

# Appendix F

**Biological Evaluation for  
Regional Forester's Sensitive Plant Species  
On the Monongahela National Forest  
For the  
West Virginia Department of Transportation  
Corridor H, Kerens to Parsons Project**



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6/24/15

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## **I. EXECUTIVE SUMMARY**

This Programmatic Biological Evaluation (BE) is an analysis of the potential effects associated with the proposed Kerens to Parsons, West Virginia Corridor H project on 61 Regional Forester Sensitive Species (RFSS) of plants that occur on the Monongahela National Forest (MNF).

A Memorandum of Understanding between United States Department of Agriculture Forest Service (USDA FS) and United States Department of Transportation Federal Highway Administration (FHWA) regarding the appropriation and transfer of National Forest system lands for highway purposes is the legal document identifying the FHWA as lead agency for Appalachian Corridor H, Kerens to Parsons Project. Therefore, all federally listed Threatened, Endangered and Proposed species survey requirements, effects, determinations, and Biological Assessments fall under the Federal Highway Administration for compliance as the lead agency. These documents are referenced in this Biological Evaluation and can be found in the project file.

A Memorandum of Understanding between United States Department of Agriculture Monongahela National Forest, United States Department of Transportation Federal Highway Administration and the West Virginia Department of Transportation (WVDOT) was signed in 2003 to facilitate continued coordination among those agencies during development and implementation of the highway project. This document is referenced and can be found in the project file.

This Biological Evaluation was written utilizing the results of intensive project field surveys and reports completed by Skelly and Loy, Inc. and AllStar Ecology during 2012-2013.

Documentation from United States Fish and Wildlife Service (USFWS), United States Department of Transportation Federal Highway Administration (FHWA) and West Virginia Department of Transportation (WVDOT) Division of Highways were used in this document preparation.

Documents listed in the Reference Document section can be found in the electronic project file.

## **DETERMINATIONS**

### **Endangered, Threatened and Proposed Species Summary**

The Federal Highway Administration is considered the lead agency on the Corridor H Kerens to Parsons Project. Federally listed Threatened, Endangered and Proposed species survey requirements, effects, determinations and Biological Assessments have been completed thru FHWA and USFWS and are not part of this document but can be found in the Project file. For the reader's convenience, a summary of TEP determinations is included here.

USFWS has determined that six federally listed species are within the Appalachian Corridor H, Kerens to Parsons Project location. The final listing and interim rule regarding Northern long-eared bat went into effect on May 4, 2015. A Biological Assessment nor further Section 7 consultation under the ESA is required for the proposed project unless additional species are

discovered or USFWS deems it necessary. These determinations are documented in a 12/9/2014 letter to WVDOT from USFWS, Appendix 1.

**Table 1. Determinations for Endangered, Threatened, and Proposed species on the MNF**

Scientific Name	Common Name	Federal Status	Within project range?	Determination
<i>Plethodon nettingi</i>	Cheat Mountain salamander	Threatened	Y	Not Likely to adversely Affect
<i>Myotis sodalis</i>	Indiana bat	Endangered	Y	With season harvest restrictions*; Not Likely to adversely Affect
<i>Corynorhinus townsendii virginianus</i>	Virginia big-eared bat	Endangered	Y	Not Likely to adversely Affect
<i>Myotis septentrionalis</i>	Northern long-eared bat	Threatened	Y	With seasonal harvest restrictions**; Not Likely to jeopardize
<i>Arabis serotina</i>	Shale barren rock cress	Endangered	N	No Effect
<i>Isotria medeoloides</i>	Small-whorled pogonia	Threatened	Y	With Alignment shift 3; May affect; Not Likely to adversely Affect
<i>Spiraea virginiana</i>	Virginia Spirea	Threatened	N	No Effect
<i>Trifolium stoloniferum</i>	Running Buffalo clover	Endangered	Y	Not Likely to adversely Affect

\*Per 10/31/14 letter from WVDOT to USFWS areas falling within the 5 mile Indiana bat hibernacula buffer zones, will be cleared only between November 15 and March 31.

\*\*A Northern long-eared bat Conservation Plan 2014 was completed by WVDOT and concurred by USFWS included commitment that trees throughout the entire project area will be cleared only between November 15 and March 31.

### Sensitive plant species

The following determination of effects to RFSS on the MNF has been made as a result of this Biological Evaluation.

**Table 2. Determinations for USFS Regional Foresters Sensitive Plant Species on the MNF**

Scientific Name	Common Name	Results
<i>Agrostis mertensii</i>	Arctic Bentgrass	No impacts.
<i>Allium allegheniense</i>	Allegheny Onion	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Allium oxyphilum</i>	Lillydale Onion	No impacts.
<i>Amelanchier bartramiana</i>	Bartram Shadbush	No impacts.
<i>Arabis patens</i>	Spreading Rockcress	No impacts.
<i>Astragalus neglectus</i>	Cooper's Milkvetch	No impacts.
<i>Baptisia australis</i> var. <i>australis</i>	Blue Wild Indigo	No impacts.
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lanceleaf Grapefern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Botrychium oneidense</i>	Bluntlobe Grapefern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Carex roanensis</i>	Roan Mountain Sedge	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Clematis occidentalis</i> var. <i>occidentalis</i>	Purple Clematis	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

<i>Corallorhiza bentleyi</i>	Bentley's Coralroot	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Cornus rugosa</i>	Roundleaf Dogwood	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Cypripedium reginae</i>	Showy Lady's-slipper	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Delphinium exaltatum</i>	Tall Larkspur	No impacts.
<i>Eriogonum alleni</i>	Shalebarren Wild-buckwheat	No impacts.
<i>Euphorbia purpurea</i>	Darlington's Spurge	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Gaylussacia brachycera</i>	Box Huckleberry	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Gymnocarpium appalachianum</i>	Appalachian Oak Fern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Hasteola suaveolens</i>	Sweet-scented Indian-plantain	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Heuchera alba</i>	White Alumroot	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Hexalectris spicata</i>	Crested Coralroot	No impacts.
<i>Hypericum mitchellianum</i>	Blue Ridge St. John's-wort	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Ilex collina</i>	Long-stalk Holly	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Juglans cinerea</i>	Butternut	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Juncus filiformis</i>	Thread Rush	No impacts.
<i>Juncus trifidus</i>	Highland Rush	No impacts.
<i>Liatis turgida</i>	Turgid Blazing Star	No impacts.
<i>Linum sulcatum</i>	Grooved Yellow Flax	No impacts.
<i>Listera cordata</i>	Heartleaf Twayblade	No impacts.
<i>Marshallia grandiflora</i>	Large-flowered Barbara's-buttons	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Menyanthes trifoliata</i>	Bog Buckbean	No impacts.
<i>Monarda fistulosa ssp. brevis</i>	Smoke Hole Bergamot	No impacts.
<i>Ophioglossum engelmannii</i>	Limestone Adder's-tongue	No impacts.
<i>Paronychia argyrocoma</i>	Silvery Nailwort	No impacts.
<i>Paronychia virginica</i>	Yellow Nailwort	No impacts.
<i>Paxistima canbyi</i>	Canby's Mountain-lover	No impacts.
<i>Pedicularis lanceolata</i>	Swamp Lousewort	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Phlox buckleyi</i>	Swordleaf Phlox	No impacts.
<i>Piptatherum (=Oryzopsis) canadense</i>	Canada Mountain Ricegrass	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Platanthera shriveri</i>	Shriver's Frilly Orchid	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Poa paludigena</i>	Bog Bluegrass	No impacts.
<i>Polemonium vanbruntiae</i>	Bog Jacob's-ladder	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

<i>Potamogeton tennesseensis</i>	Tennessee Pondweed	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Pycnanthemum beadlei</i>	Beadle's Mountainmint	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Ranunculus pennsylvanicus</i>	Pennsylvania Buttercup	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Rhamnus lanceolata</i> ssp. <i>lanceolata</i>	Lanceleaf Buckthorn	No impacts.
<i>Ribes lacustre</i>	Bristly Black Currant	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Scutellaria saxatilis</i>	Rock Skullcap	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Silene virginica</i> var. <i>robusta</i>	Fire Pink	No impacts.
<i>Stellaria borealis</i> ssp. <i>borealis</i>	Boreal Starwort	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Taenidia montana</i>	Mountain Pimpernel	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Taxus canadensis</i>	Canada Yew	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Tortula ammonsiana</i>	Ammons' Tortula Moss	No impacts.
<i>Trichomanes boschianum</i>	Bristle-fern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Trichostema setaceum</i>	Narrow-leaved Blue-curls	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Trifolium virginicum</i>	Kate's Mountain Clover	No impacts.
<i>Triphora trianthophora</i>	Nodding Pogonia	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Viola appalachiensis</i>	Appalachian Blue Violet	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Vitis rupestris</i>	Sand Grape	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Woodwardia areolata</i>	Netted Chainfern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.



