January 2012

The vascular flora of Breaks Interstate Park, Pike County, Kentucky, and Dickenson County, Virginia

Julie Bennett Clark
Eastern Kentucky University

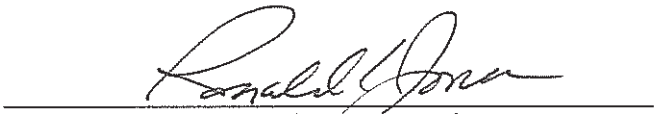
THE VASCULAR FLORA OF BREAKS INTERSTATE PARK,

PIKE COUNTY, KENTUCKY, AND DICKENSON COUNTY, VIRGINIA

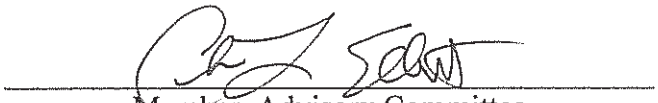
By

Julie Bennett Clark

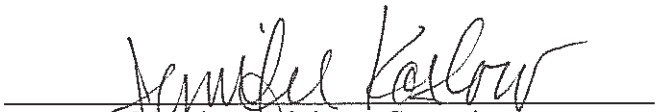
Thesis Approved:



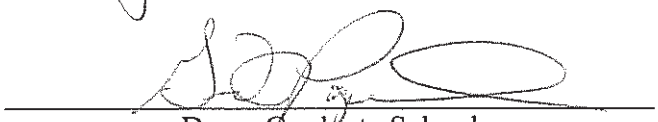
Chair, Advisory Committee



Member, Advisory Committee



Member, Advisory Committee



Dean, Graduate School

STATEMENT OF PERMISSION TO USE

In presenting this thesis in partial fulfillment of the requirements for a Master of Science degree at Eastern Kentucky University, I agree that the Library shall make it available to borrowers under rules of the Library. Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgment of the source is made. Permission for extensive quotation from or reproduction of this thesis may be granted by my major professor, or in [his/her] absence, by the Head of Interlibrary Services when, in the opinion of either, the proposed use of the material is for scholarly purposes. Any copying or use of the material in this thesis for financial gain shall not be allowed without my written permission.

Signature Julie B. Clark

Date April 11, 2012

THE VASCULAR FLORA OF BREAKS INTERSTATE PARK, PIKE COUNTY, KENTUCKY, AND DICKENSON COUNTY, VIRGINIA

By

Julie Bennett Clark

Bachelor of Science
University of Kentucky
Lexington, Kentucky
1999

Submitted to the Faculty of the Graduate School of
Eastern Kentucky University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
May, 2012

DEDICATION

This thesis is dedicated to Chip Clark,
the best field assistant, friend, and husband
that I could ask for.

I would also like to dedicate this thesis to my wonderful
parents, Wallace and Betty Bennett, who provide
endless support and encouragement.

ACKNOWLEDGMENTS

I would like to thank my advisor and professor, Dr. Ronald Jones, for his guidance throughout this project. I greatly appreciate his assistance in the field, in the lab, and in the editing of this thesis. Dr. Jones donated large amounts of his time and expertise in helping with specimen identification and exhibited great patience while I juggled work and this project. I would also like to thank my other committee members, Dr. Charles Elliott and Dr. Jennifer Koslow, for their editing and assistance with this thesis.

Dr. Ross Clark and Dr. Julian Campbell graciously provided assistance and verification of woody plants (Dr. Clark) and Poaceae and Cyperaceae (Dr. Campbell). I am very appreciative of Mr. Thomas Wieboldt, Virginia Polytechnic Institute (VPI) Herbarium Curator, who kindly searched for additional specimens from the VPI herbarium and then mailed them to Eastern Kentucky University (EKU) for our use.

I am grateful to the people who provided field assistance on this project: Chip Clark, Dr. Ronald Jones, Wallace Bennett, Rob Lewis, Amy McIntosh, and Jessica Mooreleghen. Without fail, it was my assistants who spotted the "good finds" in the field. A special thanks to Amy McIntosh who helped get me started on this project and provided excellent advice. I want to thank Jeff Levy for helping create figures and Jonathan Scheibly for managing my GPS database.

I would like to thank the Kentucky Natural History Society for providing a grant to support this project.

I greatly appreciate members of the Breaks Interstate Park staff: Terry Owens, former Park Naturalist and current Director of Maintenance; Austin Bradley, Director of Visitor Services; and Matthew O'Quinn, Superintendent. They have been great sources of information and assistance. I've never met or spoken with retired park naturalist, Ken Markley, but I am

grateful to him for starting this floristic project in the 1980s and for depositing many of his specimens in the VPI herbarium.

My parents, Betty and Wallace Betty Bennett, provided endless support thoughout this long process and encouraged me to continue pursing my goal. With much love and appreciation, I thank them for everything. My brother, Gary Bennett, and sister, Kim Bennett, were great sources of motivation. Having witnessed both of them pursue and accomplish many educational goals served as encouragement for me to keeping plugging along.

Most of all, I deeply appreciate my husband, Chip Clark, who agreed to take on this task with me and showed immense support thoughout. Chip willingly took many journeys with me to the Breaks, sacrificing weekends and days off work to accompany me in the field. I am truly grateful for his positive attitute, humor, and patience and for always believing in me. I simply could not have accomplished this project without him.

ABSTRACT

The vascular flora of Breaks Interstate Park was documented during two growing seasons, 2008 and 2009; with supplemental collections made in 2010 and 2011. The project area is located in eastern Kentucky and western Virginia at the northeastern terminus of Pine Mountain along the Appalachian Plateau. A total of 118 families, 341 genera, and 549 species, varieties, and subspecies were documented from Breaks Interstate Park. Six main vegetative communities were described: mesophytic forest, upper slopes and ridgetops, ponds/wetlands, river bottomland and floodplain/streamside, sandstone outcrops, and disturbed/open areas. Eleven rare species with state rankings were identified: *Adlumia fungosa*, *Hydrastis canadensis*, *Juglans cinerea*, *Meehania cordata*, *Monotropis odorata*, *Panax quinquefolius*, *Prosartes maculata*, *Saxifraga caroliniana*, *Silene rotundifolia*, *Spiranthes lucida*, and *Triphora trianthophora*. In addition, six taxa with Kentucky rankings were found on the Virginia side of the park. Ninety-one non-native species were documented (17% of the flora), and of this list, 48 species are considered invasive in Kentucky or Virginia. Specimens of vascular plant species were collected and voucher specimens will be housed in the Eastern Kentucky University Herbarium.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Breaks Interstate Park, established in 1954, is located in the Jefferson National Forest in Pike County, Kentucky, and Dickenson County, Virginia. The park is administered by both Kentucky and Virginia, and is one of two interstate parks in the United States. The park is located 47 kilometers (29 miles) southeast of Pikeville, KY, and 26 kilometers (16 miles) west of Grundy, VA. The main entrance to the park is accessed off VA 80 (State Hwy 80) between Haysi, VA and Elkhorn City, KY. The park encompasses 1,862 hectares (4,600 acres). The Russell Fork River cuts a deep gorge through the park, which is referred to as the "Grand Canyon of the South." The 8-kilometer (5-mile) long gorge is 503 meters (1,650 feet) deep and is the largest gorge east of the Mississippi River. The river's Class IV and V rapids are a challenging pursuit for skilled paddlers. The annual fall kayak race, known as the "Lord of the Fork," times individual's runs through the Russell Fork gorge. Along with the Russell Fork River, the Cinchfield Railroad (now the CSX Transportation Kingsport Subdivision) runs through the gorge and through three tunnels. According to the Breaks Interstate Park website, the park area was ancient hunting grounds of the Shawnee and Cherokee, and Daniel Boone, is credited with being the first person of European descent to discover "the Breaks" in 1767 (Breaks Interstate Park 2012). Hiking, mountain biking, horseback riding, pedal boats, festivals, and family reunions are common activities in the park. Forty kilometers (25 miles) of trails traverse the property. The park restaurant and swimming pool are popular with locals and tourists alike. Accommodations include the lodge, cabins, and campsites (Breaks Interstate Park 2012).

Breaks Interstate Park was chosen as the location of this thesis project for several reasons. Few comprehensive floristic studies have been conducted in the Cumberland Plateau

and Cumberland Mountains of the Appalachian Plateau. No county floras exist for either Pike County, KY, or Dickenson County, VA, or for any adjacent counties in the two states. Jones (2005) ranked regions of Kentucky most in need of floristic studies, and recommended that the southern section of the Appalachian Plateau (encompassing Bell, Breathitt, Harlan, Knott, Knox, Lee, Letcher, Perry, and Pike Counties) be given highest priority, not only because of the scarcity of studies, but because of the likelihood that high quality communities (old-growth forests, mixed mesophytic forests, fens and plateau wetlands, oak-pine forests, and oak-pine barrens) might still exist in the area. Several floristic or vegetation studies have been conducted in nearby or similar sites in Kentucky, including studies of Pine Mountain (McIntosh 2009, Braun 1935), the Cumberland Mountains (Braun 1942), Lilley Cornett Woods (McEwan et al. 2005, Sole, et al. 1983, Martin and Shepherd 1973), and Cumberland Gap (Pounds et al. 1989, Hinkle 1975). Floristic studies of similar areas on the Cumberland Plateau of Tennessee include the North Chickamauga Creek Gorge State Natural Area (Huskins and Shaw 2010) and Fall Creek Falls State Park (Fleming and Wofford 2004, Caplenor 1965).

Several different formulae are available for predicting the number of vascular plants species in a particular area, and based on these formulae, between 587 and 637 different taxa are expected to be found in the 1,862 hectares that comprise the Park (Huskins and Shaw 2010, Wade and Thompson 1991). The location of the Park in the rich Appalachian highlands, together with preliminary information compiled by park employees, along with sporadic collecting from a variety of collectors over the last several decades, suggest that a large diversity of species is likely present.

Several sources of botanical information on Breaks Interstate Park and the surrounding area are available, including the herbarium specimens and databases maintained at the Eastern Kentucky University Herbarium (EKY) and Massey Herbarium at Virginia Polytechnic University (VPI). Several atlases of vascular plant distributions are also available, including Clark and Weckman (2008) and Campbell (2006) for Kentucky, and Virginia Botanical

Associates (2012) for Virginia, but these do not usually provide specific information on the Park. The databases maintained by the Kentucky State Nature Preserves Commission (KSNPC) and the Virginia Department of Conservation and Recreation Natural Heritage Program (VDCR) have data on the rare and endangered species in the region. A query of the EKY database (Note: the acronym EKY is used when referring to the herbarium, and EKU when referring to the university) revealed 754 records for Pike County, but only 29 records, representing 24 species from the Park, whereas the digital atlas of the Virginia flora lists 769 species for Dickenson County, Virginia (Virginia Botanical Associates 2012). During the 1980s a checklist of plant species of Breaks Interstate Park was assembled by former park naturalist Ken Markley. This checklist was never published, and contains 809 names, but many are noted by question marks, and it is not known how many are vouchered at Virginia herbaria. The list does not indicate if the plants were collected in Kentucky or Virginia. Markley and former Superintendent James Childress also prepared a list in the 1980s of "Common Blooming Plants and Trees in the Park," which includes the months when each listed plant is in bloom and the trail or location of 42 herbs and 24 trees (Markley and Childress 1981-1989). Therefore, although some floristic data were available for the Park, the information has never been compiled and made available in an accessible form. The major objectives of this research project were to 1) prepare a list of vascular plant species for Breaks Interstate Park, based on collections obtained during this study, as well as collections from the park already deposited in area herbaria; 2) provide descriptive accounts of the plant communities; and 3) to describe the presence and status of rare plant species and exotic species in the park.

CHAPTER 2

STUDY AREA

Location, Topography, Physiography, Ecoregion

Breaks Interstate Park is located on the border of southeastern Kentucky and southwestern Virginia, and includes approximately 620 hectares (ha) in Pike County, KY and 1,241 hectares (ha) in Dickenson County, VA (Figure 1)[1]. The Park is found within the Elkhorn City, KY-VA U.S. Geological Survey topographic and geologic quadrangles (USGS 1978, Alvord and Miller 1972; Fig. 2). Elevations range from 280 meters (920 feet) at Russell Fork to 603 m (1,978 ft) at the Clinchfield Overlook inside the park. In addition to the typical high ridges and steep slopes that characterize the area, other types of terrain include floodplains, rolling hills, drainages, and nearly level areas in developed sections of the park (Figures 2 and 3).

Breaks Interstate Park is located in the Cumberland Mountains Section of the Appalachian Plateaus Physiographic Province (Fenneman 1938). This unglaciated region is a mountainous plateau with steep slopes, narrow ridgetops and valleys, and deep coves. Ridges are dissected with high gradient streams composed of cobble and boulder substrates (Woods, et al. 2002). The following streams are located within the Park: Russell Fork River, Grassy Creek, Center Creek, Laurel Branch, and Camp Branch (Fig. 2). Pine Mountain begins at Russell Fork River within the park and extends southwest about 201 km (125 miles) to near Jellico, Tennessee.

The Park is located in the Level IV Dissected Appalachian Plateau Ecoregion, within the Level III Central Appalachians Ecoregion (Woods, et al. 2002; Fig. 4). According to Woods, et al. (2002), mixed mesophytic forests are the dominant type of vegetation on cool north- and east-facing slopes and coves, while drier upper slopes and south- and west-facing slopes are

[1] Refer to Appendix A for all figures.

dominated by mixed oak and pine forests. Red maple (*Acer rubrum*) has become a frequent component of second-growth forests and former American chestnut (*Castanea dentata*) sites. Agricultural land is limited by the rugged landscape and nutrient-poor soils. Logging, gas and oil production, and coal mining, both surface and underground, are common in the region but not within park boundaries. Acidic drainage and sedimentation from mining have impacted aquatic biodiversity and productivity in many streams. The ecoregion is mostly forested and vegetation composition varies based on aspect, slope, topographic variation, and past land usage (Woods et al. 2002).

Geology and Soils

Alvord and Miller (1972) described the geology of the Elkhorn City, KY-VA Quadrangle. The project area is composed of alluvium along Russell Fork, the Breathitt Formation on upper slopes and ridgetops, and the middle and upper sandstone members of the Lee Formation on lower slopes. The Pennsylvanian-aged Breathitt and Lee Formations located throughout the park are composed of sandstones, conglomerates, shales, siltstones, and coal (Alvord and Miller 1972). Greb et al. (2006) describe how the mountainous landscape of the region was formed from the Cenozoic weathering of strata pushed to the surface during the Pennsylvanian geologic period. Many strata were overturned during this upthrust, such as coal beds being below their associated underclays. The break in Pine Mountain worn down by the Russell Fork River is the origin of the name “Breaks” (Adkins 2009).

The soil in the park is comprised of upland soils, mostly Ultisols and Inceptisols, formed from residuum and colluvium (Woods et al. 2002). The Pike County side of the Park, which includes the northwest face of Pine Mountain, is composed of the Kimper-Sharondale-Berks-Shelecta general soil map unit. These soils occur on ridgetops and side slopes and are deep and moderately deep, moderately to extremely steep, and well-drained with a loamy subsoil (Kelley 1990). The Park's soil composition was defined using the Web Soil Survey (USDA 2012), which

delineated the area into soil complexes and mapping units: 20 for Dickenson County and 13 Pike County. The soils accounting for the largest percentages are presented in Table 1. The largest percentage of land area (approximately 16 percent) is composed of Alticrest fine sandy loam, 15 to 35 percent slopes, rocky. This soil unit is characterized by somewhat excessively drained soils on slopes and ridges. No map units in Dickenson County meet the definition of a hydric soil (Adkins 2009).

Table 1. Main soil mapping units within Breaks Interstate Park.

Map Unit Name	Approximate % of Park
Dickenson County	
Alticrest fine sandy loam, 15 to 35 percent slopes, rocky	16.3
Ramsey-Alticrest-Rock outcrop complex, 35 to 80 percent slopes	16
Alticrest fine sandy loam, 35 to 55 percent slopes, rocky	11.7
Cloverlick-Shelocta complex, 55 to 70 percent slopes, very stony	7.3
Pike County	
Kimper-Sharondale-Muskingum complex, 35 to 80 percent slopes, very stony	12

Source: United States Department of Agriculture - Natural Resources Conservation Service. 2012. Web soil survey. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.

Climate

The Dickenson County Soil Survey (Adkins 2009) provided climate information for Grundy, Virginia, which is located near Breaks Interstate Park. The data were recorded from 1971 to 2000. In the winter months (December through January) the average daily temperature was 2.6° Celsius (C). The average daily maximum temperature was 9.2°C and the average daily minimum temperature was -4°C. In the summer months (June through August) the average daily

temperature was 22.9°C. The average daily maximum temperature was 29.8°C and the average daily minimum temperature was 16.1°C. The yearly average precipitation was 117 cm (45.98 inches), and the average number of days per year with 0.25 cm (0.10 inches) of precipitation or more was 88 days. The yearly average snowfall amount was 50 cm (19.7 inches). Average length of the growing season was 181 days (Adkins 2009).

Vegetation

General overviews of the vegetation of the Breaks Interstate Park region have been provided by Braun (1950), Küchler (1964), and Smalley (1984). (Note: Table 2 provides a list of scientific names for species frequently mentioned in the text.) The forests of this region have typically been classified as the Mixed Mesophytic Forest by these previous authors, but in a recent intepretation, Dyer (2006) includes the Park area in a more generalized forest region, the Mesophytic Forest Region. Smalley (1984) provides a general synopsis of the vegetation, which can be summarized as; 1) mesic slopes, with a canopy of eastern hemlock, American beech, yellow-poplar, red maple, and white oak, with occasional white basswood, northern red oak, yellow birch, sweet birch, blackgum, cucumbertree, Fraser magnolia, and other hickories and oaks, and an understory of bigleaf and umbrella magnolias, sourwood, flowering dogwood, American holly, and rhododendrons; and 2) dry slopes and ridges, with a canopy of oaks (chestnut, white, scarlet, post, black, blackjack), pines (shortleaf, pitch, and Virginia), and hickories (pignut and mockernut), with occasional red maple, sourwood, blackgum, eastern red-cedar, and eastern white pine, and a subcanopy of mountain laurel, sumac, and vacciniums. Formerly American chestnut was a prominent member of these upland communities until the fungal infection caused by the chestnut blight resulted in the dying off of the species in the late 1920's and 1930's (Caudill 1963). Jones (2005) describes similar communities for these Appalachian uplands, distinguishing 1) Mixed deciduous forests, similar to the mesic forests described by Smalley above, but including other subcanopy species such as buffalo-nut, sweet

Table 2. Scientific names for woody species frequently mentioned in the text.

ash
white (*Fraxinus americana*)

azaleas, wild
(*Rhododendron* spp.)

basswood
white (*Tilia americana* var. *heterophylla*)

beech, American (*Fagus grandifolia*)

birch
sweet (*Betula lenta*)
yellow (*B. allegheniensis*)

blueberries
Vacciniums (*Vaccinium* spp.)

buffalo-nut
(*Pyrularia pubera*)

chestnut, American (*Castanea dentata*)

dogwood
flowering (*Cornus florida*)

grapes, wild (*Vitis* spp.)

greenbriers (*Smilax* spp.)

gum
black (*Nyssa sylvatica*)

hemlock, eastern (*Tsuga canadensis*)

hickory
bitternut (*Carya cordiformis*)
hickories (*Carya* spp.)
mockernut (*C. tomentosa*)
pignut (*C. glabra*)
shagbark (*C. ovata*)

holly
American (*Ilex opaca*)

laurel, mountain
(*Kalmia latifolia*)

magnolia
bigleaf (*Magnolia macrophylla*)
cucumber (*M. acuminata*)
Fraser (*M. fraseri*)
umbrella (*M. tripetela*)

maple
red (*Acer rubrum*)
sugar (*A. saccharum*)

oak
black (*Quercus velutina*)
blackjack (*Q. marilandica*)
chestnut (*Q. montana*)
oaks (*Quercus* spp.)
post (*Q. stellata*)
northern red (*Q. rubra*)
scarlet (*Q. coccinea*)
white (*Q. alba*)

pepperbush, sweet
(*Clethra acuminata*)

pine
pitch (*Pinus rigida*)
shortleaf (*P. echinata*)
Virginia (*P. virginiana*)
white (*P. strobus*)

redbud (*Cercis canadensis*)

red-cedar, eastern (*Juniperus virginiana*)

rhododendron (*Rhododendron* spp.)

sassafras
(*Sassafras albidum*)

serviceberry, downy
(*Amelanchier arborea*)

sourwood
(*Oxydendrum arboreum*)

sumac
sumac (*Rhus* spp.)

wintergreen
(*Gaultheria procumbens*)

witchhazel
(*Hamamelis virginiana*)

yellow-poplar or tulip-poplar
(*Liriodendron tulipifera*)

Nomenclature source: Jones, R.L. 2005. Plant life of Kentucky.

pepperbush, and wild azaleas; 2) Mixed oak forests, on sites of more intermediate moisture regime, dominated by white oak, bitternut hickory, northern red oak, white ash, shagbark hickory, and sugar maple, with many species of Ericaceae, greenbriers, redbud, and wild grapes in the understory; and 3) Xeric oak forests, similar to that described for dry ridges and slopes by Smalley (1984) above, but with many species of Ericaceae, wintergreen, serviceberry, sassafras, and witchhazel in the understory.

Evans et al. (2006) provided a more specific listing of Kentucky plant communities that are likely to be found in the Breaks Interstate Park area, including Appalachian mesophytic forest, Hemlock-mixed forest, Appalachian sub-xeric forest, Appalachian pine-oak forest, Virginia pine forest, Dry sandstone cliff, Moist sandstone cliff, and Cumberland Plateau gravel/cobble bar. Fleming and Patterson (2012) provide a very detailed listing of the natural communities of Virginia.

Land Use

According to Woods et al. (2002), land use in the Dissected Appalachian Plateau Ecoregion consists of natural resource extraction and farming. Logging is common in the largely forested region. Flat land is limited; therefore, farming occurs on floodplains and terraces where drainage is suitable to hay, tobacco, and corn production. Pastureland is also limited. Coal is mined in a variety of ways, including surface mining, mountain-top removal, contour mining, and deep mining. Gas and oil are also extracted, and gas pipelines extend across the hilly topography (Woods et al. 2002).

