

**A NATURAL HERITAGE INVENTORY OF
MID-ATLANTIC REGION NATIONAL PARKS IN VIRGINIA:**

SUMMARY REPORT

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EXECUTIVE SUMMARY

A Natural Heritage Inventory of Mid-Atlantic Region National Parks in Virginia: Summary Report

From 1989 to 1991, the Virginia Department of Conservation and Recreation's Division of Natural Heritage conducted an inventory for "Natural Heritage Resources" in and near eight Mid-Atlantic Region national parks: Appomattox Court House National Historical Park, Booker T. Washington National Monument, Colonial National Historical Park, Fredericksburg and Spotsylvania National Military Park, George Washington Birthplace National Monument, Petersburg National Battlefield, Richmond National Battlefield Park, and Shenandoah National Park. As defined in the Virginia Natural Areas Preserves Act (10.1-209 et seq. of the Code of Virginia), Natural Heritage Resources include "the habitat of rare, threatened, or endangered plant and animal species, rare or state significant natural communities or geologic sites, and similar features of scientific interest". This report presents a brief summary of the inventory methods and results. Detailed findings and recommendations for the protection of natural heritage resources are included in separate reports provided for each of the eight parks.

This inventory was conducted in three steps. First, information was gathered on the landscape, biota, and natural heritage resources known near or within each park unit. Second, an inventory of potential resource areas was conducted to gather data on rare species and significant natural communities. Third, site boundaries and management recommendations were developed to initiate protection of natural heritage resources in and near each park.

During the study period, 225 natural heritage resource occurrences (152 plants, 27 animals, and 46 natural communities) were recorded representing 90 rare species and community types (61 plants, 14 animals, and 15 natural communities). Three species listed as endangered species under state and federal law were recorded during this study. They are: Shenandoah salamander (Plethodon shenandoah) at four sites in Shenandoah National Park; peregrine falcon (Falco peregrinus) at one site in Shenandoah National Park; and bald eagle (Haliaeetus leucocephalus) at one site in George Washington Birthplace National Monument and two sites in Colonial National Historical Park. Northeastern bulrush (Scirpus ancistrochaetus), also a federal and state endangered species, was recorded near the boundary of Shenandoah National Park. Small whorled pogonia (Isotria medeoloides), also a federal and state endangered species, was recorded near the boundary of Colonial National Historical Park. Variable sedge (Carex polymorpha), a category 2 candidate for federal listing and a Virginia endangered species, was found at two Shenandoah National Park locations. Five additional federal candidate plants were recorded during the study: glade spurge (Euphorbia purpurea), Virginia sneezeweed (Helenium virginicum), Canby's mountain-lover (Paxistima canbyi), bog bluegrass (Poa paludigena) and Virginia least trillium (Trillium pusillum var virginianum). Ninety-eight additional element occurrences (59 plants and 39 animals) were recorded previously in or near the parks, but were not found during the study.

The natural heritage resource occurrences which were observed during this survey are contained within 53 sites labeled natural heritage resource areas (39 in Shenandoah National Park, 9 in Colonial National Historical Park, 3 in Fredericksburg and Spotsylvania National Military Park, 1 in Richmond National Battlefield Park, 1 in George Washington Birthplace National Monument.) Site reports are provided in the park reports for each of the 53 areas.

INTRODUCTION

In 1988, Cooperative Agreement 4000-8-8018, between the National Park Service (NPS) and the Commonwealth of Virginia, was developed and signed. The agreement initiated a study by the Virginia Department of Conservation and Recreation, through the Natural Heritage Program (now the Division of Natural Heritage, DNH) to gather data on the locations, and management needs of rare species and significant natural communities in and near Mid-Atlantic Region national park units. The reasons for this study were set forth in the text of the agreement:

- 1) The NPS, by law, is required to conserve scenic, natural, and historic elements for current and future generations.
- 2) The DNH is organized and maintained to assess the status, locations, and condition of certain biological and ecological resources, herein referred to as natural heritage resources.
- 3) DNH and NPS are mutually interested in conducting a survey of the rare species and significant natural communities in Virginia to ensure that critical habitat is not disturbed by NPS development and to guide the parks' land management programs.
- 4) This research will be of value for the planning and management of natural heritage resources under the jurisdiction of the NPS and DNH.

Location of the Study Areas

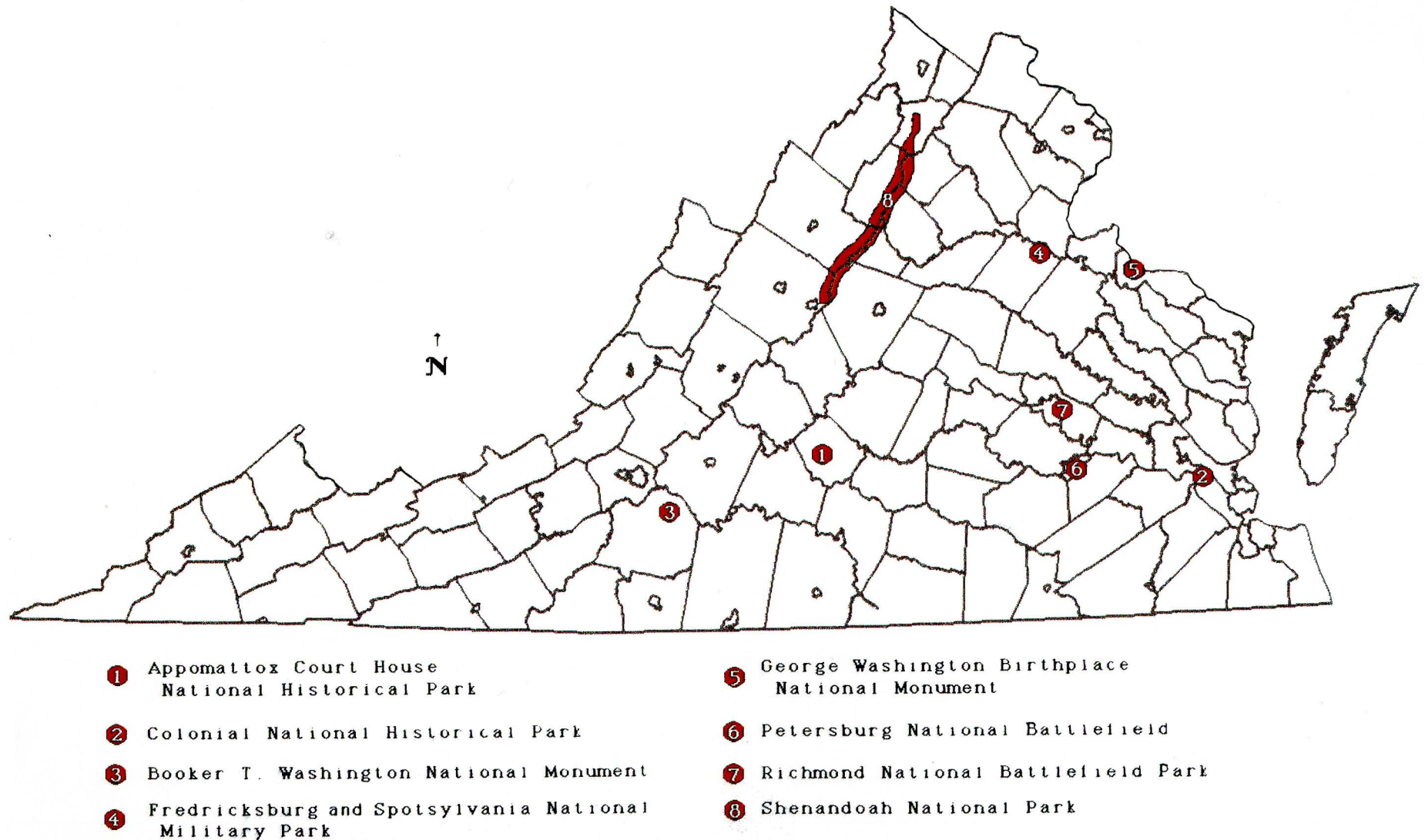
Eight Mid-Atlantic Region national parks, Appomattox Court House National Historical Park, Booker T. Washington National Monument, Colonial National Historical Park, Fredericksburg and Spotsylvania National Military Park, George Washington Birthplace National Monument, Petersburg National Battlefield, Richmond National Battlefield Park, and Shenandoah National Park, were included in this inventory. Figure 1 shows the approximate locations of each park in the Commonwealth.

Three of the national parks in this study are entirely contained within the coastal plain physiographic region of Virginia: Colonial National Historical Park, George Washington Birthplace National Monument, and Richmond National Battlefield Park. Two others, Petersburg National Battlefield and Fredericksburg and Spotsylvania National Military Park, are shared between the coastal plain and piedmont regions. Two of the parks in this study lie entirely in the Piedmont Physiographic Region. These are Appomattox Court House National Historical Park and Booker T. Washington National Monument. The final park, Shenandoah National Park, occupies a large portion of the Northern Virginia Blue Ridge.

Virginia's Natural Heritage Program

The Virginia Natural Area Preserves Act of 1989 (§10.1-209 et seq. of the

Figure 1. INVENTORIED MID-ATLANTIC NATIONAL PARK UNITS IN VIRGINIA



Code of Virginia) directs the Department of Conservation and Recreation to "preserve the natural diversity of biological resources of the Commonwealth." The Act further establishes the Virginia Natural Heritage Program and requires the Department to develop a **natural heritage plan**, produce an **inventory** of the Commonwealth's natural heritage resources, maintain a **natural heritage data bank** of inventory data, and provide for the **protection and stewardship** of natural areas. The Department's Division of Natural Heritage fulfills this mandate. It is the Commonwealth's principal collector and manager of data on natural heritage resources: "the habitat of rare, threatened, or endangered plant and animal species, rare or state significant natural communities or geologic sites, and similar features of scientific interest" (§10.1-209 of the Code of Virginia).

Each of these significant natural features (species, community type, and category of geological feature) is an **element of natural diversity**, or simply an **element**. Each element is assigned a rank that indicates its relative rarity on a five-point scale (1 = extremely rare; 5 = abundant). Appendix 1 provides a summary of the ranking system.

The primary criterion for ranking elements is the number of occurrences, i.e. the number of known distinct localities or populations. Also of great importance is the number of individuals at each locality or, for highly mobile organisms, the total number of individuals. Other considerations include the condition of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of occurrences such that ranks are an index of known biological rarity.

These ranks are assigned both in terms of the element's rarity within Virginia (its State or S-rank) and the element's rarity over its entire range (its Global or G-rank). Taken together, these two ranks give an instant picture of the rarity of the element. Although most species protected under state or federal endangered species laws are extremely rare, not all rare species are listed as Endangered or Threatened and Natural Heritage rarity ranks should not be interpreted as legal designations.

The spot on the landscape that supports a particular population of a specific species or a specific stand of a given community type is an **element occurrence**. The Division of Natural Heritage has mapped over 5500 element occurrences in Virginia. Information on the location and quality of these element occurrences is also entered into the Division's computerized Biological and Conservation Data System (BCD).

