

## Botanical Resources

### Introduction

The inventory and monitoring items presented here are parts of ongoing efforts to protect the Threatened, Endangered, and Sensitive (TES) plant species on the Forest and to build on our knowledge of their habitats on the Monongahela National Forest. Also covered in this report are non-native invasive species (NNIS) of plants. NNIS have been recognized at the national level as one of the four major threats to the ecological sustainability of NFS lands.

### 2007 Program Accomplishments

#### SURVEYS

**Contract Surveys** - Table BT-1 shows the areas and acres surveyed in FY 2007 for TES and NNIS plants. An estimated 7,846 acres were surveyed in 2007 by contract. These surveys were made in areas proposed for active management in the near future, or areas likely to be managed in the future. The areas were not selected because TES plants were expected in the area, so it is not surprising that few TES plants were found.

**Table BT-1. Acres of Contract Survey for TES and NNIS Plants in 2007**

Location	Acres	TES Plants Found	High Priority NNIS Plants Found
Big Rock potential timber project	2,521	Long-stalked holly	Garlic mustard, princess tree, Japanese stiltgrass, Morrow's honeysuckle
Lower Williams proposed timber project	312	Running buffalo clover, long-stalked holly, nodding pogonia	Garlic mustard, Japanese stiltgrass
White Sulphur proposed prescribed fire project	4,429	None	Garlic mustard
Shock Run proposed prescribed fire project	584	Butternut	None
Total	7,846		

In addition to locating TES or NNIS plants, the contract required that a check list of plants encountered in the survey areas be filled out. This list was not meant to be quantitative and it may not be all-inclusive. However, the list does serve as a general overall depiction of the herbaceous component of the surveyed areas and may be helpful in designing projects or looking for specific habitat for other plants or animals. The results could also be used for determining indicator species, and could provide clearance documentation in the event that new species are added to the TES lists.

**Forest In-house Surveys** - Every year, some areas proposed for active management are not included in the contracted survey areas. Generally these areas are associated with small projects, or they are added to a large project after award of the TES survey contract. In 2007, these areas were reviewed for TES plant individuals or potential habitat by Biological Technician, Ron Polgar. Table BT-2 displays the areas and acreages covered by forest personnel in 2007. In 2007, 2,886 acres were surveyed by Forest personnel.

**Table BT-2. Acres of In-house Surveys for TES and NNIS in 2007**

Location/Project Name	Acres	TES plants Found	High Priority NNIS Plants Found
Hogback proposed timber project	343	Appalachian blue violet, rock skullcap	Garlic mustard, Japanese stiltgrass, tree of heaven, Japanese barberry
Ramshorn proposed prescribed fire project	2,500	Rock skullcap	Garlic mustard, Japanese barberry, crown vetch, Japanese stiltgrass, bush honeysuckles, common privet
Mullenax grazing allotment	43	None	None
Total	2,886		

## NEW SITES FOUND

Except for the running buffalo clover at Lower Williams and the butternut at Shock Run, all of the TES plants found constituted new micro-sites for these species. The species were previously known to occur in these project areas, so these new micro-sites likely are part of the populations that were already known to exist. The butternut site was a confirmation of a previously known occurrence.

The running buffalo clover at Lower Williams represents a previously undiscovered population of this endangered species. Population size was estimated at over 2,000 rooted crowns, making this the fourth largest known population in the entire range of the species.

## NNIS TREATED

Garlic mustard (*Alliaria petiolata*) was noted during site monitoring of the Gaudineer Scenic Area/Virgin Spruce stand. The Forest Ecologist, assisted by volunteers, removed garlic mustard by hand pulling from the parking area, adjacent to the trail, and in some canopy gaps along the trail where garlic mustard was spotted from the trail. The gross area treated was estimated at 8 acres, although the infestation was spotty within this area. This was a follow-up treatment to the initial hand-pulling that was done by the Forest Ecologist in 2004, 2005, and 2006.

Canada thistle (*Cirsium arvense*) was treated with herbicide in the Allegheny Battlefield grazing allotment. The total area of the allotment is approximately 170 acres, and treatment was scattered throughout the allotment.