## **II. INTRODUCTION**

It is Forest Service policy to avoid all adverse impacts on threatened and endangered species and their habitats except when it is possible to compensate adverse effects totally through alternatives identified in a biological opinion rendered by the Fish and Wildlife Service. Measures are to be identified and prescribed to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (Forest Service Manual, FSM 2670.31).

Existing management direction is found in the Monongahela National Forest Land and Resource Management Plan (MNFLMP; United States Department of Agriculture, 2006). Projects proposed in occupied or potential habitat of any candidate, threatened, or endangered species on the Forest must be consistent with the Programmatic Biological Opinion for the Monongahela National Forest 2006 Plan Revision *in order to require no further consultation*. Projects that affect candidate, threatened, or endangered species require the appropriate level of consultation with the U. S. Fish and Wildlife Service.

Species classified as sensitive by the Forest Service are to be considered through the National Environmental Policy Act process by conducting biological evaluations to determine the potential effect of all programs and activities on these species (FSM 2670.32). No impacts may be allowed on sensitive species that would result in loss of population viability or create significant trends toward Federal listing.

For species other than those classified as Proposed, Endangered, Threatened or Sensitive (PETS) refer to the Appalachian Corridor H Kerens, WV to Parsons, WV Battlefield Avoidance Supplemental Final Environmental Impact Statement; FHWA-WV-EIS-92-01-SD, October 2002.

All documents referenced in this Biological Evaluation are listed in the Reference section and are filed electronically in the Corridor H project file.

### **1. PROJECT BACKGROUND AND SUMMARY**

The portion of Appalachian Corridor H project, from Elkins, WV to I-81 in Virginia, has a long history. Numerous studies have been conducted to evaluate potential impacts of the proposed project since its inception in 1965 as part of the Appalachian Development Highway System (APD System). The first alignment and impact studies were initiated in the late 1970s and culminated in 1981 with a Draft Environmental Impact Statement (EIS). In 1984, the project was put on hold and a Final EIS was not prepared.

In 1990, the West Virginia Department of Transportation Division of Highways and the Federal Highway Administration resumed the project and in 1995 Corridor "H" was included as a component of the National Highway System adopted by Congress and signed into law. Following initial re-evaluation efforts, WVDOT and FHWA agreed that subsequent project development would require preparation of a Supplemental Draft Environmental Impact Statement (SDEIS).

On August 2, 1996, the Federal Highway Administration issued a Record of Decision (ROD) for the 100-mile section of Appalachian Corridor H between Elkins, West Virginia, and the West Virginia/Virginia state line. The August 1996 ROD was based on a Final Environmental Impact Statement (FEIS) that was approved by FHWA in April 1996. Volume III of the 1996 corridor H FEIS is a composite of the mitigation commitments made and is applicable to the project until 5 years post project completion. Mitigations included: Continuous agency involvement opportunity from design through construction; advanced measures to identify and mitigate acid producing strata; physio-chemical and biological monitoring of all streams crossed before, during and for 5 years post-construction; upland habitat mitigation; watershed based aquatic resource mitigation process; re-vegetation guarantees and annual monitoring and environmental monitoring on-site during construction.

In September 1996, a lawsuit was filed challenging FHWA approval of the project. In October 1997, the U.S. District Court for the District of Columbia dismissed the lawsuit. The plaintiffs appealed that U.S. District Court decision to the U.S. Court of Appeals for the District of Columbia Circuit. The plaintiffs requested an injunction prohibiting further work on Corridor H while the appeal was pending, but the U.S. District Court denied that injunction.

In February 1999, the U.S. Court of Appeals issued an opinion in the case. The U.S. Court of Appeals held that the procedures established in the August 1996 ROD for completing the review of historic resources did not comply with Section 4(f). Because of that ruling, the U.S. Court of Appeals ordered FHWA and WVDOT not to proceed further with construction of Corridor H until the Section 106 process had been completed.

In March 1999, the FHWA and WVDOT requested permission from the U.S. Court of Appeals to continue constructing the portion of Corridor H known as the Northern Elkins Bypass. The plaintiffs in the Corridor H lawsuit supported this request. In April 1999, the U.S. Court of Appeals issued an order clarifying that FHWA and WVDOT could proceed with the construction of the Northern Elkins Bypass while the remaining historic resource reviews for the remainder of Corridor H were completed. Based on that decision, the FHWA issued "Amendment 1" to the Corridor H ROD on April 26, 1999. This Amended ROD authorized construction to continue on the Northern Elkins Bypass.

Following the decision by the U.S. Court of Appeals, the parties to the Corridor H lawsuit agreed to enter into voluntary mediation as part of the U.S. District Court Mediation Program. The mediation process resulted in a Settlement Agreement, which was approved by the U.S. District Court in February 2000. Under the Settlement Agreement, the remainder of Corridor H in West Virginia was divided into nine separate projects:

1. Elkins-to-Kerens
2. Kerens-to-Parsons
3. Parsons-to-Davis
4. Davis-to-Bismarck
5. Bismarck-to-Forman
6. Forman-to-Moorefield

7. Moorefield-to-Baker
8. Baker-to-Wardensville
9. Wardensville-to-Virginia state line

The Settlement Agreement required that FHWA issue a separate Amended ROD for each project, once the required studies for that project had been completed.

Since approval of the Settlement Agreement, the FHWA has issued seven additional Amended ROD's for Corridor H:

1. Elkins-to-Kerens Project ("Amendment #2")
2. Moorefield-to-Baker Project ("Amendment #3")
3. Baker-to-Wardensville Project ("Amendment #4")
4. Davis-to-Bismarck Project ("Amendment #5")
5. Bismarck-to-Forman Project ("Amendment #6")
6. Forman-to-Moorefield Project ("Amendment #7")
7. Kerens-to-Parsons Project ("Amendment #8")

In 2002, the Appalachian Corridor H Battlefield Avoidance Supplemental Final EIS for Kerens to Parsons Project was completed.

In April of 2003, the FHWA issued its *Amended Record of Decision* (AROD) for the Kerens to Parsons Project of Appalachian Highway Corridor H. That same year, the FHWA, WVDOT and the United States Forest Service-Monongahela National Forest (USFSMNF) signed a *Memorandum of Understanding* with the purpose of facilitating continued coordination among these agencies; outlining project specific measures to minimize and mitigate the project effects on the MNF; and outlining review processes for activities that cannot be defined until final design.

A written re-evaluation was required to assess the validity of the 2003 Amended ROD because: Number of years passed since the ROD was issued; Construction of the project has not begun; and Alignment shifts not previously assessed in the NEPA documentation have been developed.

During 2012 agency coordination meetings (required thru the 2003 MOU), the MNF requested that WVDOH conduct additional investigations regarding the presence/absence of plant and animal species referred to as Regional Forester's Sensitive Species (RFSS) along with required surveys for Federally threatened, endangered and proposed species. Surveys were completed for a total of 134 Sensitive Species and 8 listed species known to occur within the MNF. All surveys were coordinated through Michael Baker Inc. Plant surveys were completed by Skelly and Loy, Inc. and Allstar Ecology during the summers of 2012 and 2013. Animal species were surveyed by Skelly and Loy, Inc. during 2013. Bat surveys were completed by Mountain State Biosurveys, LLC during July and August 2013.

During 2012 botanical surveys, a population of federally listed Threatened Small whorled pogonia (SWP) was discovered. Follow-up surveys of the Panther Run watershed, revealed an additional population. Agency meetings (WVDOT, USFWS, FHWA, and West Virginia

Division of Natural Resources (WVDNR)) were held during 2012-2014 to discuss survey results and recommendations to avoid and minimize adverse effects to the SWP populations, to engage with the Smithsonian Environmental Research Center (SERC), and to review proposed design modifications.