STUDY METHODOLOGY

Rare Species Inventory

For purposes of this study, rare species are defined as the rarest known native species in the Commonwealth, and do not include any species with a state heritage rarity rank greater than S3. These species are maintained on a master list of Virginia's rare plants and animals given in Appendix 2. To initiate the inventory of rare species at each Mid-Atlantic Region national park, existing data on rare plant and animal species known to occur in the parks were sought. Data were also collected on rare species which occurred near park boundaries to determine if they might occur within the parks or if those occurrences may be affected by park management policies. The data collection began in winter of 1988 with a review of the DNH data base, which contained preliminary information on a number of rare species occurrences in or near some of the parks.

Additional information was gathered from a number of sources. Appropriate botanical and zoological literature was transcribed from local and regional journals and other applicable sources. Institutions which might have plant and animal collections from the parks or their vicinity were visited including the Virginia Museum of Natural History, Shenandoah National Park, the University of Richmond, the College of William and Mary, the Smithsonian Institution, the National Arboretum, Virginia Highlands Community College, Longwood College, Lynchburg College, Roanoke College, Virginia Polytechnic Institute and State University, the Carnegie Museum, Lord Fairfax Community College, Eastern Mennonite College, and Northern Virginia Community College. Interviews with biologists knowledgeable about the park areas, including Alton Harvill, Gus Hall, Richard Hoffman, Peter Mazzeo, Phil Sheridan, Charles Stevens, Donna Ware, and Robert Wright also provided important data on the biota of the Mid-Atlantic park areas.

Concurrently, information on the park landscapes was gathered through examination of aerial photographs, topographic maps, and soil surveys. These sources were examined to delineate the distribution of rare species habitat and choose sites with a high potential for species occurrences. The data compiled were used to formulate field plans and direct the field investigation.

Field work began in April, 1989 and continued through September, 1991. The habitat of potential rare plant and animal species within the national parks was surveyed during the appropriate season for the target rare species. Ruth Beck, Allen Belden, Kurt Buhlmann, Sandra Erdle, Gary Fleming, Gus Hall, Chris Hobson, Richard Hoffman, Judy Jacobs, Chris Ludwig, Joe Mitchell, John Pagels, Chris Pague, Rick Potts, Sue Ridd, Doug Stannard, Charles Stevens, Phil Stevenson, Donna Ware, Richard Wiegand, William Witt, and Robert Wright were responsible for most of the field work, receiving assistance from several other biologists and natural resource personnel.

During this investigation, field data were recorded for each site which was surveyed. These data included the site location and directions, a site description, and comments on land use, potential hazards, exotic flora and fauna,

and off-site considerations. For rare species which were located, additional data were recorded including species name, the date when the species was found, population boundaries and concentrations within those boundaries, approximate number of individuals, reproductive information, species viability, and habitat factors including moisture, sunlight, and associated species. Data were also collected on any apparent immediate or long-term threats to the rare species occurrence. When possible, photographs were taken or voucher specimens were collected to verify the identity of rare species. The location of deposition for voucher material was decided between Division of Natural Heritage staff and National Park Service Resource personnel on a case by case basis.

Staff scientists ranked each rare species' occurrence so that protection could be aimed not only at the rarest species, but at the best examples of each. In the case of species, an element occurrence was ranked (from A for most exemplary to D for least exemplary) based on four criteria: the **quality** (size, vigor, etc.) of the population, the **condition** or naturalness of the habitat, the long-term **viability** of the population, and the **defensibility** (ease or difficulty of protecting) of the occurrence.

DNH staff used element and element occurrence ranks to assess the overall significance of a site. Based on these ranks, each site is assigned a biodiversity (or B-) rank. An explanation of these ranks is provided in the introduction to the natural heritage resource areas section of this report. The biodiversity ranks are used to prioritize all sites with natural heritage resources described in the park reports.

In early spring of 1990 and 1991, field personnel met with DNH staff to develop field plans. During planning meetings, aerial photographs were re-examined to ensure that those areas most likely to have rare species were checked. During the field investigations, communication between field biologists, other investigators at the national parks, and NPS personnel ensured that new data were shared and that significant rare plant and animal habitats were investigated.

Community Inventory

For purposes of this study, significant communities are defined to include both outstanding examples of common community types (such as an old growth oak forest) and all examples of rare community types (such as a shale barren or granite flatrock). Refer to Appendix 3 for the DNH classification of indigenous biotic communities. Data collection began during the latter part of 1988 with a review of DNH data base, which contained information on a number of significant natural communities occurring in or near the Mid-Atlantic parks. Additional information was gathered from literature sources (e.g. Lipford, 1984; Owerhohle, 1982), and from interviews with botanists and ecologists, namely, Peter Mazzeo, Charles Stevens, Michael Lipford, and Gary Fleming. Aerial photographs, topographic maps, geologic maps, and soils surveys were also examined to identify noteworthy potential natural communities. Rare species locations, which often indicated significant community occurrences, were also used to identify potential community sites.

Field work began in May, 1989 and continued through September, 1991. To maximize efficiency, natural communities were sought in conjunction with the rare species work. Gary Fleming, Richard Wiegand, and Charles Stevens conducted most of the field work, but received assistance from DNH botanists and ecologists, and from park natural resource management personnel.

Site data collected during each field survey were identical to those recorded during species inventory. When a rare or exemplary community was found, additional data were recorded: community name, community boundaries, pertinent biotic and abiotic characteristics, a list of vascular plants, notes on the condition of the occurrence, evidence of disturbance, successional trends, and immediate or long-term threats. As with rare species, community occurrences were also ranked (A for most exemplary to D for least exemplary). Given the intimate relationship between a natural community and its environment, community occurrences were ranked in terms of their quality and their size. Many community occurrences were further documented with photographs.

During early spring of 1990 and 1991 field personnel met with DNH staff to develop plans for the coming field season. Aerial photographs were reexamined and follow-up field visits were prioritized. Throughout each season, the field personnel were in frequent communication with DNH and NPS staff to ensure that new data were shared and new leads were investigated.

STUDY RESULTS

During this three-year study, 225 natural heritage resource element occurrences (152 rare plants, 27 rare animals, and 46 significant natural communities) were observed in and near the eight Mid-Atlantic Region national parks. Ninety-eight other occurrences which were previously recorded in or near the parks were not found during this study. Table 1 provides a complete list of heritage resources, including the resource type, species name, common name, species ranks and status, park unit where found, and number of occurrences within and near the unit. This table also provides information on which occurrences were discovered during this study, which were updates of previously-known locations, and which were not relocated during the study period.

Detailed site-specific information on the natural heritage resource occurrences and recommendations for the protection of those resources is provided in a series of reports specific to each park unit. These reports were provided by DNH to each park as part of this study.

Plant Inventory Results

By the completion of field work, 152 plant element occurrences had been observed in or near park boundaries, representing 61 species. Fifty-nine additional plant element occurrences representing 22 additional species were previously observed, but were not seen during the study period bringing the total plant element occurrences recorded in or near the Mid-Atlantic Region national parks to 211 representing 83 species. Details on significant botanical findings are listed below by species and include all state- and federally-listed plants as well as species considered globally-rare (those ranked G1, G2, or G3 by the Heritage network):

Balsam fir (Abies balsamea): This northern conifer is at or near the southern limit of its global distribution in Shenandoah National Park. The species, unknown elsewhere in Virginia, is found at Hawksbill and Stony Man Mountains.

Bearberry (Arctostaphylos uva-ursi): Virginia's only known, remarkably disjunct population of this circumboreal, creeping ericaceous shrub is located at Millers Head in Shenandoah National Park at about 1036 meters (3400 feet) elevation. Mats of this species occur on a steep, xeric, southwest-facing granodiorite glade, 450 kilometers (280 miles) south of the next southern-most known population of this species, which is in Pennsylvania.

Gray birch (Betula populifolia): This northeastern birch reaches its southern limit of natural distribution in Shenandoah National Park. It is unknown elsewhere in Virginia. A large population occupies a high-elevation complex of old fields and shrub swamps in the Big Meadows area.

Variable sedge (Carex polymorpha): Two stations of this globally-rare, northeastern sedge were discovered in Shenandoah National Park during this study, one at Cool Spring Hollow and the other on Hogback Mountain. The Cool Spring Hollow population at 524 - 548 meters (1720 - 1800 feet) elevation is one of the lowest known in Virginia. The Hogback Mountain site is the only known in

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED
FROM MID-ATLANTIC NATIONAL PARK UNITS