Austin Bradley, Director of Park Services at Breaks Interstate Park, and Terry Owens, former Park Naturalist and current Director of Park Maintenance were very helpful in supplying information on the human history and management of the Park, and the following discussion in the remainder of this section is based on this information. Underground coal mining (likely not

surface mining) may have occurred prior to 1954 when the Park was established, on what is now park property. The Domus Mines located on the mountain, west of Russell Fork, operated in the early 1900s. From the Clinchfield Overlook, a loading bin is visible next to the railroad, and remnants of a coal chute down the mountain can be discerned when leaves are absent (WMTH 2012). Another small mine is rumored to have been located in the "Notches" area of the Park, but no confirming evidence has been found.

Most, if not all, of the Breaks Interstate Park property has been logged at some point. The Yellow Poplar Timber Company was responsible for much of the large-scale logging in the Park and the remainder was logged by small companies and private individuals clearing their fields. The only places that may have experienced more limited logging are remote areas around the Towers and the "Hickory Flats" historic settlement at the site of the present-day Mountain Bike Trail, where several large trees appear to have been left standing.

Small-scale farming was conducted in Breaks Interstate Park by several families in the Hickory Flats area, and even today (2012), there is a field that is mowed for hay. Potter's Flats, located across the Russell Fork on the Kentucky side of the property, was settled and gardened. A current house located between the Mountain Bike trailhead and several cottages was historically gardened for subsistence.

The Clinchfield Railroad (now CSX) is responsible for mitigating any impacts that are caused by its route through Breaks Interstate Park. Noise pollution is likely the main impact; however, park visitors often comment that they enjoy hearing the train whistle. From some park vantage points, the trains can be seen entering and exiting the three tunnels on the Park. The main visitor conflict with the railroad is the illegal crossing (by foot) of the railroad trestle over the river at Pool Point. Park personnel reprimand people caught crossing the bridge.

Currently, approximately 15% of Breaks Interstate Park is developed. Land use at the park includes numerous facilities, including a lodge, cottages, cabins, staff housing, restaurant,

conference center, swimming pool, amphitheater, and visitor center, as well as maintained camp sites, hiking trails, mountain bike trails, and horse stables and horseback riding trails (Fig. 5).

CHAPTER 3

MATERIALS AND METHODS

Vascular plants were documented during two growing seasons (April 2008 to October 2009), along with 2 additional trips in 2010 and 2 trips in 2011. A total of 34 trips were made to the Park. An attempt was made to survey portions of all major sections of the Park. Using the topographic map, geology map, and park trail map, collection sites were selected based on accessibility, variability of habitat, elevation, aspect, soil moisture conditions, and the degree of vegetative cover (i.e., open vs. forested). Main collection areas were visited on a periodic basis. The most frequently visited sites or trails were: 1) Garden Hole, 2) Beaver Pond and stables vicinity, 3) Laurel Lake, 4) Camp Branch Trail to Russell Fork, 5) Mountain Bike Trail Circuit, 6) Pine Mountain Trail, 7) Potter's Flats and Russell Fork, 8) Center Creek to Grassy Creek to Russell Fork, 9) Geological Trail, 10) River Access and 11) Prospector's Trail (Fig. 5).

The sampling procedure involved a modified version of the random meander technique, which was described by Cropper (1993) as "walking in a random manner throughout the study area, visiting the full range of potential habitats and recording every plant seen." Before each collecting trip, a route was planned to access several habitat types and cover different sections of the Park. Also, the previous year's notes were reviewed in order to focus on different habitats and areas of the Park than were sampled at the same time the previous year.

Standard collecting and herbarium techniques were used to obtain floristic data. Specimens with reproductive features were selected if possible (with spores, cones, flowers, or fruits), and collected in duplicate. Specimens were then processed at Eastern Kentucky University (pressed, dried, frozen, and labeled). For rare species or species for which there were not more than 20 individuals found, a photograph was taken instead of collecting the actual

specimen. Notes were taken on precise location (including latitude and longitude), habitats, and noteworthy features of the specimens. Notes were also taken on canopy and subcanopy species for each major habitat type, and utilized for the community descriptions. Selected large trees greater than 75 centimeters (cm) diameter at breast height (dbh) were measured and documented.

Additional species listings were obtained by examining specimens collected prior to this study and housed at EKY or VPI. The EKY specimens were located using the EKY database. An unpublished list of species collected from the Park by Ken Markley was provided by VPI Curator, Dr. Thomas Wieboldt, and a target list of species that had not been documented in the current study was then prepared. This list was sent to Dr. Wieboldt who kindly searched for the specimens and located a total of 97 sheets. These specimens were then mailed to EKU for examination and confirmation of their identifications.

Regional manuals and field guides were used for plant identification, including Jones (2005), Gleason and Cronquist (1991), Barnes and Francis (2004), Beal and Thieret (1986), and Wharton and Barbour (1971). Nomenclature follows that of Jones (2005). Those providing assistance and verification of specimens identifications included Dr. Ross Clark (woody plants, *Ilex*), Dr. Julian Campbell (Poaceae and Cyperaceae), and Dr. Ronald Jones (all groups). Labels were prepared for each specimen, and included the following information: genus and species, specimen number, collection location, latitude and longitude of location, date collected, and collector. Voucher specimens will be deposited at EKY, with a duplicate set deposited at VPI.

Rare species occurrence reports specifically generated for this project by the Kentucky State Nature Preserves Commission (KSNPC) and the Virginia Department of Conservation and Recreation (VDCR) were reviewed, and those species and their habitats were targeted during collecting trips. Rare plants found were noted and their status ascertained. Rare species status is based on KSNPC (2010) and Townsend (2009).

CHAPTER IV

RESULTS

Flora

For this study, 1,200 collections were made and specimens from two herbaria were confirmed. The floristic inventory of Breaks Interstate Park resulted in the identification of 549 different species or lesser taxa, representing 118 families and 341 genera. The taxa can be further broken down into 37 pteridophytes, 6 gymnosperms, 394 dicots, and 112 monocots. Eighty-six species records are based on specimens from other collectors (81 VPI, 5 EKU). The number of species documented for Virginia was 447, and the number for Kentucky was 200 (Table 3); however, this reflects an overlap where some species were collected in both states. A separate species list was not generated for each state, but rather for the Park as a whole. Families with the largest number of taxa were Asteraceae (72 species), Poaceae (41 species), Fabaceae (25 species), Cyperaceae (24 species), Rosaceae (23 species). These five families accounted for 34 percent of the total flora. No federally-listed threatened or endangered species were found, but 11 species with state rankings were identified (Table 4). The number of non-native species identified was 91, accounting for about 17 percent of the flora.

Table 3. Differences between Kentucky and Virginia for Breaks Interstate Park plant species lists. Note: A separate species list was not compiled for each state individually but rather for the Park as a whole; therefore, this chart reflects an overlap where some species were collected in both states and also an unrepresentation where some species were only collected in one state even though they may also occur in the other.

	Kentucky	**Virginia**
Species	200	447
Rare Species	1	10
State Records	0	0
Non-native Species	41	62

Table 4. State-listed rare species identified from Breaks Interstate Park. State Status Key: T = Threatened, S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure. VPI designation refers to Virginia Tech Herbarium (VPI) specimens.

Species	Collection Location	State Status
Adlumia fungosa (VPI)	Dickenson County, VA	S3 (VA)
Hydrastis canadensis	Pike County, KY & Dickenson County, VA	S3 (VA)
Juglans cinerea	Pike County, KY (County Record)	T (KY)
Meehania cordata (VPI)	Dickenson County, VA	S3 (VA)
Monotropis odorata (VPI)	Dickenson County, VA	S3 (VA)
Panax quinquefolius (VPI)	Dickenson County, VA	S3/S4 (VA)
Prosartes maculata (VPI)	Dickenson County, VA	S3 (VA)
Saxifraga caroliniana	Dickenson County, VA	S3 (VA)
Silene rotundifolia (VPI)	Dickenson County, VA	S2 (VA)
Spiranthes lucida	Dickenson County, VA (County Record)	S1 (VA)
Triphora trianthophora	Dickenson County, VA	S1 (VA)

Virginia state status source: Townsend, J.F. 2009. Natural Heritage Resources of Virginia: Rare plants. Natural Heritage Technical Report 09-07. Kentucky state status source: Kentucky State Nature Preserves Commission. 2010. Rare and extirpated biota and natural communities of Kentucky.

Vegetation

Communities

Based on distinct habitats, moisture regime, vegetative cover, and frequency of disturbance, six main community types were identified in Breaks Interstate Park: mesophytic forest, upper slopes and ridgetops, ponds/wetlands, river bottomland and floodplain / streamside, sandstone outcrops, and disturbed / open areas. Most communities were dominated by a mix of deciduous and coniferous trees, except for ponds and open areas, where herbaceous vegetation was most dominant.

Mesophytic forest

The mesophytic forest community is the predominant community found at Breaks Interstate Park. This mesic community occurs on well-drained slopes and in coves and ravines. Overall dominant canopy species are hemlock (*Tsuga canadensis*), beech (*Fagus grandifolia*), tulip-poplar (*Liriodendron tulipifera*), pignut hickory (*Carya glabra*), northern red oak (*Quercus rubra*), white oak (*Quercus alba*), chestnut oak (*Quercus montana*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), and white ash (*Fraxinus americana*). Species of shrubs and small trees in the subcanopy are striped maple (*Acer pensylvanicum*), pawpaw (*Asimina triloba*), sweet birch (*Betula lenta*), maple-leaved viburnum (*Viburnum acerifolium*), sweet pepperbush (*Clethra acuminata*), flowering dogwood (*Cornus florida*), rosebay laurel (*Rhododendron catawbiense*), great-laurel (*Rhododendron maximum*), yellow buckeye (*Aesculus flava*), wild hydrangea (*Hydrangea arborescens*), spicebush (*Lindera benzoin*), umbrella magnolia (*Magnolia tripetala*), and cucumber magnolia (*Magnolia acuminata*). There is a 1961 herbarium record of *Betula alleghaniensis* from the east boundary of the Park, which is notable because the species is typically found further south on the Cumberland Plateau.

Species composition varies throughout the circuit of mountain bike trails located in the northeast section of Breaks Interstate Park. *Tsuga canadensis* and *Fagus grandifolia* are dominant in some areas. Other slopes have a canopy of *Quercus montana*, *Tsuga canadensis*, *Liriodendron tulipifera*, *Quercus alba*, and *Carya glabra*. The east-facing aspect of the Mountain Bike Trail is dominated by *Liriodendron tulipifera*, *Acer saccharum*, and *Acer rubrum*. Prospector's Trail has a canopy composed of *Quercus montana*, *Q. rubra*, *Tsuga canadensis*, *Acer saccharum*, *Fraxinus americana*, and *Liriodenderon tulipifera*. Subcanopy species consist of *Rhododendron maximum*, *R. catawbiense*, witch hazel (*Hamamelis virginiana*), *Acer pensylvanica*, *Magnolia* spp., *Asimina triloba*, *Cornus florida*, *Acer rubrum*, and *Betula lenta*. Dominant canopy species along the Pine Mountain Trail are *Liriodendron tulipifera*, *Acer*

saccharum, basswood (*Tilia americana*), *Tsuga canadensis*, *Quercus alba*, *Carya* spp. and *Fagus grandifolia*. Subcanopy species include *Asimina triloba*, *Aesculus flava*, and *Cornus florida*.

Species composition along some of the other trails in Breaks Interstate Park include the NW-facing slope along the Laurel Branch Trail, a mesic community of *Rhododendron maximum*, *Fagus grandifolia*, *Tsuga canadensis*, *Acer rubrum*, and *Liriodendron tulipifera*. The W-facing River Trail consists of *Quercus rubra*, *Q. montana*, shagbark hickory (*Carya ovata*), *C. glabra*, and *Acer saccharum* in the canopy. The rocky, NW-facing slopes along the Grassy Creek Trail are dominated by *Rhododendron maximum*, *T. canadensis*, and *Acer rubrum*. In contrast to forested areas supporting an assemblage of species, the Park also houses some almost pure stands of *Tsuga canadensis*, as well as dense thickets of *Rhododendron maximum*.

Upper Slopes and Ridgetops

The drier upper slopes of Breaks Interstate Park are dominated by *Quercus alba*, *Quercus montana*, and pitch pine (*Pinus rigida*) in the canopy, and *Acer rubrum*, scarlet oak (*Quercus coccinea*), *Carya glabra*, and *Tsuga canadensis* are also sometimes present in the canopy. The subcanopy is composed of mountain-laurel (*Kalmia latifolia*), sourwood (*Oxydendrum arboreum*), *Hamamelis virginiana*, sassafras (*Sassafras albidum*), strawberry bush (*Euonymus americanus*), American holly (*Ilex opaca*) and Fraser magnolia (*Magnolia fraseri*). The ridgetop community refers to xeric ridgetops populated by Virginia pine (*Pinus virginiana*), *Pinus rigida*, and oaks (*Quercus montana*, *Q. coccinea*, *Q. velutina*) in the canopy, and frequently *Tsuga canadensis*. Subcanopy components include *Ilex opaca*, trailing arbutus (*Epigaea repens*), blackgum (*Nyssa sylvatica*), *Kalmia latifolia*, *Hamamelis virginiana*, *Sassafras albidum*, highbush blueberry (*Vaccinium corymbosum*), lowbush blueberry (*Vaccinium pallidum*), and *Oxydendrum arboreum*.

Ponds/Wetlands

The two bodies of open water within Breaks Interstate Park, Laurel Lake and Beaver Pond, support aquatic plants in the water column (*Potamogeton nodosus* and *P. pusillus*) and on the surface (*Lemna minor* and *Lysimachia nummularia*). Wetland vegetation is abundant along the margins, in particular, sedges (*Carex atlantica*, *C. intumescens*, *C. lurida*, *C. tribuloides*, *C. vulpinoidea*), rushes (*Juncus acuminatus*, *J. coriaceus*, *J. effusus*), and bulrushes (*Scirpus cyperinus*, *S. polyphyllus*). Canopy located around the water bodies includes *Fagus grandifolia* and *Tsuga canadensis*. Subcanopy species consist of *Sassafras albidum*, *Oxydendrum arboreum*, *Cornus florida*, winged sumac (*Rhus copallina*), hazelnut (*Corylus americana*), and downy serviceberry (*Amelanchier arborea*). A semi-open, wetland is located off the Park's Loop Trail, directly adjacent to a spring-fed stream. Several individuals of club-spur orchid (*Platanthera clavellata*) occur in the wet spot, along with New York fern (*Thelypteris noveboracensis*), *Carex intumescens*, and mosses. Surrounding canopy species include *Quercus alba* and *Tsuga canadensis*.

River bottomland and floodplain/Streamside

Within Breaks Interstate Park, Potter's Flats, a bottomland area in Russell Fork's floodplain that slopes up to the railroad tracks, has a canopy composition of *Liriodendron tulipifera*, *Tsuga canadensis*, *Acer rubrum*, *Pinus virginiana*, and *Quercus rubra*. Subcanopy components include *Magnolia tripetala*, *A. rubrum*, *Asimina triloba*, tree-of-heaven (*Ailanthus altissima*), and *Rhododendron maximum*. Sweetgum (*Liquidambar styraciflua*), sycamore (*Platanus occidentalis*), and Japanese knotweed (*Polygonum cuspidatum*) are dominant species close to the river. Further upstream, the west bank of Russell Fork, near Towers Tunnel, is composed of black locust (*Robinia pseudoacacia*), *Plantanus occidentalis*, silky dogwood (*Cornus amomum*), and common winterberry (*Ilex verticillata*).

Woody species commonly found along streams (e.g., Camp Branch, Grassy Creek, Laurel Branch, Center Creek, Russell Fork) include river birch (*Betula nigra*), *Ilex verticillata*, *Cornus amomum*, alder (*Alnus serrulata*), American hornbeam (*Carpinus caroliniana*), *Platanus occidentalis*, withe-rod (*Viburnum cassinoides*), persimmon (*Diospyros virginiana*), maleberry (*Lyonia ligustrina*), pinkster-flower (*Rhododendron periclymenoides*), *Liquidambar styraciflua*, and buttonbush (*Cephalanthus occidentalis*). Sections of Laurel Branch, one of the smaller streams on the property, is largely shaded by *Tsuga canadensis* and *Rhododendron maximum*.

Sandstone Outcrops

Sandstone outcrops, rock shelters and ledges are common on the Breaks Interstate Park's steeper slopes. Various fern species, including *Asplenium* spp. (*A. montanum*, *A. pinnatifidum*, *A. trichomanes*), *Dryopteris marginalis* and *Polypodium appalachianum* are found on these rocks. They also provide habitat for rare species such as *Adlumia fungosa*, which climbs over high sandstone cliffs above Russell Fork (VPI record). A rock shelter along a NW-facing section of Grassy Creek Trail is surrounded by *Rhododendron maximum*, *Tsuga canadensis*, *Acer rubrum*, and redbud (*Cercis canadensis*). Elsewhere, rocky, SW-facing slopes are composed of *Pinus virginiana* and *Kalmia latifolia*. A W-facing section of Prospectors Trail, located at the base of upland sandstone outcrops, supports a canopy of *Quercus rubra*, black walnut (*Juglans nigra*), and *Acer rubrum*.

Disturbed/Open Areas

An open field off the Breaks Interstate Park's Mountain Bike Trail is mowed for hay. Herbaceous species include beaked panic grass (*Panicum anceps*), purpletop (*Tridens flavus*), ox-eye daisy (*Chrysanthemum leucanthemum*), rabbit-tobacco (*Pseudognaphalium obtusifolium*), and other grasses and forbs. The picnic shelter and field along Center Creek is mowed, but *Robinia pseudoacacia*, *Platanus occidentalis*, and *Liriodendron tulipifera* are scattered along the

streambank. Semi-open and disturbed areas on Potter's Flats and the trail/road leading from here to the Pine Mountain Trail support *Juglans nigra*, *Liriodendron tulipifera*, and multiflora rose (*Rosa multiflora*), Japanese honesuckle (*Lonicera japonica*), Pennsylvania blackberry (*Rubus pensilvanicus*), and *Lindera benzoin*.

Roadside corridors thoughout developed sections of Breaks Interstate Park act as edge habitats and support many of the species found in woodland interiors, such as *Tsuga canadensis*, *Fagus grandifolia*, *Quercus coccinea*, *Oxydendrum arboreum*, and *Acer rubrum*. Species identified along roadsides but not noticed in any other habitats include big-tooth aspen (*Populus grandidentata*), southern red oak (*Quercus falcata*), and mexican plum (*Prunus mexicana*). The State Hwy 80 roadside along the outside edge of the Park is open area composed of a variety of herbaceous species. Unfortunately, the open area is also a location where invasive species have become established, such as kudzu (*Pueraria montana*) and Japanese knotweed (*Polygonum cuspidatum*).

Large Trees

Although no areas of old-growth forest were identified, many large trees do occur in Breaks Interstate Park. Species frequently found in the dbh range of 80–100 cm were beech, white oak, scarlet oak, and chestnut oak, with chestnut oak reaching the greatest sizes (about 110 cm dbh). The majority of large trees were found along the Rattlesnake Trail, which is a trail off the Mountain Bike Trail on the eastern side of the Park (Fig. 5). The area known as "Hickory Flats" near the Mountain Bike Trail was an old homestead and mostly field at one time. There are several large trees in this area where trees were not removed from the field (A.Bradley, personal communication). The majority of the park's acreage has been logged at some point in the past, with the possible exclusion of the Hickory Flats homestead and very remote areas around the Towers, a high, sandstone rock formation on the opposite side of Russell Fork from the main section of the Park.

CHAPTER V

DISCUSSION

Flora

The 549 different taxa identified during this study represent 93 percent of the expected species richness using the Cumberland Plateau TN Curve (Huskins and Shaw 2010), 88 percent using the Corrected KY Regional Curve (Huskins and Shaw 2010), and 86 percent using the Species Area Curve (Wade and Thompson 1991). Based on species curve calculations, the area surveyed is slightly less floristically rich than predicted. Reasons for this could be attributed to many factors: the Park is open to the public and is regularly used, an increase in invasive plants spreading into the Park is forcing out native species, and the absence of limestone geology. Overall, species richness is similar to other floristic studies conducted in the surrounding physiographic region (see Table 5). Four of these studies were selected for more detailed comparisons of major groupings (Table 6). In general the results were very similar, but Breaks Interstate Park has a considerably higher percentage of pteridophytes.

Table 5. A comparison of floristic studies conducted on the Cumberland Plateau or Cumberland Mountains.

Study	Size of Study Area (hectares)	Number of Species Reported
State Forest Additions, Pine Mountain, KY (McIntosh 2009)	351	514
Big Everidge Hollow, KY (McEwan, et al. 2005)	52	263
Lilley Cornett Woods, KY (Sole et al. 1983)	220	516
Cumberland Gap National Historical Park, KY, TN, and VA (Hinkle 1975)	4,272	566
Breaks Interstate Park, KY & VA (This Study)	1,862	549
North Chickamauga Creek Gorge State Natural Area, TN (Huskins & Shaw 2010)	2,862	604
Fall Creek Falls State Park, TN (Fleming & Wofford 2004)	8,900	879

Table 6. Comparison of major groups among floristic studies conducted on the Cumberland Plateau or Cumberland Mountains.

	State Forest Additions, Pine Mountain, KY (McIntosh 2009)	Lilley Cornett Woods, KY (Sole et al. 1983)	Breaks Interstate Park, KY & VA (This Study)	North Chickamauga Creek Gorge State Natural Area, TN (Huskins & Shaw 2010)	Fall Creek Falls State Park, TN (Fleming & Wofford 2004)
Study Area Size	351 Ha	220 Ha	1,862 Ha	2,862 Ha	8,900 Ha
Pteridophytes	29 (5.6%)	13(2.5%)	37 (6.7%)	23 (3.8%)	39 (4.4%)
Gymnosperms	7	6	6	5	7
Dicotyledonae	380	382	394	439	637
Monocotyledonae	98	115	112	137	196
Total Taxa	514	516	549	604	879

State Conservation Species

Records provided by the KSNPC revealed known localities for the following rare species in or near Breaks Interstate Park: rock harlequin (*Corydalis sempervirens*), Allegheny chinkapin (*Castanea pumila*), threadfoot (*Podostemum ceratophyllum*), northern white cedar (*Thuja occidentalis*), narrow-leaved meadow-sweet *(Spiraea alba*), brook saxifrage (*Boykinia aconitifolia*), Allegheny-vine (*Adlumia fungosa*). The VDCR Natural Heritage program provided localities of these rare species in the vicinity of the park: roundleaf catchfly (*Silene rotundifolia*), bittercress (*Cardamine flagellifera*), shining ladies'-tresses (*Spiranthes lucida*), freshwater cordgrass (*Spartina pectinata*), nodding pogonia (*Triphora trianthophora*), red turtlehead (*Chelone obliqua*), Virginia spiraea (*Spiraea virginiana*). Five of these species were identified from the Park. *Castanea pumila*, a state threatened species in Kentucky, was found on the Virginia side of the park; however, Virginia does not have a state status for the species. Herbarium (VPI) specimens of *Adlumia fungosa* and *Silene rotundifolia* were confirmed, both

from the Virginia side of the park. *Spiranthes lucida* and *Triphora trianthophora* were found in the Virginia section.

