N LONG 79° 44' 38" W

Altitude: 420 meters

Estimated stand size

☐ extensive (greater than 100 acres (> 40 hectares))

☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))

x small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))

☐ very small (less than 1 acre; less than 0.4 hectare)

☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) _____°

single measure ☐ or: avg of _____

☐ 0-3% (level or nearly so)

x 3-8% (gentle/undulating)

☐ 8-16% (sloping/rolling)

☐ 16-30% (moderate/hilly)

☐ 30-65% (steep)

☐ 65-75% (very steep)

☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): _____°

single measure ☐ avg. of ___

☐ area is flat, no slope (e.g. ridgetops or flat plains)

x aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)

☐ xeric (moist for brief time)

☐ somewhat xeric (moist for short time)

x submesic (moist for moderately short time)

☐ mesic (moist for significant time)

☐ subhygric (wet for signicant part of growing season; mottles <20cm)

☐ hygric (wet for most of growing season; permanent seepage/mottling)

☐ subhydric (water table at or near surface for most of the year)

☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **Tidal**

☐ Irregularly exposed (< daily)

☐ Regularly flooded (>=daily)

☐ Irregularly flooded (< daily, but >=once/yr)

☐ Wind tidally flooded

☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded

☐ Semipermanently flooded

☐ Seasonally flooded

☐ Intermittently flooded

☐ Temporarily flooded

☐ Saturated

Salinity/Halinity

☐ Saltwater

☐ Brackish

☐ Oligohaline

☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand ☐ Loam ☐ Clay

☐ Sandy Loam ☐ Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: Lichen covered sandstone

Cover by unvegetated rock (bare rock or lichen covered):

_____ % bedrock

_____ % boulders/stones

_____ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation x trails/roads ☐ wind/ice damage ☐ hemlock adelgid ☐ fire

☐ dogwood anthracnose ☐ clearing x logging ☐ gypsy moth ☐ erosion

☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Near dirt access road and stream, with evidence of logging (stumps).

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Adjacent to wetland, dirt access road adjacent to site. Within 300m of cabin, and maintained/mowed property.

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Liriodendron tulipifera	*16.6 in*	*~60ft*
Quercus rubra	*27.1in*	*~50ft*
Liriodendron tulipifera	*20.9in*	*~60ft*

Average tree diameter for stand:

14 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Liriodendron tulipifera				D		
Quercus rubra		R		R		
Betula lenta		D	D			
Magnolia acuminata		C	C			
Pinus strobus		C	C			
Rubus sp.		C				
Fagus grandifolia			R			
Smilax glauca	R					
Polystichum acrosticoides	C					
Dryopteris campyloptera	D					
Lindera benzoin		C				
Asimina triloba		C				
Fraxinus americana		P				
Lonicera japonica	P					
Rubus phoenicolasius		C				
Rubus occidentalis		R				
Sassafras albidum		P				

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: D-3 Project: Rocky Forge Wind Project

Date: 09/27/2016 Surveyors: Neil Gutherman and Michael C. Smith

Community name (DCR-DNH Ecological Community Group): Acidic Cove

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Neil Gutherman ☐ NO photos taken

Camera Nikon Cool Pix S7000

File / frame #s: ____

Description of image(s):

1093 N
1094 E
1095 S
1096 W

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: ____

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___ ___ E Y ___ ___ ___ ___ N

LAT 37° 40' 32.7" N LONG 79° 44' 38.9" W

Altitude: 321 meters

Estimated stand size

- extensive (greater than 100 acres (> 40 hectares))
- x large (greater than 10, but less than 100 acres (4 - 40 hectares))
- ☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
- ☐ very small (less than 1 acre; less than 0.4 hectare)
- ☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area

SITE CHARACTERISTICS

Slope (degrees) 26.10 °

single measure x or: avg of ____

- ☐ 0-3% (level or nearly so)
- ☐ 3-8% (gentle/undulating)
- ☐ 8-16% (sloping/rolling)
- x 16-30% (moderate/hilly)
- ☐ 30-65% (steep)
- ☐ 65-75% (very steep)
- ☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): 321 °

single measure x avg. of ____

- ☐ area is flat, no slope (e.g. ridgetops or flat plains)
- ☐ aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° x NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