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>PLANTS:</u>						
Abies balsamea	Shenandoah	within unit:	3	1	2	0
balsam fir		near unit:	0	0	0	0
(G5/S1/--/--)*						
Aeschynomene virginica	Colonial	within unit:	1	0	0	1
sensitive joint-vetch		near unit:	1	0	0	1
(G2/S2/LT/C)						
Alnus incana ssp rugosa	Shenandoah	within unit:	5	1	4	0
speckled alder		near unit:	0	0	0	0
(G5T5/S2/--/--)						
Aralia hispida	Shenandoah	within unit:	4	1	0	3
bristly sarsaparilla		near unit:	0	0	0	0
(G5/S2/--/--)						
Arctostaphylos uva-ursi	Shenandoah	within unit:	1	0	1	0
bearberry		near unit:	0	0	0	0
(G5/S1/--/--)						
Asclepias rubra	Fredericksburg	within unit:	2	2	0	0
red milkweed		near unit:	0	0	0	0
(G4/S2S3/--/--)						
Aster radula	Shenandoah	within unit:	1	0	1	0
rough-leaved aster		near unit:	0	0	0	0
(G5/S1/--/--)						
Betula papyrifera	Shenandoah	within unit:	14	2	9	3
paper birch		near unit:	1	0	1	0
(G5/S2/--/--)						
Betula populifolia	Shenandoah	within unit:	3	0	2	1
gray birch		near unit:	0	0	0	0
(G5/S1/--/--)						
Botrychium multifidum	Shenandoah	within unit:	2	0	2	0
leathery grape-fern		near unit:	0	0	0	0
(G5/S1/--/--)						
Botrychium simplex	Shenandoah	within unit:	1	0	0	1
least grape-fern		near unit:	0	0	0	0
(G5/S1/--/--)						
Bromus ciliatus	Shenandoah	within unit:	2	0	1	1
fringed brome		near unit:	0	0	0	0
(G5/S1/--/--)						
Carex buxbaumii	Shenandoah	within unit:	2	0	2	0
brown bog sedge		near unit:	1	1	0	0
(G5/S2/--/--)						
Carex collinsii	Richmond	within unit:	1	1	0	0
Collins' sedge		near unit:	0	0	0	0
(G4/S3/--/--)						
Carex conoidea	Shenandoah	within unit:	2	0	1	1
field sedge		near unit:	0	0	0	0
(G4/S2/--/--)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>PLANTS (CONTINUED):</u>						
Carex interior	Shenandoah	within unit:	2	0	0	2
inland sedge		near unit:	0	0	0	0
(G5/S1/--/--)						
Carex leptoneurvia	Shenandoah	within unit:	1	1	0	0
finely-nerved sedge		near unit:	0	0	0	0
(G4/S2/--/--)						
Carex lupuliformis	Colonial	within unit:	0	0	0	0
false hop sedge		near unit:	1	1	0	0
(G3G4Q/S1/--/--)						
Carex polymorpha	Shenandoah	within unit:	2	2	0	0
variable sedge		near unit:	0	0	0	0
(G2/S2/C2/LE)						
Carex suberecta	Shenandoah	within unit:	1	0	0	1
prairie straw sedge		near unit:	0	0	0	0
(G4/S2/--/--)						
Cenchrus carolinianus	Colonial	within unit:	0	0	0	0
coast sandbur		near unit:	1	0	0	1
(G5/S1/--/--)						
Chamaesyce bombensis	Colonial	within unit:	0	0	0	0
a spurge		near unit:	1	0	0	1
(G3G4/S2/--/--)						
Conioselinum chinense	Shenandoah	within unit:	1	1	0	0
hemlock parsley		near unit:	0	0	0	0
(G5/S1/--/--)						
Cornus canadensis	Shenandoah	within unit:	1	0	1	0
bunchberry		near unit:	0	0	0	0
(G5/S1/--/--)						
Cornus rugosa	Shenandoah	within unit:	8	2	2	4
roundleaf dogwood		near unit:	0	0	0	0
(G5/S2/--/--)						
Crataegus pruinosa	Shenandoah	within unit:	1	0	0	1
a hawthorn		near unit:	0	0	0	0
(G5/S1/--/--)						
Crataegus succulenta	Shenandoah	within unit:	2	0	0	2
fleshy hawthorn		near unit:	0	0	0	0
(G5/S1/--/--)						
Cuscuta coryli	Shenandoah	within unit:	5	5	0	0
hazel dodder		near unit:	0	0	0	0
(G5/S1?/--/--)						
Cuscuta rostrata	Shenandoah	within unit:	1	0	0	1
beaked dodder		near unit:	0	0	0	0
(G4/S2?/--/--)						
Cyperus houghtonii	Shenandoah	within unit:	1	0	0	1
Houghton's umbrella-sedge		near unit:	0	0	0	0
(G3G4/S1/--/--)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>PLANTS (CONTINUED):</u>						
Eleocharis melanocarpa	Shenandoah	within unit:	0	0	0	0
black-fruited spikerush		near unit:	1	1	0	0
(G4/S2/--/--)						
Eleocharis smallii	Shenandoah	within unit:	0	0	0	0
creeping spikerush		near unit:	1	0	0	1
(G5?/S1S2/--/--)						
Elymus t. trachycaulis	Shenandoah	within unit:	2	0	1	1
slender wheatgrass		near unit:	0	0	0	0
(G5/S2/--/--)						
Epilobium leptophyllum	Shenandoah	within unit:	2	0	2	0
linear-leaved willow-herb		near unit:	0	0	0	0
(G5/S2/--/--)						
Eriocaulon parkeri	Colonial	within unit:	0	0	0	0
Parker's pipewort		near unit:	1	1	0	0
(G3/S3/3C/--)						
Euphorbia purpurea	Shenandoah	within unit:	3	2	1	0
glade spurge		near unit:	0	0	0	0
(G2/S2/C2/--)						
Galium boreale	Shenandoah	within unit:	1	0	1	0
northern bedstraw		near unit:	0	0	0	0
(G5/S2S3/--/--)						
Geranium robertianum	Shenandoah	within unit:	3	2	1	0
herb-robert		near unit:	0	0	0	0
(G5/S1/--/--)						
Geum allepicum	Shenandoah	within unit:	2	0	0	2
yellow avens		near unit:	0	0	0	0
(G5/SH/--/--)						
Glyceria grandis	Colonial	within unit:	0	0	0	0
American mannagrass		near unit:	1	0	0	1
(G5/S1/--/--)						
Helenium virginicum	Shenandoah	within unit:	0	0	0	0
Virginia sneezeweed		near unit:	5	2	1	2
(G2/S2/C1/LE)						
Huperzia s. var selago	Shenandoah	within unit:	8	2	6	0
fir clubmoss		near unit:	0	0	0	0
(G5TU/S2/--/--)						
Iresine rhizomatosa	G.W. Birthplace	within unit:	1	0	0	1
eastern bloodleaf		near unit:	0	0	0	0
(G5/S1S2/--/--)						
Iris versicolor	Shenandoah	within unit:	1	0	1	0
blueflag		near unit:	0	0	0	0
(G5/S2/--/--)						
Isoetes virginica	Shenandoah	within unit:	0	0	0	0
Virginia quillwort		near unit:	1	0	0	1
(G1G2Q/S1?/C2/--)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>PLANTS (CONTINUED):</u>						
Isotria medeoloides	Colonial	within unit:	0	0	0	0
small whorled pogonia		near unit:	1	0	1	0
(G2/S2/LE/LE)						
Juncus trifidus	Shenandoah	within unit:	1	0	1	0
highland rush		near unit:	0	0	0	0
(G5/S1/--/--)						
Liparis loeselii	Colonial	within unit:	3	0	3	0
Loesel's twayblade		near unit:	0	0	0	0
(G5/S2/--/--)						
Listera australis	Colonial	within unit:	1	0	1	0
southern twayblade		near unit:	0	0	0	0
(G4/S2S3/--/--)						
Lonicera canadensis	Shenandoah	within unit:	13	4	7	2
American fly-honeysuckle		near unit:	0	0	0	0
(G5/S2/--/--)						
Malaxis spicata	Colonial	within unit:	1	0	1	0
Florida adder's-mouth		near unit:	1	0	0	1
(G3G4/S2/--/--)						
Muhlenbergia glomerata	Shenandoah	within unit:	4	3	1	0
marsh muhly		near unit:	0	0	0	0
(G4/S2/--/--)						
Nothoscordum bivalve	Colonial	within unit:	2	0	0	2
crow-poison		near unit:	0	0	0	0
(G4/S2/--/--)						
Paxistima canbyi	Shenandoah	within unit:	1	0	1	0
Canby's mountain-lover		near unit:	0	0	0	0
(G2/S2/C2/--)						
Phlox buckleyi	Shenandoah	within unit:	1	0	1	0
sword-leaved phlox		near unit:	0	0	0	0
(G2G3/S2/3C/--)						
Platanthera grandifolia	Shenandoah	within unit:	6	2	3	1
large purple-fringed orchis		near unit:	0	0	0	0
(G5/S1/--/--)						
Poa paludigena	Shenandoah	within unit:	3	3	0	0
bog bluegrass		near unit:	0	0	0	0
(G3G4/S2/--/--)						
Prunus alleghaniensis	Shenandoah	within unit:	0	0	0	0
Alleghany plum		near unit:	1	1	0	0
(G3/S2S3/3C/--)						
Prunus nigra	Shenandoah	within unit:	1	1	0	0
Canada plum		near unit:	0	0	0	0
(G4G5/S1/--/--)						
Pyrola chlorantha	Shenandoah	within unit:	1	0	0	1
greenish-flowered wintergreen		near unit:	0	0	0	0
(G5/SH/--/--)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>PLANTS (CONTINUED):</u>						
Pyrola elliptica	Shenandoah	within unit:	4	0	0	4
shinleaf		near unit:	0	0	0	0
(G5/S2/--/--)						
Quercus prinoides	Shenandoah	within unit:	2	0	0	2
dwarf chinquapin oak		near unit:	0	0	0	0
(G5/S2/--/--)						
Quercus shumardii	Colonial	within unit:	0	0	0	0
Shumard's oak		near unit:	1	1	0	0
(G5/S2/--/--)						
Rhamnus alnifolia	Shenandoah	within unit:	1	0	1	0
alderleaf buckthorn		near unit:	0	0	0	0
(G5/S1/--/--)						
Rubus idaeus	Shenandoah	within unit:	5	2	2	1
common red raspberry		near unit:	0	0	0	0
(G5/S2/--/--)						
Sanguisorba canadensis	Shenandoah	within unit:	4	2	2	0
Canada burnet		near unit:	0	0	0	0
(G5/S2/--/--)						
Sanicula trifoliata	Shenandoah	within unit:	2	1	1	0
large-fruited sanicle		near unit:	0	0	0	0
(G4/S2/--/--)						
Scirpus ancistrochaetus	Shenandoah	within unit:	0	0	0	0
northeastern bulrush		near unit:	3	2	0	1
(G2/S2/LE/LE)						
Scirpus torreyi	Shenandoah	within unit:	0	0	0	0
Torrey's bulrush		near unit:	2	1	0	1
(G5?/S1/--/--)						
Sibbaldiopsis tridentata	Shenandoah	within unit:	4	0	3	1
three-toothed cinquefoil		near unit:	0	0	0	0
(G5/S2/--/--)						
Solidago arguta harrisii	Shenandoah	within unit:	2	2	0	0
shale-barren goldenrod		near unit:	0	0	0	0
(G5T3/S2/3C/--)						
Solidago simplex randii	Shenandoah	within unit:	16	5	10	1
Rand's goldenrod		near unit:	0	0	0	0
(G?T3?/S2/--/--)						
Spiranthes odorata	Colonial	within unit:	1	0	0	1
sweetscent ladies'-tresses		near unit:	0	0	0	0
(G5/S2/--/--)						
Stachys palustris	Shenandoah	within unit:	1	0	0	1
marsh hedge nettle		near unit:	0	0	0	0
(G5/S2/--/--)						
Steinchisma hians	Colonial	within unit:	1	0	0	1
gaping panic grass		near unit:	0	0	0	0
(G5/S1/--/--)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>PLANTS (CONTINUED):</u>						
Stewartia ovata	Colonial	within unit:	1	0	1	0
mountian camellia		near unit:	1	0	0	1
(G4/S2/--/--)						
Streptopus amplexifolius	Shenandoah	within unit:	2	1	1	0
white mandarin		near unit:	0	0	0	0
(G5/S1/--/--)						
Tillandsia usneoides	Colonial	within unit:	0	0	0	0
Spanish moss		near unit:	1	1	0	0
(G5/S2/--/--)						
Trillium pusillum virg.	Colonial	within unit:	0	0	0	0
Virginia least trillium		near unit:	2	0	1	1
(G3T2/S2/C2/--)						
Trisetum spicatum	Shenandoah	within unit:	1	0	1	0
narrow false oats		near unit:	0	0	0	0
(G5/S1/--/--)						
Utricularia fibrosa	Colonial	within unit:	1	0	1	0
fibrous bladderwort		near unit:	0	0	0	0
(G4G5/S1/--/--)						
Vaccinium myrtilloides	Shenandoah	within unit:	2	2	0	0
velvetleaf blueberry		near unit:	0	0	0	0
(G5/S1S2/--/--)						
Zigadenus elegans glauc.	Shenandoah	within unit:	1	0	0	1
white camass		near unit:	0	0	0	0
(G5T4?/S2/--/--)						
<u>ANIMALS:</u>						
Ardea herodias	Colonial	within unit:	2	0	2	0
great blue heron		near unit:	1	0	1	0
(G5/S3/--/--)	Fredericksburg	within unit:	0	0	0	0
		near unit:	1	0	1	0
Arigomphus villosipes	Colonial	within unit:	1	0	0	1
unicorm clubtail		near unit:	0	0	0	0
(G5/S2/--/--)						
Casmerodius albus	Colonial	within unit:	1	0	1	0
great egret		near unit:	0	0	0	0
(G5/S2/--/--)						
Cordulegaster erronea	Shenandoah	within unit:	1	0	0	1
erroneous biddie		near unit:	0	0	0	0
(G4/S1/--/--)						
Dendroica fusca	Shenandoah	within unit:	1	1	0	0
blackburnian warbler		near unit:	0	0	0	0
(G5/S2/--/--)						
Falco peregrinus	Shenandoah	within unit:	1	0	1	0
peregrine falcon		near unit:	0	0	0	0
(G3/S1/LE/LE)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>ANIMALS (CONTINUED):</u>						
Fontigens orilabis	Shenandoah	within unit:	1	0	1	0
Blue Ridge springsnail		near unit:	0	0	0	0
(G3Q/S2/--/--)						
Gammarus pseudolinmaeus	Colonial	within unit:	1	1	0	0
northern spring amphipod		near unit:	0	0	0	0
(G2/S1/--/--)						
Glyphyalinia virginica	Shenandoah	within unit:	5	0	0	5
deppressed glyph		near unit:	0	0	0	0
(G3/S2S3/--/--)						
Haliaeetus leucocephalus	Colonial	within unit:	2	0	2	0
bald eagle		near unit:	0	0	0	0
(G3/S2S3/LE/LE)	G.W. Birthplace	within unit:	1	0	1	0
		near unit:	0	0	0	0
Ixobrychus exilis	Colonial	within unit:	1	1	0	0
least bittern		near unit:	0	0	0	0
(G5/S2/--/--)						
Lanthus parvulus	Shenandoah	within unit:	1	1	0	0
Zorro clubtail		near unit:	0	0	0	0
(G3G4/S1/--/--)						
Nannaria morrisonii	Shenandoah	within unit:	2	0	0	2
a millipede		near unit:	0	0	0	0
(G3/S3/--/--)						
Opheodrys vernalis	Shenandoah	within unit:	2	0	1	1
smooth greensnake		near unit:	0	0	0	0
(G5/S3/--/--)						
Pallifera varia	Shenandoah	within unit:	4	0	0	4
variable mantleslug		near unit:	0	0	0	0
(G2/S2/--/--)						
Philomycus virginicus	Shenandoah	within unit:	2	0	0	2
Virginia mantleslug		near unit:	0	0	0	0
(G3/S3/--/--)						
Pituophis melanoleucus	Shenandoah	within unit:	3	0	0	3
pine snake		near unit:	2	0	0	2
(G5/SU/--/--)						
Plethodon shenandoah	Shenandoah	within unit:	5	0	5	0
Shenandoah salamander		near unit:	0	0	0	0
(G1/S1/LE/LE)						
Rana virgatipes	Colonial	within unit:	0	0	0	0
carpenter frog		near unit:	1	0	0	1
(G5/S3/--/--)						
Scytonotus virginicus	Shenandoah	within unit:	4	0	0	4
a millipede		near unit:	0	0	0	0
(G3/S3/--/--)						
Semionellus placidus	Shenandoah	within unit:	3	1	2	0
a millipede		near unit:	0	0	0	0
(G3/S1/--/--)						