Avoidance and minimization measures (which included moving the highway alignment 800 feet, and hydraulic and hydrologic studies to ensure no impacts from storm water management, erosion or sedimentation controls) resulted in a Biological Assessment and concurrence from USFWS with a finding of “May affect, not likely to adversely affect” for SWP. Additionally, the proposed listing of the northern long-eared bat (NLEB) and new guidance from USFWS West Virginia Field Office resulted in a NLEB Conservation Plan. USFWS concurrence for all TEP species for the Kerens to Parsons Project was received on December 9, 2014.

TEPS survey results were also used for the permit required to complete geotechnical investigations (core boring) essential for highway design work. A copy of the Core Boring Biological Evaluation for Section 1B (areas only on Forest Service land) can be found in the project file.

## **2. PROJECT PURPOSE AND DESCRIPTION**

The proposed Kerens-to-Parsons Project involves the construction of a four-lane divided highway, with partial control of access, between the West Virginia localities of Kerens and Parsons, WV. The project begins in Kerens, 0.2 miles north of the intersection of US 219 and Randolph County Route 7 (Clifton Run Road), which is also the eastern terminus of the Elkins-to-Kerens Project. The project ends east of the City of Parsons, 0.2 miles south of the northern most point at which Tucker County Route 219/4 (Mackeyville Road) intersects US 219. The total length of the project is approximately 13.5 miles and disturbs approximately 780 forested land acres.

The purpose of the action is to safely and efficiently accommodate present and future traffic demand. The completion of the Kerens to Parsons Project will further advance WVDOT’s objective of completing Corridor H as a continuous four-lane highway from i-79 to the West Virginia/Virginia state line. The Kerens to Parsons Project, however, will also serve a useful transportation purpose on its own. The project will provide an enhance road system for various trip purposes between Kerens and the city of Parsons. It will provide a four-lane divided highway using current highway design standards and thus will not contain any deficient curves or areas with inadequate stopping sight distances as existing US 219. In addition, local traffic will be free of safety problems associated with large trucks and other through traffic currently using existing roadways between Kerens and Parsons.

The right-of-way encompasses approximately 700 acres, the majority of which is forested land cover. Except for the southernmost area, the corridor lies within the Monongahela National Forest. Adjacent to the right-of-way, waste sites will be located to receive excess excavated material from project construction. Waste areas will total approximately 80 forested acres.

The 2003 Battlefield Avoidance Alternative (Alternative 1) was used as the baseline area from which multiple alignment alternatives have been developed. Multiple alignments were necessary to mitigate finding Small Whorled Pogonia populations within Panther watershed, requests to re-examine bridge scenarios, waste areas and to minimize impacts to Laurel Run. At the time of this writing Alternative 3D is currently the Preferred Alternative.

**Table 3. Alternative alignments Kerens to Parsons Section 1.**

Resource		Alt 1	Alt 2A	Alt 2B	Alt 3A	Alt 3B	Alt 3C	Alt 3D
Disturbance Area (acres)		222	300	249	257	258	258	258
Impact acres	MNF	185	253	203	213	216	215	215
	Private	35	47	46	44	42	43	42
Stream impact (ft.)	Perennial	4505	7253	7974	6712	4685	5631	5541
	Intermittent	4769	5103	4912	4912	4292	4244	4912
	Ephemeral	7170	7027	6883	6094	6740	6381	6668
Total (ft.)		16444	19404	19733	17595	15786	16280	17102
Laurel Run (ft.)		0	0	698	0	0	0	0
Soils (acres)	Non-sensitive	68	96	74	80	85	84	81
	Slope 30-70%	140	183	155	158	157	157	160
	Wet	6	9.7	10	10	10	10	10
Species populations	SWP	1	0	0	0	0	0	0
	Blunt-lobed grapefern	2	3	1	3	4	4	4
Bridges		6	4	4	4	6	5	5
Excavation (million cubic yards)		6.36	11.22	9.09	9.28	9.06	9.29	9.05

### 3. EXISTING CONDITIONS / AFFECTED ENVIRONMENT

The area is located within the Allegheny Mountain physiographic province at elevation between 2,000 to 2,500 feet above mean sea level. This Project section crosses both private land and the Monongahela National Forest (MNF). Private lands contained areas of residential housing, farming, as well as forested areas. Access to the forested areas is limited. Monongahela National Forest property contains forest roads in various states of accessibility. Most require high clearance vehicles, while some require four-wheel drive, and others are not accessible due to vegetation or downed trees.

Vegetation within this Project section was uniform. Many areas contain the same tree species. These include white oak (*Quercus alba*), chestnut oak (*Q. prinus*), and red oak (*Q. rubra*), various hickories (*Carya* spp.), sourwood (*Oxydendrum arboreum*), tulip tree (*Liriodendron tulipifera*), red maple (*Acer rubrum*), black birch (*Betula lenta*), and black locust (*Robinia pseudoacacia*). Some areas contain a dense understory of rhododendron (*Rhododendron maximum*) and mountain laurel (*Kalmia latifolia*). Though species are similar throughout, the size of trees are much greater on MNF property than on private lands. Forested habitat dominates the landscape.

Topography is steep especially in areas of the MNF. Stream corridors are high gradient containing boulder, cobble, and bedrock substrate. Most are covered with dense vegetation.

MNF parcels within the study area are managed by the USFS using two Management Prescriptions, 3.0-Vegetation Diversity and 6.1-Wildlife Habitat Emphasis (USFS 2006). These prescriptions emphasize the following:

- 1) Management Prescription 3.0 – Vegetation Diversity: age class diversity and sustainable timber production; a variety of forest scenery; habitat for wildlife species tolerant of disturbances, such as deer, grouse, and squirrel; and, a primarily motorized recreation environment
  
- 2) Management Prescription 6.1 - Wildlife Habitat Emphasis: sustainable production of mast and other plant species that benefit wildlife; active restoration of pine-oak and oak-hickory communities; restricted motorized access and a network of security areas that reduces disturbance to wildlife; a primarily non-motorized recreational setting; and, a mix of forest products.

### **III. RFSS PLANTS STUDY AND FINDINGS**

#### **4. RESOURCE IMPACTS ADDRESSED**

This report discloses expected direct, indirect, and cumulative effects of the Corridor H “Kerens to Parsons” section on Regional Forester’s Sensitive Species plants on the Monongahela National Forest. Regional Forester’s Sensitive Species Plants are hereafter referred to as sensitive or RFSS plants.

Both of the action alternatives under consideration would involve various types of vegetation management and recreation improvements that have the potential to affect RFSS plants. The following specific activities have been proposed:

#### **5. SCOPE OF THE ANALYSIS**

##### **5.1 Project study area**

The project study area included the proposed project footprint, defined as the proposed highway’s construction cut and fill limits and a buffer area that varied dependent upon the species under investigation. Specifically, the project study area included:

- 1) all USFS owned property within the cut and fill limits of the proposed Kerens to Parsons project;
- 2) a buffer zone of approximately 1,000 feet on both sides of the cut and fill limits; and,
- 3) existing forest service roads identified by WVDOH and the USFS to be utilized as proposed access roads for final design investigations.

The western terminus of the project study area is the western boundary of the MNF, located roughly parallel to Baldlick Fork, approximately 3 miles east of US 219. The eastern terminus of the project study area is the eastern terminus of the Kerens to Parsons project, located east of the City of Parsons, 0.2 miles south of the intersection of Tucker County Route 219/4 (Mackeyville Road) and US 219.

An area in Panther Hollow known to support the federally endangered small-whorled pogonia, and subsequently designated as the Panther Hollow Avoidance Area, is within the study area. Project commitments have been made to avoid impacts to this area. Therefore, no further follow-up on other species in this area was necessary.

##### **5.2 Effects analysis area**

For direct and indirect effects, the spatial boundary of the analysis is the project area boundary. The project area boundary includes all parcels of land that would be affected by project activities; therefore it is an appropriate boundary for the analysis of direct and indirect effects on TES plants.

For cumulative effects, the spatial boundary of the analysis is the Proclamation and Purchase Unit boundary for the Monongahela National Forest. This is the boundary to which the National Forest Management Act's species diversity and viability requirements apply.

The temporal boundary for direct and indirect effects on RFSS species is 120 years from the beginning of project implementation. This is the time frame within which effects to forested habitat will persist. While effects to each individual species may not persist that long, successional changes set in motion by regeneration harvesting will continue for at least that long, potentially affecting some species that occur in forested habitats. This temporal boundary is also used for the cumulative effects analysis because the contribution to cumulative effects ends when the direct and indirect effects no longer exist.