Eleven rare species, each with a ranking from the state where found, were identified at Breaks Interstate Park. Six taxa with Kentucky rankings (*Castanea dentata*, *Castanea pumila*, *Solidago curtissii*, *Melampyrum lineare* var. *pectinatum*, *Sambucus racemosa* subspecies *pubens*, *Woodsia scopulina*) were found on the Virginia side of the park but not on the Kentucky side, and therefore, were not included in the list of rare species encountered. Below is collection information on the rare species found in the Park, including information on state rankings (Townsend 2009, KSNPC 2010), known county locations (Virginia Botanical Associates 2012, KSNPC 2006), and habitat (Jones 2005).

Climbing fumatory (*Adlumia fungosa*) - Vulnerable (S3) in VA, Endangered in KY

This collection record is from the VPI herbarium. *Adlumia fungosa* was documented climbing and sprawling over vegetation and the lower portion of high sandstone cliffs along Russell Fork, 2.4 km (1.5 miles) above Garden Hole in Dickenson County, VA. The species was abundant when Thomas F. Wieboldt collected it on 25 August 1982. The current status of the population is unknown. The species is known from 17 counties in Virginia, 2 counties in Kentucky, and historically, 2 other counties in Kentucky. Habitat for the species is sandstone outcrops and stream banks of mixed mesophytic forests.

Goldenseal (*Hydrastis canadensis*) - Vulnerable (S3) in VA, No status in KY

Hydrastis canadensis was collected in the rich woods of Garden Hole, Dickenson County, VA, and also on the Pine Mountain Trail, north-facing slope in a semi-open area of the woods, in Pike County, KY. The species was rarely observed during this study. The species is known from 19 counties in Virginia. Habitat is mesic forests.

Butternut (*Juglans cinerea*) - Vulnerable (S3) in VA, Threatened in KY

Juglans cinerea was collected from the steep, wooded, upper slope located between the State Hwy 80 pull-off and the railroad trestle over Russell Fork. It was also noted on the Pine Mountain Trail. Both locations are from Pike County, KY. The species was rarely observed during this study. The species has been recorded in 63 counties in Virginia and 17 counties in Kentucky. It is a county record for Pike County. Habitat is bottomlands, ravines, and moist slopes.

Meehan's mint (*Meehania cordata*) - Vulnerable (S3) in VA, No status in KY

This collection record is from the VPI herbarium. The specimen was collected on 14 May 1986 by Ken Markley in Garden Hole, in the rich hollow above the parking area near the river. The location is in Dickenson County, VA. The current status of the population is unknown. The species is known from 13 counties in Virginia and occurs in mesic forests.

Sweet pinesap (*Monotropis odorata*) - Vulnerable (S3) in VA, Threatened in KY

This collection record is from the VPI herbarium. Doug Ogle collected the species from Prospector's Trail, 183 meters (200 yards) south of State Line Overlook, and also at the base of a cliff along Prospector's Trail. Both records are from Dickenson County, VA, but the collection date was not recorded. The species is known from 18 counties in Virginia, and in Kentucky it is currently known from five counties and historically known in one county. Habitat consists of upland beech and oak-pine forests.

Ginseng (*Panax quinquefolius*) - Vulnerable (S3)/Apparently Secure (S4), No status in KY

This collection record is from the VPI herbarium. Ken Markley collected this specimen on 10 September 1985 along the Towers Overlook Trail to the right of a fallen chestnut log. The

current status of the population is unknown. The species has been recorded from the majority of counties in Virginia and occurs in mesic forests.

Spotted mandarin (*Prosartes maculata*) - Vulnerable (S3) in VA, Special Concern in KY

This collection record is from the VPI herbarium. It was collected in Dickenson County, VA on 14 May 1986 by Ken Markley at the cottage compound junction, along the east wood's edge. The current status of the population is unknown. The species is known from 9 counties in Virginia, currently known from 3 counties in Kentucky, and 3 counties have a historic observation in Kentucky. Habitat for the species is old-growth mesophytic woods.

Carolina saxifrage (*Saxifraga caroliniana*) - Vulnerable (S3) in VA, No status in KY

Saxifraga caroliniana is synonymous with *Micranthes caroliniana* (Gray) Small. The specimen was collected in Dickenson County, VA, from the N-facing slope of Garden Hole, along the trail running parallel to Russell Fork. The species has been recorded in 9 counties in Virginia. Mesic forests are habitat.

Round-leaf catchfly (*Silene rotundifolia*) - Imperiled (S2), No status in KY

This VPI herbarium specimen was collected by Thomas F. Wieboldt on 23 August 1982 is Dickenson County, VA. The specimen was found in crevices of a dry cliff face on the SW side of Russell Fork in the Breaks, 2 miles (3.2 kms) ESE of Elkhorn City. The species is known from 3 counties in Virginia. Sandstone rockhouses, ledges and cliffs are habitat.

Shining ladies'-tresses (*Spiranthes lucida*) - Critically Imperiled (S1), Threatened in KY

Spiranthes lucida was documented by photograph because only 1 individual was found along Russell Fork near the mouth of Camp Branch. The specimen is from Dickenson County, VA. The species was only found at this location during the study; however, it has been recorded

by other observers at various points along Russell Fork in the Park. The species is known from 10 counties in Virginia and appears to be a county record for Dickenson County. Nine counties in Kentucky have observation records for the species. Habitat for the species is stream banks.

Three-birds orchid (*Triphora trianthophora*) - Critically Imperiled (S1), No status in KY

Triphora trianthophora was found at the edge of flat, open, hemlock woods, next to a parking lot and sidewalk, across the road from the Park Visitor Center in Dickenson County, VA. Only one individual was found during the study. The species is known from 10 counties in Virginia. Typical habitat is mesic forests, over sandstone and limestone.

Exotic Species

Of the 91 non-native species found within Breaks Interstate Park, 48 of these are considered invasive plants. Thirty-four of the 48 non-native species have been given an invasive ranking in Virginia (VDCR 2009), and 40 of the 48 have a ranking in Kentucky (Kentucky Exotic Pest Plant Council 2012; Table 7). Based on observations during sampling for this study, the invasive species most often encountered in the Park and that appear to spread readily are: *Ailanthus altissima, Elaeagnus umbellata*, *Ligustrum sinense* , *Lonicera japonica*, *Polygonum cuspidatum, Pueraria montana,* and *Rosa multiflora*. In particular, *Polygonum cuspidatum* has spread over the shore along Russell Fork on Potter's Flats, on the Kentucky side of the Park. The Park is not currently actively managing any invasive plants. The area appearing to have the highest abundance of invasive plants is along State Hwy 80, but the Park is not currently experiencing any issues with exotic species spreading from the road right-of-way into the interior of the woods or the Park (A.Bradley, pers.comm.).

Table 7. Invasive species identified from Breaks Interstate Park. Status key: Virginia, Highly = Highly Invasive Species, Moderately = Moderately Invasive Species, Occasionally = Occasionally Invasive Species. Kentucky, Severe = Severe Threat, Significant = Significant Threat, Lesser = Lesser Threat (Kentucky Exotic Pest Plant Council 2012).

Invasive Species	**Status in Virginia**	**Status in Kentucky**
Agrostis gigantea	Occasionally	No status
Ailanthus altissima	Highly	Severe
Albizia julibrissin	Moderately	Significant
Arthraxon hispidus	Moderately	Significant
Barbarea vulgaris	No status	Lesser
Chenopodium ambrosioides	No status	Lesser
Chrysanthemum leucanthemum	No status	Significant
Cichorium intybus	No status	Lesser
Commelina communis	Occasionally	Lesser
Coronilla varia	Occasionally	Severe
Dactylis glomerata	Occasionally	No status
Daucus carota	No status	Significant
Dianthus armeria	No status	Lesser
Echinochloa crus-galli	No status	Lesser
Elaeagnus umbellata	Highly	Severe
Festuca arundinacea	No status	Severe
Glechoma hederacea	Moderately	Significant
Hedera helix	Moderately	Significant
Hemerocallis fulva	No status	Lesser
Holcus lanatus	Moderately	Lesser
Ipomoea coccinea	Occasionally	No status
Ipomoea hederacea	Moderately	Significant
Lapsana communis	Occasionally	No status
Lespedeza bicolor	Occasionally	Significant
Ligustrum sinense	Highly	Severe
Lonicera japonica	Highly	Severe
Lonicera morrowii	Highly	Severe
Lysimachia nummularia	Moderately	No status
Melilotus alba	Occasionally	Severe
Melilotus officinalis	Occasionally	Severe
Mentha × piperita	No status	Significant
Microstegium vimineum	Highly	Severe
Paulownia tomentosa	Moderately	Severe
Perilla frutescens	Occasionally	No status
Poa pratensis	No status	Significant
Polygonum caespitosum	Moderately	Significant
Polygonum cuspidatum	Highly	Severe
Polygonum persicaria	No status	Significant
Pueraria montana	Highly	Severe
Ranunculus bulbosus	No status	Lesser
Rosa multiflora	Highly	Severe
Rubus phoenicolasius	Highly	No status

Table 7 (continued)

Invasive Species	Status in Virginia	Status in Kentucky
Rumex acetosella	Moderately	Lesser
Rumex crispus	Moderately	No status
Setaria viridis	No status	Significant
Spiraea japonica	Moderately	Significant
Stellaria media	Moderately	Severe
Vinca minor	Occasionally	Significant

Status in Virginia source: Virginia Department of Conservation and Recreation Division of Natural Heritage. 2009. Invasive alien plant species of Virginia. Status in Kentucky source: Kentucky Exotic Pest Plant Council. 2012. List of severely invasive plant threats to Kentucky.

Vegetation

The communities described for Breaks Interstate Park in the Results section of this report are very similar to those previously described for the area by Smalley (1984), Braun (1950), and Küchler (1964). Vegetation decriptions by Jones (2005) for the Mixed deciduous forests and Mixed oak forests of the Appalachian uplands are also very similar to the observations in this study. Because no quantitative sampling was done, it is not possible to make more detailed comparisons to the more specific listings of communities types presented in Evans et al. (2006) and Fleming and Patterson (2012).

Noteworthy Habitat—Garden Hole

Within Breaks Interstate Park, the mesic slopes of Garden Hole were found to be particularly rich in species diversity and wildflower composition. The vegetative community is especially noteworthy in the spring season when the herbaceous stratum hosts a profusion of purple trillium (*Trillium erectum*), big white trillium (*Trillium grandiflorum*), squirrel corn (*Dicentra canadensis*), dutchman's breeches (*Dicentra cucullaria*), wild ginger (*Asarum canadense*), bloodroot (*Sanguinaria canadensis*), jack-in-the-pulpit (*Arisaema triphyllum*), and many other wildflower species. Dominant canopy trees are hemlock, sugar maple, and yellow-

poplar; dominant subcanopy trees are magnolia species and rhododendron. This exceptionally diverse habitat is worthy of protection.

Invasive Pests

The hemlock woolly adelgid (HWA, *Adelges tsugae*) found in eastern North America originated from southern Japan. Without the natural controls found in its native range, the HWA has become a pest by infesting hemlocks and feeding on the young twigs at base of needles (USDA Forest Service 2005, 2011). The HWA was observed on hemlocks during this study, in both Virginia and Kentucky. In Breaks Interstate Park, the pest was infecting hemlocks along the Mountain Bike Trail and the Pine Mountain Trail, but it is likely present in other areas of the Park as well. Park personnel have not witnessed much die-back from HWA infestations, but it is being monitored. If a greater infestation occurs, the Park will consider treating individual trees (A.Bradley, pers. comm.). A number of other invasive pests pose potential threats for the park's vegetation, including the Emerald Ash Borer (EAB, *Agrilus planipennis*). Ash trees are attacked and eventually killed when EAB larvae feed on the tissue between the bark and sapwood, preventing the transport of water and nutrients (McCullough and Schneeberger 2008). The EAB is not currently known to be infesting ash trees in Pike or Dickenson County (USDA 2012). The Southern pine beetle (SPB, *Dendroctonus frontalis*) attacks loblolly, shortleaf, Virginia, and pitch pines. The destructive larvae chew into the inner bark and cambian layer and can girdle the tree (University of Kentucky 2010). While Pike and Dickenson Counties are within SPB's geographic range (Coulson and Klepzig 2011), the most recent outbreak (1999-2003) does not appear to have affected pine trees at the Park to any great extent.

CHAPTER VI

SUMMARY AND CONCLUSION

The objectives of this research were to compile an inventory of each vascular plant species found within Breaks Interstate Park, identify locations of rare plants, and describe vegetative communities. Reasons for the study included the potential for high species richness due to varying topography and the park's location within the Mixed Mesophytic Forest. Also, the study could be useful in the park's future management plans by noting where rare species and expectional habitats are located.

A total of 549 species, varieties and subspecies comprising 341 genera and 118 families were documented from Breaks Interstate Park. Eleven rare species with state rankings were identified. In addition, six taxa with Kentucky rankings were found on the Virginia side of the park. Communities identified were mesophytic forest, upper slopes and ridgetops, ponds/wetlands, river bottomland and floodplain/streamside, sandstone outcrops, and disturbed/open areas. The number of non-native species found was 91, and of this list, 48 species are considered invasive in either Kentucky or Virginia. While the sampling effort for this research was sufficient to obtain a representative species list, Breaks Interstate Park is very rugged, and many remote areas warrant further exploration. Additional floristic surveys, especially in areas of the park not routinely visited, would be useful and should contribute additional taxa to the inventory.

LITERATURE CITED

Adkins, T.D. 2009. Soil survey of Dickenson County, Virginia. United States Department of Agriculture, Natural Resources Conservation Service, Washington, DC.

Alvord, D.C. and R.L. Miller. 1972. Geologic map of the Elkhorn City Quadrangle, Kentucky-Virginia and part of the Harman Quadrangle, Pike County, Kentucky. United States Geological Survey, Washington, D.C.

Barnes, T.G. and S.W. Francis. 2004. Wildflowers and ferns of Kentucky. The University Press of Kentucky, Lexington, KY. 344 pp.

Beal, E.O. and J.W. Thieret. 1986. Aquatic and wetland plants of Kentucky. Kentucky State Nature Preserves Commission, Frankfort, KY. 315 pp.

Bradley, A., Director of Visitor Services, Breaks Interstate Park, Breaks, VA. 13 March 2012. Personal Communication.

Braun, E.L. 1935. The vegetation of Pine Mountain, Kentucky. American Midland Naturalist 16: 517–565.

———. 1942. Forests of the Cumberland Mountains. Ecological Monographs 12(4): 413–447.

———. 1950. Deciduous forests of Eastern North America. The Blackburn Press, Caldwell, New Jersey. 596 pp.

Breaks Interstate Park. 2004. Park Map. Scruggs and Hammond, Inc. http://www.breakspark.com/about/park-map.html. Accessed March 2012.

———. 2012. http://www.breakspark.com. Accessed 4 March 2012.

Campbell, J. and M. Medley. 2006. Illustrated atlas of vascular plants in Kentucky: a first approximation. July 2006 draft. Bound manuscript distributed by authors, Lexington, Kentucky.

Caplenor, D. 1965. The vegetation of the gorges of the Fall Creek Falls State Park in Tennessee. Journal of the Tennessee Academy of Science 40(1): 27–39.

Caudill, H.M. 1963. Night comes to the Cumberlands. Little, Brown, and Co., Boston, MA. 404 pp.

Clark, R.C. and T.J. Weckman. 2008. Annotated atlas of Kentucky woody plants. Castanea Occasional Papers, #3.

Coulson, R.N. and K.D. Klepzig. 2011. Southern pine beetle II. United States Department of Agriculture - Forest Service, Southern Research Station. General Technical Report SRS–140. http://www.srs.fs.usda.gov/pubs/gtr/gtr_srs140/gtr_srs140.pdf. Accessed 23 March 2012.

Cropper, S.C. 1993. Management of endangered plants. CSIRO Publications, East Melbourne, Victoria, Australia. 182 pp.

Dyer, J.M. 2006. Revisiting the deciduous forests of eastern North America. Bioscience 56 (4): 341–352.

ESRI. 2009. ESRI data and maps. DVD.

Evans, M., M. Hines, B. Yahn. 2006. Kentucky ecological communities. Kentucky State Nature Preserves Commission, Frankfort, KY. 23 pp.

Fenneman, N.M. 1938. Physiography of eastern United States. McGraw-Hill Book Co., Inc., New York, New York. 714 pp.

Fleming, C.A. and B.E. Wofford. 2004. The vascular flora of Fall Creek Falls State Park, Van Buren and Bledsoe Counties, Tennessee. Castanea 69(3): 164–184.

Fleming, G.P. and K.D. Patterson 2012. Natural communities of Virginia: ecological groups and community types. Natural Heritage Technical Report 12-04. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. 36 pp.

Gleason, H.A. and A. Conquist. 1991. Manual of the vascular plants of Northeastern United States and adjacent Canada, Second Edition. New York Botanical Garden, New York, NY. 986 pp.

Greb, S.F., W.M. Andrews, Jr., R.A. Smath. 2006. Geology and geomorphology of the Breaks Interstate Park Area. Kentucky Geological Survey. Lexington, KY. 28 pp.

Hinkle, C.R. 1975. A preliminary study of the flora and vegetation of Cumberland Gap National Historical Park, Middlesboro, Kentucky. Unpublished M.S. thesis. University of Tennessee, Knoxville, Tennessee. 236 pp.

Huskins, S.D. and J. Shaw. 2010. The vascular flora of the North Chickamauga Creek Gorge State Natural Area, Tennessee. Castanea 75(1): 101–125.

Jones, R.L. 2005. Plant Life of Kentucky, An illustrated guide to the vascular flora. The University Press of Kentucky, Lexington. 834 pp.

Kelley, J.A. 1990. Soil survey of Pike County, Kentucky. United States Department of Agriculture, Soil Conservation Service, in cooperation with the Kentucky Natural Resources and Environmental Protection Cabinet and the Kentucky Agricultural Experiment Station.

Kentucky Exotic Pest Plant Council. 2012. List of severely invasive plant threats to Kentucky. http://www.se-eppc.org/ky/list.htm. Accessed 20 March 2012.

[KSNPC] Kentucky State Nature Preserves Commission. 2010. Rare and extirpated biota and natural communities of Kentucky. Kentucky Academy of Science 71(1–2): 67–81.

———. 2006. Rare plant database. http://eppcapp.ky.gov/nprareplants/index.aspx. Accessed 10 March 2012.

Küchler, A. 1964. The potential natural vegetation of the conterminous United States (map and illustrated manual). American Geographical Society, Spec. Publication 36.

KY DGI. 1978. Elkhorn City, KY-VA. kygeonet.ky.gov. Accessed March 2012.

———. 2010. NAIP Imagery. kygeonet.ky.gov. Accessed March 2012.
Markley, K. and J. Childress. 1981-1989. Common blooming plants and trees in Breaks Interstate Park. Unpublished list. Breaks Interstate Park, Breaks, VA.

Martin, W.H. and C. Shepherd. 1973. Trees and shrubs of Lilley Cornett Wood, Letcher County, Kentucky. Castanea 38. 327–335.

MuCullough, D.G. and N.F. Schneeberger. 2008. Pest alert, Emerald Ash Borer. United States Department of Agriculture–Forest Service, Northeastern Area State and Private Forestry, Newtown Square, PA. NA-PR-02-04.

McEwan, R.W., R.D. Paratley, R.N. Muller, C.L. Riccardi. 2005. The vascular flora of an old-growth Mixed Mesophytic Forest in southeastern Kentucky. Journal of the Torrey Botanical Society 132(4). 618–627.

McIntosh A.V. 2009. The vascular flora of Kentucky State Forest additions (Greene, Cupp and Golden tracts), Pine Mountain, Kentucky. M.S. thesis, Eastern Kentucky University, Richmond, KY. 219 pp.

National Health and Environmental Effects Research Laboratory-U.S. Environmental Protection Agency. 2011. Level III & IV ecoregions of the conterminous United States. Corvallis, OR.

Pounds, L., T.S. Patrick, and R. Hinkle. 1989. Rare plant assessment and checklist for Cumberland Gap National Historical Park. National Park Service, Atlanta, GA.

Sole, J.D., S. Lassetter, and W.H. Martin. 1983. The vascular flora of Lilley Cornett Woods, Letcher County, Kentucky. Castanea 48(3):174–188.

Smalley, G.W. 1984. Classification and evaluation of forest sites in the Cumberland Mountains. U.S. Department of Agricultural Services, General Technical Report. SO–60. 74 pp.

Townsend, J.F. 2009. Natural Heritage Resources of Virginia: Rare plants. Natural Heritage Technical Report 09-07. Virginia Department of Conservation and Recreation, Division of Natural Heritage, Richmond, Virginia. Unpublished report. April 2009. 62 pages plus appendices.

[USDA] United States Department of Agriculture. 2012. Cooperative emerald ash borer project. http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/multistateeab.pdf. Accessed 22 March 2012.

[USDA Forest Service] United State Department of Agriculture - Forest Service. 2005. Pest alert. NA-PR-09-05. http://na.fs.fed.us/spfo/pubs/pest_al/hemlock/hwa05.htm. Accessed 23 March 2012.

United States Department of Agriculture - Natural Resources Conservation Service. 2012. Web soil survey. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed 12 March 2012.

[USDA] United States Forest Service. 2011. Forest health protection - hemlock woolly adelgid. http://na.fs.fed.us/fhp/hwa/. Accessed 22 March 2012.

United States Geological Survey. 1978. Elkhorn City, KY–VA Topographic Quadrangle.
University of Kentucky - Department of Entomology. 2010. Southern pine beetle. http://www.ca.uky.edu/entomology/entfacts/ef443.asp. Accessed 23 March 2012.

Virginia Botanical Associates. 2012. Digital atlas of the Virginia flora. http://vaplantatlas.org/. c/o Virginia Botanical Associates, Blacksburg. Accessed 9 March 2012.

[VDCR] Virginia Department of Conservation and Recreation Division of Natural Heritage. 2009. Invasive alien plant species of Virginia. http://www.dcr.virginia.gov/natural_heritage/documents/invlist.pdf. Accessed 20 March 2012.

