

## **APPENDIX G: INVASIVE SPECIES RESOURCE REPORT**

# DOOMS-BREMO 230 KV TRANSMISSION LINE EA

Appalachian National Scenic Trail, Virginia  
Shenandoah National Park, Virginia

The National Park Service  
U.S. Department of the Interior



Invasive Species Report  
September 2012

FINAL



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## **EXECUTIVE SUMMARY**

The National Park Service (NPS) received a proposal from Dominion Virginia Power (DVP) to upgrade a high voltage electric transmission line on an existing right-of-way within Appalachian National Scenic Trail and Shenandoah National Park in Virginia. The existing line crosses approximately 3,000 feet of NPS property. The proposed project would remove the existing 115-kilovolt (kV) transmission line and rebuild a 230kV transmission line between the Dooms substation in Augusta County and the Bremo Substation in Fluvanna County.

An Environmental Assessment is being prepared to decide whether and under what conditions to issue DVP construction and special use permits to complete construction. To determine the baseline for invasive exotic species, a survey was conducted in the location where the right-of-way crosses NPS property.

On July 5-6, 2012, The Louis Berger Group, Inc. conducted an invasive plant species survey of the Dooms-Bremo 230kV transmission line right-of-way crossing Skyline Drive and the Appalachian Trail in Shenandoah National Park. Fourteen species considered invasive in Virginia by the NPS were documented on the site, and two additional species not on the Virginia list are also considered invasive at the site. The areal extent of each species was documented using a Trimble GeoXH handheld global positioning systems unit. Large monotypic patches of vegetation, mixed combinations of invasive species, and, small patches or individual plants were located and recorded.

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## **I. PROJECT BACKGROUND**

### **i. Introduction to the Project**

The National Park Service (NPS) received a proposal from Dominion Virginia Power (DVP) to upgrade a high voltage electric transmission line on an existing right-of-way within Appalachian National Scenic Trail and Shenandoah National Park in Virginia (the parks) (figure 1). The existing line crosses approximately 3,000 feet of NPS property. The proposed project would remove the existing 115-kilovolt (kV) transmission line and rebuild a 230kV transmission line between the Dooms substation in Augusta County and the Brems Substation in Fluvanna County (the Dooms – Brems line).

An Environmental Assessment (EA) is being prepared to decide whether and under what conditions to issue DVP construction and special use permits to complete construction. The EA will focus on the area where the existing transmission line directly crosses NPS lands, also known as the project area.

### **ii. Scope of Survey**

The Louis Berger Group, Inc. (LBG) was contracted to complete both the EA and necessary environmental surveys across NPS lands. The Dooms – Brems line crosses NPS lands in two locations, on three NPS parcels. The transmission line crosses approximately 525 feet of Shenandoah National Park land, immediately adjacent to approximately 740 feet of Appalachian National Scenic Trail property. At this crossing, the existing 115kV line is collocated with two other DVP transmission lines (one single-circuit 500kV and one double-circuit 230kV) in a 330-foot right-of-way. About 1 mile east of Skyline Drive, the Dooms – Brems line crosses approximately 1,600 feet of an additional Appalachian National Scenic Trail parcel. At this crossing, the existing 115kV line is collocated with one other DVP transmission line (one single-circuit 500kV) in a 250-foot right-of-way. Figure 1 depicts the general project location; figure 2 shows the areas of the two crossings.

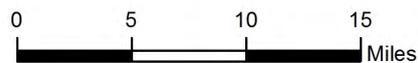
A survey for the invasive exotic species was required to obtain a baseline of current conditions of such species in the project area. The area to be surveyed includes the existing right-of-way, the proposed access road locations within NPS lands, and 15 feet on either side of the right-of-way edge. The surveys areas are shown below in **Figure 2**.