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>		<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>		<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>ANIMALS (CONTINUED):</u>						
Sitta canadensis	Shenandoah	within unit:	1	0	0	1
red-breasted nuthatch		near unit:	0	0	0	0
(G5/S2/--/--)						
Striatura exigua	Shenandoah	within unit:	2	0	0	2
ribbed striate		near unit:	0	0	0	0
(G4/S2/--/--)						
Stygobromus spinosus	Shenandoah	within unit:	8	1	0	7
Blue Ridge Mountain amphipod		near unit:	0	0	0	0
(G2/S2/--/--)						
Troglodytes troglodytes	Shenandoah	within unit:	3	2	1	0
winter wren		near unit:	0	0	0	0
(G5/S2/--/--)						
Vertigo parvula	Shenandoah	within unit:	3	0	0	3
small-mouth vertigo		near unit:	0	0	0	0
(G3/S3/--/--)						
<u>COMMUNITIES:</u>						
scrub:						
mesotrophic scrub	Shenandoah	within unit:	6	6	0	0
		near unit:	0	0	0	0
oligotrophic scrub	Shenandoah	within unit:	7	7	0	0
		near unit:	0	0	0	0
submesotrophic scrub	Shenandoah	within unit:	5	5	0	0
		near unit:	0	0	0	0
forest:						
eutrophic forest	Shenandoah	within unit:	2	2	0	0
		near unit:	0	0	0	0
mesotrophic forest	Shenandoah	within unit:	2	2	0	0
		near unit:	0	0	0	0
permesotrophic forest	Shenandoah	within unit:	2	2	0	0
		near unit:	0	0	0	0
submesotrophic forest	Shenandoah	within unit:	5	5	0	0
		near unit:	0	0	0	0
saturated palustrine wetland:						
mesotrophic forest	Shenandoah	within unit:	4	4	0	0
		near unit:	0	0	0	0
mesotrophic scrub	Shenandoah	within unit:	1	1	0	0
		near unit:	0	0	0	0
oligotrophic forest	Shenandoah	within unit:	1	1	0	0
		near unit:	0	0	0	0
oligotrophic scrub	Shenandoah	within unit:	2	2	0	0
		near unit:	0	0	0	0

TABLE 1. SUMMARY OF ALL NATURAL HERITAGE RESOURCES RECORDED (CONTINUED)

<u>SPECIES NAME</u>	<u>MID-ATLANTIC</u>	<u>ELEMENT OCCURRENCE INFORMATION</u>			
<u>STATUS AND RANK</u>	<u>PARK UNIT</u>	<u>TOTAL</u>	<u>NEW</u>	<u>UPDATE</u>	<u>NOT FOUND</u>
<u>COMMUNITIES (CONTINUED):</u>					
herbaceous palustrine wetland:					
low	Shenandoah	within unit: 0	0	0	0
		near unit: 5	5	0	0
mid-height	Shenandoah	within unit: 0	0	0	0
		near unit: 1	1	0	0
seasonally-flooded palustrine woodland:					
oligotrophic	Shenandoah	within unit: 0	0	0	0
		near unit: 2	2	0	0
herbaceous estuarine wetland:					
mid-height	Colonial	within unit: 0	0	0	0
		near unit: 1	1	0	0
<u>TOTAL PLANTS</u>		211	65	87	59
<u>TOTAL ANIMALS</u>		66	8	19	39
<u>TOTAL COMMUNITIES</u>		46	46	0	0
<u>GRAND TOTAL</u>		323	119	106	98

* - Below each species' common name, a series of codes are given. For example, under *Isotria medeoloides*, the small whorled pogonia, the codes read (G2/S2/LE/LE). These represent the species' global rank (G2), state rank (S2), federal legal status (LE, which is listed endangered), and state legal status (LE). For more information on the species' ranks and legal status see Appendices 1 and 2. If the species does not have a legal status, the symbol "--" is given.

Virginia on granitic rocks and soil. This species is listed in Virginia as Endangered and is a category 2 candidate for listing under the U.S. Endangered Species Act.

Hemlock parsley (Conioselinum chinense): The only known occurrence of this species in Virginia is in Shenandoah National Park. It was discovered on the north face of Stony Man Mountain in 1990 by Gary Fleming. The species grows in a mossy seep at the toe of a massive greenstone cliff which is covered with ice during the winter months.

Hazel dodder (Cuscuta coryli): Virginia's only known extant occurrences of this dodder are found at five sites in Shenandoah National Park. The species is restricted to the park's most exemplary, low-elevation greenstone glades.

Slender wheatgrass (Elymus trachycaulus ssp trachycaulus): Virginia's only station outside of the ridge and valley province occurs at Trayfoot Mountain in the Shenandoah National Park's southern section.

Parker's pipewort (Eriocaulon parkeri): A large population of this globally-rare pipewort was found in the tidal section of Powhatan Creek near Colonial National Historical Park. This species was formerly a candidate 2 category for listing under the U.S. Endangered Species Act.

Glade spurge (Euphorbia purpurea): Three populations of this globally-rare spurge occur in Shenandoah National Park. Thousands of stems inhabit a seepy, open-canopy forest at the head of Naked Creek and a low, rich forest at the head of Entry Run. A third, small population was found near the large Entry Run population. This species is a category 2 candidate for listing under the U.S. Endangered Species Act.

Herb-robert (Geranium robertianum): Shenandoah National Park's three populations of this diminutive herb are the only ones known in Virginia.

Virginia sneezeweed (Helenium virginicum): Three occurrences of this sneezeweed are found not far outside Shenandoah National Park boundaries at the Deep Run/Madison Run Pond Complex natural heritage resource area. The species is endemic to two Virginia counties, is listed as Endangered in Virginia, and is a category 1 candidate for listing under the U.S. Endangered Species Act.

Small whorled pogonia (Isotria medeoloides): Several sub-populations of this species are found in the Chisel Run watershed near Colonial National Historical Park. The species is listed as endangered on the federal and state levels.

Highland rush (Juncus trifidus): Virginia's sole occurrence of this rush occurs on the steep north face of Stony Man Mountain in Shenandoah National Park.

Canby's mountain-lover (Paxistima canbyi): A globally-rare endemic of the middle Appalachian region, this tiny evergreen shrub is known from one Shenandoah National Park site near Overall Run Falls on a northwest-facing greenstone cliff at 548 meters (1800 feet) elevation. This is the only known occurrence of the species on greenstone. This species is a category 2 candidate for listing under the U.S. Endangered Species Act.

Sword-leaved phlox (Phlox buckleyi): Two small groups of plants were recorded from Shenandoah National Park along Skyline Drive near Horsehead Overlook. This phlox is a globally-rare endemic known from shaley habitats in Virginia and West Virginia. This species was formerly considered for designation as a federally listed endangered species.

Bog bluegrass (Poa paludigena): Three occurrences of this globally-rare bluegrass (two near Mount Marshall and one near Overall Run) were found in Shenandoah National Park. This species is a category 2 candidate for listing under the U.S. Endangered Species Act.

Northeastern bulrush (Scirpus ancistrochaetus): Two occurrences of this bulrush are found not far outside Shenandoah National Park boundaries near Harriston. The species is endemic to mountain ponds in the northeast and Mid-Atlantic, and is listed as endangered under federal and state laws.