Virginia Department of Conservation and Recreation Natural Heritage Program. 2009. Element occurrence report of natural heritage resources generated specifically for Breaks Interstate Park. Richmond, VA.

Wade, G.L. and R.L. Thompson. 1991. The species-area curve and regional floras. Transactions of the Kentucky Academy of Science 52 (1–2):21–26.

Wharton, M.E. and R.W. Barbour. 1971. A guide to the wildflowers and ferns of Kentucky. The University Press of Kentucky, Lexington. 344 pp.

[WMTH] WMTH Corporation. Virginia Coal Heritage Trail. http://www.trailsrus.com/vacoaltrail/dickenson-famtour.html. Accessed 19 March 2012.

Woods, A.J., J.M. Omernik, W.H. Martin, G.J. Pond, W.M Andrews, S.M. Call, J.A. Comstock, and D.D. Taylor. 2002. Ecoregions of Kentucky (color poster with map, descriptive text, summary tables, and photographs): Reston, VA., U.S. Geological Survey (map scale 1:1,000,000).

APPENDIX A: FIGURES

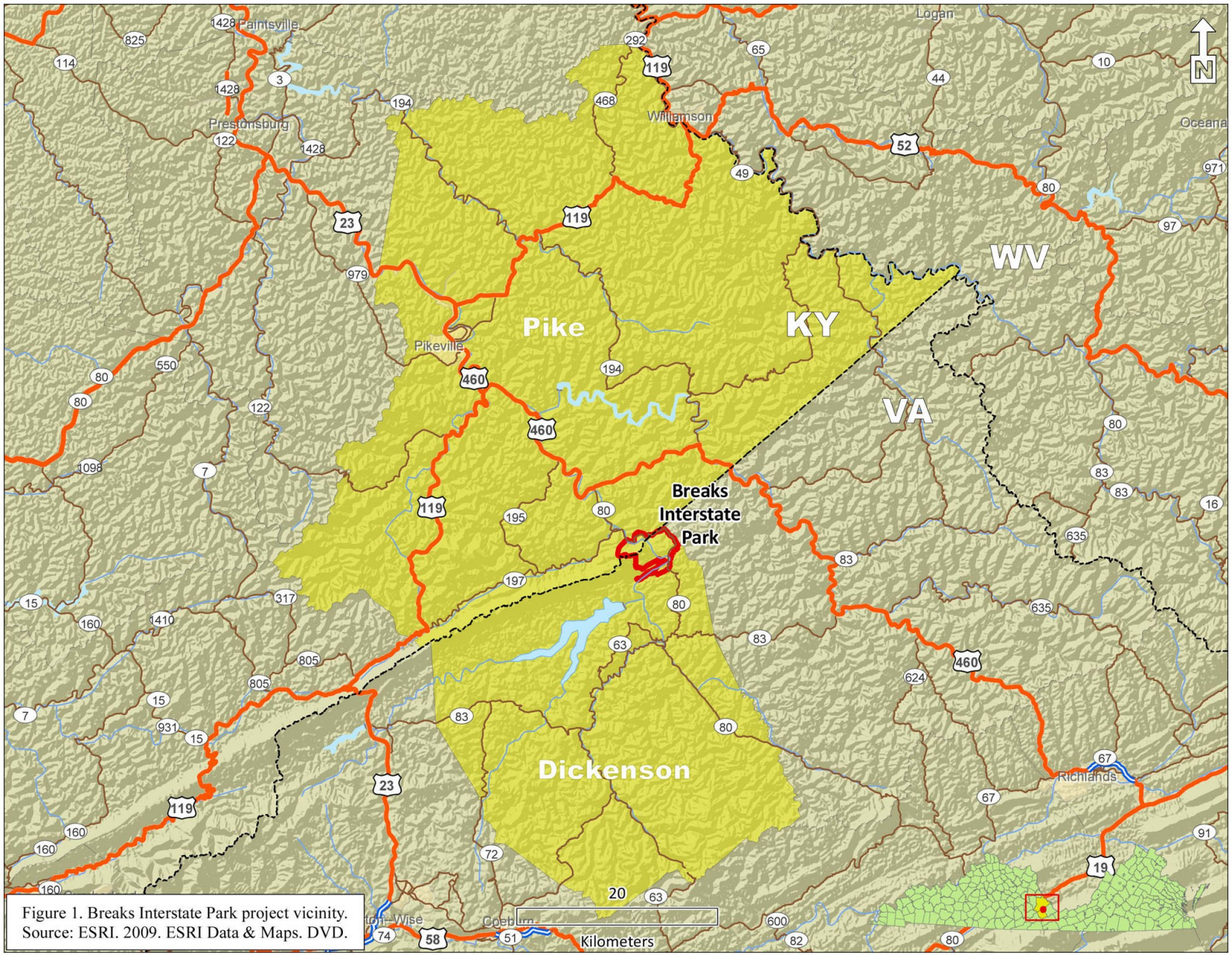


Figure 1. Breaks Interstate Park project vicinity.
Source: ESRI. 2009. ESRI Data & Maps. DVD.

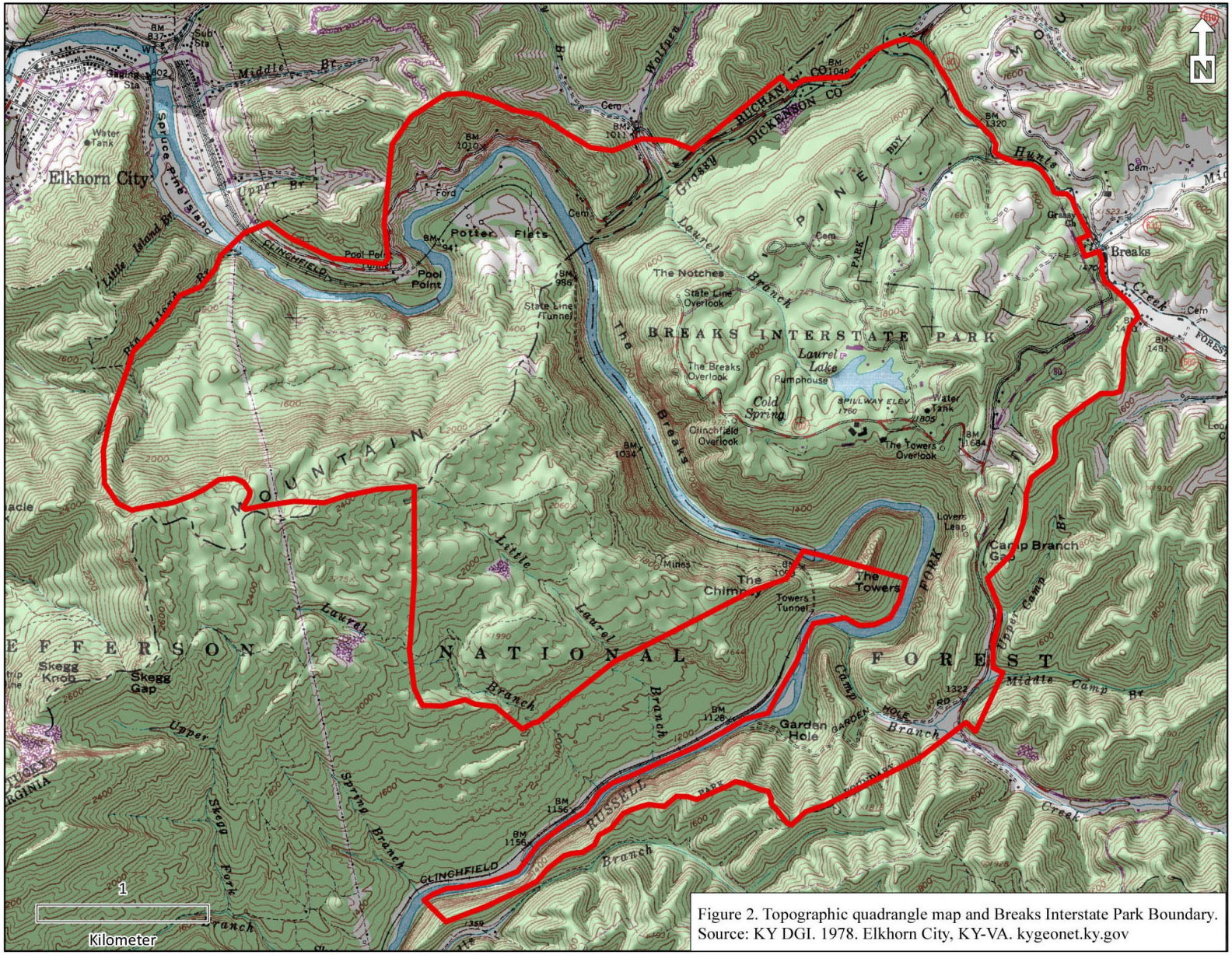


Figure 2. Topographic quadrangle map and Breaks Interstate Park Boundary. Source: KY DGI. 1978. Elkhorn City, KY-VA. kygeonet.ky.gov

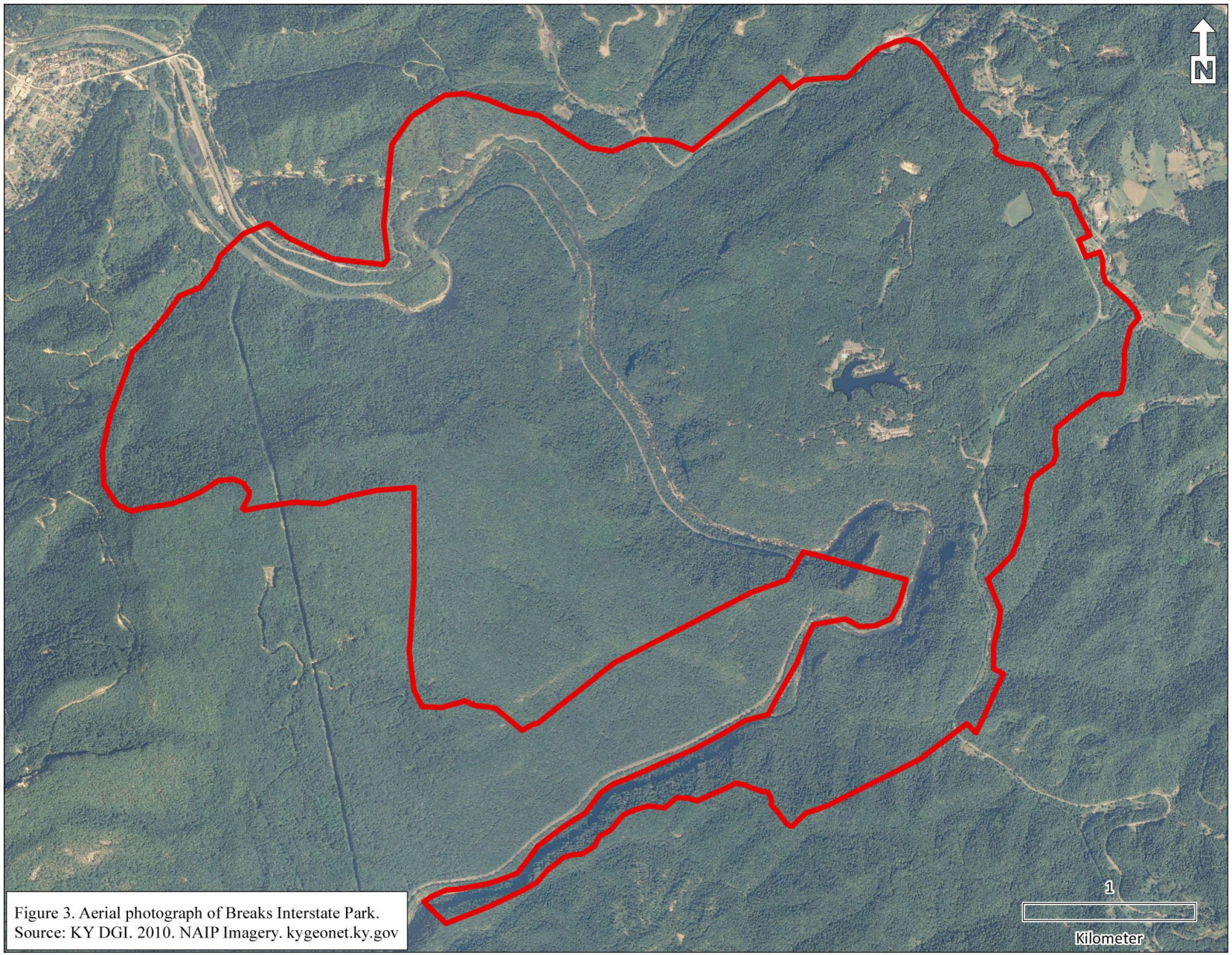


Figure 3. Aerial photograph of Breaks Interstate Park.
Source: KY DGI. 2010. NAIP Imagery. kygeonet.ky.gov

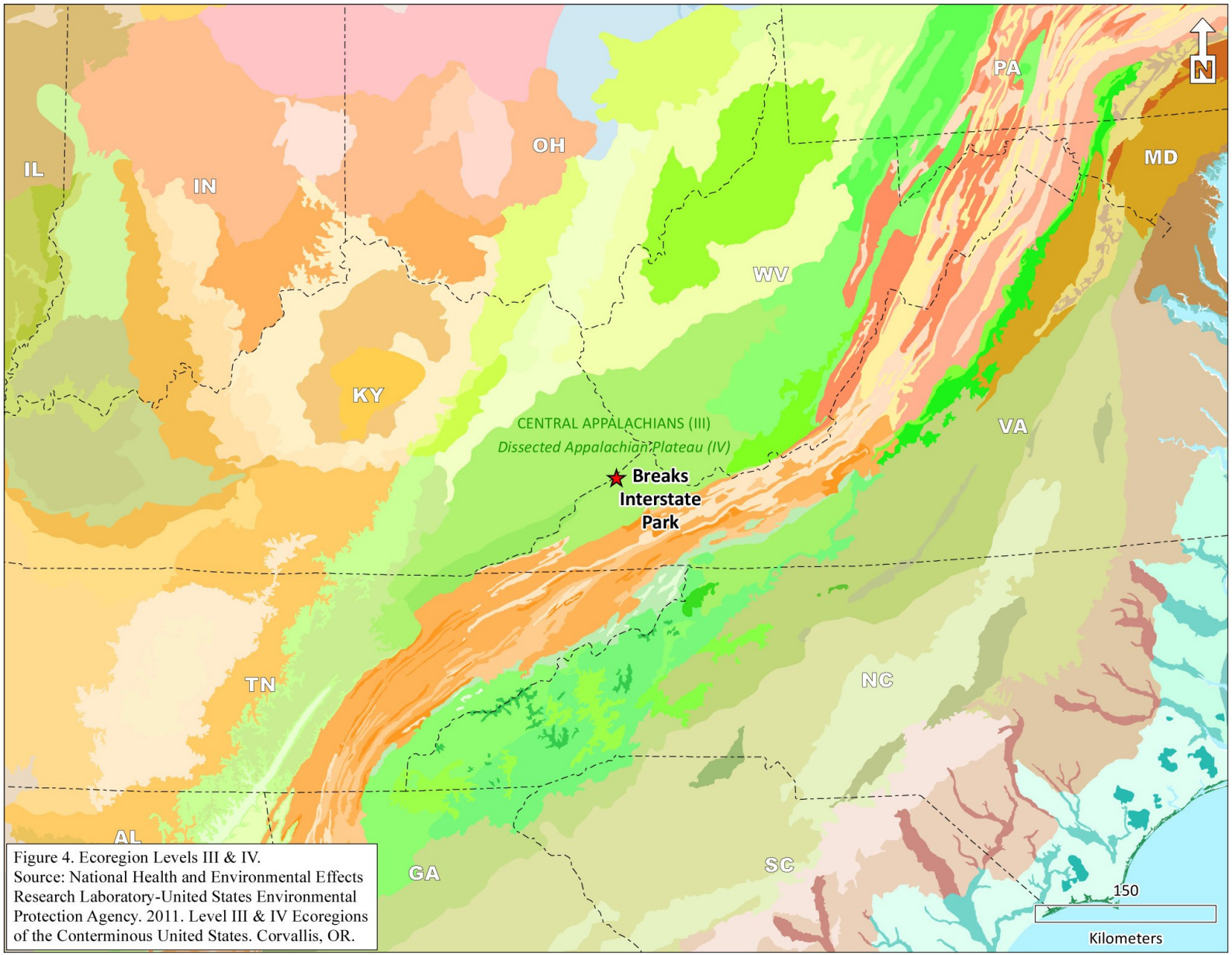


Figure 4. Ecoregion Levels III & IV.
Source: National Health and Environmental Effects Research Laboratory-United States Environmental Protection Agency. 2011. Level III & IV Ecoregions of the Conterminous United States. Corvallis, OR.

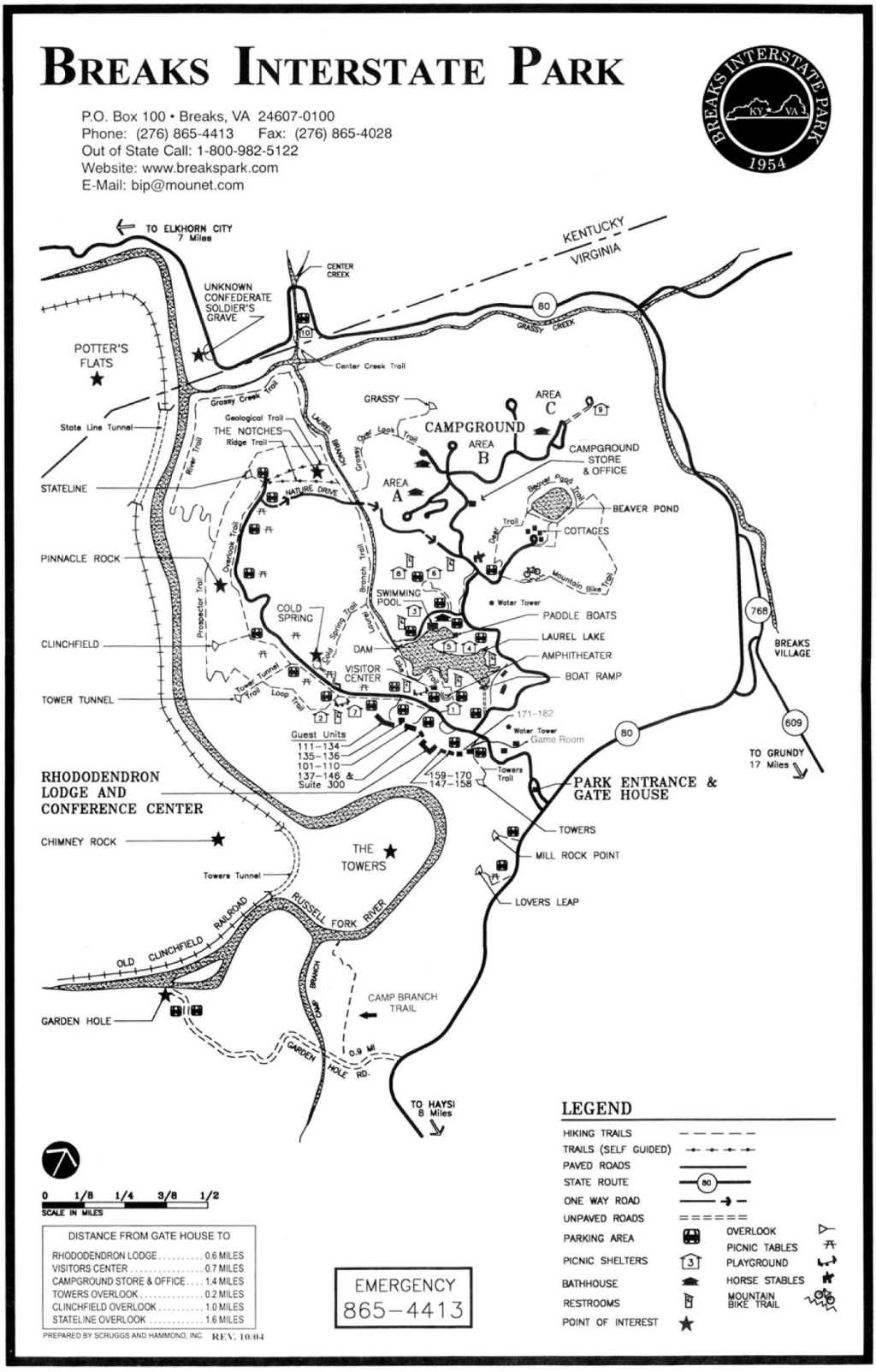


Figure 5. Park Map
Source: Breaks Interstate Park. 2004. http://www.breakspark.com/about/park-map.html.

APPENDIX B:
An Annotated List of the Vascular Flora of Breaks Interstate Park

Appendix B
An Annotated List of the Vascular Flora of Breaks Interstate Park

This list contains 549 species, varieties and subspecies comprising 341 genera and 118 families. The taxonomic arrangement and nomenclature follow Jones (2005). Within each major category (Pteridophytes, Gymnosperms, Dicotyledonae, and Monocotyledonae), the families, genera, and species are arranged alphabetically.

Each taxon's entry includes: scientific name (genus, species, author), collection number, and collection habitat and locality. Records not based on collections by the author are indicated by VPI (Virginia Tech's Massey Herbarium) or EKY(Eastern Kentucky University Herbarium).

Taxa monitored, based on KSNPC (2010) or VDCR (2009) are indicated by (!), and the state status (Endangered, Threatened, or Special Concern in KY; S1, S2, S3, or S4 in VA) given following the location description. Virginia State Status: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure.

Taxa proceeded by (*) are naturalized, non-native, or escaped from cultivation. Specified country or region of origin are taken from Jones (2005).

Pteridophytes

Aspleniaceae

Asplenium bradleyi D.C.Eaton.
River Trail, upriver from large rock house on rock ledge. Dickenson County, VA. Collected 29 June 1987 by Ken Markley. VPI.

Asplenium montanum Willd.
Sandstone overlook below spring along Loop Trail. Dickenson County, VA. Ken Markley, 14 September 1984. VPI.

Asplenium pinnatifidum Nutt.
Ciff above river near state line. Dickenson County, VA. Ken Markley, 27 September 1984. VPI.

Asplenium platyneuron (L.) BSP. #209
Mountain Bike Trail, forested east-facing slope. Dickenson County, VA.

Asplenium rhizophyllum L. #643
Prospectors Trail, at base of upland sandstone outcrop, forested west-facing slope. Dickenson County, VA.