**Legend**

- NPS Lands
- Appalachian National Scenic Trail
- Existing Transmission Lines**
- 69 kV
- 115 - 138 kV
- 230 - 500 kV

**Figure 1: Appalachian Trail and  
Shenandoah National Park  
Crossings Overview**



Dooms - Bremo 230kV Transmission Line Project  
Appalachian National Scenic Trail and  
Shenandoah National Park

National Park Service  
U.S. Department of the Interior



Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

- Existing ROW
- County Boundary
- Proposed Access Roads
- Existing Towers on NPS Land
- Shenandoah National Park
- Appalachian National Scenic Trail Land
- Appalachian National Scenic Trail

Figure 2: Skyline Drive and  
Appalachian Trail Crossing

0 500 1,000 2,000 Feet



### iii. Description of Survey Areas

The project is located approximately 8 miles northeast of Waynesboro, VA, north of Calf Mountain and at the southern extent of Shenandoah National Park. The survey area for invasive plants was limited to the cleared right-of-way as it crosses NPS lands, proposed access roads, and 15 feet on either side of the right-of-way. The right-of-way has been previously cleared of all woody and tall vegetation and is predominantly grasses and shrubs. The survey areas are located on a ridge in rough terrain with steep slopes.

The project was broken into two survey areas, Survey Area A (**Figures 3 and 5**) and Survey Area B (**Figures 4 and 6**). Survey Area A includes both parks, Skyline Drive and the Appalachian Trail. The parcel is accessible via Skyline Drive or Calf Mountain Road. Skyline Drive is located along the side of ridge, with a harsh 25% down slope to the west and east. While the terrain is very steep on either side of Skyline Drive, it levels off slightly east of the Appalachian Trail. Vegetation is low growing grasses and shrubs, approximately 3 to 5 feet tall. There is a cleared right-of-way access road from Calf Mountain Road to the west that cuts through the majority of the survey area, east of the Appalachian Trail.