## SUPPORT TO CONSERVATION ASSESSMENTS, RESEARCH, ETC.

During FY 2007, the Forest provided authorizations for the following botany and ecology-related research activities:

- A genetics study of black cohosh, conducted by the Missouri Botanical Garden,
- A genetics study of ginseng, conducted by the U.S. Geological Survey,
- A population genetics study of three-tooth cinquefoil, conducted by Appalachian State University,
- Dendrochronology research on ancient red cedars in the limestone glades of the Smoke Hole area of the Forest, conducted by West Virginia University, and
- Plant species composition and soil properties in high elevation wetlands, conducted by Canaan Valley Institute.

The Forest continued its cooperative agreement with West Virginia University to develop a geospatial database containing information from the original warrant surveys that were conducted on the Forest during the 1930s. Among the data to be included are the witness tree records for all of the survey corners. The database will make this early data on vegetation of the Forest more accessible to the Forest Ecology staff and to researchers.

The Forest also continued its cooperative agreement with the Nature Conservancy to prepare a conservation assessment for the limestone glades and barrens communities in the Smoke Hole area of the Forest. Substantial work on the assessment was accomplished in FY 2007, with completion of the assessment expected in FY 2008.

## Monitoring and Evaluation

### FOREST PLAN MONITORING FOR BOTANICAL RESOURCES

The 2006 Forest Plan monitoring chapter (Chapter IV) contains three monitoring items/questions related to TES plants and NNIS plants:

26. *To what extent is Forest management contributing to the conservation of sensitive species and maintaining or restoring their habitat conditions?*
31. *To what extent is Forest management contributing to the protection and recovery of threatened and endangered species?*
35. *Are non-native invasive plants located and treated to prevent or limit further spread?*

The Forest Ecologist provided planning input for TES plants for every project on the Forest that went through the NEPA process during FY 2007. Where TES plants were present, the Ecologist recommended project design criteria to protect these occurrences from adverse effects. In most cases, these recommendations were incorporated into the project design. Therefore, projects on the Forest are being designed to contribute to the conservation of sensitive species and the protection and recovery of threatened and endangered species. However, the Forest did not have the personnel or funding available to conduct implementation and effectiveness monitoring on

TES protection measures for projects that were implemented in FY 2007. Therefore, the first two monitoring questions cannot be completely answered.

The program accomplishments listed above demonstrate that the Forest conducted some treatment to limit the spread of NNIS plants in FY 2007. This activity addressed only a small fraction of the infestations of high priority NNIS on the Forest. Currently the Forest is limited in its capacity to treat NNIS due to lack of NEPA decision coverage on most of the sites in need of treatment. In FY 2008 the Forest is preparing a Forest-wide NEPA analysis of high priority NNIS treatment needs, so control activity should increase in future years.

### **Evaluation, Conclusions, and Recommendations for Questions 26, 31, and 35**

A few new TES species observations were made, and design features were incorporated into project planning to protect other known locations. NNIS continue to be a growing concern on the Forest, as populations are found in many of the places surveyed or monitored. Effective monitoring of TES and NNIS plants is a tough challenge due to inadequate staffing and budgets.

#### **Recommendations:**

1. Running buffalo clover sites on the Forest that have been monitored by Fernow Experimental Forest personnel should be monitored by Forest personnel in future years.
2. Monitoring of the TES plants in the Lower Williams, Hogback, Shock Run, and Ramshorn project areas should occur during and after timber sale and prescribed fire activity to check for effectiveness of design criteria and mitigation.
3. TES plant sites in the Upper Williams timber sale areas should be monitored to determine whether design features in these sales adequately protected the TES plant occurrences.
4. NNIS control efforts that are part of the design of the Hogback and Lower Williams projects should be monitored for implementation and effectiveness.
5. NNIS monitoring should be conducted on ongoing and recently closed timber sales to determine whether these sales contributed to the spread of high priority NNIS.
6. Garlic mustard control at the Gaudineer Scenic Area/NNL should continue.
7. Completion of the Forest-wide NNIS NEPA process should be a high priority because it is a prerequisite for increasing control efforts in the future.
8. Additional NNIS inventory should be conducted over the Forest to allow better prioritization of control efforts. Inventory should be conducted in a systematic fashion and should concentrate on high probability establishment sites (roads, utility corridors, trails, recent timber harvests) and high value ecosystems that have not been surveyed in recent years.
9. The Forest should make a concerted effort to collect new TES and NNIS data in the appropriate corporate databases. Legacy data should be edited and entered as time allows.