Asplenium trichomanes L.
Moist, shady sandstone rocks, SW side of Russell Fork in the Breaks. Dickenson County, VA. Thomas F. Wieboldt #4441, 23 August 1982. VPI.

Asplenium × *trudellii* Wherry
50 feet above Russell Fork (100 yds down from state line on Potter's Flats side of river) on sandstone cliff face. Pike County, KY. Ken Markley, 11 October 1984. VPI.

Dennstaedtiaceae

Dennstaedtia punctilobula (Michx.) T.Moore.
Rt. 734, road slope at east end of Laurel Lake. Dickenson County, VA. Ken Markley, 14 September 1984. VPI.

Pteridium aquilinum (L.) Kuhn.
Dry oak-pine woods above cliff, edge of forest on overlooks. Dickenson County, VA. Ken Markley, 14 September 1984. VPI.

Dryopteridaceae

Athyrium filix-femina subsp. *asplenioides* (Michx.) Hulten
Just off road on knoll above maintenance area. Dickenson County, VA. Ken Markley. Date unknown. VPI.

Cystopteris protrusa (Weath.) Blasdell
Slope above road in Garden Hole. Dickenson County, VA. Ken Markley, 5 October 1984. VPI

Deparia acrostichoides (Sw.) M.Kato. #820
Camp Branch floodplain. Dickenson County, VA.

Diplazium pycnocarpon (Spreng.) M.Broun. #149, 358, 747
Pine Mountain Trail, northeast-facing mesic slope. Pike County, KY. On rocky hillside near parking area for Geological Trail, Dickenson County, VA.

Dryopteris goldiana (Hook.) A.Gray
Dickenson County, VA. Habitat and locality unknown. Ken Markley, 15 October 1984. VPI.

Dryopteris intermedia (Muhl. Ex Willd.) A.Gray. #223, 426
Laurel Branch Trail, NW-facing slope, mesic community of rhododendron, beech, hemlock, red maple, tulip-poplar; rocky banks and boulder substrate of Camp Branch. Dickenson County, VA.

Dryopteris marginalis (L.) A.Gray. #1, 190, 887
Ridgetop to Geological Trail; Prospector's Trail, NW-facing, community of hemlock, sugar maple, rhododendron. Dickenson County, VA. West side of Russell Fork, boulder/rock shelter habitat. Pike County, KY.

Onoclea sensibilis L. #264
Along river at the river access off State Hwy 80. Pike County, KY.

Polystichum acrostichoides (Michx.) Schott. #134, 662
Pine Mountain Trail, near ridgetop, NE slope, community of hemlock, witch hazel, white oak. Pike County, KY.

Woodsia obtusa (Spreng.) Torr.
North side of Stateline Tunnel, among crossties and boulders. Dickenson County, VA. Ken Markley, 27 September 1984. VPI.

Woodsia scopulina D.C.Eaton
Scattered along N-facing sandstone cliffs above Russell Fork about 1 mile above Garden Hole. Dickenson County, VA. Thomas F. Wieboldt #4484, 25 August 1982. VPI.

Equisetaceae

Equisetum arvense L. #98, 288
Along stream south of Garden Hole Rd. Dickenson County, VA. Along Russell Fork at the river access off State Hwy 80. Pike County, KY.

Hymenophyllaceae

Trichomanes boschianum Sturm. #892
Along west side of Russell Fork. Pike County, KY.

Lycopodiaceae

Huperzia lucidula (Michx.) Trevis. #552
Grassy Creek Trail, wooded slope. Dickenson County, VA.

Lycopodium digitatum Dill. #137, 317, 598
Potter's Flats Trail, N-facing slope, community of tulip-poplar, red maple, flowering dogwood, Virginia pine, sourwood. Pike County, KY. Laurel Lake Trail; Beaver Pond Trail. Dickenson County, VA.

Lycopodium obscurum L. #449
Grassy Overlook Trail, upland community of rhododendron, hemlock, American holly, magnolia spp. Dickenson County, VA.

Lygodiaceae

Lygodium palmatum (Bernh.) Sw.
East end of Laurel Lake near powerline right-of-way. Dickenson County, VA. Ken Markley, 12 August 1984. VPI.

Ophioglossaceae

Botrychium dissectum Spreng. #553
Grassy Creek Trail, mesic woods. Dickenson County, VA.

Osmundaceae

Osmunda claytoniana L. #205
Mountain Bike Trail, NE-facing, cove community dominated by spicebush. Dickenson County, VA.

Osmunda cinnamomea L. #886
Along west side of Russell Fork, boulders/rock shelter habitat. Pike County, KY.

Osmunda regalis L. #429, 779, 867
Along Russell Fork near mouth of Camp Branch and downstream at tree line. Dickenson County, VA.

Polypodiaceae

Pleopeltis polypodioides (L.) E.G. Andrews & Windham
On white oak in ravine about half way below State Line Tunnel. Dickenson County, VA. Ken Markley, 11 October 1984. VPI.

Polypodium appalachianum Haufler & Windham. #224, 427, 888
Grassy Creek Trail, NW-facing, on rock shelter, community of rhododendron, hemlock, red maple, redbud; rocky banks and boulder substrate of Camp Branch. Dickenson County, VA. Along west side of Russell Fork, boulder/rock shelter habitat. Pike County, KY.

Pteridaceae

Adiantum pedatum L. #90, 704
Garden Hole Trail, N-facing slope, rich woods; Rattlesnake Trail, NW-facing, community of tulip-poplar, spicebush, sugar maple. Dickenson County, VA.

Cheilanthes lanosa (Michx.) D.C.Eaton
Below very dry cliffs off State Hwy 80. Pike County, KY. Ken Markley, 15 October 1984. VPI.

Selaginellaceae

Selaginella apoda (L.) Spring
Center Creek below shelter. Pike County, KY. Ken Markley, 15 October 1984. VPI.

Thelypteridaceae

Phegopteris hexagonoptera (Michx.) Fee. #771, 840
Potter's Flats along Russell Fork. Pike County, KY. Near beginning of Mountain Bike Trail, E-facing, community of tulip-poplar, red maple. Dickenson County, VA.

Thelypteris noveboracensis (L.) Nieuwl. #361, 458, 730
Pine Mountain Trail, N-facing, community of tulip-poplar, sugar maple, pawpaw, beech; along stream by horse stables. Pike County, KY. Rattlesnake Trail, community of tulip-poplar, pawpaw, spicebush; Deer Trail in bottomland woods. Dickenson County, VA.

Gymnosperms

Cupressaceae

Juniperus virginiana L. #15, 729, 891
Near lodge/shelters; Beaver Pond. Dickenson County, VA. Along railroad tracks. Pike County, KY.

Pinaceae

**Picea abies* (L.) H.Karst. #607, 6
Along Beaver Pond. Dickenson County, VA.
Cultivated specimen.

Pinus rigida Mill
Below Pinnacle Rock, Overlook Trail. Dickenson County, VA. Ken Markley, 24 May 1986. VPI.

Pinus strobus L. #339
Laurel Lake Trail. Dickenson County, VA.

Pinus virginiana Mill. #19
Tower overlook. Dickenson County, VA.

Tsuga canadensis (L.) Carriere. #13
Near lodge. Dickenson County, VA.

Dicotyledonae

Acanthaceae

Justicia americana (L.) Vahl. # 374, 423, 868
Trail along Grassy Creek; along Russell Fork near mouth of Camp Branch. Dickenson County, VA. Gravel bar in Russell Fork, downstream from Grassy Creek confluence. Pike County, KY.

Aceraceae

Acer negundo L.
Breaks Interstate Park. Dickenson County, VA. Ken Markley, 24 November 1986. VPI.

Acer nigrum F.Michx.
Garden Hole, rich hollow, 150 yards from road, up (dry) creek bed. Dickenson County, VA. Ken Markley, 27 June 1986. VPI.

Acer pensylvanicum L. #125
Prospector's Trail, community of rhododendron, witch hazel, striped maple, chestnut oak, northern red oak. Dickenson County, VA.

Acer rubrum L. #18
Tower overlook, ridgetop. Dickenson County, VA.

Acer saccharum Marshall. #527
Pine Mountain Trail, wooded slope. Pike County, KY.

Amaranthaceae

Amaranthus spinosus L. #626
Dry hillside by stables. Dickenson County, VA.

Anacardiaceae

Rhus copallina L. #329, 499, 571
Laurel Lake Trail; Beaver Pond, along pond and road. Dickenson County, VA.

Rhus typhina L. #245
Along State Hwy 80 roadside at pulloff. Pike County, KY.

Toxicodendron radicans (L.) Kuntze. #185
Pine Mountain Trail, near ridgetop, NE slope, community of hemlock, witch hazel, white oak. Pike County, KY.

Annonaceae

Asimina triloba (L.) Dunal. #124
Prospector's Trail, community of magnolia sp. pawpaw, flowering dogwood, white ash, tulip-poplar, red oak sp., striped maple, red maple, sweet birch. Dickenson County, VA.

Apiaceae

Cryptotaenia canadensis (L.) DC. #710
Garden Hole along Russell Fork. Dickenson County, VA.

**Daucus carota* L. #262
Along river at the river access off Rt 80. Pike County, KY.
Naturalized from Eurasia.

Erigenia bulbosa (Michx.) Nutt.
Along Russell Fork at Garden Hole. Dickenson County, VA. D.W. Ogle & C.H. Owens, 30 March 1979. VPI.

Osmorhiza claytonia (Michx.) C.B.Clarke. #240, 263
Steep wooded slope between State Hwy 80 and railroad trestle over river; along river at the river access. Pike County, KY.

Sanicula canadensis L. #239
Steep wooded slope between State Hwy 80 and railroad trestle. Pike County, KY.

Taenidia integerrima (L.) Drude
Highest point on Garden Hole road. Dickenson County, VA. Ken Markley, 14 May 1986.

Thaspium barbinode (Michx.) Nutt. #160
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Apocynaceae

Apocynum cannabinum L. #372, 866
Along State Hwy 80 roadside on east side of park; along Russell Fork, downstream from mouth of Camp Branch. Dickenson County, VA.

**Vinca minor* L. #9
Along park entrance road. Dickenson County, VA.
Introduced from Europe.

Aquifoliaceae

Ilex opaca Aiton. #22, 138
Ridgetop community along Ridge Trail. Dickenson County, VA. N-facing slope on Potter's Flats Trail, community of tulip-poplar, sugar maple, hickory spp. Pike County, KY.

Ilex verticillata (L.) A.Gray. #713, 826, 890
West bank of Russell Fork, near Towers Tunnel, community of black locust, sycamore, silky dogwood; along Russell Fork, downstream from mouth of Camp Branch. Dickenson County, VA.

Araliaceae

Aralia racemosa L. #505
Garden Hole, trail parallel to river, rich woods. Dickenson County, VA.

Aralia spinosa L. #606
By road at woodland edge across from head of Mountain Bike Trail. Dickenson County, VA.

**Hedera helix* L. #9b
Along park entrance road. Dickenson County, VA.
Introduced from Europe.

!*Panax quinquefolius* L.
Towers Overlook Trail to the right of fallen chestnut log. Dickenson County, VA. Ken Markley, 10 September 1985. VPI. S3/S4 Status.

Aristolochiaceae

Aristolochia macrophylla Lam. #599
Garden Hole, rich woods. Dickenson County, VA.

Asarum canadense L. #68
Garden Hole, rich woods. Dickenson County, VA.

Hexastylis virginica (L.) Small. #654
Pine Mountain Trail, upland hillside, NE-facing, canopy of tulip-poplar, hemlock, sugar maple. Pike County, KY.

Asclepiadaceae

Asclepias quadrifolia Jacq. #181
Gravel path looping from water tank to main road, upland community of hemlock, red maple, scarlet oak. Dickenson County, VA.

Asclepias syriaca L. #290, 378
Along Center Creek in picnic area. Pike County, KY; shore at confluence of Grassy Creek and Russell Fork. Dickenson County, VA.

Asclepias tuberosa L.
Potter's Flats, 100 yards from railroad bridge. Dickenson County, VA. Ken Markley, 3 July 1986. VPI.

Asteraceae

Achillea millefolium L. #211, 400
Beaver Pond Trail, community of sassafras, beech, sourwood, hemlock, dogwood; grassy opening in woods off road leading to stables. Dickenson County, VA.

Ageratina altissima (L.) R.M.King & H.Rob. #536
Trail from State Hwy 80 to railroad trestle over Russell Fork River to Potters Flats. Pike County, KY.

Ambrosia artemisiifolia L. #557
State Hwy 80 roadside at head of trail leading down to railroad trestle. Pike County, KY.

Ambrosia trifida L.
State Hwy 80 between park village, Rt. 768 and park entrance Rt. 702. Dickenson County, VA. Kenneth T. Markley, 5 September 1986. VPI.

Antennaria solitaria Rydb. #640
Prospectors Trail, upland wood of pine and mountain laurel, on rocks, SW-facing slope. Dickenson County, VA.

Arnoglossum atriplicifolium (L.) H.Rob.
Old road below Beaver pond, near horse stable. Dickenson County, VA. Kenneth T. Markley, 26 August 1987. VPI.

Bidens bipinnata L.
Stateline Overlook parking area at head of Ridge Trail. Dickenson County, VA. Kenneth T. Markley, 2 September 1986. VPI.

Bidens frondosa L. #808
Laurel Lake. Dickenson County, VA.

**Chrysanthemum leucanthemum* L. #210, 368, 696
Mountain Bike Trail, E-facing, community of tulip-poplar, sugar maple, red maple, flowering dogwood; grassy opening in woods off road leading to stables; along State Hwy 80 roadside on east side of park; open field off Rattlesnake Trail. Dickenson County, VA.
Naturalized from Eurasia.

**Cichorium intybus* L. #367
Along State Hwy 80 roadside on east side of park. Dickenson County, VA.
Naturalized from Europe.

Cirsium discolor (Muhl. ex Willd.) Spreng. #493
Along Beaver Pond and road next to pond. Dickenson County, VA.

Conoclinium coelestinum (L.) DC. #521, 769
Along Camp Branch. Dickenson County, VA. Potter's Flats along Russell Fork. Pike County, KY.

Coreopsis major Walter. #351, 409, 732
Pine Mountain Trail, W-facing slope, community of sugar maple, hickory sp., hemlock, flowering dogwood, white oak; along Russell Fork and road along river at river access off State Hwy 80. Pike County, KY. Trail to Clinchfield Overlook. Dickenson County, VA.

Doellingeria infirma (Michx.) Nees. #872
Prospectors Trail, SW-facing with witch hazel, chestnut oak. Dickenson County, VA.

Elephantopus carolinianus Raeusch. #452
Open field by Beaver Pond. Dickenson County, VA.

Erigeron annuus (L.) Pers. #357
Pine Mountain Trail. Pike County, KY.

Erigeron philadelphicus L. #80, 141
Garden Hole Trail, N-facing slope. Dickenson County, VA. Open area along trail leading to Pine Mountain Trail, bordered by young woods of *Rubus* spp., *Rosa* spp., and tulip-poplar seedlings. Pike County, KY.

Erigeron pulchellus Michx.
Maintenance area road at south entrance. Dickenson County, VA. Kenneth T. Markley, 12 May 1986. VPI.

Erigeron strigosus Muhl. ex Willd. #252, 453, 869
In woods between State Hwy 80 and railroad trestle over river. Pike County, KY. Along Garden Hole Road; along road by horse stables; along Russell Fork near mouth of Camp Branch. Dickenson County, VA.

Eupatorium fistulosum Barratt. #432
Along Russell Fork near mouth of Camp Branch. Dickenson County, VA.

Eupatorium perfoliatum L. #430, 476
Along Russell Fork near mouth of Camp Branch; along Russell Fork near confluence with Grassy Creek. Dickenson County, VA.

Eupatorium purpureum L. #796, 805
River Trail; woods along park road and near lodges. Dickenson County, VA.

Eupatorium serotinum Michx. #484, 800
Along road parallel to Russell Fork at river access. Pike County, KY. Mountain Bike Trail/Rattlesnake Trail. Dickenson County, VA.

Eurybia divaricata (L.) G.L.Nesom. #510, 765, 806
Along trail in Garden Hole; woods along park road and near lodges. Dickenson County, VA. Potter's Flats along Russell Fork. Pike County, KY.

**Galinsoga parviflora* Cav. #403, 463, 589
Low spot in open woods near stables; along road by stables. Dickenson County, VA. Naturalized from tropical America.

Helenium autumnale L. #470, 788, 824
Along park road; Russell Fork/Grassy Creek Confluence, along shore; along Russell Fork, downstream from mouth of Camp Branch. Dickenson County, VA.

Helianthus divaricatus L. #440
Along State Hwy 80 roadside. Dickenson County, VA.

Helianthus microcephalus Torr. & A.Gray. #475, 489, 509, 787
Along Russell Fork near confluence with Grassy Creek; along trail in Garden Hole. Dickenson County, VA. Along road parallel to Russell Fork at river access. Pike County, KY.

Hieracium caespitosum Dumort. #332, 464
Laurel Lake Trail; along road by campground store. Dickenson County, VA.

Hieracium venosum L. #118
Prospector's Trail, community of chestnut oak, tulip-poplar, mountain-laurel, red maple. Dickenson County, VA.

Ionactis linariifolius (L.) Greene
On sandstone ledges above Russell Fork in rock crevices, about 300 feet downstream from mouth of Camp Branch. Dickenson County, VA. Kenneth Markley, 1 September 1988. VPI.

Krigia biflora (Walter) S.F.Blake. #168, 180
Path leading up hillside to water tank, S-facing slope, community of hemlock, sourwood, rhododendron, red maple. Dickenson County, VA.

Lactuca floridana (L.) Gaertn. #801
Mountain Bike Trail/Rattlesnake Trail. Dickenson County, VA.

**Lapsana communis* L. #231
Steep wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY. Adventive from Eurasia.

Packera anonyma (Alph. Wood) W.A.Weber & A.Love. #167b, 253
Steep wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Packera aurea (L.) A.Love & D.Love. #57, 102, 167
Along park entrance road; along Camp Branch, south of Garden Hole Rd. Dickenson County, VA.

Packera obovata (Muhl. ex Willd.) W.A.Weber & A.Love. #5
Along park entrance road. Dickenson County, VA.

Pityopsis graminifolia (Michx.) Nutt.
Clinchfield Overlook. Dickenson County, VA. D.W. Ogle, 18 September 1983. VPI.

Polymnia canadensis L. #188, 784
River Trail, W-facing, community of northern red oak, shagbark hickory, chestnut oak; at edge of woods. Dickenson County, VA. Uphill from Center Creek. Pike County, KY.

Prenanthes altissima L. #535, 852
Russell Fork River/Potters Flats. Pike County, KY. Abandoned road at Lover's Leap Overlook, open area with road cut in rock outcrops. Dickenson County, VA.

Pseudognaphalium obtusifolium (L.) Hilliard & B.L.Burtt. #560, 844
Open meadow off Mountain Bike Trail. Dickenson County, VA.

Rudbeckia hirta L. #370, 462, 466
Along State Hwy 80 roadside on east side of park; on hillside by Laurel Lake; along road by campground store. Dickenson County, VA.

Rudbeckia laciniata L. #421, 459, 524
Along Russell Fork near mouth of Camp Branch; along road by horse stables; along Camp Branch. Dickenson County, VA.

Sericocarpus asteroides (L.) BSP.
Breaks Interstate Park. Dickenson County, VA. Ken Markley. Date unknown. VPI.

Smallanthus uvedalius (L.) Mack. #408, 741, 767
Along Russell Fork and road parallel to river at river access; Potter's Flats along Russell Fork. Pike County, KY.

Solidago caesia L. #542, 594, 842
Wooded hillside leading down to railroad trestle. Pike County, KY. Along gravel road leading to stables; woods along park road and near lodges; Mountain Bike Trail, NW-facing, community of red maple, pignut hickory. Dickenson County, VA.

Solidago canadensis L. #479, 487, 563
Along Garden Hole Road; along Laurel Lake; in drain, upstream from Beaver Pond. Dickenson County, VA. Along road parallel to Russell Fork at river access. Pike County, KY.

Solidago curtisii Torr. & A.Gray. #468
Along roadside in main section of park. Dickenson County, VA.

Solidago faucibus Wieboldt. #507, 832
Along trail in Garden Hole. Dickenson County, VA. Along Center Creek streambank. Pike County, KY.

Solidago flexicaulis L. #502, 605, 794
Along trail in Garden Hole; River Trail. Dickenson County, VA.

Solidago nemoralis Aiton. #520
Along Camp Branch. Dickenson County, VA.

Solidago odora Aiton. #819
Camp Branch floodplain. Dickenson County, VA.

Solidago rugosa Mill. #811
Camp Branch floodplain. Dickenson County, VA.

Solidago speciosa Nutt. #847
Edge of open meadow and dry woods off Mountain Bike Trail. Dickenson County, VA.

Solidago sphacelata Raf. #738
River access off State Hwy 80. Pike County, KY.

Solidago ulmifolia Muhl. #486
Along road parallel to Russell Fork at river access. Pike County, KY.

Symphyotrichum cordifolium (L.) G.L.Nesom. #554, 601, 851
Grassy Creek Trail leading to Russell Fork; trail in Garden Hole; abandoned road at Lover's Leap Overlook, open area with road cut in rock outcrops. Dickenson County, VA. Steep, wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Symphyotrichum divaricatum (Nutt.) G.L.Nesom. #504
Along trail in Garden Hole. Dickenson County, VA.

Symphyotrichum dumosum (L.) G.L.Nesom. #825
Along Russell Fork, downstream from mouth of Camp Branch. Dickenson County, VA.

Symphyotrichum lateriflorum (L.) A.Love & D.Love. #600, 603, 843
Garden Hole; Mountain Bike Trail, NE-facing slope, community of white oak, scarlet oak, hemlock. Dickenson County, VA.

Symphyotrichum lowrieanum (Porter) G.L.Nesom. #602, 608
Garden Hole. Dickenson County, VA.

Symphyotrichum ontarione (Wiegand) G.L.Nesom
Collected from southern edge of island at Garden Hole, in cobbles and sand. Dickenson County, VA. John F. Townsend #4097. 16 September 2008. VPI.

Symphyotrichum phlogifolium (Muhl. ex Willd.) G.L.Nesom
NE corner of Breaks Park, open sandstone slope. Buchanan County, VA. R. Kral #14232, 14 September 1961. VPI.

Symphyotrichum pilosum (Willd.) G.L.Nesom
Breaks Interstate Park roadside. Dickenson County, VA. D.W. Ogle, 17 October 1981. VPI.