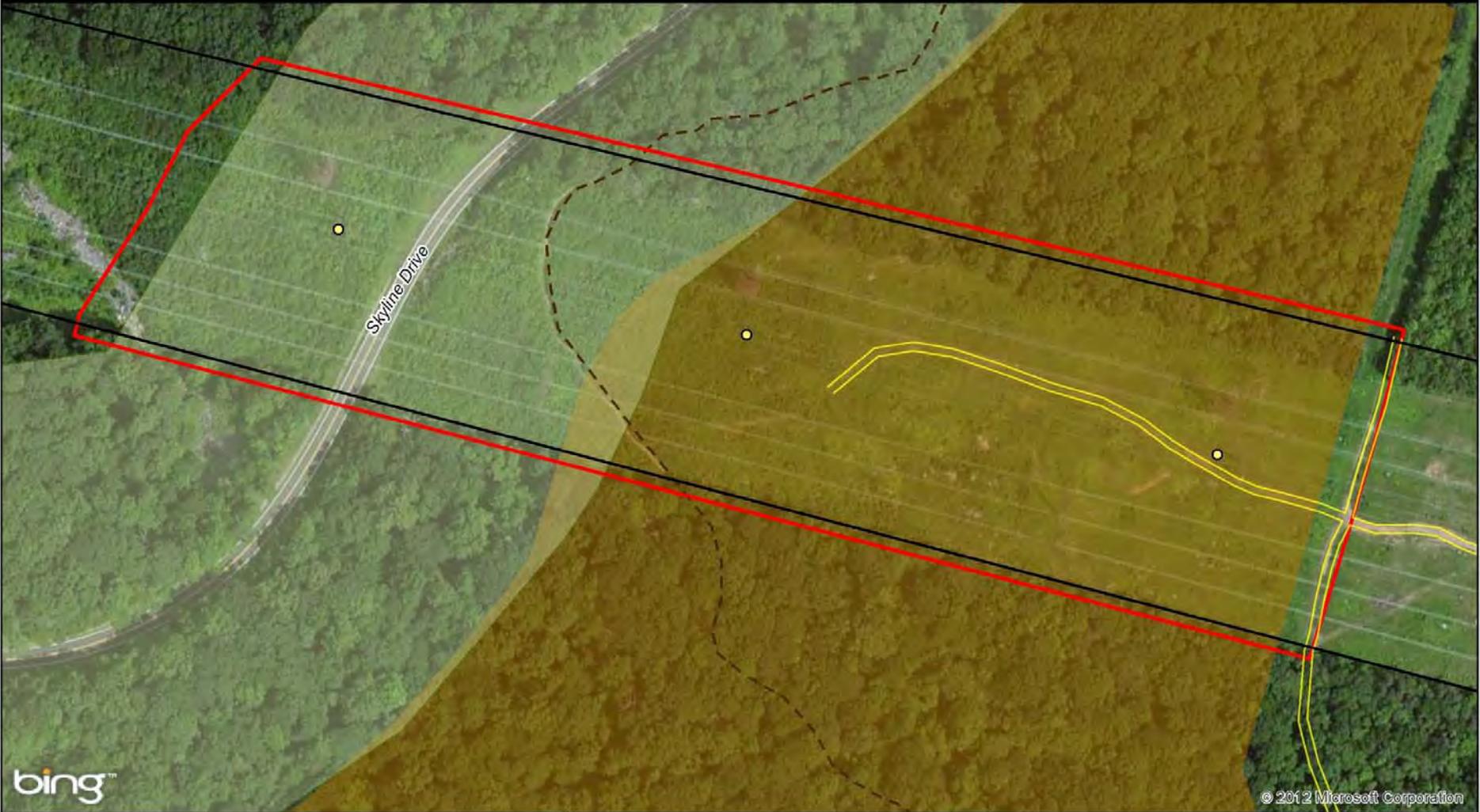


**Figure 3: Survey Area A - Looking west and east (respectively) from Skyline Drive**

Survey Area B includes a small Appalachian National Scenic Trail parcel west of Survey Area A. Survey Area B consists of very rough terrain with thick vegetation. The right-of-way is located in an area of the ridge that slopes down both north and east on a 30% slope. Terrain and vegetation density becomes progressively steeper and denser, respectively, on the east side of the survey area closer to the base of the ridge.

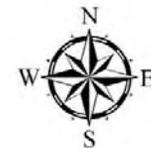
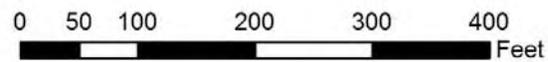


**Figure 4: Survey Area B – Looking northwest and southeast from survey area**



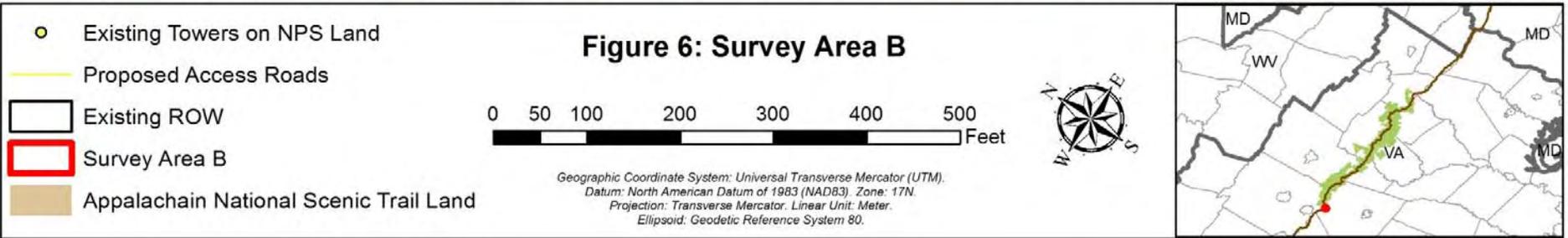
- Existing Towers on NPS Land
- Proposed Access Road
- Existing ROW
- Survey Area A
- Appalachian National Scenic Trail
- Shenandoah National Park
- Appalachian National Scenic Trail Land

**Figure 5: Survey Area A**



Geographic Coordinate System: Universal Transverse Mercator (UTM).  
 Datum: North American Datum of 1983 (NAD83), Zone: 17N.  
 Projection: Transverse Mercator. Linear Unit: Meter.  
 Ellipsoid: Geodetic Reference System 80.