- ☐ very xeric (moist for a negligible time after precipitation)
- x xeric (moist for brief time)
- ☐ somewhat xeric (moist for short time)
- ☐ submesic (moist for moderately short time)
- ☐ mesic (moist for significant time)
- ☐ subhygric (wet for signicant part of growing season; mottles <20cm)
- ☐ hygric (wet for most of growing season; permanent seepage/mottling)
- ☐ subhydric (water table at or near surface for most of the year)
- ☐ hydric (water table at or above surface year round)

Hydrologic Regime

_X Site is terrestrial (i.e. not a wetland) **tidal**

- ☐ Irregularly exposed (< daily)
- ☐ Regularly flooded (>=daily)
- ☐ Irregularly flooded (< daily, but >=once/yr)
- ☐ Wind tidally flooded
- ☐ Subtidal (permanently flooded)

Non-Tidal

- ☐ Permanently flooded
- ☐ Semipermanently flooded
- ☐ Seasonally flooded
- ☐ Intermittently flooded
- ☐ Temporarily flooded
- ☐ Saturated

Salinity/Halinity

- ☐ Saltwater
- ☐ Brackish
- ☐ Oligohaline
- ☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

- ☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

- ☐ Sand ☐ Loam ☐ Clay
- x Sandy Loam Silt Loam ☐ Clay loam
- ☐ Peat ☐ Muck ☐ other

Rock Types Present: Sandstone and quartz cobbles observed.

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

1 % boulders/stones

20 % gravel/cobbles

Evidence of Disturbance

- ☐ ditching/hydrologic alternation
- ☐ dogwood anthracnose
- ☐ exotic plants
- ☐ trails/roads
- ☐ clearing
- ☐ grazing/browsing
- ☐ wind/ice damage
- logging
- ☐ oak decline
- x hemlock adelgid
- ☐ gypsy moth
- ☐ spruce decline
- ☐ fire
- ☐ erosion
- ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Evidence of Hemlock adelgid observed within Sample Plot
Invasive species present: garlic mustard (*Alliaria petiolata*)

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse wood debris
Stream adjacent to Sample Plot

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Quercus montana	36.4 *in*	61.3 *ft*
Liriodendron tulipifera	22.5 *in*	53.4 *ft*
Liriodendron tulipifera	22.0 *in*	51.2 *ft*

Average tree diameter for stand:

17-19 inch dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Acer pensylvanican	C		C			
Acer rubrum	D		D			
Alliara petiolata	C					
Betula lenta			R			
Dioscorea villosa	R					
Kalmia latifolia	D	D				
Liriodendron tulipifera			C			
Parthenocissus quiquefolia	R					
Pinus strobus			R			
Polystichum acrostichoides	C					
Quercus alba			R			
Quercus montana	C			C		
Quercus rubra			R			
Sassafras albidum	C	C				
Smilax glauca	R					
Thelypteris noveboracensis	R					
Tsuga canadensis		LD				
Ulmus americana			R			
Vaccinium sp.	D	D				
		R				

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: E-1 Project: Rocky Forge Wind Project

Date: 11/19/2015 Surveyors: Beth A. Clements and Jennifer D. Feese

Community name (DCR-DNH Ecological Community Group): Eastern White Pine-Hardwood Forest

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Beth Clements ☐ NO photos taken

Camera Canon SX610 HS

File / frame #s: ____

Description of image(s):

355 N

356 E

357 S

358 W

(photo # and direction)

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: geographic

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X __ __ __,__ __ __ E Y __,__ __ __,__ __ __ N

LAT 37° 40' 08" N LONG 79° 43' 60" W

Altitude: 425 meters

Estimated stand size

- ☐ extensive (greater than 100 acres (> 40 hectares))
- ☐ large (greater than 10, but less than 100 acres (4 - 40 hectares))
- x small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
- ☐ very small (less than 1 acre; less than 0.4 hectare)
- ☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area.