## 6. METHODOLOGY

The goal of the study was to investigate for the probable presence or absence of forest RFSS plant species to assist project engineers with alternatives development and evaluation. This was accomplished through field investigations over two subsequent seasons in 2012 and 2013. Coordination between WVDOH personnel, their consultants, and USFS natural resources personnel was conducted during the planning phases of the field surveys to identify target species that could potentially occur within the study area for the project and to determine acceptable survey techniques.

Both office screenings and field investigations were conducted to determine whether appropriate habitat conditions or documented occurrences of federally listed or RFSS plants existed in the study corridor.

### 6.1 Office screenings

In coordination with the United States Fish and Wildlife Service (USFWS), the USFS maintains a list of Regional Forester Sensitive Species (RFSS). These plants and animals have been identified by the Regional Forester as species for which population viability is a concern, as evidenced by significant current or predicted downward trend in numbers and density, or by habitat capability or trend that would reduce the species' existing distribution. RFSS include, but are not limited to, USFWS candidate species, species de-listed by the USFWS in the last five years, and species with NatureServe Global, Trinomial or National Ranks of G1-G3, T1-T3 or N1-N3. Certain species with a state rank of S1 or S2 may also be included.

The RFSS list for the Monongahela National Forest was most recently revised in 2011. Current RFSS plant species existing on the MNF are listed in Table 1.

**Table 4. Regional Forester Sensitive Species Plants on the Monongahela National Forest**

Scientific Name	Common Name
<i>Agrostis mertensii</i>	Arctic bentgrass
<i>Allium allegheniense</i>	Allegheny onion
<i>Allium oxyphilum</i>	Lillydale onion
<i>Amelanchier bartramiana</i>	Bartram shadbush
<i>Arabis patens</i>	Spreading rockcress



<i>Astragalus neglectus</i>	Cooper's milkvetch
<i>Baptisia australis</i> var. <i>australis</i>	Blue wild indigo
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lanceleaf grapefern
<i>Botrychium oneidense</i> *	Bluntlobe grapefern*
<i>Carex roanensis</i>	Roan Mountain sedge
<i>Clematis occidentalis</i> var. <i>occidentalis</i>	Purple clematis
<i>Corallorhiza bentleyi</i>	Bentley's coralroot
<i>Cornus rugosa</i>	Roundleaf dogwood
<i>Cypripedium reginae</i>	Showy lady's-slipper
<i>Delphinium exaltatum</i>	Tall larkspur
<i>Eriogonum alleni</i>	Shalebarren wild-buckwheat
<i>Euphorbia purpurea</i>	Darlington's spurge
<i>Gaylussacia brachycera</i>	Box huckleberry
<i>Gymnocarpium appalachianum</i>	Appalachian oak fern
<i>Hasteola suaveolens</i> *	Sweet-scented Indian-plantain*
<i>Heuchera alba</i>	White alumroot
<i>Hexalectris spicata</i>	Crested coralroot
<i>Hypericum mitchellianum</i>	Blue Ridge St. John's-wort
<i>Ilex collina</i>	Long-stalk holly
<i>Juglans cinerea</i> *	Butternut*
<i>Juncus filiformis</i>	Thread rush
<i>Juncus trifidus</i>	Highland rush
<i>Liatris turgida</i>	Turgid blazing star
<i>Linum sulcatum</i>	Grooved yellow flax
<i>Listera cordata</i>	Heartleaf twayblade
<i>Marshallia grandiflora</i>	Large-flowered Barbara's-buttons
<i>Menyanthes trifoliata</i>	Bog buckbean
<i>Monarda fistulosa</i> ssp. <i>Brevis</i>	Smoke Hole bergamot
<i>Ophioglossum engelmannii</i>	Limestone adder's-tongue
<i>Paronychia argyrocoma</i>	Silvery nailwort
<i>Paronychia virginica</i>	Yellow nailwort
<i>Paxistma canbyi</i>	Canby's mountain-lover
<i>Pedicularis lanceolata</i>	Swamp lousewort
<i>Phlox buckleyi</i>	Swordleaf phlox
<i>Piptatherum (Oryzopsis) canadense</i>	Canada mountain ricegrass
<i>Platanthera shriveri</i>	Shriver's frilly orchid
<i>Poa paludigena</i>	Bog bluegrass
<i>Polemonium vanbruntiae</i>	Bog Jacob's-ladder
<i>Potamogeton tennesseensis</i>	Tennessee pondweed
<i>Pycnanthemum beadlei</i>	Beadle's mountainmint
<i>Ranunculus pensylvanicus</i>	Pennsylvania buttercup
<i>Rhamnus lanceolata</i> ssp. <i>Lanceolata</i>	Lanceleaf buckthorn
<i>Ribes lacustre</i>	Bristly black currant
<i>Scutellaria saxatilis</i>	Rock skullcap
<i>Silene virginica</i> var. <i>robusta</i>	Fire pink
<i>Stellaria borealis</i> ssp. <i>Borealis</i>	Boreal starwort
<i>Taenidia montana</i>	Mountain pimpernel
<i>Taxus canadensis</i>	Canada yew
<i>Tortula ammonsiana</i>	Ammons' Tortula Moss
<i>Trichomanes boschianum</i>	Bristle-fern
<i>Trichostema setaceum</i>	Narrow-leaved blue-curls
<i>Trifolium virginicum</i>	Kate's mountain clover
<i>Triphora trianthophora</i>	Nodding pogonia

<i>Viola appalachiensis</i>	Appalachian blue violet
<i>Vitis rupestris</i>	Sand grape
<i>Woodwardia areolata</i>	Netted chainfern

\*Signifies species detected within MNF project study area during botanical surveys

Because of the size of the MNF (over 900,000 acres) and its topographical, geological and ecological diversity, the consulting parties recognized that it was unlikely that each of these species had an equal likelihood of occurring everywhere in the forest and, therefore, that an initial screening must occur to match habitat requirements of the species with the habitats present within the approximately 2,000-acre project study area. This “matching” proceeded as follows, and results of the screening are described in Table 2.

- 1) The habitat requirements of each of the species were compared with the Likelihood of Occurrence (LOO) table developed by the MNF. LOO descriptions are based on field surveys, historic records, NatureServe and other scholarly data sources, unpublished WVDNR and USFS data, and botanists’ personal experiences with these plants in the field. LOO determinations were made by comparing broad habitat requirements (e.g., mesophytic, xeric, calciphile, wetland, etc.) listed for each plant with GIS habitat conditions present in the project study area (MBC 2013b), and with USFS and WVDNR GIS data showing documented occurrences of RFSS species in the study area.
- 2) Based on the LOO and GIS data and the knowledge base of the MNF personnel, species that are demonstrated or are most likely to occur within the project study area and therefore would require further investigation were identified, and are shown in Table 2.

**Table 5. Likelihood of Analysis Screening Results**

Scientific Name	Common Name	Species is present in suitable habitat	Suitable habitat found; species not confirmed.	No suitable habitat, OR project area exceeds species range
<i>Agrostis mertensii</i>	Arctic Bentgrass			X
<i>Allium allegheniense</i>	Allegheny Onion		X	
<i>Allium oxyphilum</i>	Lillydale Onion			X
<i>Amelanchier bartramiana</i>	Bartram Shadbush			X
<i>Arabis patens</i>	Spreading Rockcress			X
<i>Astragalus neglectus</i>	Cooper's Milkvetch			X
<i>Baptisia australis</i> var. <i>australis</i>	Blue Wild Indigo		X	
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lanceleaf Grapefern		X	
<i>Botrychium oneidense</i>	Bluntlobe Grapefern	X		
<i>Carex roanensis</i>	Roan Mountain Sedge		X	
<i>Clematis occidentalis</i> var. <i>occidentalis</i>	Purple Clematis		X	
<i>Corallorhiza bentleyi</i>	Bentley's Coralroot		X	
<i>Cornus rugosa</i>	Roundleaf Dogwood		X	
<i>Cypripedium reginae</i>	Showy Lady's-slipper		X	
<i>Delphinium exaltatum</i>	Tall Larkspur			X
<i>Eriogonum allenii</i>	Shalebarren Wild-buckwheat			X