## II. SCOPE OF THE ANALYSIS AND BACKGROUND INFORMATION

Prior to the survey, a review of the Department of Conservation and Recreation (DCR) *Invasive Alien Plant Species of Virginia list* (DCR 2009) and the *Mid-Atlantic Exotic Pest Plant Council Plant List* (NPS n.d.) was conducted to create a list of potential invasive plants that may occur in and near the project area. The list provided by DCR contains a key of the habitats where the invasives are typically found. All plants in the Mountain Region and of Mesic moisture level were considered as potentially occurring in the study area. These species were reviewed by field staff prior to conducting field work. A full list of these species from both resources is found in Attachment 1.

## III. SEARCH METHODOLOGY

On July 5-6, 2012, Mr. William Sipple, assisted by Mr. Nick Tatalovich, documented the presence and extent of any invasive exotic vascular plants at the northwestern (Survey Area A) and southeastern (Survey Area B) areas. The invasive exotic vascular species survey was conducted simultaneously with the rare target species, the small-whorled pogonia (*Isotria medeoloides*).

Stem densities and cover values were not obtained, but when such invasive exotic species were encountered, their areal extent was documented using a Trimble GeoXH handheld global positioning systems (GPS) unit. In some instances, large monotypic patches of vegetation invasive exotic were found; in other instances, mixed combinations of invasive species were noted. At other times, small patches or individual plants were located and recorded. The results are presented in *Section V: Summary of Findings* as either individually numbered clones or patches designated by the dominant species. Except for small patches, the invasive species are shown on maps as polygons in **Figures 7 and 8** (shown in *Section V: Summary of Findings*).

Scientific nomenclature for exotic invasive plants mentioned in this report follows the PLANTS database (USDA 2012). In addition to the surveyor's personal knowledge of invasive exotic vascular plants, two pertinent references helped to establish the status of invasive species for Virginia: *Mid-Atlantic Exotic Pest Plant Council Plant List* (NPS n.d.) and the PLANTS database mentioned above.