SITE CHARACTERISTICS

Slope (degrees) ____ °

single measure ☐ or: avg of ____

- ☐ 0-3% (level or nearly so)
- ☐ 3-8% (gentle/undulating)
- ☐ 8-16% (sloping/rolling)
- ☐ 16-30% (moderate/hilly)
- x 30-65% (steep)
- ☐ 65-75% (very steep)
- ☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): ____ °

single measure ☐ avg. of ____

- ☐ area is flat, no slope (e.g. ridgetops or flat plains)
- x aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: magnetic corrected

Soil Moisture Regime

- ☐ very xeric (moist for a negligible time after precipitation)
- ☐ xeric (moist for brief time)
- ☐ somewhat xeric (moist for short time)
- x submesic (moist for moderately short time)
- ☐ mesic (moist for significant time)
- ☐ subhygric (wet for signicant part of growing season; mottles <20cm)
- ☐ hygric (wet for most of growing season; permanent seepage/mottling)
- ☐ subhydric (water table at or near surface for most of the year)
- ☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland)

Tidal

- ☐ Irregularly exposed (< daily)
- ☐ Regularly flooded (>=daily)
- ☐ Irregularly flooded (< daily, but >=once/yr)
- ☐ Wind tidally flooded
- ☐ Subtidal (permanently flooded)

Non-Tidal

- ☐ Permanently flooded
- ☐ Semipermanently flooded
- ☐ Seasonally flooded
- ☐ Intermittently flooded
- ☐ Temporarily flooded
- ☐ Saturated

Salinity/Halinity

- ☐ Saltwater
- ☐ Brackish
- ☐ Oligohaline
- ☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

- ☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand	☐ Loam	☐ Clay
x Sandy Loam	☐ Silt Loam	☐ Clay loam
☐ Peat	☐ Muck	☐ other

Rock Types Present: sandstone

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

____ % boulders/stones

15 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation	☐ trails/roads	☐ wind/ice damage	☐ hemlock adelgid	☐ fire
☐ dogwood anthracnose	☐ clearing	x logging	☐ gypsy moth	☐ erosion
☐ exotic plants	☐ grazing/browsing	☐ oak decline	☐ spruce decline	☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Stand appears to have been logged in the past

Young stand

Invasive species present (Ailanthus altissima)

Unpaved access road

Adjacent to Dagger Springs Road

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Stream adjacent to Sample Plot
Moderate amount of coarse woody debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (in)	HT (ft)
Pinus strobus	*11.4 in*	*~70 ft*
Pinus strobus	*11.4 in*	*~70 ft*
Pinus strobus	*15.0 in*	*~75 ft*

Average tree diameter for stand:

9-10 in dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Pinus strobus	R	D	D	D		
Liriodendron tulipifera			C	R		
Prunus serotina			C			
Rubus sp.	P					
Solidago sp.	P					
Polystichum acrostichoides	C					
Symphoricarpos orbiculatus	C					
Linderon benzoin		C				
Asplenium platyneuron	P					
Acer rubrum	P					
Athyrium filix-femina	C					
Robinia pseudoacacia			C			
Vitis sp.			C			
Ailanthus altissima			R			
Cercis canadensis		R				
Euonymus americanus	R					
Sambucus canadensis		R				
Betula lenta		R	R			
Parthenocissus quinquefolia			P			
Smilax rotundifolia			C			
Potentilla sp.	P					
Ulmus rubra	P					
Juniperus virginiana		R				
Unknown sp.	P					

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

LD = Locally dominant

C = Common

R = Rare

P = Present

GENERAL INFORMATION

Plot code / identifer: E-2 Project: Rocky Forge Wind Project

Date: 09/27/2016 Surveyors: Neil Gutherman and Michael C. Smith

Community name (DCR-DNH Ecological Community Group): Eastern White Pine and Hardwood Forest

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Neil Gutherman ☐ NO photos taken