Shale-barren goldenrod (Solidago arguta var harrissii): A characteristic goldenrod of shale barrens, this globally-rare, mid-Appalachian endemic was discovered at two Shenandoah National Park locations: the greenstone glades at Overall Run, and the glades along Little Devil's Stairs. These populations are the only ones known growing on greenstone.

Rand's goldenrod (Solidago simplex var randii): Numerous occurrences of this species were recorded in Shenandoah National Park, almost all on exposed greenstone outcrops at the higher elevations. Although some uncertainty currently exists, this taxon is probably globally rare and the large number of occurrences in the park is significant.

White mandarin (Streptopus amplexifolius): Two occurrences of this circumboreal species are found in Shenandoah National Park near Stony Man, the only known location for this species in Virginia.

Virginia least trillium (Trillium pusillum var virginianum): Many sub-populations of this trillium species are found along Powhatan Creek near Colonial National Historical Park. This species is a candidate 2 category for listing under the U.S. Endangered Species Act.

Narrow false oats (Trisetum spicatum): This grass has only one Virginia location: the wet ledges of a seepy north-facing greenstone cliff at about 1145 meters (3760 feet) on Hawksbill in Shenandoah National Park.

Animal Inventory Results

By the completion of field work, 27 animal element occurrences had been observed in or near park boundaries, representing 14 species. Thirty-nine additional animal element occurrences representing twelve additional species were previously observed, but were not seen during the study period, bringing the total animal element occurrences recorded in or near the Mid-Atlantic Region national parks to 66 representing 26 species (see Table 1). Details on significant findings are listed below by species and include all state- and federally-listed animals as well as species considered globally-rare (those

ranked G1, G2, or G3 by the Heritage network):

Great blue heron (Ardea herodias): Four breeding colonies containing this species were recorded during this project: three for Colonial National Historical Park and one for Fredericksburg and Spotsylvania National Military Park. The large colony abutting Colonial National Historical Park's southeastern boundary on Beaverdam Creek is considered one of Virginia's most significant colonies.

Great egret (Casmerodius albus): A significant number of egrets were recorded co-occurring with great blue herons in the breeding colony on Beaverdam Creek adjoining Colonial National Historical Park.

Peregrine falcon (Falco peregrinus): The peregrine falcon may have bred naturally in Shenandoah National Park historically. Today this bird is being reintroduced into the Appalachian Mountains from captive-bred stock. Thus far, several juveniles have been hacked from Hawksbill Mountain. When fledged, these birds are sometimes observed on other peaks with rock outcrops or cliffs. It is hoped that these birds will join with others released in the George Washington National Forest to form a breeding population.

Blue ridge springsnail (Fontigens orolibas): This tiny, aquatic snail was found in a single location at Hawksbill Spring in Shenandoah National Park. Other populations have been reported but were not located.

An amphipod (Gammarus pseudolinmaeus): A population of this species was located in the Washington Headquarters Spring(s) in Colonial National Historical Park. Identifications made by John R. Holsinger revealed that this was the first location of this species known in Virginia.

Bald eagle (Haliaeetus leucocephalus): Three nests, 2 in Colonial National Historical Park and 1 in George Washington Birthplace National Monument, were recorded during this study. This species is listed as endangered on the federal and state levels.

Least bittern (Ixobrychus exilis): The first breeding records for the lower James River were found on Jamestown Island in Colonial National Historical Park. The secretive bird is believed to occur throughout the marshes of the island.

Zorro clubtail (Lanthus parvulus): This small dragonfly inhabits mountain springs and seeps. It was found at only a single locality at the lower end of Big Meadows South in Shenandoah National Park.

Smooth green snake (Opheodrys vernalis): This snake has been recorded from several sites in Shenandoah National Park, most prominently in Big Meadows. The viability of other populations is low due to successional trends. The size of the Big Meadows population is unknown but believed to be substantial.

Shenandoah salamander (Plethodon shenandoah): This globally rare salamander is known from only four populations worldwide, all in Shenandoah National Park. Populations occur on limited portions of Millers Head, The Pinnacle, Stony Man Mountain, and on Hawksbill Mountain. All four populations have large numbers of individuals in their restricted areas.

A millipede (Semionellus placidus): This species is known from the Blue Ridge Mountains including Shenandoah National Park. It was located at three sites: Stony Man Mountain, the Limberlost, and Hawksbill Mountain.

Winter wren (Troglodytes troglodytes): The winter wren was observed during the breeding season at four sites in Shenandoah National Park including Hawksbill Mountain, Stony Man Mountain, Hemlock Spring, and High Knob. At Hawksbill at least four males were heard calling. This species usually breeds in high elevation forests from Mount Rogers to Shenandoah Mountain. Additional sites may be found with added search in the higher elevations and more mesic north slopes.

Community Inventory Results

The need to protect rare species is generally well understood and appreciated, but the need to protect indigenous biotic communities sometimes requires explanation. Community classification, inventory, and protection should be regarded as an essential complement to rare species inventories. Communities represent functioning units of the landscape which: 1) support myriad life forms too cryptic or poorly known to be catalogued and prioritized individually, 2) provide the nurturing environment for the known rare species, 3) contribute to the maintenance of larger ecosystems, and 4) possess unique intrinsic scientific, educational, and aesthetic values. It is therefore important to locate, classify, and evaluate these features as part of a comprehensive management and protection plan for the Mid-Atlantic Region national parks.

By the completion of field work, 46 community element occurrences had been recorded, representing 15 community classes. All but one of the significant communities, an estuarine wetland near Colonial National Historical Park, were found in or near Shenandoah National Park.

The inventory at Shenandoah National Park documented four broad types of upland forest vegetation: Eutrophic Forest, Permesotrophic Forest, Mesotrophic Forest, and Submesotrophic Forest. The Eutrophic Forests occupied the most fertile soils and consequently contained many nutrient-demanding plant species. Permesotrophic, Mesotrophic, and Submesotrophic Forests were communities of moderately fertile, medium fertility, and moderately infertile soil conditions, respectively.

Rock outcrops scattered throughout Shenandoah National Park support a great variety of scrub communities. Most impressive are the high elevation, wind-blasted summits and ledges of Stony Man, Hawksbill, and Old Rag Mountains. Classified as Oligotrophic Scrub, this vegetation supports many disjunct boreal plants and has affinity to alpestrine vegetation farther north. Outcrops of greenstone at mid-elevations which receive extra moisture and colluvium via lateral transit support Submesotrophic Scrub and Mesotrophic Scrub. These communities, often referred to as "Greenstone Glades", are particularly interesting from a phytogeographic perspective; they are floristically rich and contain outlying populations of several shale barren plants.

Forested wetlands, classified as Mesotrophic Saturated Palustrine Forest

and Oligotrophic Saturated Palustrine Forest, are quite scarce in the Shenandoah National Park due in large part to the pervading steep, mountainous terrain. The wetlands are very important from a biological diversity perspective because they contain a large number of habitat-limited plant species, and some rare species. The mesotrophic class of forested wetland is generally dominated by deciduous trees such as white ash (Fraxinus americana) and contains nutrient demanding herbaceous species. In contrast, the oligotrophic class tends to be dominated by hemlock and yellow birch with abundant sphagnum.

The Big Meadows area of Shenandoah National Park supports a globally rare type of wetland vegetation classified as Oligotrophic Saturated Palustrine Scrub. This vegetation has been characterized as a "mafic wetland" on the basis of soils analysis and the presence of magnesium indicators such as canada burnet (Sanquisorba canadensis) (Rawinski, 1991). Very few natural communities in Virginia are richer in rare plant species than mafic wetlands. Wetlands, more than any other class of community, depend upon surrounding landscape features for their continued maintenance. Land use within the watersheds should therefore be limited and closely monitored.

One last community type in Shenandoah National Park deserves mention because it appears to be very rare and extremely sensitive to foot traffic. It is a steeply sloping wetland community classified as Mesotrophic Saturated Palustrine Scrub which occurs within the splash zone of certain waterfalls. One such occurrence was documented at Stony Man and supports part of Virginia's only known population of hemlock parsley (Conioselinum chinense).

DISCUSSION

To enhance protection for natural heritage resources identified in the Mid-Atlantic Region national parks, boundaries were drawn around lands which contain all resources identified during this study. This exercise is required as part of Cooperative Agreement 4000-8-8018 which states that critical areas would be delineated, though the meaning of critical area is not defined further. Fifty-three sites, labeled natural heritage resource areas, have been delineated. These areas are not legal designations nor does their delineation carry any legal or regulatory restrictions. Table 2 lists all of these sites including thirty-nine delineated in Shenandoah National Park, nine delineated in Colonial National Historical Park, three delineated in Fredericksburg and Spotsylvania National Military Park, one delineated in Richmond National Battlefield Park, and one delineated in George Washington Birthplace National Monument. Standard site reports for each area are provided in the individual park reports. The sections of these site reports, and their content, are outlined below.

SIZE: Approximate acreage included within the conservation planning boundary for the natural area.

BIODIVERSITY RANK: The overall (global) significance of the natural area in terms of the rarity of the natural heritage resources and the quality (health, abundance, etc.) of their occurrences is given in this field. These ranks range from B1 (Outstanding significance) to B5 (General Biodiversity Significance) as determined through the ranking criteria below:

B1 Outstanding Significance: only site known for an element or an excellent occurrence of a G1 species.

B2 Very High Significance: one of the best known examples of a community type, good occurrence of a G1 species, or excellent occurrence of a G2 or G3 species.

B3 High Significance: excellent example of any community type, good occurrence of a G3 species.

B4 Moderate Significance: good example of a community type, excellent or good occurrence of state-rare species.

B5 General Biodiversity Significance: good or marginal occurrence of a community type, S1, or S2 species.

LOCALITY: The county or counties which contain the site.

QUADRANGLE: The USGS 7.5' quadrangle(s) that includes the natural heritage resource area.