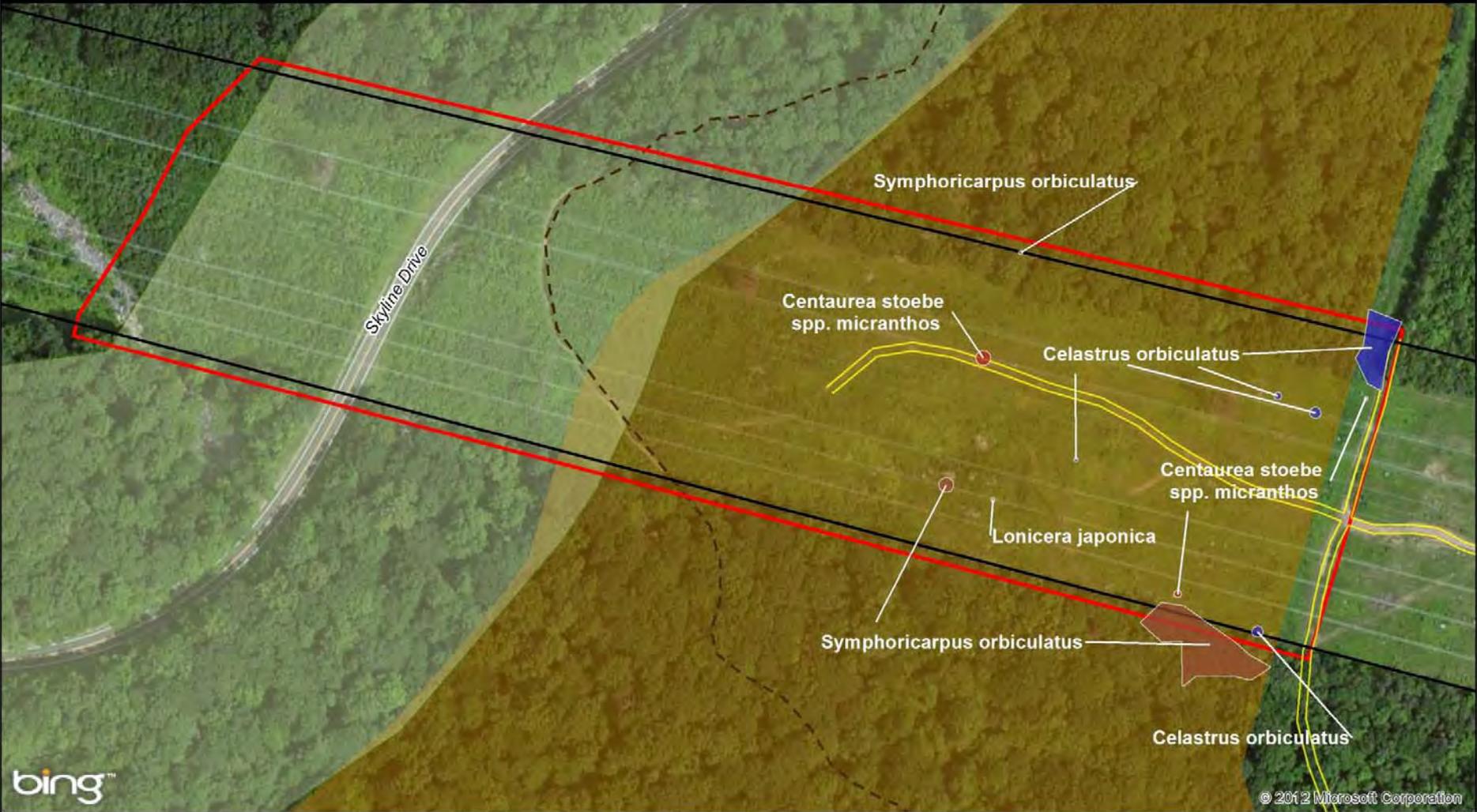
## IV. SUMMARY OF FINDINGS

The following 14 invasive exotic vascular species were found during the survey at Survey Areas A and B, all of which are listed as invasive for Virginia on the *Mid-Atlantic Exotic Pest Plant Council list* or DCR's *Invasive Alien Plant Species of Virginia*. Photographs from the survey are found in Attachment 2.

1. Spinny plumeless thistle (*Carduus acanthoides*)
2. Spotted knapweed (*Centaurea stoebe* spp. *micranthos*)
3. Princesstree (*Paulownia tomentosa*)
4. Japanese honeysuckle (*Lonicera japonica*)
5. Tree-of-heaven (*Ailanthus altissima*)
6. Oriental bittersweet (*Celastrus orbiculatus*)
7. Wine raspberry (*Rubus phoenicolasius*)
8. Multiflora rose (*Rosa multiflora*)
9. Sericea lespedeza (*Lespedeza cuneata*)
10. Common burdock (*Arctium minus*)
11. Japanese barberry (*Berberis thunbergii*)
12. Common mullein (*Verbascum thapsus*)
13. Black locust (*Robinia pseudoacacia*)
14. Garlic mustard (*Alliaria petiolata*)