Camera Nikon Cool Pix S7000

File / frame #s: ____

Description of image(s):

1078 N
1079 E
1080 S
1081 W

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: ____

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___ ___ E Y ___ ___ ___ ___ ___ N

LAT 37° 40 40.4" N LONG 79° 44' 44" W

Estimated stand size

extensive (greater than 100 acres (> 40 hectares))
x large (greater than 10, but less than 100 acres (4 - 40 hectares))
☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
☐ very small (less than 1 acre; less than 0.4 hectare)
☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area

SITE CHARACTERISTICS

Slope (degrees) 9.65 °

single measure x or: avg of ____

☐ 0-3% (level or nearly so)
☐ 3-8% (gentle/undulating)
☐ 8-16% (sloping/rolling)
x 16-30% (moderate/hilly)
☐ 30-65% (steep)
☐ 65-75% (very steep)
☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): 335 °

single measure x avg. of ____

☐ area is flat, no slope (e.g. ridgetops or flat plains)
☐ aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °
E 68-112 ° NE 23-67 ° x NW 293-337 °
S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)
x xeric (moist for brief time)
☐ somewhat xeric (moist for short time)
☐ submesic (moist for moderately short time)
☐ mesic (moist for significant time)
☐ subhygric (wet for signicant part of growing season; mottles <20cm)
☐ hygric (wet for most of growing season; permanent seepage/mottling)
☐ subhydric (water table at or near surface for most of the year)
☐ hydric (water table at or above surface year round)

Hydrologic Regime

X Site is terrestrial (i.e. not a wetland)

Tidal

☐ Irregularly exposed (< daily)
☐ Regularly flooded (>=daily)
☐ Irregularly flooded (< daily, but >=once/yr)
☐ Wind tidally flooded
☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded
☐ Semipermanently flooded
☐ Seasonally flooded
☐ Intermittently flooded
☐ Temporarily flooded
☐ Saturated

Salinity/Halinity

☐ Saltwater
☐ Brackish
☐ Oligohaline
☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand ☐ Loam ☐ Clay
☐ Sandy Loam x Silt Loam ☐ Clay loam
☐ Peat ☐ Muck ☐ other

Rock Types Present: **Sandstone and quartz cobbles observed.**

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock
____ % boulders/stones
1 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation ☐ trails/roads ☐ wind/ice damage ☐ hemlock adelgid ☐ fire
☐ dogwood anthracnose ☐ clearing ☐ logging ☐ gypsy moth ☐ erosion
☐ exotic plants ☐ grazing/browsing ☐ oak decline ☐ spruce decline ☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Logging was evident by the presence of serveral stumps.

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse wood debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Pinus strobus	13.5 *in*	45.6 *ft*
Pinus strobus	12.5 *in*	38.5 *ft*
Pinus strobus	12.3 *in*	47.2 *ft*

Average tree diameter for stand:

9-10 inch dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Acer rubrum	C	C				
Amelanchier canadensis		R				
Carica papaya	R	R				
Carya glabra						
Cercis canadensis	R	R				
Fraxinus americana	C	C				
Kalmia latifolia		C				
Liriodendron tulipifera			C			
Nyssa sylvatica		R				
Parthenocissus quiquefolia	R					
Pinus strobus				D		
Polygonatum biflorum	R					
Polystichum acrostichoides	C					
Prunus serotina			R			
Quercus montana			C			
Quercus rubra			R			
Robinia pseudoacacia	R	R				
Sassafra albidum	C	C				
Smilax glauca	R					
Solidago sp.	H					
Thelypteris noveboracensis	C					
Tsuga Canadensis		R				
Viburnum acerfolium		R				

Strata

- **H :** herbaceous or woody under 0.5 m tall
- **S:** shrub 0.5 - 6 m tall
- **SC:** subcanopy; trees 6 - 20 m tall
- **TC:** canopy; trees over 20 m tall

Abundance

- **D =** Dominant
- **LD =** Locally dominant
- **C =** Common
- **R =** Rare
- **P =** Present