TABLE 2. SUMMARY OF NATURAL HERITAGE RESOURCE AREAS IDENTIFIED
IN MID-ATLANTIC NATIONAL PARK UNITS

<u>NATURAL HERITAGE RESOURCE AREA</u>	<u>BIODIVERSITY RANK</u>	<u>APPROX. ACRES</u>	<u>ELEMENT OCCURENCES FOUND</u>		
			<u>PLANT</u>	<u>ANIMAL</u>	<u>COMMUNITY</u>
<u>Appomatox Court House National Historical Park</u>					
No areas identified					
<u>Booker T. Washington National Monument</u>					
No areas identified					
<u>Colonial National Historical Park</u>					
Beaverdam Creek	B5	1050	2	3	0
Brackens Pond	B5	140	1	0	0
Cheatham Pond Ravines	B5	80	1	0	0
Cub Creek	B5	150	2	0	0
Jamestown Island	B2	1560	1	3	0
Jones Mill Pond	B5	85	1	0	0
Powhatan Creek	B2	6600	5	1	0
Queen Creek	B4	2730	0	0	1
Swanns Point	B3	460	0	1	0
<u>Fredericksburg and Spotsylvania National Military Park</u>					
Lewis Run	B5	120	0	1	0
Little Hunting Run	B5	150	1	0	0
Stuart Drive Seep	B5	28	1	0	0
<u>George Washington Birthplace National Monument</u>					
Dancing Marsh	B3	675	0	1	0
<u>Petersburg National Battlefield</u>					
No areas identified					
<u>Richmond National Battlefield Park</u>					
Bloody Run	B5	70	1	0	0

TABLE 2. SUMMARY OF NATURAL HERITAGE RESOURCE AREAS IDENTIFIED
IN MID-ATLANTIC NATIONAL PARK UNITS (CONTINUED)

<u>NATURAL HERITAGE RESOURCE AREA</u>	<u>BIODIVERSITY</u>	<u>APPROX.</u>	<u>ELEMENT OCCURENCES FOUND</u>		
	<u>RANK</u>	<u>ACRES</u>	<u>PLANT</u>	<u>ANIMAL</u>	<u>COMMUNITY</u>
<u>Shenandoah National Park</u>					
Bearfence Mountain	B5	132	1	0	0
Big Meadows North	B3	235	6	0	1
Big Meadows South	B3	265	8	2	1
Blackrock Gap	B5	73	1	0	0
Blackrock - Lewis Spring Falls	B3	189	3	0	1
Brown Mountain Overlook	B5	60	1	0	0
Cedar Run - Halfmile Cliff	B3	260	1	0	1
Cool Spring Hollow	B2	148	1	0	0
Deep Run / Madison Run Pond Complex	B1	410 *	6	0	7
Devils Tanyard	B5	63 *	1	0	0
East Branch Naked Creek Watershed	B2	1062	5	0	1
Franklin Cliffs	B4	124	1	0	1
Gooney Manor Overlook	B4	43	2	0	1
Harriston Ponds	B1	353 *	3	0	1
Hawksbill Mountain	B1	1395	14	5	3
Hazletop Ridge Overlook	B5	55	1	0	0
Hightop	B5	2049	1	1	0
Hogback Mountain - Little Devils Stairs	B3	1291	5	0	2
Horsehead Overlook	B4	75	1	0	0
Ivy Creek	B4	258	1	0	1
Jeremy's Run Watershed	B5	5237	10	0	0
Laurel Prong - Mill Prong	B4	1560	3	0	2
Millers Head	B2	235	1	1	1
Mount Marshall	B2	3074	9	0	3
Old Rag Mountain	B4	300	1	0	1
Overall Run Watershed	B2	1245	4	0	3
Pass Mountain	B4	366	1	0	1
The Pinnacle - Upper Hazel River	B1	3024	7	2	1
Pocosin - Entry Run	B2	926	3	0	2
Pond Ridge	B5	189	2	0	1
Rockytop Overlook	B5	27	1	0	0
Rocky Mountain	B5	40	1	0	0
South Fork Moormans River	B2	675	0	0	1
South River	B4	498	1	0	1
Stony Man Mountain	B1	1214	13	3	3
Trayfoot Mountain - Hall Mountain	B5	2176	6	0	0
Upper Rose River Watershed	B4	1006	4	0	1
Upper Staunton River	B4	453	1	0	1
White Oak Canyon	B4	1950	6	3	2

* - acres calculated only for portion of Natural
Heritage Resource Area within park boundaries

QUADRANGLE CODE: The code for the quadrangle used by the Division of Natural Heritage is listed.

LOCATION: Location and helpful directions to the site are given.

NATURAL HERITAGE RESOURCE SUMMARY TABLE: All natural heritage resources found at the site during the study period are included in the summary table. The scientific name, common name, global and state natural heritage rarity rank, the federal and state legal status, and the element occurrence rank are presented for each element occurrence (see Appendix 1 for an explanation of status and rank, see Appendix 2 for lists of rare plants and animals, see Appendix 3 for an explanation of community classification system).

SITE DESCRIPTION: A brief narrative picture of the topography, vegetation, and natural heritage resources at the site.

BOUNDARY JUSTIFICATION: A brief description of the boundary and the reasons for its delineation.

THREATS: Threats to the natural heritage resources observed during this study.

MANAGEMENT RECOMMENDATIONS: Management recommendations designed to ameliorate the threats to the natural heritage resources.

PROTECTION RECOMMENDATIONS: A summary of recommended protection steps to help insure the continued existence of the natural heritage resources.

As outlined above, site-specific management and protection recommendations were recorded for each park's natural heritage resource areas. Because Shenandoah National Park is extremely rich in natural heritage resources and large portions the park are relatively unspoiled, general recommendations were made to enhance protection of the park's natural heritage resources through system-wide inventory, protection, and management efforts. The six recommendations, given in the Shenandoah National Park report, are summarized below:

1. Conduct research to enhance or restore natural heritage resources.
2. Work with DNH natural area biologists to develop and implement management and monitoring plans for each natural heritage resource area.
3. Conduct additional selected natural heritage resource inventories.
4. Establish Research Natural Areas and Special Interest Areas for

the sites of greatest biological importance.

5. Incorporate natural heritage resource area information in the planning, management, and maintenance documents of Shenandoah National Park.

6. Consult with DNH natural area biologists regarding land use or management changes within natural heritage resource areas.

ACKNOWLEDGEMENTS

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APPENDIX 1:

EXPLANATION OF NATURAL HERITAGE RESOURCE RANKING SYSTEM

Definition of Abbreviations Used on Natural Heritage Resource Lists
of the
Virginia Department of Conservation and Recreation

Natural Heritage Ranks

The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources, or "NHR's," are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The primary criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities. Also of great importance is the number of individuals in existence at each locality or, if a highly mobile organism (e.g., sea turtles, many birds, and butterflies), the total number of individuals. Other considerations may include the quality of the occurrences, the number of protected occurrences, and threats. However, the emphasis remains on the number of populations or occurrences such that ranks will be an index of known biological rarity.

- S1 Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
- S2 Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.
- S3 Rare to uncommon; usually between 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- S4 Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
- S5 Very common; demonstrably secure under present conditions.
- SA Accidental in the state.
- SB# Breeding status of an organism within the state.
- SH Historically known from the state, but not verified for an extended period, usually > 15 years; this rank is used primarily when inventory has been attempted recently.
- SN# Non-breeding status within the state. Usually applied to winter resident species.
- SR Reported without persuasive documentation
- SU Status uncertain, often because of low search effort or cryptic nature of the element.
- SX Apparently extirpated from the state.
- SZ Long distance migrant whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.

Global ranks are similar, but refer to a species' rarity throughout its total range. Global ranks are denoted with a "G" followed by a character. Note that GA and GN are not used and GX means apparently extinct. A "Q" in a rank indicates that a taxonomic question concerning that species exists. Ranks for subspecies are denoted with a "T". The global and state ranks combined (e.g. G2/S1) give an instant grasp of a species' known rarity.

These ranks should not be interpreted as legal designations.

Federal Legal Status

The Division of Natural Heritage uses the standard abbreviations for Federal endangerment developed by the U.S. Fish and Wildlife Service, Division of Endangered Species and Habitat Conservation.

- | | |
|----------------------------|---|
| LE - Listed Endangered | 3A - Former candidate - presumed extinct |
| LT - Listed Threatened | 3B - Former candidate - not a valid species under |
| PE - Proposed Endangered | current taxonomic understanding |
| PT - Proposed Threatened | 3C - Former candidate - common or well protected |
| C1 - Candidate, category 1 | NF - no federal legal status |
| C2 - Candidate, category 2 | |

State Legal Status

The Division of Natural Heritage uses similar abbreviations for State endangerment.

- | | |
|------------------------|----------------------------|
| LE - Listed Endangered | PE - Proposed Endangered |
| LT - Listed Threatened | PT - Proposed Threatened |
| C - Candidate | NS - no state legal status |

For information on the laws pertaining to threatened or endangered species, contact:

U.S. Fish and Wildlife Service for all FEDERALLY listed species
Virginia Department of Agriculture and Consumer Services Plant Protection Bureau for STATE listed plants and insects;
Virginia Department of Game and Inland Fisheries for all other STATE listed animals.

APPENDIX 2:

RARE SPECIES LISTS

OF THE

**VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION,
DIVISION OF NATURAL HERITAGE**

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

VIRGINIA RARE PLANT LIST

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
ABIES BALSAMEA	BALSAM FIR	G5	S1		
ABIES FRASERI	FRASER FIR	G2G3	S1	C2	
ADIANTUM CAPILLUS-VENERIS	SOUTHERN MAIDENHAIR-FERN	G5	SH		
AESCHYNOMENE VIRGINICA	SENSITIVE JOINT-VETCH	G2	S2	LT	C
AGALINIS AURICULATA	EARLEAF FOXGLOVE	G2	SH	C2	
=TOMANTHERA AURICULATA					
AGALINIS DECEMLOBA	BLUE RIDGE GERARDIA	G3G4	S2		
=GERARDIA DECEMLOBA, UNDER A. OBTUSIFOLIA IN KARTESZ (IN PRESS)					
AGALINIS PAUPERCUA	SMALL-FLOWER GERARDIA	G5	S1		
=GERARDIA PAUPERCUA					
AGALINIS TENELLA	PENNEL GERARDIA	G3G5Q	S1		
UNDER A. OBTUSIFOLIA IN KARTESZ (IN PRESS)					
AGALINIS VIRGATA	PINE-BARREN GERARDIA	G3G4	S1		
=GERARDIA RACEMULOSA, UNDER A. FASCICULATA IN KARTESZ (IN PRESS)					
ALETRIS AUREA	GOLDEN COLICROOT	G5	SH		
ALNUS INCANA SSP RUGOSA	SPECKLED ALDER	G5T5	S2		
=A. RUGOSA					
ALOPECURUS AQUALIS	SHORT-AWN FOXTAIL	G5	S1		
AMARANTHUS PUMILUS	SEABEACH PIGWEED	G2	SH	PT	
AMPHICARPUM PURSHII	BLUE MAIDEN-CANE	G3?	SH		
ANAGALLIS MINIMUS	CHAFFWEED	G5	SH		
=CENTUNCULUS MINIMUS					
ANDROPOGON MOHRII	MOHR BLUESTEM	G3G4	SH		
ANEMONE BERLANDIERI	SOUTHERN THIMBLE-WEED	G3G5Q	S1		
=A. CAROLINIANA					
ANEMONE CANADENSIS	CANADA ANEMONE	G5	S1		
ANGELICA ATROPURPUREA	GREAT ANGELICA	G5	SR		
ARABIS GLABRA	TOWER-MUSTARD	G5	S1		
ARABIS HIRSUTA	WESTERN HAIRY ROCKCRESS	G5	S1		
ARABIS SEROTINA	SHALE-BARREN ROCKCRESS	G2	S2	LE	LE
ARABIS SHORTII	SHORT'S ROCKCRESS	G5	S2		
=A. PERSTELLATA VAR SHORTII					
ARALIA HISPIDA	BRISTLY SARSAPARILLA	G5	S2		
ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	G5	S1		
ARENARIA LANUGINOSA	A SANDWORT	G5	SH		
ARETHUSA BULBOSA	DRAGON'S MOUTH	G4	S1		
ARISTIDA TUBERCULOSA	SEABEACH NEEDLEGRASS	G5	S2		
ARMORACIA LACUSTRIS	LAKE CRESS	G4?	SH	C2	
=A. AQUATICA					
ASCLEPIAS LONGIFOLIA	LONG-LEAF MILKWEED	G4G5	S1		
ASCLEPIAS RUBRA	RED MILKWEED	G4G5	S2S3		
ASIMINA PARVIFLORA	DWARF PAW-PAW	G5	S2S3		
ASTER ERICOIDES	WHITE HEATH ASTER	G5	S2		
ASTER RACEMOSUS	COASTAL-PLAIN ASTER	G3?	S1		
=A. PILOSUS VAR DEMOTUS IN KARTESZ (IN PRESS)					
ASTER PRAEALTUS	WILLOW ASTER	G5	S1		
ASTER PUNICEUS VAR ELLIOTTII	ELLIOTT'S ASTER	G5T3T4	S1		
=A. ELLIOTTII					
ASTER RADULA	ROUGH-LEAVED ASTER	G5	S1		
ASTER SCHISTOSUS	FALL ASTER	GHQ	SU	C2*	
=A. X SCHISTOSUS IN KARTESZ (IN PRESS)					
ASTER SHORTII	SHORT'S ASTER	G4G5	S1		
ASTER SURCULOSUS	CREEPING ASTER	G3G5	S1		
ASTRAGALUS DISTORTUS	BENT MILKVETCH	G5	S1		
ASTRAGALUS NEGLECTUS	COOPER'S MILKVETCH	G3G4	S1	C2	