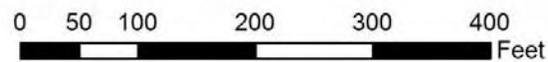
The first nine (9) species listed above occur in various size patches; sometimes as clones in the right-of-way. They are depicted as polygons named after one (e.g., Oriental bittersweet) or more (e.g., Japanese honeysuckle-wine raspberry) dominant species involved (**Figures 7 and 8**). Of these nine species, the spinny plumeless thistle, spotted knapweed, princesstree, Japanese honeysuckle, tree-of-heaven, Oriental bittersweet, and wine raspberry are the most abundant. They also occur as scattered individuals throughout much of the right-of-way. There was also substantial dead garlic mustard, both in and outside of the right-of-way. Being a biennial, this invasive was undoubtedly more noticeable in 2011. Because it can be quite aggressive, the site should be monitored for its presence again in 2013. A small patch of both the multiflora rose and sericea lespedeza were found, as were a few patches of Japanese barberry. The remaining three invasive species (common burdock, common mullein, and black locust) occur more scattered throughout the survey areas.

Although the catnip (*Nepeta cataria*) is not shown for Virginia on the *Mid-Atlantic Exotic Pest Plant Council list*, it is listed for Maryland, and it is quite aggressive at this site and probably should be considered an obnoxious invasive on the right-of-way. Likewise, the coralberry (*Symphoricarpos orbiculatus*) is not shown on the list for any mid-Atlantic state. However, Strausbaugh and Core (n.d.) mention that, although this species is a native in West Virginia, it is often cultivated and has widely escaped. Therefore, it might have done so on this right-of-way because a few dense patches exist. Overall, invasive exotic plants were not dominant at either location. Invasive exotics were fairly infrequent in Survey Area A, with denser and more numerous patches in Survey Area B.