GENERAL INFORMATION

Plot code / identifer: E-3 Project: Rocky Forge Wind Project

Date: 09/27/2016 Surveyors: Neil Gutherman and Michael C. Smith

Community name (DCR-DNH Ecological Community Group): Eastern White Pine and Hardwood

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Neil Gutherman ☐ NO photos taken

Camera Nikon Cool Pix S7000

File / frame #s: ____

Description of image(s):

1100 N
1101 E
1102 S
1103 W

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: ____

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___,___,___ E Y ___,___,___ N

LAT 37° 40' 24.7" N LONG 79° 44' 29.9" W

Altitude: 459 meters

Estimated stand size

- extensive (greater than 100 acres (> 40 hectares))
- x large (greater than 10, but less than 100 acres (4 - 40 hectares))
- ☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
- ☐ very small (less than 1 acre; less than 0.4 hectare)
- ☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area

SITE CHARACTERISTICS

Slope (degrees) 9.9 °

single measure x or: avg of ____

- ☐ 0-3% (level or nearly so)
- ☐ 3-8% (gentle/undulating)
- x 8-16% (sloping/rolling)
- 16-30% (moderate/hilly)
- ☐ 30-65% (steep)
- ☐ 65-75% (very steep)
- ☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): 140 °

single measure x avg. of 3

- ☐ area is flat, no slope (e.g. ridgetops or flat plains)
- ☐ aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °
E 68-112 ° NE 23-67 ° NW 293-337 °
S 158-202 ° x SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

- ☐ very xeric (moist for a negligible time after precipitation)
- x xeric (moist for brief time)
- ☐ somewhat xeric (moist for short time)
- ☐ submesic (moist for moderately short time)
- ☐ mesic (moist for significant time)
- ☐ subhygric (wet for signicant part of growing season; mottles <20cm)
- ☐ hygric (wet for most of growing season; permanent seepage/mottling)
- ☐ subhydric (water table at or near surface for most of the year)
- ☐ hydric (water table at or above surface year round)

Hydrologic Regime

_x Site is terrestrial (i.e. not a wetland) **tidal**

- ☐ Irregularly exposed (< daily)
- ☐ Regularly flooded (>=daily)
- ☐ Irregularly flooded (< daily, but >=once/yr)
- ☐ Wind tidally flooded
- ☐ Subtidal (permanently flooded)

Non-Tidal

- ☐ Permanently flooded
- ☐ Semipermanently flooded
- ☐ Seasonally flooded
- ☐ Intermittently flooded
- ☐ Temporarily flooded
- ☐ Saturated

Salinity/Halinity

- ☐ Saltwater
- ☐ Brackish
- ☐ Oligohaline
- ☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

- ☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand ☐ Loam ☐ Clay
Sandy Loam x Silt Loam ☐ Clay loam
☐ Peat ☐ Muck ☐ other

Rock Types Present: N/A

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock
____ % boulders/stones
____ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation	☐ trails/roads	☐ wind/ice damage	☐ hemlock adelgid	☐ fire
☐ dogwood anthracnose	☐ clearing	x logging	☐ gypsy moth	☐ erosion
☐ exotic plants	☐ grazing/browsing	☐ oak decline	☐ spruce decline	☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Evidence of logging was observed through several stumps within the plot.

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse wood debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Pinus strobus	11.6 *in*	50.4 *ft*
Pinus strobus	11.2 *in*	48.4 *ft*
Pinus strobus	11.2 *in*	43.2 *ft*

Average tree diameter for stand: 7.2 inch dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Acer rubrum	C		C			
Aralia spinosa		R				
Carya tomentosa		LC				
Dicanthelium	R					
Galium sp.	R					
Kalmia latifolia	C	C				
Liriodendron tulipifera	D		D			
Microstegium vimineum	R					
Parthenocissus quinquefolia	C					
Pinus rigida		R				
Pinus strobus			D			
Polygonatum biflorum	R					
Polystichum acrostichoides	C					
Quercus veluntina		R				
Sassafras albidum	C					
Smilax glauca	R					
Smilax rotundifolia	R					
Thelypteris noveboracensis	C					
	D					