DEPARTMENT OF CONSERVATION & RECREATION
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VIRGINIA RARE PLANT LIST

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
BACOPA CAROLINIANA	CAROLINA WATER-HYSSOP	G4G5	S1		
BACOPA INNOMINATA	TROPICAL WATER-HYSSOP	G5	S2		LE
INCLUDES B. STRAGULA					
BACOPA ROTUNDIFOLIA	ROUND-LEAVED WATER-HYSSOP	G5	S1		
INCLUDES B. SIMULANS					
BAPTISIA ALBA	PRAIRIE FALSE-INDIGO	G4	S1		
BAPTISIA AUSTRALIS	WILD FALSE-INDIGO	G5?	S2		
BAPTISIA CINEREA	HAIRY FALSE-INDIGO	G2G3	S1		
BETULA PAPYRIFERA	PAPER BIRCH	G5	S2		
BETULA POPULIFOLIA	GRAY BIRCH	G5	S1		
BETULA UBER	VIRGINIA ROUND-LEAF BIRCH	G1Q	S1	LE	LE
BLEPHILIA HIRSUTA	HAIRY WOODMINT	G4?	S2		
BOLTONIA ASTEROIDES	ASTER-LIKE BOLTONIA	G5	S2		
BOLTONIA CAROLINIANA	CAROLINA BOLTONIA	G2Q	S2		
BOTRYCHIUM JENMANII	ALABAMA GRAPE-FERN	G3	S1		
=B. ALABAMENSE					
BOTRYCHIUM LANCEOLATUM	TRIANGLE GRAPE-FERN	G5	S1		
BOTRYCHIUM MULTIFIDUM	LEATHERY GRAPE-FERN	G5	S1		
BOTRYCHIUM SIMPLEX	LEAST GRAPE-FERN	G5	S1		
BROMUS CILIATUS	FRINGED BROME	G5	S1		
BROMUS KALMII	WILD CHESS	G5	S1		
BUCHNERA AMERICANA	BLUE-HEARTS	G3G4	S1		
BUCKLEYA DISTICHOPHYLLA	PIRATEBUSH	G2	S2	C2	LE
BURMANNIA BIFLORA	NORTHERN BURMANNIA	G4G5	SH		
CABOMBA CAROLINIANA	CAROLINA FANWORT	G5	S1		
CACALIA MUHLENBERGII	GREAT INDIAN-PLANTAIN	G3G4	S1		
CACALIA SUAVEOLENS	SWEET-SCENTED INDIAN-PLANTAIN	G4?	S2		
CALAMINTHA GLABELLA	SAVORY	G3Q	S1		
=SATUREJA GLABELLA					
CALAMOVILFA BREVPILIS	PINE-BARREN REED-GRASS	G3	SX	3C	
CALLISIA GRAMINEA	GRASS-LIKE ROSELINGS	G5	S1		
=TRADESCANTIA ROSEA VAR GRAMINEA, =CUTHBERTIA GRAMINEA					
CALOPOGON PALLIDUS	PALE GRASS-PINK	G4G5	SH		
CALYCANTHUS FLORIDUS VAR FLORIDUS	SWEET-SHRUB	G5T4T5	S2?		
CALYCANTHUS FLORIDUS VAR GLAUCUS	SMOOTH SWEET-SHRUB	G5T5	S1?		
CAMASSIA SCILLOIDES	WILD HYACINTH	G4G5	S2S3		
CAMPANULA ROTUNDIFOLIA	AMERICAN HAREBELL	G5	S1		
CARDAMINE CLEMATITIS	MOUNTAIN BITTERCRESS	G2	S1	C2	
CARDAMINE FLAGELLIFERA	A BITTERCRESS	G3	S1		
CARDAMINE MICRANTHERA	SMALL-ANTHERED BITTERCRESS	G1	S1	LE	
CARDAMINE PRATENSIS VAR PALUSTRIS	CUCKOOFLOWER	G5T4T5	S1		
DOES NOT INCLUDE EUROPEAN TYPE					
CAREX APPALACHICA	APPALACHIAN SEDGE	G?	S1S2		
CAREX ARCTATA	BLACK SEDGE	G5?	S1		
CAREX ATHERODES	AWNEED SEDGE	G5	S1		
CAREX BARRATTII	BARRATT'S SEDGE	G3	S1S2	3C	
CAREX BUXBAUMII	BROWN BOG SEDGE	G5	S2		
CAREX CAREYANA	CAREY'S SEDGE	G5	S1		
CAREX CHAPMANII	CHAPMAN'S SEDGE	G2G3	SR	C2	
CAREX COLLINSII	COLLINS' SEDGE	G4	S3		
CAREX CONOIDEA	FIELD SEDGE	G4	S1S2		
CAREX CRISTATELLA	CRESTED SEDGE	G5	S2		
CAREX CRUS-CORVI	RAVENFOOT SEDGE	G5	S1S2		
CAREX DECOMPOSITA	EPIPHYTIC SEDGE	G3G4	S1	3C	
CAREX HIRTIFOLIA	PUBESCENT SEDGE	G5	S2		

DEPARTMENT OF CONSERVATION & RECREATION
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VIRGINIA RARE PLANT LIST

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
CAREX HITCHCOCKIANA	HITCHCOCK'S SEDGE	G5	S2		
CAREX INTERIOR	INLAND SEDGE	G5	S1		
CAREX LACUSTRIS	LAKE-BANK SEDGE	G5	S1		
CAREX LEPTONERVIA	FINELY-NERVED SEDGE	G4	S2		
CAREX LUCORUM	A SEDGE	G4	S2		
=C. PENSYLVANICA VAR DISTANS					
CAREX LUPULIFORMIS	FALSE HOP SEDGE	G3G4Q	S1		
UNDER C. LUPULINA IN HARVILL ET AL. (1986)					
CAREX MEADII	MEAD'S SEDGE	G4G5	S2		
CAREX PALLESCENS	PALE SEDGE	G5	S1		
CAREX PEDUNCULATA	LONGSTALK SEDGE	G5	S2		
CAREX POLYMORPHA	VARIABLE SEDGE	G2	S2	C2	LE
CAREX PRAIREA	PRAIRIE SEDGE	G5?	S1		
CAREX PURPURIFERA	PURPLE SEDGE	G3?	S1	3C	
CAREX RENIFORMIS	RENIFORM SEDGE	G4?	S1		
CAREX ROSTRATA	BEAKED SEDGE	G5	S1		
CAREX SCHWEINITZII	SCHWEINITZ'S SEDGE	G3	S1		
CAREX SILICEA	SEA-BEACH SEDGE	G5	S1		
CAREX STRAMINEA	STRAW SEDGE	G5	S2		
CAREX STRIATA	A SEDGE	G4	S1S2		
=C. WALTERIANA					
CAREX SUBERECTA	PRAIRIE STRAW SEDGE	G4	S2		
CAREX TETANICA	RIGID SEDGE	G4G5	S2		
CAREX TRISPERMA	THREE-SEED SEDGE	G5	S2		
CAREX VESICARIA	INFLATED SEDGE	G5	S1S2		
CAREX VESTITA	A SEDGE	G5	S1		
CARPHEPHORUS BELLIDIFOLIUS	SANDY-WOODS CHAFFHEAD	G4	S1		
CARPHEPHORUS TOMENTOSUS	WOOLY CHAFFHEAD	G4	S1		
CARYA LACINIOSA	BIG SHELLBARK HICKORY	G5	S1		
CASSIA FASCICULATA VAR MACROSPERMA	PRAIRIE SENNA	G5T2Q	S2	C2	
UNDER CHAMAECRISTA FASCICULATA IN KARTESZ (IN PRESS)					
CENCRHUS CAROLINIANUS	COAST SANDBUR	G5	S1		
=C. INCERTUS					
CHAMAECYPARIS THYOIDES	ATLANTIC WHITE CEDAR	G4	S2		
CHAMAESYCE BOMBENSIS	A SPURGE	G3G4	S2		
=EUPHORBIA AMMANIODES					
CHASMANTHIUM LAXUM VAR SESSILIFLORUM	LONG-LEAF SPIKEGRASS	G5T5	S2		
=UNIOLA SESSILIFLORA, C. SESSILIFLORUM					
CHEILANTHES ALABAMENSIS	ALABAMA LIPFERN	G5	S1		
CHEILANTHES EATONII	CHESTNUT LIPFERN	G3G4	S2		
=C. CASTANEA					
CHEILANTHES FEEI	FEE'S LIPFERN	G5	S1		
CHELONE CUTHBERTII	CUTHBERT TURTLEHEAD	G3	S2		
CHELONE OBLIQUA	RED TURTLEHEAD	G4	S1		
CHRYSOPSIS GOSSYPINA	COTTONY GOLDEN-ASTER	G5	S1		
=HETEROTHECA GOSSIPYNA					
CICUTA BULBIFERA	BULB-BEARING WATER-HEMLOCK	G5	S1		
CIMICIFUGA RUBIFOLIA	APPALACHIAN BUGBANE	G3	S1S2	C2	
CINNA LATIFOLIA	SLENDER WOOD REEDGRASS	G5	S2		
CIRSIIUM ALTISSIMUM	TALL THISTLE	G5	S1		
=CARDUUS ALTISSIMUS					
CIRSIIUM CAROLINIANUM	CAROLINA THISTLE	G5	S1		
=CARDUUS CAROLINIANUS					
CIRSIIUM NUTTALLII	NUTTALL'S THISTLE	G5	SH		
=CARDUUS NUTTALLII					