Symphyotrichum prenanthoides (Muhl. ex Willd.) G.L.Nesom. #551, 616, 813
Grassy Creek Trail leading to Russell Fork; along horse trail; Camp Branch floodplain. Dickenson County, VA.

Symphyotrichum undulatum (L.) G.L.Nesom. #592
Trail around Beaver Pond. Dickenson County, VA.

Symphyotrichum urophyllum (DC) G.L.Nesom. #558
Trail around Beaver Pond. Dickenson County, VA.

**Taraxacum officinale* (L.) Weber. #14
Weedy community near lodge. Dickenson County, VA.
Naturalized from Eurasia.

**Tussilago farfara* L. #6, 633
Side road near park entrance. Garden Hole hillside, near river. Dickenson County, VA.
Naturalized from Europe.

Verbesina alternifolia (L.) Britton. #491, 802, 810
Along road parallel to Russell Fork at river access. Pike County, KY. Mountain Bike Trail/Rattlesnake Trail; Camp Branch floodplain. Dickenson County, VA.

Verbesina occidentalis (L.) Walter. #540, 562
Potters Flats vicinity. Pike County, KY. Along Beaver Pond. Dickenson County, VA.

Vernonia gigantea (Walter) Trel. #482, 495
Along road parallel to Russell Fork at river access. Pike County, KY. Along Beaver Pond and road next to pond. Dickenson County, VA.

Balsaminaceae

Impatiens capensis Meerb. #436
Along Garden Hole Road. Dickenson County, VA.

Impatiens pallida Nutt. #457, 506
Along stream by horse stables; along trail in Garden Hole. Dickenson County, VA.

Berberidaceae

Caulophyllum giganteum (Farw.) Loconte & W.H.Blackw. #650
Garden Hole, on W-facing upper hillslope with hemlock and maple spp. Dickenson County, VA.

Podophyllum peltatum L. #31, 666
Lake Trail; Mountain Bike Trail in young woods with flowering dogwood, spicebush, red maple, tulip-poplar. Dickenson County, VA.

Betulaceae

Alnus serrulata (Aiton) Willd. #281, 412
Along Russell Fork and road parallel to river at river access. Pike County, KY.

Betula alleghaniensis Britton
East boundary of Breaks Interstate Park, on sandy slope. Dickenson County, VA.
R. Kral #12661, 14 June 1961. VPI.

Betula lenta L. #3, 284, 580
Ridge and Geological Trails; open field near Beaver Pond. Dickenson County, VA.
Along Russell Fork at river access off State Hwy 80. Pike County, KY.

Betula nigra L. #513
Along Laurel Lake. Dickenson County, VA.

Carpinus caroliniana Walter. #282, 529
Along Russell Fork at the river access; steep wooded trail from State Hwy 80 to railroad trestle. Pike County, KY.

Corylus americana Walter. #569, 596
Trail around Beaver Pond. Dickenson County, VA.

Ostrya virginiana (Mill.) K.Koch.
Breaks Interstate Park on Russell Fork downstream from mouth of Camp Branch.
Dickenson County, VA. D.W. Ogle, 29 June 1987. VPI.

Bignoniaceae

Bignonia capreolata L. #222, 753
Grassy Creek Trail, NW-facing, rocky, community of rhododendron, hemlock, red maple, redbud. Dickenson County, VA. Pine Mountain Trail, N-facing, with sugar maple and basswood. Pike County, KY.

Campsis radicans (L.) Seem. ex Bureau. #291, 379
Along Center Creek at Center Creek trailhead. Pike County, KY.

**Paulownia tomentosa* (Thunb.) Steud. #109
Parking lot and steps at overlook off State Hwy 80. Pike County, KY.
Naturalized from China.

Boraginaceae

Cynoglossum virginianum L.
Between log cabin and amphitheater. Dickenson County, VA. Ken Markley, 12 May 1986. VPI.

Myosotis verna Nutt. #171
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Brassicaceae

**Barbarea vulgaris* R.Br. #140, 672, 677
Open area along trail (leading to Pine Mountain Trail), bordered by young woods of *Rubus* spp., *Rosa* spp., and tulip-poplar seedlings; Potter's Flats, along Russell Fork, with abundant young sycamore and Japanese knotweed. Pike County, KY.
Naturalized from Eurasia.

**Brassica juncea* (L.) Czern. #679
Potter's Flats, along Russell Fork, with abundant young sycamore and Japanese knotweed. Pike County, KY.
Adventive from Asia.

**Brassica rapa* L. #32, 56
State Hwy 80 roadside between park entrance and Garden Hole. Dickenson County, VA.
Introduced from Europe.

Cardamine douglassii (Torr.) Britton. #860
Along Russell Fork at the river access. Pike County, KY.

**Cardamine hirsuta* L. #11, 646
Near rock wall along park entrance road; Cold Spring Trail, open area next to parking lot. Dickenson County, VA.
Naturalized from Eurasia.

Cardamine pensylvanica Muhl. ex Willd. #721
Along Center Creek. Pike County, KY.

Cardamine rotundifolia Michx.
Collected from large rock within bed of Camp Branch. This stream part of NW-facing, mesic slope, southeast of Russell Fork. Dickenson County, VA. John F. Townsend #3990, 2 June 2008. VPI.

Dentaria diphylla Michx. #70
Garden Hole. Dickenson County, VA.

Dentaria laciniata Muhl. ex Willd. #636
Garden Hole, on wooded hillside near river. Dickenson County, VA.

**Draba verna* L. #8
Along park entrance road. Dickenson County, VA.
Naturalized from Eurasia.

Lepidium virginicum L. #107
Parking lot and steps at overlook off State Hwy 80. Pike County, KY.

**Rorippa sylvestris* (L.) Besser. #275, 278
Along Russell Fork at the river access. Dickenson County, VA.
Adventive from Eurasia.

**Sinapsis arvensis* L. #196
Stables area along open, grassy road, stream and wall. Dickenson County, VA.
Adventive from Europe.

**Sisymbrium officinale* L. #195
Stables area along open, grassy road, stream and wall. Dickenson County, VA.
Naturalized from Eurasia.

**Thlaspi alliaceum* L. #881
River access, in Russell Fork floodplain. Pike County, KY.
Naturalized from Europe.

Campanulaceae

Campanula divaricata Michx. #762
Steep, wooded hillside off State Hwy 80 leading down to railroad testle. Pike County, KY.

Campanulastrum americanum (L.) Small. #752
Pine Mountain Trail, N-facing, community of sugar maple and basswood. Pike County, KY.

Lobelia cardinalis L. #434, 781
Along Center Creek in picnic shelter area; along Russell Fork with sycamore, rhododendron, beech, hemlock. Pike County, KY.

Lobelia inflata L. #399, 537, 750
Grassy opening in woods off road leading to stables; head of Cold Spring Trail near parking area; Mountain Bike Trail/Rattlesnake Trail. Dickenson County, VA. Trail near railroad, leading up to Pine Mountain Trail, NE-facing, young forest of tulip-poplar and black locust. Pike County, KY.

Lobelia siphilitica L. #478, 816
Along Garden Hole Road; Camp Branch floodplain. Dickenson County, VA.

Triodanis perfoliata (L.) Nieuwl. #200, 695
Bottomland, open area along old road near stables with black walnut and tulip-poplar; flat, open field off Rattlesnake Trail. Dickenson County, VA.

Caprifoliaceae

**Lonicera japonica* Thunb. #145, 485
Trail off railroad tracks leading to Pine Mountain Trail, open, young-growth woods dominated by black walnut and *Rosa* spp.; along road parallel to Russell Fork at river access. Pike County, KY.
Naturalized from Asia.

**Lonicera morrowii* A.Gray. #63, 319, 336
At park entrance sign and roadside; Laurel Lake Trail. Dickenson County, VA.
Naturalized from Japan.

Sambucus canadensis L. 236
Along State Hwy 80 roadside at pulloff. Pike County, KY.

Sambucus racemosa subsp. *pubens* (Michx.) House
Prospectors Trail, 0.25 miles from Laurel Branch. Several shrubs with fruit along trail. Dickenson County, VA. Ken Markley, 25 June 1987. VPI.

Viburnum acerifolium L. #123, 136
Prospector's Trail, community of red maple, hickory sp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut. Dickenson County, VA. Potter's Flats Trail leading to Pine Mountain Trail, N-facing slope, community of tulip-poplar, red maple, flowering dogwood, Virginia pine, sourwood. Pike County, KY.

Viburnum cassinoides L. #862, 902
Along Russell Fork, downstream from mouth of Camp Branch; along west side of Russell Fork. Dickenson County, VA.

Viburnum dentatum L. #863, 900
Along Russell Fork, downstream from mouth of Camp Branch; along west side of Russell Fork. Dickenson County, VA.

Viburnum prunifolium L.
Gorge of Russell Fork below the Towers Dickenson County, VA. D.W. Ogle & Ken Markley, 2 September 1987. VPI.

Caryophyllaceae

**Cerastium glomeratum* Thuill. #880
In weedy area of road by stables. Dickenson County, VA.
Naturalized from Eurasia.

**Dianthus armeria* L. #699, 718
Flat, open field off Rattlesnake Trail; along Russell Fork at confluence with Grassy Creek, river birch community. Dickenson County, VA.
Naturalized from Europe.

**Saponaria officinalis* L. #407, 474, 766
Along Russell Fork and road in river access; Potter's Flats along Russell Fork. Pike County, KY. Along Russell Fork near confluence with Grassy Creek, along shore. Dickenson County, VA.
Naturalized from Eurasia.

!*Silene rotundifolia* Nutt.
Crevices of dry cliff face, SW-side of Russell Fork in the Breaks. Dickenson County, VA. Thomas F. Wieboldt #4445, 23 August 1982. VPI. S2 Status.

Silene virginica L. #82
Garden Hole Trail, N-facing slope. Dickenson County, VA.

**Stellaria media* (L.) Vill. #144, 644, 719
Trail off railroad tracks leading to Pine Mountain Trail, open woods dominated by tulip-poplar and black walnut. Pike County, KY. Prospectors Trail, at base of upland sandstone outcrop, on rock, W-facing, community of red oak, walnut, red maple; along Russell Fork at confluence with Grassy Creek, river birch community; weedy area of road by stables. Dickenson County, VA.
Naturalized from Eurasia.

Stellaria pubera Michx. #37, 42, 649
Garden Hole, roadside hillslope; Lake Trail. Dickenson County, VA.

Celastraceae

Euonymous americanus L. #177, 254, 673
S-facing hill along roadside, at path to water tank. Dickenson County, VA. Hillside trail leading from State Hwy 80 to railroad bridge. Pike County, KY.

Chenopodiaceae

**Chenopodium ambrosioides* L. #624
By horse stables. Dickenson County, VA.
Naturalized from tropical America.

Chenopodium simplex (Torr.) Raf. #187
River Trail, W-facing, community of northern red oak, shagbark hickory, chestnut oak. Dickenson County, VA.

Clethraceae

Clethra acuminata Michx. # 198, 320, 356
Stables area along grassy road; Laurel Lake Trail. Dickenson County, VA. Pine Mountain Trail. Pike County, KY.

Clusiaceae

Hypericum punctatum Lam. #397, 590, 754
Grassy opening in woods off road to stables; along Russell Fork near mouth of Camp Branch; bottomland open woods next to gravel road, near stables. Dickenson County, VA. Pine Mountain Trail, N-facing, community of sugar maple and basswood. Pike County, KY.

Hypericum stragulum W.P.Adams & N.Robson. #251, 401, 870
Wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY. NE-facing, gentle slope down to Beaver Pond; open woods next to rooms. Dickenson County, VA.

Convolvulaceae

Calystegia sepium (L.) R.Br. #294
Center Creek in picnic area. Pike County, KY.

**Ipomoea coccinea* L. #490
Weedy area near Russell Fork at river access. Pike County, KY.
Naturalized from tropical America.

**Ipomoea hederacea* Jacq.
Garden near cottages. Dickenson County, VA. Ken Markley, 6 October 1986. VPI.
Naturalized from tropical America.

Ipomoea lacunosa L.
Garden near cottages. Dickenson County, VA. Ken Markley, 6 October 1986. VPI.

Ipomoea pandurata (L.) G.Mey. #416, 492
Along Russell Fork streambank at river access. Pike County, KY.

Cornaceae

Cornus alternifolia L.f. #112
Garden Hole, rich woods. Dickenson County, VA.

Cornus amomum Mill. #220, 259, 716
Confluence of Grassy Creek and Russell Fork, on shore; along Russell Fork near mouth of Camp Branch. Dickenson County, VA. Along Russell Fork at river access. Pike County, KY.

Cornus florida L. #65
Roadside at head of Overlook Trail. Dickenson County, VA.

Crassulaceae

Sedum ternatum Michx. #53, 433
Prospector's Trail near Laurel Branch Trail; rocky banks and boulder substrate of Camp Branch. Dickenson County, VA.

Cucurbitaceae

Sicyos angulatus L. #623
Dry hillside by stables. Dickenson County, VA.

Cuscutaceae

Cuscuta gronovii Willd. #525
Along Camp Branch. Dickenson County, VA.

Diapensiaceae

Galax urceolata (Poir.) Brummitt. #219, 334
Intersection of Grassy Creek Trail and River Trail, on rocks, with witch hazel, red maple, beech; Laurel Lake Trail. Dickenson County, VA.

Ebenaceae

Diospyros virginiana L. #258, 302, 414
Center Creek in picnic area; along Russell Fork streambank at river access. Pike County, KY.

Elaeagnaceae

**Elaeagnus umbellata* Thunb. #104, 191, 431
Along Camp Branch, south of Garden Hole Rd.; Laurel Lake Trail; along Russell Fork near mouth of Camp Branch; along road and woodland edge near park naturalist's house. Dickenson County, VA.
Naturalized from east Asia.

Ericaceae

Epigaea repens L. #7
Tower Overlook Trail. Dickenson County, VA.

Kalmia latifolia L. #217, 682
Mountain Bike Trail, ridgetop community of witchhazel, American chestnut saplings, black oak, red maple, hemlock. Dickenson County, VA. Potter's Flats, along Russell Fork. Pike County, KY.

Lyonia ligustrina (L.) DC. #827, 865
Along Russell Fork, downstream from mouth of Camp Branch. Dickenson County, VA.

Oxydendrum arboreum (L.) DC. #321, 577
Laurel Lake Trail; open field near Beaver Pond. Dickenson County, VA.

Rhododendron catawbiense Michx. #133, 733
Prospector's Trail, community of red maple, hickory sp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut; trail to Clinchfield Overlook. Dickenson County, VA.

Rhododendron maximum L. #186, 207, 226
Geological Trail; Mountain Bike Trail, ridgetop community of mountain laurel, witchhazel, American chestnut saplings, black oak, red maple, hemlock; Grassy Creek Trail, NW-facing, rocky, community of rhododendron, hemlock, red maple, redbud. Dickenson County, VA.

Rhododendron periclymenoides (Michx.) Shinners. #79, 127, 780
Garden Hole Trail, N-facing slope; Tower Tunnel Trail, ridgetop community of mountain laurel, Virginia pine, magnolia sp., witch hazel, maple spp. Dickenson County, VA. Along west side of Russell Fork, boulder and rock shelter habitat. Pike County, KY.

Vaccinium corymbosum L. #121, 183, 561
Lover's Leap, W-facing; Prospector's Trail, community of red maple, hickory sp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut; bottomland open woods next to gravel road, up the road from stables; Towers Overlook. Dickenson County, VA.

Vaccinium pallidum Aiton. #722
Clinchfield Overlook. Dickenson County, VA.

Vaccinium stamineum var. *stamineum* L. #675
Potter's Flats woods. Pike County, KY.

Euphorbiaceae

Euphorbia corollata L. #418, 473, 768
Along Russell Fork River at river access off KY 80; Potter's Flats along Russell Fork. Pike County, KY. Trail along Grassy Creek leading to river. Dickenson County, VA.

Fabaceae

**Albizia julibrissin* Durazz. #255, 389
Along Russell Fork at river access. Pike County, KY. Grassy opening in woods off road to stables. Dickenson County, VA.
Naturalized from tropical Asia.

Amphicarpaea bracteata (L.) Fernald. #761, 831
Wooded area along main park road near cottage and rooms. Dickenson County, VA. Along wooded section of Center Creek. Pike County, KY.

Apios americana Medik. #260, 417, 420
Russell Fork streambank at river access. Pike County, KY. Russell Fork near mouth of Camp Branch. Dickenson County, VA.

Cercis canadensis L. #67, 875
Roadside near intersection of Nature Drive and Route 702; Rattlesnake Trail, NE-facing, community of hemlock, American holly, beech. Dickenson County, VA.

Chamaecrista nictitans (L.) Moench.
Gravel road edge near Beaver Pond. Dickenson County, VA. Kenneth T. Markley, 15 August 1986. VPI.

**Coronilla varia* L. #292, 371, 676
Center Creek in picnic area; Potter's Flats, along Russell Fork, with abundant young sycamore and Japanese knotweed. Pike County, KY. State Hwy 80 roadside on E side of park. Dickenson County, VA.
Naturalized from the Mediterranean.

Desmodium ciliare (Muhl. ex Willd.) DC. #488
Along road parallel to Russell Fork at river access. Pike County, KY.

Desmodium glabellum (Michx.) DC. #523
Along Camp Branch. Dickenson County, VA.

Desmodium glutinosum (Muhl. ex Willd.) Alph.Wood. #380, 758
Along Nature Drive roadside near campground entrance; mesic woods near cottage and rooms, SW-facing, with hemlock, beech, sugar maple. Dickenson County, VA.

Desmodium nudiflorum (L.) DC. #467
Along roadside in main section of park. Dickenson County, VA.

Desmodium pauciflorum (Nutt.) DC. #814
Camp Branch floodplain. Dickenson County, VA.

Desmodium paniculatum (L.) DC. #471, 498
Along road inside main area of park; along Beaver Pond and road next to pond. Dickenson County, VA.

**Lespedeza bicolor* Turcz. #783
Center Creek picnic area. Pike County, KY.
Native of Japan.

**Melilotus alba* Medik. #296, 363
Center Creek in picnic area; along railroad tracks running parallel to State Hwy 80 and Russell Fork. Pike County, KY.
Naturalized from Eurasia.

**Melilotus officinalis* (L.) Pall. #267
Along Russell Fork at river access. Pike County, KY.
Naturalized from Eurasia.

**Pueraria montana* var. *lobata* (Willd.) Maesen & S.M.Almeida. #295
Center Creek in picnic area. Pike County, KY.
Naturalized from Japan.

Robinia hispida L. #126
Prospector's Trail, community of rhododendron spp., witch hazel, striped maple, chestnut oak, northern red oak. Dickenson County, VA.

Robinia pseudoacacia L. #108
Parking lot and steps at overlook off State Hwy 80. Pike County, KY.

**Trifolium campestre* Schreb. #179, 698
Lover's Leap, W-facing; flat, open field off Rattlesnake Trail. Dickenson County, VA.
Eurasian & African weed.

**Trifolium hybridum* L. #265, 273
Along Russell Fork at the river access. Pike County, KY.
A European cultigen.

**Trifolium pratense* L. #369, 725
Along State Hwy 80 roadside on east side of park; in open field next to Beaver Pond. Dickenson County, VA.
A European cultigen.

**Trifolium repens* L. #199, 213
Bottomland, semi-open area along road near stables with black walnut and tulip-poplar; stables area along grassy road, stream and wall. Dickenson County, VA.
A Eurasian cultigen.

Vicia caroliniana Walter. #40, 41
Roadside approaching Cold Spring Trail. Dickenson County, VA.

*_Vicia sativa_ L. #670
In vicinity of horse stables. Dickenson County, VA.
Naturalized from Europe.

Vicia villosa Roth. #192
Stables area along grassy road, stream and wall. Dickenson County, VA.

Fagaceae

Castanea dentata (Marshall) Borkh. #208, 328, 585.
Mountain Bike Trail, NW-facing, community of beech, chestnut oak, northern red oak, red maple, hemlock; Laurel Lake Trail; along road and woodland edge near park naturalist's house. Dickenson County, VA.

*_Castanea mollissima_ Blume. #388
Along road in front of park naturalist's house. Dickenson County, VA.
Naturalized from east Asia.

Castanea pumila (L.) Mill. #615.
At woodland edge, by stream, across from stables. Dickenson County, VA.

*_Castanea sativa_ Mill.
Potter Flats, along State Hwy 80, abandoned homesite. Pike County, KY. Bryce D. Fields #895, 18 July 1996. EKY.
An escape, native to Eurasia.

Fagus grandifolia Ehrh. #757
Mesic woods near cottage and rooms, SW-facing, with hemlock, beech, sugar maple. Dickenson County, VA.

Quercus alba L. #706
Old homestead and road, with tulip-poplar and red maple. Dickenson County, VA.

Quercus coccinea Münchh. #581
Along road and woodland edge near park naturalist's house. Dickenson County, VA.

Quercus falcata Michx. #848
Abandoned road at Lover's Leap Overlook, open area with road cut in rock outcrops. Dickenson County, VA.

Quercus montana Willd. #744
Grassy Overlook Trail. Dickenson County, VA.

Quercus rubra L. #618
Dry hillside by stables. Dickenson County, VA.

Quercus stellata Wangenh.
KY 80, short distance W of KY-VA state line on dry S-facing steep slopes above Russell Fork. Breaks Interstate Park. Pike County, KY. Elizabeth M. Browne and Edward T. Brown, Jr. #8451, 21 May 1964. EKY.

Quercus velutina Lam. #572, 724
Trail around Beaver Pond. Dickenson County, VA.

Fumariaceae

!*Adlumia fungosa* (Aiton) Greene ex BSP.
Near State Line Tunnel. Dickenson County, VA. D.W. Ogle, 24 May 1981. VPI. S3 Status.

Corydalis flavula (Raf.) DC.
Circuit from campground to Laurel Branch to Grassy Creek to Russell Fork to Stateline Overlook. Dickenson County, VA. D.W. Ogle, 22 April 1979. VPI.

Dicentra canadensis (Goldie) Walp. #635
Garden Hole hillside. Dickenson County, VA.

Dicentra cucullaria (L.) Bernh. #628
Garden Hole hillside. Dickenson County, VA.

Gentianaceae

Gentiana villosa L.
Beaver Pond, along wooded side of lake. Dickenson County, VA. Ken Markley, 11 October 1986. VPI.

Obolaria virginica L. #874
Rattlesnake Trail. Dickenson County, VA.

Sabatia angularis (L). Pursh.
Right-of-way to powerline maintenance area road. Dickenson County, VA. Ken Markley, 25 July 1986. VPI.