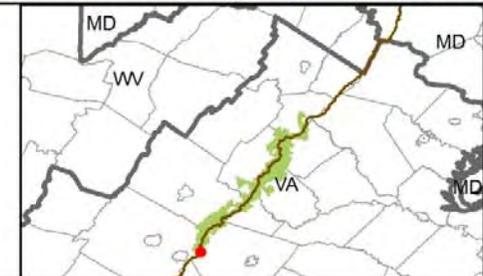


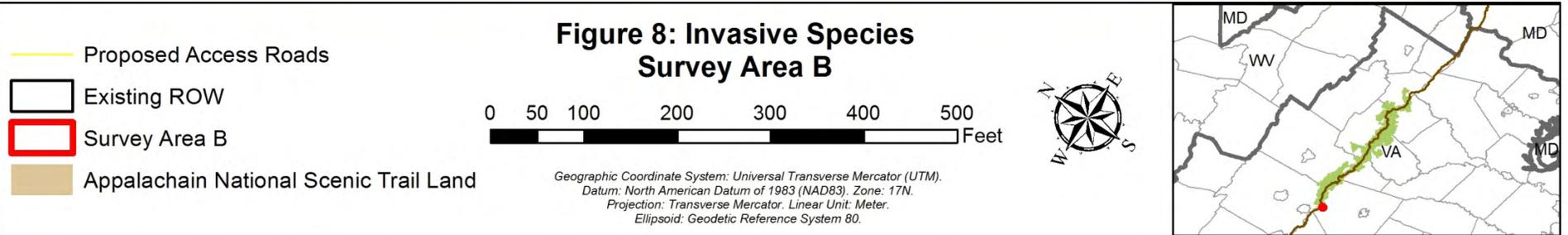
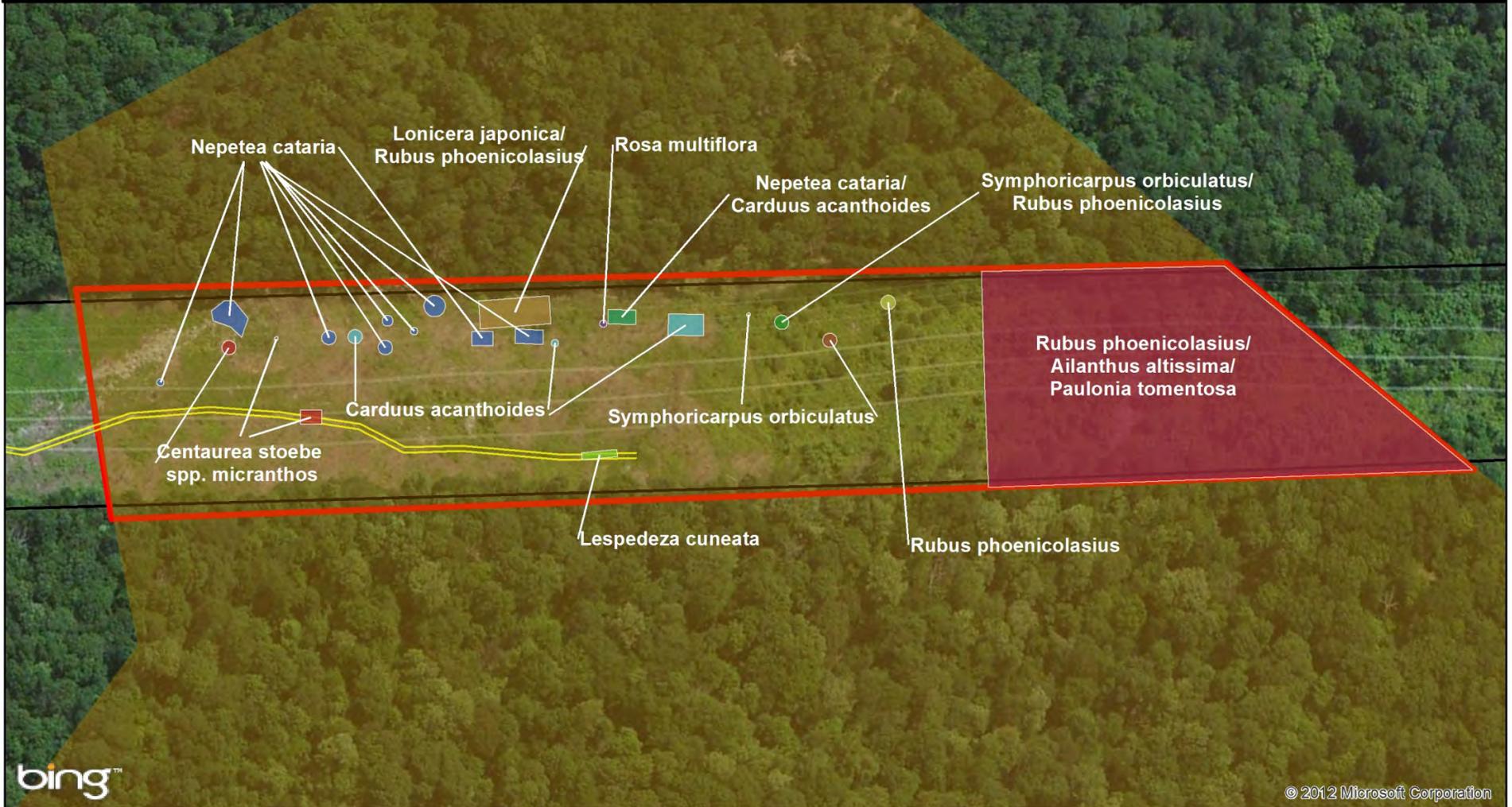
- Proposed Access Road
- Existing ROW
- Survey Area A
- Appalachian National Scenic Trail
- Shenandoah National Park
- Appalachian National Scenic Trail Land

**Figure 7: Invasive Species  
 Survey Area A**



Geographic Coordinate System: Universal Transverse Mercator (UTM).  
 Datum: North American Datum of 1983 (NAD83). Zone: 17N.  
 Projection: Transverse Mercator. Linear Unit: Meter.  
 Ellipsoid: Geodetic Reference System 80.