<i>Euphorbia purpurea</i>	Darlington's Spurge		X	
<i>Gaylussacia brachycera</i>	Box Huckleberry		X	
<i>Gymnocarpium appalachianum</i>	Appalachian Oak Fern		X	
<i>Hasteola suaveolens</i>	Sweet-scented Indian-plantain	X		
<i>Heuchera alba</i>	White Alumroot		X	
<i>Hexalectris spicata</i>	Crested Coralroot			X
<i>Hypericum mitchellianum</i>	Blue Ridge St. John's-wort		X	
<i>Ilex collina</i>	Long-stalk Holly		X	
<i>Juglans cinerea</i>	Butternut	X		
<i>Juncus filiformis</i>	Thread Rush			X
<i>Juncus trifidus</i>	Highland Rush			X
<i>Liatris turgida</i>	Turgid Blazing Star			X
<i>Linum sulcatum</i>	Grooved Yellow Flax			X
<i>Listera cordata</i>	Heartleaf Twayblade			X
<i>Marshallia grandiflora</i>	Large-flowered Barbara's-buttons		X	
<i>Menyanthes trifoliata</i>	Bog Buckbean			X
<i>Monarda fistulosa ssp. brevis</i>	Smoke Hole Bergamot			X
<i>Ophioglossum engelmannii</i>	Limestone Adder's-tongue			X
<i>Paronychia argyrocoma</i>	Silvery Nailwort			X
<i>Paronychia virginica</i>	Yellow Nailwort			X
<i>Paxistima canbyi</i>	Canby's Mountain-lover			X
<i>Pedicularis lanceolata</i>	Swamp Lousewort		X	
<i>Phlox buckleyi</i>	Swordleaf Phlox			X
<i>Piptatherum (=Oryzopsis) canadense</i>	Canada Mountain Ricegrass		X	
<i>Platanthera shriveri</i>	Shriver's Frilly Orchid		X	
<i>Poa paludigena</i>	Bog Bluegrass			X
<i>Polemonium vanbruntiae</i>	Bog Jacob's-ladder		X	
<i>Potamogeton tennesseensis</i>	Tennessee Pondweed		X	
<i>Pycnanthemum beadlei</i>	Beadle's Mountainmint		X	
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup		X	
<i>Rhamnus lanceolata ssp. lanceolata</i>	Lanceleaf Buckthorn			X
<i>Ribes lacustre</i>	Bristly Black Currant		X	
<i>Scutellaria saxatilis</i>	Rock Skullcap		X	
<i>Silene virginica var. robusta</i>	Fire Pink			X
<i>Stellaria borealis ssp. borealis</i>	Boreal Starwort		X	
<i>Taenidia montana</i>	Mountain Pimpernel		X	
<i>Taxus canadensis</i>	Canada Yew		X	
<i>Tortula ammonsiana</i>	Ammons' Tortula Moss			X
<i>Trichomanes boschianum</i>	Bristle-fern		X	
<i>Trichostema setaceum</i>	Narrow-leaved Blue-curls		X	
<i>Trifolium virginicum</i>	Kate's Mountain Clover			X
<i>Triphora trianthophora</i>	Nodding Pogonia		X	
<i>Viola appalachiensis</i>	Appalachian Blue Violet		X	
<i>Vitis rupestris</i>	Sand Grape		X	
<i>Woodwardia areolata</i>	Netted Chainfern		X	
<b>Totals:</b>		<b>3</b>	<b>33</b>	<b>25</b>

## 6.2 Field Investigations

Contractors conducted botanical field surveys in 2012 and 2013 by walking the study area following the meander method as required by the USFS in *Attachment A – Scope of Work for Botanical Surveys on the Monongahela National Forest Portion of Corridor H, Kerens to Parsons Segment* (USFS Undated).

The meander method is a labor intensive method that provides a high level of reliability. Utilizing the method, botanists traverse the project area on foot in systematic meandering paths, identifying major habitats, topographical features, target species, and other species in the area (Bisonette, 2010). Survey efforts included all habitat areas encountered within the study area, with a focus on habitats which would be likely to support target species identified through GIS and the LOO screening process (Table 6). However, all identified plant species in the survey area were recorded.

An average coverage of at least 100 linear feet per acre, distributed across the survey unit is required. The meander paths are kept in a GPS log to provide a record for later quality assurance.

One minor deviation from the survey protocol was recommended by the USFS regarding survey unit sizes for surveys of the proposed access roads conducted in 2013. Since the focus of this survey was for existing access/forest service roads the survey unit size was modified from 2,000 feet in length to 1-mile in length along an approximate/average roadway width of 12 feet for surveys specific to the proposed access roads. Correspondence regarding the survey unit size is included in the *Botanical Survey Report for Proposed Access Routes* (Skelly and Loy 2013).

Three separate field investigations for this project were conducted by several botanists with several organizations during 2012 and 2013. The 2012 ROW surveys documented plant species growing within the proposed cut/fill lines for the project ROW on public and private land, as well as areas within the Panther Run watershed. In 2013, surveys were conducted in a buffer zone beyond the proposed cut/fill lines, and along the proposed access roads to be utilized for final design field investigations.

All botanical surveys were conducted according to protocols supplied by Monongahela National Forest to ensure consistent and thorough coverage.

### 6.2.1 Corridor H Right-of-Way Surveys 2012

Field investigations were conducted from August to September 2012 by AllStar Ecology LLC, and in August 2012 by Brian Streets (WVDNR) as a subconsultant to Mountain States Biosurveys. These surveys covered both private and public land located within the proposed Corridor H ROW within the Kerens to Parsons project area.

Stretching approximately 15 miles from Kerens at US 219 and Randolph County Route 7 to Mackeyville Road east of Parsons, AllStar Ecology's survey covered an area of 0.85 square

miles or 545 acres. Maps showing the extent of the area are located in Appendix A of their report, *Botanical Survey for Threatened & Endangered Species within the Corridor H Right-of-Way Kerens to Parsons* (AllStar Ecology 2012). A complete copy of this report is located in Appendix 2.

Brian Streets surveyed approximately 200 acres from Bald Lick Run to the South Branch of Haddix Run in Randolph and Tucker Counties. His report, titled “Survey for Threatened, Endangered, Sensitive and Non-Native Plant Species along the Corridor H Right of Way within the Monongahela National Forest from Bald Lick Run to the South Branch of Haddix Run Randolph and Tucker Counties, West Virginia: Final Report”, is located in Appendix 3.

#### 6.2.1.1 ROW Results 2012

Brian Streets found four populations of bluntlobe grapefern (*Botrychium oneidense*) in various areas of the ROW, and one population of small whorled pogonia (*Isotria medeoloides*) in the Monongahela National Forest portion of the Panther Run watershed.

In 2012 AllStar Ecology also located the Panther Run small-whorled pogonia population, and found an additional stem within that same location. AllStar then located another population consisting of a single stem a few hundred yards upstream. AllStar Ecology also found blunt-lobed grapefern (*Botrychium oneidense*) and sweet-scented Indian-plantain (*Hasteola suaveolens*) within the Panther Run watershed and Corridor H ROW, though *H. suaveolens* was located on private property.

Within the Monongahela National Forest stands, 69-153 species and infraspecific taxa of plants were observed. Further details and a complete list of vascular plant taxa detected within the Monongahela National Forest in 2012 is located in Appendix C of AllStar’s report (Appendix 2 of this BE).

#### 6.2.2 Kerens to US 219 Buffer Surveys 2013

In June-September 2013, as a sub-consultant to Skelly and Loy, Inc., AllStar Ecology, LLC conducted a botanical survey for a buffer zone that extended approximately 1,000 feet beyond the proposed cut/fill limits to each side of the corridor, for a total width of 2,000 feet.

The study area for this effort covered approximately 960 acres. It broadened the area traversed in 2012 within the Monongahela National Forest and ran from the western boundary of the Forest to the 219 connector, sometimes referred to as Section 1B. Maps showing the extent of the area covered are located in Appendix A of their report, *Botanical Survey for Threatened & Endangered Species within the Appalachian Corridor H Right-of-Way 2013* (AllStar Ecology 2013). A complete copy of this report is located in Appendix 4.

#### 6.2.2.1 Buffer results 2013

AllStar Ecology identified two RFSS plant species on MNF property in the buffer zone study area: seven individual blunt-lobed grapeferns (*Botrychium oneidense*) and four individual butternuts (*Juglans cinerea*).

Within the Monongahela National Forest stands, 81-355 species and infraspecific taxa of vascular plants were observed. Further details and a complete list of species detected within the Monongahela National Forest in 2013 is located in Appendix 4.