Geraniaceae

Geranium carolinianum L. #157, 214
Pool Point on rocks above river. Pike County, KY. Beaver Pond Trail, community of sassafras, beech, sourwood, hemlock, dogwood. Dickenson County, VA.

Geranium maculatum L. #61
Garden Hole. Dickenson County, VA.

Grossulariaceae

Ribes cynosbati L. #2
Ridge and Geological Trails. Dickenson County, VA.

Hamamelidaceae

Hamamelis virginiana L. #20, 139
Ridgetop community along Ridge Trail. Dickenson County, VA. N-facing slopes on Potter's Flat's trail, community of tulip-poplar, American holly, sugar maple, hickory spp. Pike County, KY.

Liquidambar styraciflua L. #737
River access. Pike County, KY.

Hippocastanaceae

Aesculus flava Ait. #653
Edge habitat between powerline and forest, E-facing slope. Pike County, KY.

Hydrangeaceae

Hydrangea arborescens L. #221, 377
Grassy Creek Trail, NW-facing, rocky, community of rhododendron, hemlock, red maple, redbud. Dickenson County, VA.

Philadelphus hirsutus Nutt. #566
Along Beaver Pond. Dickenson County, VA.

Hydrophyllaceae

Phacelia bipinnatifida Michx. # 86, 95, 645
Garden Hole Trail, N-facing slope; wetland south of Garden Hole Rd.; Prospectors Trail, rocky hillslope on sandstone, N-facing, community of rhododendron, white oak, hickory spp. Dickenson County, VA.

Juglandaceae

Carya glabra (Mill.) Sweet. #250, 587
Steep wooded slope between State Hwy 80 and railroad trestle. Pike County, KY. Along road and woodland edge near park naturalist's house. Dickenson County, VA.

Carya ovata (Mill.) K.Koch. #803
River Trail. Dickenson County, VA.

Carya tomentosa (Poir.) Nutt. #338, 584, 736
Laurel Lake Trail; along road and woodland edge near park naturalist's house. Dickenson County, VA. River access. Pike County, KY.

!*Juglans cinerea* L. #526
Steep wooded slope between State Hwy 80 and railroad trestle. Pike County, KY. Threatened.

Juglans nigra L. #393
Grassy opening in woods off road to stables. Dickenson County, VA.

Lamiaceae

Collinsonia canadensis L. #604, 773, 804
Gardenhole; woods along park road and near lodges. Dickenson County, VA. Potter's Flats along Russell Fork, with sycamore, black locust, rhododendron spp., hemlock. Pike County, KY.

Cunilla origanoides (L.) Britton. #793
River Trail. Dickenson County, VA.

**Glechoma hederacea* L. #10, 161
Along main park road; Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA. Naturalized from Europe.

*_Lamium purpureum_ L. #48, 49
State Hwy 80 roadside between park entrance and Garden Hole. Dickenson County, VA. Naturalized from Eurasia.

!_Meehania cordata_ (Nutt.) Britton
Garden Hole, rich hollow above parking area near river. Dickenson County, VA. Ken Markley, 14 May 1986. VPI. S3 Status.

*_Mentha × piperita_ L. #386, 435
Laurel Lake. Dickenson County, VA. Center Creek in picnic shelter area. Pike County, KY.
Naturalized from Europe.

Monarda clinopodia L. #306, 376, 705
Laurel Lake Trail; trail along Grassy Creek; Rattlesnake Trail, NW-facing, community of tulip-poplar, spicebush, sugar maple; Camp Branch Trail. Dickenson County, VA.

*_Perilla frutescens_ (L.) Britton. #539
Trail from State Hwy 80 to railroad trestle and Potters Flats. Pike County, KY.
Naturalized from India.

Prunella vulgaris L. #382, 446
Center Creek at Center Creek Trailhead. Pike County, KY. Head of Cold Spring Trail. Dickenson County, VA.

Pycnanthemum incanum (L.) Michx. #390
Grassy opening in woods off road to stables. Dickenson County, VA.

Salvia lyrata L. #154, 170, 279
Pine Mountain Trail, NE-facing slope, community of hemlock, tulip-poplar, sugar maple, redbud; Russell Fork at the river access. Pike County, KY.

Scutellaria elliptica Muhl. #684
Mountain Bike Trail - Ladies' Loop, in low, wet area, NE-facing slope, community of sugar maple, tulip-poplar, red maple. Dickenson County, VA.

*_Scutellaria lateriflora_ L. #445, 515
Vicinity of horse stables; Laurel Lake. Dickenson County, VA.
Naturalized from Eurasia.

Stachys cordata Riddell. #709
Garden Hole along Russell Fork. Dickenson County, VA.

Teucrium canadense L. #384
Russell Fork River at river access. Pike County, KY.

Lauraceae

Lindera benzoin (L.) Blume. #23
Ridge and Geological Trails. Dickenson County, VA.

Sassafras albidum (Nutt.) Nees.
Pinnacle Rock parking area. Dickenson County, VA. Ken Markley, 24 May 1986. VPI.

Linaceae

Linum virginianum L. #251b
Steep, wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Magnoliaceae

Liriodendron tulipifera L.
East boundary of Breaks State Park; small tree in sandy cove. Dickenson County, VA. R. Kral #12663, 14 June 1961. VPI.

Magnolia acuminata (L.) L. #533, 627
Trail from State Hwy 80 to Pine Mountain Trail. Pike County, KY. Along road and woodland edge near park naturalist's house. Dickenson County, VA.

Magnolia fraseri Walter. #131
Tower Tunnel Trail, ridgetop community of mountain laurel, Virginia pine, magnolia sp., witch hazel, maple sp. Dickenson County, VA.

Magnolia tripetala L. #89, 337, 701
Garden Hole Trail, N-facing slope; Laurel Lake Trail; Grassy Creek Trail; Rattlesnake Trail, community of sugar maple, white oak, hickory spp. Dickenson County, VA.

Monotropaceae

Monotropa hypopithys L.
Park naturalist's residence in maintenance area, 50 feet northwest from front porch of house, rich dry woods above rock wall. Dickenson County, VA. Kenneth Markley & Michael Newsome, 4 July 1989. VPI.

Monotropa uniflora L. #751
Old home site off Potter's Flats trail, N-facing, community of tulip-poplar, cherry, hickory spp. Pike County, KY.

!*Monotropis odorata* Schwein. ex Elliott
Prospector's Trail, 200 yards south of State Line Overlook; base of cliff along Prospector's Trail. Dickenson County, VA. Doug Ogle. Date unknown. VPI. S3 Status.

Moraceae

Morus rubra L. # 528, 735
Potters Flats; river access. Pike County, KY.

Nyssaceae

Nyssa sylvatica Marshall. # 531, 731
Pine Mountain Trail. Pike County, KY; Trail to Clinchfield Overlook. Dickenson County, VA.

Oleaceae

Chionanthus virginicus L.
Along Russell Fork, downstream 250 ft from drop off at River Trail. Dickenson County, VA. Doug Ogle, 16 May 1987. VPI.

**Forsythia viridissima* Lindl. #4, 564
Beaver Pond; near park entrance. Dickenson County, VA.
Eurasian.

Fraxinus americana L. #583
Along road and woodland edge near park naturalist's house. Dickenson County, VA.

Fraxinus pennsylvanica Marshall. #703, 884
Wet, seepy area off Rattlesnake Trail. Dickenson County, VA. Along west side of Russell Fork, boulder/rock shelter habitat. Pike County, KY.

**Ligustrum sinense* Lour. #17, 234, 437
Near lodge and picnic shelters; Beaver Pond; Dickenson, County, VA. Steep, wooded hillside between State Hwy 80 and railroad trestle; along Center Creek in picnic shelter area. Pike County, KY.
Native of China.

Onagraceae

Circaea lutetiana (L.) Asch. & Magnus. #392, 743
Grassy opening in woods off road to stables; Laurel Branch Trail. Dickenson County, VA

Ludwigia alternifolia L. #385
Laurel Lake. Dickenson County, VA.

Ludwigia palustris (L.) Elliott. #591
In Beaver Pond. Dickenson County, VA.

Oenothera fruticosa L. #700, 708, 711
Open field off Rattlesnake Trail; roadside intersection of Garden Hole and State Hwy 80; along Garden Hole road. Dickenson County, VA.

Oenothera parviflora L. #481
Along road parallel to Russell Fork at river access. Pike County, KY.

Orobanchaceae

Conopholis americana (L.) Wallr. #87, 668
Garden Hole Trail, N-facing slope; hemlock woods, along trail leading to horse stables. Dickenson County, VA.

Epifagus virginiana (L.) Barton. #512, 829
Laurel Lake; Camp Branch Trail. Dickenson County, VA.

Oxalidaceae

Oxalis grandis Small. #163
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Oxalis stricta L. #106, 305
Parking lot and steps at overlook off State Hwy 80. Pike County, KY. Laurel Lake Trail. Dickenson County, VA.

Papaveraceae

Sanguinaria canadensis L. # 117, 629, 873
Garden Hole hillside; Mountain Bike Trail. Dickenson County, VA.

Phrymaceae

Phryma leptostachya L. #748
Laurel Branch Trail. Dickenson County, VA.

Phytolaccaceae

Phytolacca americana L. #404
Low spot in open woods off gravel road to stables. Dickenson County, VA.

Plantaginaceae

**Plantago lanceolata* L. #298
Center Creek in picnic area. Pike County, KY.
Naturalized from Eurasia.

Plantago rugelii Decne. #428
Rocky banks and boulder substrate of Camp Branch. Dickenson County, VA.

Plantago virginica L.
Grassy woods border southwest of Rt. 702 between Tower Tunnel Overlook parking lot and Shelter No. 2. Dickenson County, VA. Kenneth T. Markley, 22 May 1986. VPI.

Polemoniaceae

Phlox glaberrima L. #549
Grassy Creek Trail leading to Russell Fork River. Dickenson County, VA.

Phlox maculata L. #419, 770
Along Russell Fork near mouth of Camp Branch. Dickenson County, VA. Potter's Flats along Russell Fork. Pike County, KY.

Phlox stolonifera Sims. #97
Along Camp Branch south of Garden Hole Rd. Dickenson County, VA.

Polygonaceae

**Polygonum caespitosum* Blume. #454, 508, 778
Road by horse stables; along trail in Garden Hole. Dickenson County, VA. Along Russell Fork. Pike County, KY.
Naturalized from Asia.

**Polygonum cuspidatum* Siebold & Zucc. #242, 354, 413
Along State Hwy 80 roadside at pulloff; along Russell Fork streambank at river access. Pike County, KY. Confluence of Grassy Creek and Russell Fork River. Pike County, KY and Dickenson County, VA.
From East Asia.

**Polygonum persicaria* L. #849
Old road at Lover's Leap Overlook, open area with road cut. Dickenson County, VA.
Naturalized from Europe.

Polygonum punctatum Elliott. #544, 815
Potters Flats. Pike County, KY. Camp Branch floodplain. Dickenson County, VA.

Polygonum sagittatum L. #494
Beaver Pond. Dickenson County, VA.

Polygonum scandens L. #556
State Hwy 80 roadside at head of trail leading down to railroad trestle. Pike County, KY.

Polygonum virginianum L. #460, 469, 501
Along road by horse stables; trail between park road and swimming pool; along trail in Garden Hole. Dickenson County, VA.

**Rumex acetosella* L. #697
Open field off Rattlesnake Trail. Dickenson County, VA.
Naturalized from Eurasia.

**Rumex crispus* L. #293
Center Creek in picnic area. Pike County, KY.
Naturalized from Europe.

**Rumex obtusifolius* L. #283, 625
Along Russell Fork at the river access. Pike County, KY. Next to horse stables. Dickenson County, VA.
Naturalized from Europe.

Portulacaceae

Claytonia caroliniana Michx. #55, 91, 630
Garden Hole hillside; Prospector's Trail; trail in Garden Hole, N-facing slope. Dickenson County, VA.

Primulaceae

**Lysimachia nummularia* L. #496
Beaver Pond. Dickenson County, VA.
Naturalized from Europe.

Lysimachia tonsa (Alph. Wood) R.Knuth. #350, 746
Pine Mountain Trail, west-facing slope, community of sugar maple, hickory sp., hemlock, flowering dogwood, white oak. Pike County, KY. Rocky hillside near parking area for Geological Trail. Dickenson County, VA.

Pyrolaceae

Chimaphila maculata (L.) Pursh. #178, 693
Path leading up hillside to water tank, S-facing slope, community of hemlock, sourwood, rhododendron, red maple; Rattlesnake Trail, N-facing, community of hemlock, spicebush, sourwood, sugar maple. Dickenson County, VA.

Ranunculaceae

Actaea pachypoda Elliott. #115, 545
Prospector's Trail; Grassy Creek Trail leading to Russell Fork. Dickenson County, VA.

Anemone quinquefolia L. #85, 116, 661
Garden Hole Trail, N-facing slope. Dickenson County, VA. Pine Mountain Trail, NE-facing, with hemlock and red maple. Pike County, KY.

Anemone virginiana L. #280, 373, 395
Along Russell Fork at the river access. Pike County, KY. Along State Hwy 80 roadside on east side of park; along gravel road next to Beaver Pond. Dickenson County, VA.

Anemonella thalictroides (L.) Spach. #38, 631
Garden Hole hillside. Dickenson County, VA.

Aquilegia canadensis L.
One mile up river from Garden Hole, damp shaley cliff. Dickenson County, VA. Ken Markley, 30 April 1986. VPI.

Cimicifuga racemosa (L.) Nutt. #366, 503
In woods off park road leading to swimming pool; along trail in Garden Hole. Dickenson County, VA.

Clematis virginiana L. #447
Laurel Lake at dam. Dickenson County, VA.

Delphinium tricorne Michx. #111
Garden Hole. Dickenson County, VA.

Hepatica acutiloba DC. #634
Garden Hole, on hillside, near river, and along trail parallel to river. Dickenson County, VA.

!*Hydrastis canadensis* L. #73, 658
Garden Hole. Dickenson County, VA. Pine Mountain Trail, semi-open, N-facing, with tulip-poplar, honeysuckle spp., spicebush. Pike County, KY. S3 Status.

Ranunculus abortivus L. #99, 155
Camp Branch south of Garden Hole Rd. Dickenson County, VA. Pine Mountain Trail, NE-facing slope, community of hemlock, tulip-poplar, sugar maple, redbud. Pike County, KY.

**Ranunculus bulbosus* L. #307, 669
Laurel Lake Trail; in vicinity of horse stables. Dickenson County, VA.
Naturalized from Europe.

Ranunculus hispidus Michx. #50, 54, 647
Roadside along entrance road; State Hwy 80 roadside between park entrance and Garden Hole; Garden Hole, roadside on hillslope. Dickenson County, VA.

Ranunculus recurvatus Poir. #77, 81
Trail in Garden Hole, N-facing slope. Dickenson County, VA.

Thalictrum dioicum L.
Garden Hole. Dickenson County, VA. Kenneth T. Markley. Date unknown. VPI.

Trautvetteria caroliniensis (Walter) Vail. #720, 764, 882
Along Grassy Creek. Dickenson County, VA. Potter's Flats along Russell Fork. Along west side of Russell Fork, boulder/rock shelter habitat. Pike County, KY.

Rhamnaceae

Rhamnus caroliniana Walter
Breaks Interstate Park. Dickenson County, VA. James L. Childress, 11 July 1988. VPI.

Rosaceae

Agrimonia parviflora Aiton. #461
Along road by horse stables. Dickenson County, VA.

Agrimonia pubescens Wallr. #439
Along Garden Hole Road. Dickenson County, VA.

Agrimonia rostellata Wallr. #759
Mesic woods near cottage and rooms, SW-facing, with hemlock, beech, sugar maple. Dickenson County, VA.

Amelanchier arborea (F. Michx.) Fernald. #25, 315, 664
Lover's Leap, West-facing; Laurel Lake Trail. Dickenson County, VA.; Pine Mountain ridgetop, in opening along trail/ATV road. Pike County, KY.

Fragaria virginiana Duchesne.
Beaver Pond, open field above lake. Dickenson County, VA. Ken Markley, 29 April 1986. VPI.

Geum canadense Jacq. #394, 739
Along dirt/gravel road intersection, past stables. Dickenson County, VA. River access. Pike County, KY.

**Malus pumila* Mill. #582
Along Beaver Pond. Dickenson County, VA.
Cultivar from Eurasia.

Physocarpus opulifolius (L.) Maxim.
Railroad tracks near State Line Tunnel along Russell Fork River. Dickenson County, VA. D.W. Ogle, 23 May 1981. VPI.

Potentilla canadensis L. #120
Prospector's Trail, community of red maple, hickory sp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut. Dickenson County, VA.

Potentilla simplex Michx. #156, 304
Potter's Flats, somewhat bottomland, community of Virginia pine, sweetgum, tulip-poplar, sycamore, red maple. Pike County, KY. Laurel Lake Trail. Dickenson County, VA.

Prunus americana Marshall. #597
Along Beaver Pond. Dickenson County, VA.

Prunus angustifolia Marshall. #878
Trail past stables and near intersection of trails. Dickenson County, VA.

Prunus mexicana S.Watson. #206
Bottomland, open area along old road, past stables, with black walnut and tulip-poplar. Dickenson County, VA.

Prunus serotina Ehrh. #532
Trail from KY 80 to railroad trestle and Potters Flats. Pike County, KY.

Rosa carolina L. #189
River Trail, W-facing, community of northern red oak, chestnut oak, pignut hickory, redbud, sugar maple. Dickenson County, VA.

**Rosa multiflora* Thunb. #142
ATV trail off railroad tracks leading to Pine Mountain Trail, open, young-growth woods dominated by black walnut and *Rosa* spp. Pike County, KY.
Naturalized from Asia.

Rubus allegheniensis Porter
Behind visitor center. Dickenson County, VA. Ken Markley, 4 May 1986. VPI.

Rubus flagellaris Willd. #162
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Rubus odoratus L. #749, 859
Garden Hole along Russell Fork. Dickenson County, VA.

Rubus occidentalis L.
Across road from bathhouse C in campground, at wood's edge. Dickenson County, VA. Ken Markley, 26 June 1986. VPI.

Rubus pensilvanicus Poir. #143
Open area along ATV trail leading to Pine Mountain Trail, bordered by young growth of *Rubus* spp., *Rosa* spp., and tulip-poplar seedlings. Pike County, KY.

**Rubus phoenicolasius* Maxim. #184, 246
Disturbed, rock slide area in vicinity of Pine Mountain Trail, E-facing. Dickenson County, VA. On steep, wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.
Naturalized from Asia.

**Spiraea japonica* L.f. #898, 899
Along west side of Russell Fork. Dickenson County, VA.
Naturalized from Japan.

Rubiaceae

Cephalanthus occidentalis L. #257, 789
Along Russell Fork at river access off State Hwy 80. Pike County, KY. Russell Fork/Grassy Creek confluence, along shore. Dickenson County, VA.

Diodia teres Walter. #415
Along Russell Fork streambank at river access off State Hwy 80. Pike County, KY.

Galium latifolium Michx.
Geological Trail near post #24. Dickenson County, VA. Kenneth T. Markley, 27 May 1986. VPI.

Galium triflorum Michx. #574
In drain, upstream from Beaver Pond. Dickenson County, VA.

Houstonia caerulea L. #100
Along Russell Fork at end of Camp Branch Trail. Dickenson County, VA.

Houstonia longifolia Gaertn. #212, 691, 871
Mountain Bike Trail, SE-facing, clearing in forest, community of *Rosa* spp., red maple, spicebush; Mountain Bike Trail in hemlock woods, NW-facing; Prospectors Trail, S-facing. Dickenson County, VA.

Mitchella repens L. #225, 657
Intersection of Grassy Creek Trail and River Trail, on rocks, with witch hazel, red maple, beech. Dickenson County, VA. Pine Mountain Trail, N-facing slope with hemlock and tulip-poplar. Pike County, KY.

Salicaceae

Populus grandidentata Michx.
Breaks Interstate Park on road near State Line and Clinchfield Overlooks. Dickenson County, VA. D.W. Ogle, 29 May 1981. VPI.

Salix caroliniana Michx. #261
Along Russell Fork at river access off State Hwy 80. Pike County, KY.

Santalaceae

Pyrularia pubera Michx.
KY 80, short distance W of KY-VA state line on dry S-facing steep slope above Russell Fork of Big Sandy River. Breaks Interstate Park, Pike County, KY. Elizabeth M. Browne and Edward T. Brown, Jr. #8450, 21 May 1964. EKY.

Saxifragaceae

Heuchera americana L. #119, 158, 683
Prospector's Trail, community of rhododendron, witch hazel, striped maple, chestnut oak, northern red oak. Dickenson County, VA. Pine Mountain Trail, NE-facing, community of sugar maple, magnolia sp., white ash, spicebush; Potter's Flats, next to railroad. Pike County, KY.

Heuchera parviflora Bartl. #472, 785
Grassy Creek Trail, NW-facing, community of hemlock, rhododendron, red maple. Dickenson County, VA.

Mitella diphylla L. #51, 52
Prospector's Trail near Laurel Branch Trail. Dickenson County, VA.

Penthorum sedoides L. #576
Along Beaver Pond. Dickenson County, VA.

!*Saxifraga caroliniana* A.Gray. #92, 114
Garden Hole Trail, N-facing slope. Dickenson County, VA. S3 Status.

Tiarella cordifolia L. #35, 36, 78
Garden Hole. Dickenson County, VA.

Scrophulariaceae

Aureolaria laevigata (Raf.) Raf. #465, 514
Along road by campground store; along Laurel Lake. Dickenson County, VA.

Melampyrum lineare var. *pectinatum* (Pennell) Fernald
Second curve area below Clinchfield Overlook, 20 feet from road, very sandy soil under *Pinus virginiana*. Dickenson County, VA. Ken Markley, 29 September 1987. VPI.

Mimulus ringens L. #383
Along Russell Fork at river access off State Hwy 80. Pike County, KY.

Pedicularis canadensis L. #33, 96
Along Laurel Branch Trail; head of Camp Branch Trail. Dickenson County, VA.

Penstemon canescens (Britton) Britton. #165
Garden Hole roadside, S-facing slope, community of red maple, beech, redbud, buckeye, northern red oak. Dickenson County, VA.

**Verbascum thapsus* L. #274, 381
Along Russell Fork at river access off State Hwy 80; along Center Creek at Center Creek Trail head. Pike County, KY.
Naturalized from Europe.