Strata

- **H:** herbaceous or woody under 0.5 m tall
- **S:** shrub 0.5 - 6 m tall
- **SC:** subcanopy; trees 6 - 20 m tall
- **TC:** canopy; trees over 20 m tall

Abundance

- **D =** Dominant
- **LD =** Locally dominant
- **C =** Common
- **R =** Rare
- **P =** Present

GENERAL INFORMATION

Plot code / identifer: G-1 Project: Rocky Forge Wind Project

Date: 09/27/2016 Surveyors: Neil Gutherman and Michael C. Smith

Community name (DCR-DNH Ecological Community Group): Eastern White Pine and Hardwood

Observation area:

Circle of radius 17.8 m; or area ____ m by ____ m; or area = ____

PLOT DOCUMENTATION

Photographer: Neil Gutherman ☐ NO photos taken

Camera Nikon Cool Pix S7000

File / frame #s: ____

Description of image(s):

1114 N
1115 E
1116 S
1117 W

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: ____

GPS point or file name: ____

est accuracy: ____ m/ft # of positions averaged: ____

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ E Y ___ N

LAT 37° 40' 14.0" N LONG 79° 44' 22.4" W

Altitude: 430 meters

Estimated stand size

- extensive (greater than 100 acres (> 40 hectares))
- x large (greater than 10, but less than 100 acres (4 - 40 hectares))
- ☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
- ☐ very small (less than 1 acre; less than 0.4 hectare)
- ☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area

SITE CHARACTERISTICS

Slope (degrees) 9.65 °

single measure x or: avg of ____

- ☐ 0-3% (level or nearly so)
- ☐ 3-8% (gentle/undulating)
- 8-16% (sloping/rolling)
- x 16-30% (moderate/hilly)
- ☐ 30-65% (steep)
- ☐ 65-75% (very steep)
- ☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): 61 °

single measure x avg. of 3

- ☐ area is flat, no slope (e.g. ridgetops or flat plains)
- ☐ aspect is variable over stand

N 338-22 ° W 248-292 ° SW 203-247 °

E 68-112 ° x NE 23-67 ° NW 293-337 °

S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

- ☐ very xeric (moist for a negligible time after precipitation)
- x xeric (moist for brief time)
- ☐ somewhat xeric (moist for short time)
- ☐ submesic (moist for moderately short time)
- ☐ mesic (moist for significant time)
- ☐ subhygric (wet for signicant part of growing season; mottles <20cm)
- ☐ hygric (wet for most of growing season; permanent seepage/mottling)
- ☐ subhydric (water table at or near surface for most of the year)
- ☐ hydric (water table at or above surface year round)

Hydrologic Regime

x Site is terrestrial (i.e. not a wetland) **tidal**

- ☐ Irregularly exposed (< daily)
- ☐ Regularly flooded (>=daily)
- ☐ Irregularly flooded (< daily, but >=once/yr)
- ☐ Wind tidally flooded
- ☐ Subtidal (permanently flooded)

Non-Tidal

- ☐ Permanently flooded
- ☐ Semipermanently flooded
- ☐ Seasonally flooded
- ☐ Intermittently flooded
- ☐ Temporarily flooded
- ☐ Saturated

Salinity/Halinity

- ☐ Saltwater
- ☐ Brackish
- ☐ Oligohaline
- ☐ Freshwater

Refractometer Measurement: ppt ____

Evaluate separately from above:

- ☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay

Sandy Loam Silt Loam ☐ Clay loam

☐ Peat ☐ Muck ☐ other

Rock Types Present: N/A

Cover by unvegetated rock (bare rock or lichen covered):

____ % bedrock

____ % boulders/stones

____ % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation	x trails/roads	☐ wind/ice damage	☐ hemlock adelgid	☐ fire
☐ dogwood anthracnose	☐ clearing	x logging	☐ gypsy moth	☐ erosion
☐ exotic plants	☐ grazing/browsing	☐ oak decline	☐ spruce decline	☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Stand appears to have been logged in the past
young stand
Invasive species present: garlic mustard (*alliara petiolata*)
Dirt access roads