### 6.2.3 Access Roads Surveys 2013

In 2013, WVDOH contracted with Skelly and Loy, Inc. to conduct a botanical survey for a series of proposed access roads to be utilized by WVDOH contractors in order to access the project corridor for final design field investigations. These proposed access roads were identified through a collaborative effort between the WVDOH and USFS. The roads investigated were existing Forest Service Roads (FR) 116A, FR117, FR862, and FR933. All except portions of FR933 are gated to restrict motor vehicle access. Surveys were limited to the limits of the existing roadways, and slightly more than 15 miles of access roads were surveyed within the Monongahela National Forest. All were within the area referred to as 1B, which runs from the western border of the forest to almost the 219 connector west of Parsons.

#### 6.2.3.1 Access Roads results 2013

No RFSS plant species were identified by the access road surveys. Survey units along these roads were determined to be supporting 87-172 species and infraspecific taxa of vascular plants. Survey units located on private property were determined to be supporting 73-165 species and infraspecific taxa of vascular plants.

Details regarding the 2013 botanical survey conducted by Skelly and Loy, Inc. are presented in the *Botanical Survey Report for Proposed Access Routes* (Skelly and Loy 2013). A complete copy of this report is located in Appendix 5.

## **7. SPECIES FOUND IN STUDY AREA**

### **7.1 Regional Forester Sensitive Species**

Of the 36 RFSS species identified through GIS and the LOO table as having potential habitat in the corridor study area, only three were identified by botanical surveys as being present in the corridor study area. These three RFSS plant species are butternut (*Juglans cinera*), blunt-lobe grapefern (*Botrychium oneidense*), and sweet-scented Indian-plantain (*Hasteola suaveolens*).

#### 7.1.1 Butternut

Butternut (*Juglans cinera*) is a large, deciduous tree that can reach a height of 30 meters. It has a grayish brown bark with smooth ridges. The pith of the stems is dark brown and chambered. It bears compound leaves with 11-17 long pointed leaflets. Often the species has a pad of dense hairs which extend transversely along the upper margin of past leaf scars (NatureServe 2013).

Butternut typically occurs in rich mesophytic forests on lower slopes, ravines, and various types of bottomland situations (NatureServe 2013). On the Monongahela, it prefers rich loamy soils,

especially limestone soils (Polgar, R. USFS field survey observation) and mixed hardwood forests, open fields, riparian zones, ridges, and edge habitats. (USFS, unpublished data).

Four individual butternut trees were found during the 2013 botanical survey conducted within the Kerens to US 219 Buffer. Three of these individuals are found in the Haddix Run valley floor and one is found in the South Branch Haddix Run valley.

#### 7.1.2 Blunt-lobe Grapefern

The blunt-lobe grapefern is a perennial, evergreen fern species that produces a single, sterile, pinnate leaf blade, or frond, along with a fertile blade (USDA Forest Service, Eastern Region 2003). The sterile leaf blade can grow up to 15 x 20 cm in size. This leaf is typically leathery and a dull bluish green color. The leaf blade is typically divided into two or three triangular leaflets or pinnae with the terminal pinnae being egg shaped and larger than the lateral pinnae. The pinnae are further divided into pinnules which are further divided into segments. The segments of the pinnules are relatively large and rounded and range from finely to bluntly toothed to nearly smooth (NatureServe 2013).

Blunt-lobe grapefern occurs in low lying, acidic, second growth woods and swamps (USDA Forest Service, Eastern Region 2003). On the Monongahela most occurrences are in leaf litter on old logging roads and skid trails (Polgar, R. USFS field survey observation).

Four individual blunt-lobe grapefern plants were detected during the 2012 botanical surveys of the Corridor H ROW. Two of these individuals were observed near FR 117 (one within the proposed cut and fill limits and one outside those limits), one was observed at a location that would fall under the proposed South Branch Haddix Run bridge, and the fourth was observed within cut and fill limits approximately 4,000 feet south of Haddix Run and adjacent to a proposed waste area.

Seven more individual blunt-lobe grapefern plants were detected during the buffer surveys conducted in 2013. These individuals were observed to be scattered throughout the study area with a cluster of four located in the South Branch Haddix Run watershed.

#### 7.1.3 Sweet-scented Indian plantain

The sweet-scented Indian plantain is a smooth perennial (1-2.5 m. tall) with fleshy fibrous roots, large arrowhead shaped leaves, and large clusters of white flowers. It prefers low, moist ground, rich floodplain forests, thickets, or clearings, and calcareous fens (NatureServe 2011). Research in Pennsylvania indicates it prefers high elevation, moderately to well-drained floodplains above high-energy scour zones (Williams, 2010).

On the Monongahela, sweet-scented Indian plantain occurs along floodplains of several major rivers. (WVDNR and USDA Forest Service unpublished data).

Sweet-scented Indian plantain was located by AllStar Ecology on private property within the Monongahela NF Proclamation boundaries, along the main stem of Haddix Run. It is included in this analysis of population viability because it is within the MNF proclamation boundaries.\

#### 7.1.4 Other RFSS Species

Based on the Likelihood of Occurrence assessment, 33 other RFSS species are assumed to have suitable habitat in the project area, but were not found during any of the three sets of surveys.

To facilitate analysis, these plants were been grouped according to their primary habitat (Tables 7-9). The three habitat groupings are wetland/riparian habitat, mesic/cove forest, and rocky habitat.

**Table 6. Wetland & riparian RFSS plants that could occur in the Corridor H vicinity (15)**

<i>Scientific Name</i>	<b>Common Name</b>	<b>Habitat</b>
<i>Baptisia australis</i> var. <i>australis</i>	Blue Wild Indigo	Primarily early successional wetlands
<i>Euphorbia purpurea</i>	Darlington's Spurge	Seepage swamps, high-elevation dry pastures over limestone, circumneutral alluvium along high elevation rivers.
<i>Gymnocarpium appalachianum</i>	Appalachian Oak Fern	Found in cool microclimates in higher elevation maple/birch/hemlock forests, moist sandstone, talus slopes, bouldery colluvium.
<i>Hasteola suaveolens</i> *	Sweet-scented Indian plantain*	low moist ground, floodplain forests, thickets & clearings, calcareous fens.
<i>Hypericum mitchellianum</i>	Blue Ridge St. John's-wort	Riverbanks and disturbed wetlands
<i>Ilex collina</i>	Long-stalk Holly	Open or closed canopy, wet
<i>Marshallia grandiflora</i>	Large-flowered Barbara's-buttons	Flood-scoured stream banks in full sun
<i>Pedicularis lanceolata</i>	Swamp Lousewort	May prefer circumneutral soil
<i>Polemonium vanbruntiae</i>	Bog Jacob's-ladder	Swamps, bogs, riparian zones
<i>Potamogeton tennesseensis</i>	Tennessee Pondweed	Standing or slow-flowing water
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup	Open areas that are wet to periodically flooded: marsh edges, vernal pools, riverbanks, ROWs thru alluvial wetlands, etc.
<i>Ribes lacustre</i>	Bristly Black Currant	Wetlands in partial shade to full sun, Mt. Storm, Backbone Mtn, Blister Swamp.
<i>Taxus canadensis</i>	Canada Yew	Wetland and riparian habitat, spruce forests.
<i>Vitis rupestris</i>	Sand Grape	River banks and washes
<i>Woodwardia areolata</i>	Netted Chainfern	Swamps and wet woods

\*Species is confirmed in project area

**Table 7. Mesic forest and cove RFSS plants that could occur in the Corridor H vicinity (7)**

<i>Scientific Name</i>	<b>Common Name</b>	<b>Habitat</b>
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lanceleaf Grapefern	Moist, shady woods and swamp margins
<i>Botrychium oneidense</i> *	Blunt-lobe grapefern*	Wooded, acidic wetlands and mature mixed mesophytic/cove forests. Leaf litter and old skid trails.
<i>Corallorhiza bentleyi</i>	Bentley's Coralroot	Habitat preferences poorly understood



<i>Cypripedium reginae</i>	Showy Lady's-slipper	Swamps and woods
<i>Juglans cinera</i> *	Butternut*	Rich alluvial soil
<i>Platanthera shriveri</i>	Shriver's Frilly Orchid	In full shade of damp, open, mixed deciduous and coniferous woods, esp along seepage lines.
<i>Triphora trianthophora</i>	Nodding Pogonia	Deep leaf litter or humus