**Veronica agrestis* L. #24
Along Camp Branch, south of Garden Hole Road. Dickenson County, VA.

**Veronica officinalis* L.
KY 80, short distance W of KY-VA state line on dry S-facing steep slope above Russell Fork of Big Sandy River. Breaks Interstate Park. Pike County, KY. Elizabeth M. Browne and Edward T. Brown, Jr. #8455, 21 May 1964. EKY.
Naturalized from Europe.

**Veronica serpyllifolia* L. #169
Garden Hole roadside, S-facing slope, community of red maple, beech, redbud, buckeye, northern red oak. Dickenson County, VA.
Naturalized from Europe.

Simaroubaceae

**Ailanthus altissima* (Mill.) Swingle. #355, 854
Pine Mountain Trail, N-facing, community of sugar maple, tulip-poplar, hemlock; Potter's Flats, thick undergrowth in woods of tulip-poplar, pawpaw, red maple. Pike County, KY.
Cultivated from eastern Asia and widely escaping.

Solanaceae

Solanum carolinense L. #218, 586
Confluence of Grassy Creek and Russell Fork, on sandy shore; along gravel road, towards stables. Dickenson County, VA.

Tiliaceae

Tilia americana L. #128, 755
Tower Tunnel Trail, ridgetop community of mountain laurel, Virginia pine, magnolia sp., witch hazel, maple sp. Dickenson County, VA. Pine Mountain Trail, NE-facing, upland forest of red maple, scarlet oak, sugar maple. Pike County, KY.

Ulmaceae

Ulmus americana L. #256
Along Russell Fork at river access off State Hwy 80. Pike County, KY.

Urticaceae

Boehmeria cylindrica (L.) Sw. #405
Low spot in open woods off gravel road to stables. Dickenson County, VA.

Laportea canadensis (L.) Wedd. #362
Pine Mountain Trail, N-facing, community of tulip-poplar, rhododendron, hemlock. Pike County, KY.

Pilea pumila (L.) A.Gray. #450
Along road by horse stables, Dickenson County, VA.

Valerianaceae

Valerianella umbilicata (Sull.) Alph. Wood. #164
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Verbenaceae

Verbena urticifolia L. #353
Pine Mountain Trail, W-facing slope, community of sugar maple, hickory sp., hemlock, flowering dogwood, white oak. Pike County, KY.

Violaceae

Viola blanda Willd. #660
Pine Mountain Trail, NE-facing, with hemlock and red maple. Pike County, KY.

Viola canadensis L. #59, 60, 651
Laural Lake Trail; Garden hole, on W-facing upper slope with hemlock and maple sp. Dickenson County, VA.

Viola hastata Michx. #45, 641, 877
Prospectors Trail, W-facing upland hillside, with rhododendron sp., tulip-poplar community; Rattlesnake Trail, NE-facing, community of hemlock, American holly, beech. Dickenson County, VA.

Viola palmata L.
Hollow above lake No. 2. Dickenson County, VA. Ken Markley, 29 April 1986. VPI.

Viola pubescens Aiton. #76, 637
Garden Hole hillside. Dickenson County, VA.

Viola rostrata Pursh. #648, 876
Garden Hole, roadside hillslope; Rattlesnake Trail, NE-facing, community of hemlock, American holly, beech. Dickenson County, VA.

Viola sororia Willd. #34, 663
Laurel Lake Trail. Dickenson County, VA. Pine Mountain ridgetop, in powerline right-of-way, open/shrubby habitat. Pike County, KY.

Viscaceae
Phoradendron leucarpum (Raf.) Reveal & M.C. Johnst. #66
In chestnut oak at parking lot of Loop Trail. Dickenson County, VA.

Vitaceae
Vitis cinerea (Engelm. in A.Gray) Engelm. ex Millardet. #233, 289
Along State Hwy 80 roadside at pulloff; Center Creek picnic area. Pike County, KY.

Vitis rotundifolia Michx. #243, 314, 885
Along State Hwy 80 roadside at pulloff; along west side of Russell Fork, boulder / rock shelter habitat. Pike County, KY. Laurel Lake Trail. Dickenson County, VA.

Vitis vulpina L. #197, 570
Stables vicinity; along Beaver Pond. Dickenson County, VA.

Monocotyledonae

Alismataceae
Alisma subcordatum Raf. #782
In Center Creek, open area with scattered black locust, sycamore, tulip-poplar. Pike County, KY.

Araceae
Arisaema triphyllum subsp. *triphyllum* (L.) Schott. #71, 88
Garden Hole Trail, N-facing slope. Dickenson County, VA.

Commelinaceae
**Commelina communis* L. #352, 396
Pine Mountain Trail, W-facing slope, community of sugar maple, hickory spp., hemlock, flowering dogwood, white oak. Pike County, KY. At stable buildings. Dickenson County, VA.
Naturalized from Asia.

*_Commelina diffusa_ Burm.f. #359
Pine Mountain Trail. Pike County, KY.
Naturalized from Old World.

Convallariaceae

Maianthemum racemosum (L.) Link. #113, 375
Garden Hole; trail along Grassy Creek. Dickenson County, VA.

Polygonatum biflorum (Walter) Elliott. #110, 655
Garden Hole. Dickenson County, VA. Pine Mountain Trail, NE-facing upland hillside, canopy of tulip-poplar, hemlock, sugar maple. Pike County, KY.

Cyperaceae

Carex albicans Willd. ex Spreng. #642
Prospectors Trail, on rock at base of sandstone outcrop, W-facing upland community of red oak, walnut, red maple. Dickenson County, VA.

Carex atlantica L.H.Bailey. #308, 340
Laurel Lake Trail. Dickenson County, VA.

Carex baileyi Britton. #172, 271
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA. Along Russell Fork at river access off State Hwy 80. Pike County, KY.

Carex cephalophora Muhl. ex Willd. #26, 689
Mountain Bike Trail, ridgetop community of chestnut oak, red maple, sassafras, blackgum, sourwood, hemlock. Dickenson County, VA.

Carex crinita Lam. #674
Along Center Creek at picnic shelter area off State Hwy 80. Pike County, KY.

Carex gracillima Schwein. #175
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Carex intumescens Rudge. #343, 411, 702
Laurel Lake Trail; wet, seepy area off Rattlesnake Trail. Dickenson County, VA. Along Russell Fork and road parallel to river at river access off State Hwy 80. Pike County, KY.

Carex lurida Wahlenb. #333, 728
Laurel Lake Trail; Beaver Pond. Dickenson County, VA.

Carex plantaginea Lam. #638
Garden Hole, near Russell Fork. Dickenson County, VA.

Carex prasina Wahlenb. #94
Wetland area south of Garden Hole Road. Dickenson County, VA.

Carex rosea Schkuhr ex Willd. #204, 241, 685
Mountain Bike Trail, NE-facing, cove community dominated by spicebush; Mountain Bike Trail - Ladies' Loop, NE-facing slope, in wet area, community of sugar maple, tulip-poplar red maple. Dickenson County, VA. Steep, wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Carex scabrata Schwein. #173
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Carex sparganioides Muhl. ex Willd. #174
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Carex stipata Muhl. ex Willd. #313
Laurel Lake Trail. Dickenson County, VA.

Carex tribuloides Wahlenb. #723
Beaver Pond. Dickenson County, VA.

Carex vulpinoidea Michx. #331, 726, 897
Laurel Lake Trail; Beaver Pond. Dickenson County, VA. Along west side of Russell Fork. Pike County, KY.

Cyperus esculentus L. #547
Grassy Creek Trail. Dickenson County, VA.

Cyperus flavescens L. #455, 835
Along road by horse stables. Dickenson County, VA. Along Center Creek streambank near parking lot. Pike County, KY.

Cyperus lancastriensis Porter. #621, 740
Dry hillside by stables. Dickenson County, VA. Russell Fork at river access off State Hwy 80. Pike County, KY.

Cyperus strigosus L. #448, 451
Along Laurel Lake by pedalboat dock; Beaver Pond. Dickenson County, VA.

Eleocharis obtusa (Willd.) Schult.
Potter's Flats, Russell Fork River ford. Pike County, KY. Ken Markley, 3 July 1986. VPI.

**Kyllinga gracillima* Miq. #809, 837
Laurel Lake. Dickenson County, VA. Along Center Creek streambank near parking lot. Pike County, KY.
Naturalized from Asia.

Scirpus cyperinus (L.) Kunth. #518
Along Laurel Lake. Dickenson County, VA.

Scirpus polyphyllus Vahl. #410, 522, 742
Along Russell Fork at river access off State Hwy 80. Pike County, KY. Along Camp Branch; Beaver Pond; seepy area near Cold Spring trailhead. Dickenson County, VA.

Dioscoreaceae

Dioscorea villosa L. #129, 148
Prospector's Trail, community of red maple, hickory spp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut. Dickenson County, VA. Pine Mountain Trail, NE-facing, community of sugar maple, magnolia spp., white ash, spicebush. Pike County, KY.

Hemerocallidaceae

**Hemerocallis fulva* (L.) L. #232
Steep, wooded hillside between State Hwy 80 roadside and railroad trestle. Pike County, KY.
From Eurasia.

Hypoxidaceae

Hypoxis hirsuta (L.) Coville. #176, 681, 688
Old road/powerline, near picnic shelter #4, S-facing, community of sourwood, scarlet oak, red maple, beech; Mountain Bike Trail - Ladies' Loop, NE-facing slope, wet area, community of sugar maple, tulip-poplar, red maple. Dickenson County, VA. Potter's Flats, along Russell Fork, with abundant young sycamore and Japanese knotweed. Pike County, KY.

Iridaceae

Iris cristata Soland. ex Aiton. #84, 656
Garden Hole Trail, N-facing slope. Dickenson County, VA. Pine Mountain Trail, N-facing slope with hemlock and tulip-poplar. Pike County, KY.

Sisyrinchium angustifolium Mill. #159
Pine Mountain Trail, NE-facing, community of tulip-poplar, beech, pawpaw, redbud. Pike County, KY.

Juncaceae

Juncus acuminatus Michx. #309, 593
Laurel Lake Trail; in drain, upstream from Beaver Pond. Dickenson County, VA.

Juncus coriaceus Mack. #593b, 712
Along Beaver Pond; west bank of Russell Fork, near Towers Tunnel, community of black locust, sycamore, *Cornus amomum*. Dickenson County, VA.

Juncus diffusissimus Buckley
Potter's Flats, along Russell Fork, upstream of ford. Dickenson County, VA. Ken Markley, 3 July 1986. VPI.

Juncus effusus L. #266, 325
Along Russell Fork at the river access off State Hwy 80. Pike County, KY. Laurel Lake Trail. Dickenson County, VA.

Juncus marginatus Rostk.
Small, springy seepage area along jeep trail up Falls Branch, 1 mile NE of Bartlick, VA. Dickenson County, VA. Thomas F. Wieboldt #4497, 25 August 1982. VPI.

Juncus tenuis Willd. #237, 686
Steep wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY. Mountain Bike Trail - Ladies' Loop, NE-facing slope, wet area, community of sugar maple, tulip-poplar, red maple. Dickenson County, VA.

Luzula acuminata Raf. #12, 72
At rock wall along park entrance road. Dickenson County, VA.

Liliaceae

Clintonia umbellulata (Michx.) Morong.
Laurel Branch Trail between Nature Drive and Cold Spring Trail. Dickenson County, VA. Ken Markley, 27 May 1986. VPI.

Erythronium americanum Ker Gawl. #632
Garden Hole hillside. Dickenson County, VA.

Medeola virginiana L. #166
Camp Branch floodplain, community of tulip-poplar, yellow buckeye, pawpaw, spicebush, American hornbeam. Dickenson County, VA.

Melanthiaceae

Chamaelirium luteum (L.) A.Gray
Rt. 787, Nature Drive, 150 feet south of bridge. Dickenson County, VA. Ken Markley, 27 May 1986. VPI.

Orchidaceae

Aplectrum hyemale (Muhl. Es Willd.) Torr.
Woods between shelter No. 4 and maintenance area. Dickenson County, VA. Ken Markley, 27 May 1986. VPI.

Cleistes bifaria (Fernald) Catling & Gregg
North end of Pool Point trestle on railroad right-of-way, growing in grassy area on south side of railroad. Pike County, KY. D.W. Ogle, 20 June 1983. VPI.

Cypripedium acaule Aiton. #667, photographic documentation
Just off Mountain Bike Trail in hemlock stand. Dickenson County, VA.

Cypripedium parviflorum var. pubescens (Willd.) O.W.Knight. #665, photographic documentation
Mountain Bike Trail in young woods with flowering dogwood, spicebush, red maple, tulip-poplar. Dickenson County, VA.

Galearis spectabilis (L.) Raf. #27, photographic documentation
Along Camp Branch in bottomland area, across road from Camp Branch trailhead. Dickenson County, VA.

Goodyera repens (L.) R.Br. #443
Laurel Branch Trail, community of rhododendron, sweet birch, and hemlock. Dickenson County, VA.

Liparis liliifolia (L.) Rich. Ex Lindl.
About 100 feet southeast of Tunnel Overlook parking area, at wood's edge. Dickenson County, VA. Ken Markley, 24 May 1986. VPI.

Platanthera clavellata (Michx.) Luer. #760, photographic documentation
Loop Trail, semi-open wetland in woods, adjacent to spring-fed stream, with white oak and hemlock. Dickenson County, VA.

Spiranthes cernua (L.) Rich.
Loop Trail behind shelter No. 2. Dickenson County, VA. Ken Markley, 6 October 1986. VPI.

!*Spiranthes lucida* (H.H.Eaton) Ames. #717, photographic documentation
Along Russell Fork near mouth of Camp Branch. Dickenson County, VA. S1 Status.

Spiranthes ovalis Lindl. #839, photographic documentation
At edge of woods on small hillside next to paved road and single-story lodge. Dickenson County, VA.

Tipularia discolor (Pursh) Nutt. #444, 756
SW-facing mesic woods near cottage and rooms, just off sidewalk near rock wall, with hemlock, beech, sugar maple. Dickenson County, VA.

!*Triphora trianthophora* (Sw.) Rydb. #853, photographic documentation
At edge of flat, open, hemlock woods, next to parking lot and sidewalk, across road from Visitor Center. Dickenson County, VA. S1 Status.

Poaceae

**Agrostis gigantea* Roth.
Potter's Flats near lane. Dickenson County, VA. Ken Markley. 3 July 1986. VPI.
Naturalized from Europe.

Andropogon gerardii Vitman. #546, 776, 797
Grassy Creek Trail leading to Russell Fork; River Trail. Dickenson County, VA. Along Russell Fork. Pike County, KY.

**Anthoxanthum odoratum* L. #201
Bottomland, open area along old road past stables, with black walnut and tulip-poplar. Dickenson County, VA.
Naturalized from Europe.

**Arthraxon hispidus* (Thunb.) Makino. #555, 833
Grassy Creek Trail leading to Russell Fork. Dickenson County, VA. Along Center Creek streambank near parking lot. Pike County, KY.
Naturalized from Asia.

**Avena sativa* L. #193, 406
Stables vicinity; low spot in open woods off gravel road to stables. Dickenson County, VA.
Introduced from Europe.

**Bromus commutatus* Schrad. #229
Steep, wooded hillside between State Hwy 80 and railroad trestle over river. Pike County, KY.
Naturalized from Europe.

**Bromus hordaeceus* L. #152
E-facing disturbed, rock slide area off Pine Mountain Trail. Dickenson County, VA.
Adventive from Europe.

Chasmanthium latifolium (Michx.) H.O.Yates. #774
Along Russell Fork. Pike County, KY.

Cinna arundinacea L. #565, 579, 821
Along Beaver Pond; Camp Branch floodplain. Dickenson County, VA.

**Dactylis glomerata* L. #150, 230, 619
Disturbed, rock slide area off Pine Mountain Trail, E-facing; by horse stables. Dickenson County, VA. Steep, wooded hillside between State Hwy 80 pulloff and railroad trestle. Pike County, KY.
Naturalized from Europe.

Danthonia spicata (L.) P.Beauv. #238, 247
Steep wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Dichanthelium clandestinum (L.) Gould. #303, 322, 690
Center Creek in picnic area. Pike County, KY. Laurel Lake Trail; Mountain Bike Trail. Dickenson County, VA.

Dichanthelium commutatum (Schult.) Gould. #203, 680
Mountain Bike Trail, SE-facing clearing in forest, community of *Rosa* spp., red maple, spicebush. Dickenson County, VA. Potter's Flats, along Russell Fork. Pike County, KY.

Dichanthelium dichotomum (L.) Gould. #323, 595
Laurel Lake Trail; along Beaver Pond. Dickenson County, VA.

Dichanthelium linearifolium (Scribn.) Gould.
Dry banks on dirt road. Potter's Flats in Breaks Interstate Park. Pike County, KY.
Raymond Athey #4630, 1 July 1982. EKY.

Dichanthelium polyanthes (Schult.) Mohlenbr. #249
Steep wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Dichanthelium sphaerocarpon (Elliott) Gould. #153
Disturbed, rock slide area off Pine Mountain Trail, E-facing. Dickenson County, VA.

Dichanthelium villosissimum (Nash) Freckmann. #248, 249c
On wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

**Digitaria ischaemum* (Schreb.) Schreb. ex Muhl. #622
Dry hillside by stables. Dickenson County, VA.
Naturalized from Eurasia.

**Echinochloa crus-galli* (L.) P.Beauv.
Old road from Beaver Pond to open field, 0.5 miles from pond. Dickenson County, VA. Ken Markley, 26 August 1987. VPI.
Naturalized from Europe.

Elymus riparius Wiegand. #483
Along road parallel to Russell Fork at river access off State Hwy 80. Pike County, KY.

**Festuca arundinacea* Schreb. #202, 299
Bottomland, open area along old road past stables with black walnut and tulip-poplar. Dickenson County, VA. Center Creek in picnic area. Pike County, KY.
Naturalized from Europe.

Festuca subverticillata (Pers.) E.B.Alexeev. #182, 216
Gravel path leading to water tank, upland community of hemlock, red maple, scarlet oak; Mountain Bike Trail, ridgetop community of chestnut oak, red maple, sassafras, blackgum, sourwood, hemlock. Dickenson County, VA.

Glyceria striata (Lam.) Hitchc. #272, 578
Along Russell Fork at river access off State Hwy 80. Pike County, KY. Along Beaver Pond. Dickenson County, VA.

**Holcus lanatus* L. #391, 671, 707
Grassy opening in woods off road leading to stables; in vicinity of horse stables; trail intersection past stables. Dickenson County, VA.
Naturalized from Europe.

Leersia oryzoides (L.) Sw. #834
Along Center Creek streambank near parking lot. Pike County, KY.

**Lolium perenne* L.
1978 old strip area/gas well, below Gateway mkt. Dickenson County, VA. Ken Markley, 26 May 1987. VPI.
Naturalized from Europe.

**Microstegium vimineum* (Trin.) A.Camus.
Open, gravelly riverbed along Russell Fork. Dickenson County, VA. Thomas F. Wieboldt #4450, 23 August 1982. VPI.
Naturalized from Asia.

**Miscanthus sinensis* Anderss.
Railroad trestle near State Line Tunnel, along Russell Fork River. Dickenson County, VA. Doug Ogle, 23 May 1981. VPI.
Naturalized from China.

Panicum anceps Michx. #845
Open meadow off Mountain Bike Trail. Dickenson County, VA.

Panicum rigidulum Bosc ex Nees. #519
Along Laurel Lake. Dickenson County, VA.

Paspalum laeve Michx. #836
Along Center Creek streambank near parking lot. Pike County, KY.

Paspalum pubiflorum Rupr. #480
Along road parallel to Russell Fork at river access. Pike County, KY.

Poa alsodes A.Gray. #93
Garden Hole Trail, N-facing slope. Dickenson County, VA.

Poa cuspidata Nutt. #130
Prospector's Trail, community of red maple, hickory spp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut. Dickenson County, VA.

**Poa pratensis* L. #147
Potter's Flats, open area, possibly old homestead, remains of concrete building, community of black walnut, tulip-poplar, *Rosa* spp. Pike County, KY.
Cultivated and naturalized from northern U.S. and Europe.

**Secale cereal* L. #316, 344, 346
Laurel Lake Trail at shelter construction site; Laurel Lake Trail. Dickenson County, VA.
A long-cultivated crop plant.

**Setaria pumila* (Poir.) Roem. & Schult. #567
Bottomland open woods next to gravel road, up from stables. Dickenson County, VA.
Naturalized from Europe.

**Setaria viridis* (L.) P.Beauv. #364
Along railroad tracks running parallel to State Hwy 80 and Russell Fork. Pike County, KY.
Naturalized from Eurasia.

Tridens flavus (L.) Hitchc. #846
Open meadow off Mountain Bike Trail. Dickenson County, VA.

**Triticum aestivum* L. #194
Stables vicinity along grassy road. Dickenson County, VA.
A Eurasian cultigen.

Potamogetonaceae

Potamogeton nodosus Poir. #318, 330, 822
Laurel Lake. Dickenson County, VA.

Potamogeton pusillus L. #347, 348
Laurel Lake. Dickenson County, VA.

Smilacaceae

Smilax glauca Walter. #244
Wooded hillside between State Hwy 80 and railroad trestle. Pike County, KY.

Smilax rotundifolia L. #122, 530, 573
Prospector's Trail, community of red maple, hickory spp., chestnut oak, tulip-poplar, northern red oak, redbud, black walnut; trail around Beaver Pond. Dickenson County, VA. Trail from State Hwy 80 to railroad trestle and Potter's Flats. Pike County, KY.

Trilliaceae

Trillium erectum L. #69
Garden Hole. Dickenson County, VA.

Trillium grandiflorum (Michx.) Salisb. #46, 47, 62
State Hwy 80 roadside between park entrance and Garden Hole; Garden Hole. Dickenson County, VA.

Typhaceae

Sparganium americanum Nutt. #327, 387
Along Laurel Lake. Dickenson County, VA.

Typha latifolia L. #516
Along Laurel Lake. Dickenson County, VA.

Uvulariaceae

Prosartes lanuginosa (Michx.) D.Don.
Garden Hole, rich hollow, near top. Dickenson County, VA. Ken Markley, 30 April 1986. VPI.

!*Prosartes maculata* (Buckley) A.Gray
Cottage compound junction, east wood's edge. Dickenson County, VA. Ken Markley, 14 May 1986. VPI. S3 Status.

Uvularia grandiflora Sm. #101
Along Camp Branch, south of Garden Hole Rd. Dickenson County, VA.

Uvularia perfoliata L. #692
Rattlesnake Trail, N-facing, community of hemlock, spicebush, sourwood, sugar maple. Dickenson County, VA.