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Low amount of coarse wood debris
Young Stand

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Pinus strobus	17.4 *in*	61 *ft*
Quercus montana	12.9 *in*	48 *ft*
Quercus falcata	11.5 *in*	44 *ft*

Average tree diameter for stand:

8.5 inch dbh

SPECIES COMPOSITION AND ABUNDANCE BY STRATUM

List all trees and shrub species, and all herbaceous species that cover at least one square meter within the observation area
Indicate relative abundance for each species in each layer in which it occurs.

TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Acer rubrum	C		C			
Alliaria petiolata	C					
Betula lenta		R				
Carya sp.	D	D				
Dicanthelium sp.	R					
Fagus grandifolia		R				
Gleditsia triacanthos		R				
Kalmia latifolia		C				
Liriodendron tulipifera			C			
Nyssa sylvatica		R				
Osmundastrum cinnamomeum	R					
Oxydendrum arboreum	C	C				
Pinus rigida		R				
Pinus strobus		C		C		
Polystichum acrostichoides	R					
Quercus alba			R			
Quercus coccinea	R					
Quercus falcata	C		C			
Quercus montana	D		D			
Sassafras albidum	C	C				
Smilax rotundifolia	C					
Tsuga canadensis		R				
Vaccinium angustifolium		C				
Unknown sp.	P					

Strata

- **H :** herbaceous or woody under 0.5 m tall
- **S:** shrub 0.5 - 6 m tall
- **SC:** subcanopy; trees 6 - 20 m tall
- **TC:** canopy; trees over 20 m tall

Abundance

- **D =** Dominant
- **LD =** Locally dominant
- **C =** Common
- **R =** Rare
- **P =** Present

GENERAL INFORMATION

Plot code / identifer: G-2 Project: Rocky Forge Wind Project

Date: 09/27/2016 Surveyors: Neil Gutherman and Michael C. Smith

Community name (DCR-DNH Ecological Community Group): Pine - Oak/Heath Forest

Observation area:

Circle of radius 17.8 m; or area _____ m by _____ m; or area = _____

PLOT DOCUMENTATION

Photographer: Neil Gutherman ☐ NO photos taken

Camera Nikon Cool Pix S7000

File / frame #s: _____

Description of image(s):

1135 N
1136 E
1137 S
1138 W

GPS DATA

GPS Unit: GETAC F110 Tablet GPS Datum: _____

GPS point or file name: _____

est accuracy: _____ m/ft # of positions averaged: ___

Reciever status: 2D / 3D / 2D WAAS / 3D WAAS

Field Coordinates:

UTM X ___ ___ ___,___ ___ ___ E Y ___,___ ___ ___,___ ___ ___ N

LAT 37° 40' 18.3" N LONG 79° 44' 40.8" W

Altitude: 398 meters

Estimated stand size

extensive (greater than 100 acres (> 40 hectares))
x large (greater than 10, but less than 100 acres (4 - 40 hectares))
☐ small (greater than 1 acre, but less than 10 acres (0.4 - 4 hectares))
☐ very small (less than 1 acre; less than 0.4 hectare)
☐ Unknown

Notes on stand size:

Stand size limited to areas within the study area

SITE CHARACTERISTICS

Slope (degrees) 9.65 °

single measure x or: avg of _____

☐ 0-3% (level or nearly so)
☐ 3-8% (gentle/undulating)
8-16% (sloping/rolling)
16-30% (moderate/hilly)
x 30-65% (steep)
☐ 65-75% (very steep)
☐ 75+% (extremely steep)