\*Species is confirmed in project area

**Table 8. Rocky habitat RFSS plants that could occur in the Corridor H vicinity (12)**

Scientific Name	Common Name	Habitat
<i>Allium allegheniense</i>	Allegheny Onion	Thin soils around mafic or calcareous rock outcrops. In mature oak and pine-oak forests at higher elevations.
<i>Carex roanensis</i>	Roan Mountain Sedge	Moderate to steep rocky, wooded, sparsely vegetated slopes on rich soils in mid/high elevation mesic cove & hardwood forests.
<i>Clematis occidentalis</i> var. <i>occidentalis</i>	Purple Clematis	Rocky sites with partial shade at high elevation.
<i>Cornus rugosa</i>	Roundleaf Dogwood	Rocky areas within forests
<i>Gaylussacia brachycera</i>	Box Huckleberry	Acidic sandy soil w/in submesic forests & wooded slopes under hardwoods/pine/heath
<i>Heuchera alba</i>	White Alumroot	Most likely in dry microsites
<i>Piptatherum</i> (= <i>Oryzopsis</i> ) <i>canadense</i>	Canada Mountain Ricegrass	Dry sandy or rocky woods.
<i>Pycnanthemum beadlei</i>	Beadle's Mountainmint	Open canopy over rocks
<i>Scutellaria saxatilis</i>	Rock Skullcap	Rocky areas within forests. On the MNF, also known from shaded cut banks and shoulders of infrequently used roads.
<i>Taenidia montana</i>	Mountain Pimpernel	Dry outcrops. Typically a shale barren species, but one occurrence in Tucker county.
<i>Trichomanes boschianum</i>	Bristle-fern	Dripping rocks
<i>Trichostema setaceum</i>	Narrow-leaved Blue-curls	Shale barrens, sandstone woodlands, glades, dry oak forests.

## 7.2 Desired Future Conditions

The Forest Plan addresses TES species at several places in the Forest-wide direction. The Forest Integrated Desired Conditions (USDA Forest Service 2006, p. II-6) call for maintaining habitats that support populations of TES species. Desired conditions for vegetation (p. II-17) emphasize protection and enhancement of rare plants and their habitats. Desired conditions for threatened and endangered species (p. II-22) call for managing habitats to maintain or enhance populations consistent with recovery plans, and for keeping adverse effects at levels that do not threaten population persistence.

## 8. EFFECTS -- REGIONAL FORESTERS SENSITIVE SPECIES

The locations of all known RFSS and habitat preferences RFSS species with potential to exist in the study area have been compared to proposed project design. The individual study areas, project preliminary design, and species locations can be found in Appendices 2-5. The species locations illustrated on the project mapping represent individuals and not populations, with one

exception. The westernmost point illustrating the small whorled pogonia represents a colony. Per the recovery plan for small whorled pogonia, these two localities represent a single site (USFWS 1992). This effects analysis is derived from Skelly Loy's report, "Forest Sensitive Plant Species Screening for the Appalachian Corridor H Kerens to Parsons Project", Appendix 6. The Skelly Loy report conducts an effects analysis of the proposed construction, and also contains this BE's Appendices 2, 4, and 5 as its appendices. The full report including figures is listed in Literature Cited.

## 8.1 Environmental Effects Common to Both Alternatives

Construction of Corridor H will eliminate all natural habitat within the limits of construction, and all plants within that habitat.

Both alternatives involve filling in crossing 1 and retaining bridge 2. There are no documented occurrences of RFSS plant species within crossing 1, but despite extensive surveying, it is possible that undiscovered occurrences may be present. These occurrences will be eliminated by either alternative.

One butternut tree and one occurrence of *Botrychium oneidense* occur within the project area for bridge 2. These occurrences may be impacted by either alternative.

One *Botrychium oneidense* occurs within the cut and fill limits near a proposed waste area approximately 4,000 feet from Haddix Run, and one *Botrychium oneidense* occurs within the cut and fill limits of FR 117. Both occurrences may be affected.

Both alternatives could have at least a small chance of affecting unknown occurrences of sensitive plant species. These activities are analyzed according to their potential to affect sensitive plant species in the three broad habitat groupings (wetland/riparian habitat, mesic forest habitat, and rocky habitat).

### 8.1.1 Wetland Species

Riparian habitat and small areas of wetland habitat occur along streams throughout the project area. Small seep wetlands may also occur on slopes in areas that are not near streams.

Forest Plan direction requires maintenance, enhancement, or restoration of vegetation conditions that provide ecological and habitat conditions for aquatic and riparian-dependent species (SW31). It also protects stream channel corridors and wetlands by limiting potential effects of construction and associated activities on wetland/riparian sensitive plants outside the immediate construction zone (SW37). Ground disturbance is limited to essential crossings for stream channel buffers, seeps, and other wetlands (Standard SW51). Stream crossing construction is encouraged to be completed as soon as practical to limit the potential for sedimentation (SW62).

Because proposed construction and associated waste and fill areas would avoid the known locations of wetland and riparian sensitive plants to the extent possible, the potential for impacts is considered low. Surveys may have missed sensitive plants, however, so the potential for

impacts cannot be completely ruled out. Because of the allowance for essential crossings of streams and wetlands, any waste or fill areas associated with Corridor H construction would have some potential to impact wetland and riparian sensitive plants. Although proposed waste and fill areas would avoid all large stream channels and wetlands that are depicted on 1:24,000 scale topographic mapping, it is possible some will impact small ephemeral and intermittent streams and wetlands not depicted on the maps, and any species therein. Such impacts could include damaging or eliminating plants through materials placement, equipment movement, and grading and subsequent construction.

In contrast to the potential for negative impacts from road and skid trail crossings, habitat adjacent to the crossings could be improved for species that prefer an open or partially open canopy (blue wild indigo, sweet-scented Indian plantain, Blue Ridge St. John's wort, Pennsylvania buttercup, bristly black currant, and sand grape). Actual benefits to these species would not occur if no individuals are present nearby to colonize the habitat.

The sweet scented Indian plantain along Haddix Run may be moderately to severely impacted by the proposed project, but it exists on private property and the MNF has no management authority over it. Sweet scented Indian plantain was not found within the area of crossing 3; therefore it is likely to be equally affected by either alternative.

#### 8.1.2 Mesic/Riparian Species

The majority of land covered by the Corridor H ROW is mixed oak forest, interspersed with patches of mesic cove hardwoods. Forests dominated by oaks and hickories (*Carya* spp.) occur in the western part of the project area, but they generally fall toward the mesic end of the oak-hickory forest moisture spectrum. Therefore the oak-hickory forests were included with mesic forests for this analysis.

The proposed activities that involve major ground and vegetation disturbance hold the possibility of impacting blunt-lobed grapefern, butternut, and other mesic forest species with potential habitat in this area, including lanceleaf grapefern, Bentley's coralroot, showy lady's slipper, Shriver's frilly orchid, and nodding pogonia. Major soil disturbing activities, including road construction and construction of associated waste and fill areas, likely would eliminate occurrences of these species if any occurs within the footprint of disturbance.

One butternut tree and one occurrence of *Botrychium oneidense* occur within the project area for bridge 2. These occurrences may be impacted by either alternative.

To protect the butternut tree in the area of bridge 2 during construction, the WVDOH will "flag and buffer" the tree to clearly identify it as a species of concern. The WVDOH will also insert a clause in the construction contract instructing construction crews to avoid the tree. Additionally, the USFS noted concern over potential indirect impacts to this tree from future roadway runoff. Indirect impacts are unlikely, however, because the tree is 100 feet upstream from the bridge crossing, far enough away from dispersal patterns of bridge runoff. The butternut on the north edge of the fill limits along the main stem of Haddix Run is unlikely to be affected if it is flagged and buffered before construction. The two butternuts downstream of the Haddix Run bridge are

outside all construction areas and unlikely to be affected. Butternut is shade-intolerant and requires an open canopy to regenerate (Burns and Honkala 1990). If any undiscovered butternut seedlings or saplings exist near the limits of clearing and survive the construction, they would benefit from the more open canopy.

### 8.1.3 Dry/Rocky Habitat Species

None of the rocky habitat sensitive species are known to occur in or immediately adjacent to any of the proposed activity areas. Due to the representative nature of the botanical surveys, undiscovered occurrences of rocky habitat species could exist in activity areas. However, given the relative rarity of rocky habitat in the part of the project area where all activity is planned, the potential for effects appears to be low.

## **8.2 Direct/Indirect Environmental Effects to RFSS plants by Alternative**

The alternatives analyzed include 3A and 3D. Alternative 3A would retain bridge 2 and fill in crossings 1 and 3. Alternative 3D would fill in crossing 1 and retain bridges 2 and 3. Both alternatives would fill in crossing 1 and retain bridge 2; the only difference between alternatives is that Alternative 3A would fill in crossing 3 and Alternative 3D would retain a bridge over it.