## **V. RECOMMENDATIONS FOR SPECIFIC MITIGATION MEASURES FOR CONTROLLING INVASIVE PLANTS**

Per Virginia DCR guidance, following a disturbance, planting and/or seeding of native species can establish a desirable natural community and preempt infestation by invasives. Whenever possible, native plant material should be from locally collected seeds or cuttings. After construction, DVP will restore the right-of-way with a native species mix, agreed upon by the NPS.

The best way to control invasive plants is to develop an invasive species management plan. Such a plan includes: site goals or management objectives, a list of the invasive plant species identified as interfering with goals or objectives, species life history information, the observed or potential impacts on the site, an assessment of control options, a monitoring plan to measure the effects of management actions, and a detailed budget of projected costs (Heffernan 1998).

There are a variety of other control methods that could be implemented after construction. A control method should be selected based upon goals set by the NPS and DVP and the resources available to achieve those goals. Possible methods include:

1. *Mechanical Control*, including, hand pulling, use of hand and power tools to cut, remove, mow, or rototill invasive plants
2. *Chemical Control*, including the use of EPA or NPS approved herbicides. Herbicides must be applied with extreme care and proper safety precautions.
3. *Biological Control*, by intentionally introducing an undomesticated enemy organism of the target species, usually an insect herbivore or a microbial pathogen. However, this method often results in undesirable or unintended effects (Heffernan 1998).

## **VI. LIST OF PREPARERS**

### **William S. Sipple Wetland and Environmental Training and Consulting**

*William S. Sipple*: Botanist with more than 30 years of experience. Mr. Sipple is currently on the U.S. Fish & Wildlife Service's list of approved surveyors to conduct plant searches for the following federally threatened or endangered plant species: the small whorled pogonia (*Isotria medeoloides*), harparella (*Ptilimnium nodosum*), swamp pink (*Helonias bullata*), and sensitive joint-vetch (*Aeschynomene virginica*).

**The Louis Berger Group, Inc.**

*Nick Tatalovich*: An environmental scientist with 3 years of experience in assisting botanical searches and creating maps in ArcGIS both for field teams and for private/federal clients.

*Emily Larson*: An environmental scientist with 5 years of experience in environmental sciences and regulatory compliance for both private and federal clients, primarily relating to utilities and infrastructure planning.

**VII. REFERENCES**

Gleason, H.A. and A. Cronquist

- 1991 *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*. The New York Botanical Garden. 910 pp.

Heffernan, K.E.

- 1998 *Managing Invasive Alien Plants in Natural Areas, Parks, and Small Woodlands*. Natural Heritage Technical Report 98-25. Virginia Department of Conservation and Recreation, Division of Natural Heritage. Richmond, VA.

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- n.d. Mid-Atlantic Exotic Pest Plant Council Plant List. Accessed online at: (<http://nps.gov/plants/alien/list/midatlantic.htm>).

Strausburgh, P.D. and E.L. Core

- n.d. *Flora of West Virginia*. 2<sup>nd</sup> edition. Seneca Books, Inc., Morgantown, WV. 1079 pp.

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- 2012 PLANTS database. Accessed online at: <http://www.plants.usda.gov>.

Virginia Department of Conservation and Recreation (VDCR)

- 2009 *Invasive Alien Plant Species of Virginia*. Access online at: [http://www.dcr.virginia.gov/natural\\_heritage/documents/invlist.pdf](http://www.dcr.virginia.gov/natural_heritage/documents/invlist.pdf)

## **VIII. ATTACHMENTS**

## **Attachment 1: DCR Invasive Alien Plant Species of Virginia**

## **Attachment 2: Field Photographs**



*Carduus acanthoides*



*Celastrus orbiculatus*



*Centaurea stoebe spp micranthos*



*L. japonica\_Rubus phoenicolasius*



*Lespedeza cuneata*



*Lonicera japonica*



*Nepeta cataria*



*Rosa multiflora*



*Symphoricarpos orbiculatus*