Slope Aspect (N = 0 degrees): 12 °

single measure x avg. of _____

☐ area is flat, no slope (e.g. ridgetops or flat plains)
☐ aspect is variable over stand

xN 338-22 ° W 248-292 ° SW 203-247 °
E 68-112 ° NE 23-67 ° NW 293-337 °
S 158-202 ° SE 113-157 °

compass: x magnetic corrected

Soil Moisture Regime

☐ very xeric (moist for a negligible time after precipitation)
xeric (moist for brief time)
x somewhat xeric (moist for short time)
☐ submesic (moist for moderately short time)
☐ mesic (moist for significant time)
☐ subhygric (wet for signicant part of growing season; mottles <20cm)
☐ hygric (wet for most of growing season; permanent seepage/mottling)
☐ subhydric (water table at or near surface for most of the year)
☐ hydric (water table at or above surface year round)

Hydrologic Regime

_x Site is terrestrial (i.e. not a wetland) **tidal**

☐ Irregularly exposed (< daily)
☐ Regularly flooded (>=daily)
☐ Irregularly flooded (< daily, but >=once/yr)
☐ Wind tidally flooded
☐ Subtidal (permanently flooded)

Non-Tidal

☐ Permanently flooded
☐ Semipermanently flooded
☐ Seasonally flooded
☐ Intermittently flooded
☐ Temporarily flooded
☐ Saturated

Salinity/Halinity

☐ Saltwater
☐ Brackish
☐ Oligohaline
☐ Freshwater

Refractometer Measurement: ppt _____

Evaluate separately from above:

☐ ephemeral seepage/subsurface water present locally in plot (non-wetland habitats)

Soil Texture (top 10 cm of mineral soil)

☐ Sand x Loam ☐ Clay
Sandy Loam Silt Loam ☐ Clay loam
☐ Peat ☐ Muck ☐ other

Rock Types Present: Several sandstone cobbles were observed.

Cover by unvegetated rock (bare rock or lichen covered):

_____ % bedrock
_____ % boulders/stones
2 % gravel/cobbles

Evidence of Disturbance

☐ ditching/hydrologic alternation
☐ dogwood anthracnose
☐ exotic plants
trails/roads
☐ clearing
☐ grazing/browsing
x wind/ice damage
logging
☐ oak decline
☐ hemlock adelgid
☐ gypsy moth
☐ spruce decline
☐ fire
☐ erosion
☐ Other

Notes re: Disturbance: (past land use, list exotics species, other natural or anthropogenic disturbance, evidence of stand age)

Evidence of logging was ovsered from the presence of several stumps
Blow down from wind
Young stand
Adjacent to Dagger Springs Road

Notes re: Landscape context: (adjacent vegetation or land use, condition of surrounding landscape)

Undeveloped
Moderate amount of coarse wood debris

TREE DIAMETER AND HEIGHT (identify and measure the three largest trees in the stand)

SPECIES	DBH (cm)	HT (m)
Carya tomentosa	14.5 *in*	66 *ft*
Liriodendron tulipifera	15.3 *in*	60 *ft*
Pinus rigida	16.1 *in*	59 *ft*

Average tree diameter for stand:

9 inch dbh

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TAXON	H	S	SC	TC	ID	Coll./ #
EXAMPLE SPECIES		P		D	✓	132
Acer pensylvanicum		C				
Acer rubrum	C		C			
Ailanthus altissima		R				
Betula lenta			C			
Carya tomentosa	D			D		
Cercis canadensis		R				
Dioscorea villosa	R					
Fagus grandidolia			R			
Hamamelis virginiana		C				
Kalmia latifolia		C				
Liriodendron tulipifera	D			D		
Magnolia acuminata		R				
Nyssa sylvatica			C			
Oxydendrum aboreum		R				
Pinus strobus		C				
Polystichum acrostichoides	R					
Quercus alba	C		C			
Quercus montana			C			
Quercus rubra			C			
Robinia pseudo-acacia		R				
Thelypteris noveboracensis	R					
Tsuga canadensis		R				

Strata

H : herbaceous or woody under 0.5 m tall

S: shrub 0.5 - 6 m tall

SC: subcanopy; trees 6 - 20 m tall

TC: canopy; trees over 20 m tall

Abundance

D = Dominant

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