Crossing 3 is characterized by mixed hardwoods on the west and oak on the east. However, neither butternut, blunt-lobe grapefern, sweet-scented Indian plantain, nor any other RFSS plant which prefers this habitat was found within the area of crossing 3.

If any undiscovered populations of Regional Foresters Sensitive Species exist in the vicinity of crossing 3, Alternative 3A has a slightly higher probability of negatively impacting those occurrences.

Despite the low probability of there being undiscovered populations of sensitive plants, the possibility cannot be completely discounted, and survey coverage is not complete. While the probability is considered low, some potential exists for impacts to sensitive plants in addition to what is described above.

## **8.3 Cumulative Effects to RFSS plants**

Blunt-lobe grapefern is known to occur in scattered locations across the project area; therefore additional undiscovered occurrences probably exist. There are over 60 documented occurrences of blunt-lobe grapefern (individuals and populations) within the proclamation boundaries of the MNF, including the 11 individuals identified in the Corridor H surveys, with the majority of occurrences in other districts on the MNF. Most of the occurrences documented in the Corridor H ROW are likely to be negatively impacted. There are other individuals of blunt-lobe grapefern beyond the US 219 terminus of the current project that also could be impacted. Those potential impacts will be addressed in the planning process as the project progresses. Because plants may exist for many years underground as sporophytes and gametophytes (Chadde and Kudray, 2003), and because the majority of the MNF has not been surveyed for this plant, it is likely that there are more individual plants on the MNF than have been recorded. Therefore, the proposed

highway construction may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

Butternut occurs in over 100 locations within the MNF proclamation boundary. Based on the analysis above, there is potential for two butternut trees to be affected as a result of this project, but if appropriate precautions are taken, negative effects are unlikely. Possible impacts to these butternut trees should not negatively affect species viability on the MNF. Therefore, the proposed highway construction may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

There are more than 10 occurrences of sweet-scented Indian plantain within the MNF proclamation boundary, with the majority of them to the east and south. The single occurrence of sweet-scented Indian plantain in the Corridor H ROW may be negatively affected, but this occurrence exists on private property, and the Monongahela NF thus has no ability to regulate impacts to it. Therefore, the proposed highway construction may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

Given the lack of known occurrences of any other RFSS species despite site surveys, it is unlikely that crossing 3 supports substantial populations that are crucial for the continued viability of these species on the MNF. Therefore, the proposed highway construction may impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

#### 8.4 Determinations for USFS Regional Forester's Sensitive Species

The following determination of effects to RFSS with potential to occur within the project boundary has been made as a result of this Biological Evaluation:

**Table 9. Determinations for USFS Regional Foresters Sensitive Plant Species on the MNF**

<i>Scientific Name</i>	<b>Common Name</b>	<b>Determination</b>
<i>Agrostis mertensii</i>	Arctic Bentgrass	No impacts.
<i>Allium allegheniense</i>	Allegheny Onion	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Allium oxyphilum</i>	Lillydale Onion	No impacts.
<i>Amelanchier bartramiana</i>	Bartram Shadbush	No impacts.
<i>Arabis patens</i>	Spreading Rockcress	No impacts.
<i>Astragalus neglectus</i>	Cooper's Milkvetch	No impacts.
<i>Baptisia australis</i> var. <i>australis</i>	Blue Wild Indigo	No impacts.
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lanceleaf Grapefern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Botrychium oneidense</i>	Bluntlobe Grapefern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Carex roanensis</i>	Roan Mountain Sedge	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Clematis occidentalis</i> var. <i>occidentalis</i>	Purple Clematis	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Corallorhiza bentleyi</i>	Bentley's Coralroot	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

<i>Cornus rugosa</i>	Roundleaf Dogwood	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Cypripedium reginae</i>	Showy Lady's-slipper	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Delphinium exaltatum</i>	Tall Larkspur	No impacts.
<i>Eriogonum alleni</i>	Shalebarren Wild-buckwheat	No impacts.
<i>Euphorbia purpurea</i>	Darlington's Spurge	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Gaylussacia brachycera</i>	Box Huckleberry	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Gymnocarpium appalachianum</i>	Appalachian Oak Fern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Hasteola suaveolens</i>	Sweet-scented Indian-plantain	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Heuchera alba</i>	White Alumroot	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Hexalectris spicata</i>	Crested Coralroot	No impacts.
<i>Hypericum mitchellianum</i>	Blue Ridge St. John's-wort	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Ilex collina</i>	Long-stalk Holly	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Juglans cinerea</i>	Butternut	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Juncus filiformis</i>	Thread Rush	No impacts.
<i>Juncus trifidus</i>	Highland Rush	No impacts.
<i>Liatis turgida</i>	Turgid Blazing Star	No impacts.
<i>Linum sulcatum</i>	Grooved Yellow Flax	No impacts.
<i>Listera cordata</i>	Heartleaf Twayblade	No impacts.
<i>Marshallia grandiflora</i>	Large-flowered Barbara's-buttons	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Menyanthes trifoliata</i>	Bog Buckbean	No impacts.
<i>Monarda fistulosa ssp. brevis</i>	Smoke Hole Bergamot	No impacts.
<i>Ophioglossum engelmannii</i>	Limestone Adder's-tongue	No impacts.
<i>Paronychia argyrocoma</i>	Silvery Nailwort	No impacts.
<i>Paronychia virginica</i>	Yellow Nailwort	No impacts.
<i>Paxistima canbyi</i>	Canby's Mountain-lover	No impacts.
<i>Pedicularis lanceolata</i>	Swamp Lousewort	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Phlox buckleyi</i>	Swordleaf Phlox	No impacts.
<i>Piptatherum (=Oryzopsis) canadense</i>	Canada Mountain Ricegrass	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Platanthera shriveri</i>	Shriver's Frilly Orchid	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Poa paludigena</i>	Bog Bluegrass	No impacts.
<i>Polemonium vanbruntiae</i>	Bog Jacob's-ladder	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Potamogeton tennesseensis</i>	Tennessee Pondweed	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

<i>Pycnanthemum beadlei</i>	Beadle's Mountainmint	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Rhamnus lanceolata</i> ssp. <i>lanceolata</i>	Lanceleaf Buckthorn	No impacts.
<i>Ribes lacustre</i>	Bristly Black Currant	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Scutellaria saxatilis</i>	Rock Skullcap	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Silene virginica</i> var. <i>robusta</i>	Fire Pink	No impacts.
<i>Stellaria borealis</i> ssp. <i>borealis</i>	Boreal Starwort	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Taenidia montana</i>	Mountain Pimpernel	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Taxus canadensis</i>	Canada Yew	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Tortula ammonsiana</i>	Ammons' Tortula Moss	No impacts.
<i>Trichomanes boschianum</i>	Bristle-fern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Trichostema setaceum</i>	Narrow-leaved Blue-curls	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Trifolium virginicum</i>	Kate's Mountain Clover	No impacts.
<i>Triphora trianthophora</i>	Nodding Pogonia	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Viola appalachiensis</i>	Appalachian Blue Violet	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Vitis rupestris</i>	Sand Grape	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.
<i>Woodwardia areolata</i>	Netted Chainfern	May impact individuals but is not likely to cause a trend toward federal listing or loss of viability.

### 8.5 Consistency with the Forest Plan

Standard VE13 states “for management actions that have been identified by the Forest as likely to cause a negative effect on RFSS populations, negative effects shall be avoided or minimized to the maximum extent practical while still accomplishing the purpose of the project or action. Unavoidable negative effects shall be mitigated to the extent practical and consistent with the project purpose.” Therefore the proposed project is consistent with the Forest Plan.

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6/24/15

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**10. APPENDICES--**See project file.

1. 12/9/2014 letter to WVDOH from USFWS
2. Botanical Survey for Threatened & Endangered Species within the Corridor H Right-of-Way Kerens to Parsons (AllStar Ecology 2012)
3. Brian Streets's Corridor H Survey Report
4. Botanical Survey for Threatened & Endangered Species within the Appalachian Corridor H Right-of-Way 2013 (AllStar Ecology 2013)
5. Botanical Survey Report for Proposed Access Routes (Skelly and Loy 2013)
6. Appalachian Corridor H Kerens to Parsons Project 2011 Regional Forest Sensitive Species Plants Screening (Skelly Loy 2014)