DEPARTMENT OF CONSERVATION & RECREATION
DIVISION OF NATURAL HERITAGE

VIRGINIA RARE PLANT LIST

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
CIRSIIUM REPANDUM =CARDUUS REPANDUS	COASTAL-PLAIN THISTLE	G5	SH		
CIRSIIUM VIRGINIANUM =CARDUUS VIRGINIANUS	VIRGINIA THISTLE	G3G4	S2		
CLADIUM MARISCUS SSP JAMAICENSE =C. JAMAICENSE	SAWGRASS	G5T5	S1		
CLEISTES DIVARICATA	SPREADING POGONIA	G4	S1		
CLEMATIS ADDISONII	ADDISON'S LEATHERFLOWER	G2	S2	3C	
CLEMATIS ALBICOMA	WHITE-HAIRED LEATHERFLOWER	G4	S2	3C	
CLEMATIS CATESBYANA	SATIN-CURLS	G4G5	S1		
UNDER C. VIRGINIANA IN RADFORD ET AL. (1968)					
CLEMATIS COACTILIS	VIRGINIA WHITE-HAIRED LEATHERFLOWER	G3	S2S3		
CLEMATIS GLAUCOPHYLLA	WHITE-LEAVED LEATHERFLOWER	G3?	S1		
CLEMATIS VITICAULIS	MILLBORO LEATHERFLOWER	G2	S2	C2	
COELORACHIS RUGOSA =MANISURIS RUGOSA	WRINKLED JOINTGRASS	G5	SH		
COLLINSIA VERNA	SPRING BLUE-EYED MARY	G5	S1S2		
COLLINSONIA VERTICILLATA	WHORLED HORSE-BALM	G2G3	S1		
CONIOSELINUM CHINENSE	HEMLOCK PARSLEY	G5	S1		
COREOPSIS LINIFOLIA	TEXAS TICKSEED	G4Q	S1		
COREOPSIS PUBESCENS	STAR TICKSEED	G5?	S2		
CORNUS AMOMUM SPP OBLIQUA =C. OBLIQUA	SILKY DOGWOOD	G5T?	S1		
CORNUS CANADENSIS	BUNCHBERRY	G5	S1		
CORNUS RUGOSA	ROUNDLEAF DOGWOOD	G5	S2		
CORNUS SERICEA SSP SERICEA =C. STOLONIFERA	RED-OSIER DOGWOOD	G5T5	S1		
CRATAEGUS AESTIVALIS	MAY HAWTHORN	G5	S1		
CRATAEGUS CALPODENDRON	PEAR HAWTHORN	G5	S1		
CRATAEGUS PRUINOSA	A HAWTHORN	G5	S1		
UNDER C. FLABELLATA IN RADFORD ET AL. (1968)					
CRATAEGUS SPATHULATA	A HAWTHORN	G4G5	S1		
CRATAEGUS SUCCULENTA	FLESHY HAWTHORN	G5	S1		
CROTALARIA ROTUNDIFOLIA =C. ANGULATA	PROSTRATE RATTLE-BOX	G5	S1		
CTENIUM AROMATICUM	TOOTHACHE GRASS	G5	S1		
CUSCUTA CEPHALANTHI	BUTTON-BUSH DODDER	G5	S1?		
CUSCUTA CORYLI	HAZEL DODDER	G5	S1?		
CUSCUTA INDECORA	PRETTY DODDER	G5	S2?		
CUSCUTA ROSTRATA	BEAKED DODDER	G4	S2?		
CYPERUS ACUMINATUS	SHORT-POINT FLATSEDGE	G5	S1		
CYPERUS DENTATUS	TOOTHED SEDGE	G4	S1		
CYPERUS DIANDRUS	UMBRELLA FLATSEDGE	G5	SH		
CYPERUS ENGELMANNII	ENGELMANN'S UMBRELLA-SEDE	G4Q	SH		
UNDER C. ODORATUS IN KARTESZ (IN PRESS) AND HARVILL ET AL. (1986)					
CYPERUS GRANITOPHILUS	GRANITE-LOVING FLATSEDGE	G3Q	S1	3C	
CYPERUS HOUGHTONII	HOUGHTON'S UMBRELLA-SEDE	G3G4	S1		
CYPRIPEDIUM REGINAE	SHOWY LADY'S-SLIPPER	G4	S1		
CYSTOPTERIS TENNESSEENSIS	TENNESSEE BLADDERFERN	G5	S1		
DALIBARDA REPENS	ROBIN RUNAWAY	G5	S1		
DESCHAMPSIA CAESPITOSA	TUFTED HAIRGRASS	G5	S1		
DESMODIUM CANADENSE	SHOWY TICK-TREFOIL	G5	S1S2		
DESMODIUM OCHROLEUCUM	CREAMFLOWER TICK-TREFOIL	G2G3	S1		
DESMODIUM SESSILIFOLIUM	SESSILE-LEAF TICK-TREFOIL	G5	S2		
DESMODIUM STRICTUM	PINELAND TICK-TREFOIL	G3G4	S2		

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DESMODIUM TENUIFOLIUM	SLIM-LEAF TICK-TREFOIL	G3G4	S2		
DIAMORPHA SMALLII	SMALL'S STONECROP	G3G4	S1		
DIARRHENA AMERICANA	AMERICAN BEAKGRAIN	G5	S2S3		
DIARRHENA OBOVATA	A BEAKGRAIN	G?	S1		
UNDER D. AMERICANA VAR OBOVATA IN KARTESZ (IN PRESS)					
DICLIPTERA BRACHIATA	WILD MUDWORT	G5	S1		
DIDIPLAS DIANDRA	WATER-PURSLANE	G5	S1		
=PEPLIS DIANDRA					
DIGITARIA COGNATUM	MOUNTAIN HAIRGRASS	G5	S1		
=LEPTOLOMA COGNATUM					
DIGITARIA SEROTINA	DWARF CRABGRASS	G5?	S1		
DIPHYLLEIA CYMOSA	UMBRELLA-LEAF	G4	S2		
DISPORUM MACULATUM	NODDING MANDRIN	G5	S2		
DROSER A BREVIFOLIA	DWARF SUNDEW	G5	S2		
=D. LEUCANTHA					
ECHINACEA LAEVIGATA	SMOOTH CONEFLOWER	G2	S2		PE
ELATINE MINIMA	SMALL WATER-WORT	G5	S1		
ELEOCHARIS BALDWINII	BALDWIN SPIKERUSH	G4G5	S1		
ELEOCHARIS ELLIPTICA	SLENDER SPIKERUSH	G5	S1S2		
ELEOCHARIS EQUISETOIDES	HORSE-TAIL SPIKERUSH	G4	S1		
ELEOCHARIS HALOPHILA	SALT-MARSH SPIKERUSH	G4	S1		
ELEOCHARIS INTERMEDIA	MATTED SPIKERUSH	G5	S1		
ELEOCHARIS MELANOCARPA	BLACK-FRUITED SPIKERUSH	G4	S2		
ELEOCHARIS RADICANS	ROOTED SPIKERUSH	G5	SH		
ELEOCHARIS ROBBINSII	ROBBINS SPIKERUSH	G4G5	S1		
ELEOCHARIS ROSTELLATA	BEAKED SPIKERUSH	G5	S2		
ELEOCHARIS SMALLII	CREeping SPIKERUSH	G5?	S1S2		
UNDER E. PALUSTRIS IN RADFORD ET AL. (1968) AND HARVILL ET AL. (1986)					
ELEOCHARIS TENUIS VAR VERRUCOSA	SLENDER SPIKERUSH	G5T3T5	S1		
=E. VERRUCOSA					
ELEOCHARIS TRICOSTATA	THREE-ANGLE SPIKERUSH	G3	S1		
ELEOCHARIS VIVIPARA	VIVIPAROUS SPIKERUSH	G5	S1		
ELYMUS TRACHYCAULUS SSP TRACHYCAULUS	SLENDER WHEATGRASS	G5T5	S2		
=AGROPYRON TRACHYCAULUM					
EPILOBIUM LEPTOPHYLLUM	LINEAR-LEAVED WILLOW-HERB	G5	S2		
EPILOBIUM STRICTUM	DOWNY WILLOW-HERB	G5?	S1		
EQUISETUM FLUVIATILE	WATER HORSETAIL	G5	S1		
EQUISETUM SYLVATICUM	WOODLAND HORSETAIL	G5	S1		
ERIGERON VERNUS	WHITE-TOP FLEABANE	G5	S2		
ERIOCAULON AQUATICUM	WHITE BUTTONS	G5	S1		
=E. SEPTANGULARE, =E. PELLUCIDUM					
ERIOCAULON COMPRESSUM	FLATTENED PIPEWORT	G5	S1		
ERIOCAULON DECANGULARE	TEN-ANGLE PIPEWORT	G5	S2		
ERIOCAULON PARKERI	PARKER'S PIPEWORT	G3	S3		3C
ERYNGIUM YUCCIFOLIUM	RATTLESNAKE-MASTER	G5	S2		
ERYSIMUM CAPITATUM	WESTERN WALLFLOWER	G5	S1		
ERYTHRONIUM ALBIDUM	WHITE TROUT-LILY	G5	S2		
EUPATORIUM GLAUCESCENS	WEDGE-LEAF THOROUGH-WORT	G5	SH		
=E. CUNEIFOLIUM					
EUPATORIUM MACULATUM	SPOTTED JOE-PYE WEED	G5	S2		
=EUPATORIADELPHUS MACULATUS					
EUPATORIUM PINNATIFIDUM	PINELAND THOROUGH-WORT	G2G3Q	S1		
=E. X PINNATIFIDUM IN KARTESZ (IN PRESS)					
EUPHORBIA PURPUREA	GLADE SPURGE	G2	S2		C2
FILIPENDULA RUBRA	QUEEN-OF-THE-PRAIRIE	G4G5	S2		

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FIMBRISTYLIS CAROLINIANA	CAROLINA FIMBRISTYLIS	G4	S1		
UNDER F. SPADICEA IN RADFORD ET AL. (1968)					
FIMBRISTYLIS PERPUSILLA	HARPER'S FIMBRISTYLIS	G2	S1	C2	LE
FIMBRISTYLIS PUBERULA	HAIRY FIMBRISTYLIS	G5	S1		
UNDER F. SPADICEA IN RADFORD ET AL. (1968) AND UNDER F. CAROLINIANA IN FERNALD (1950)					
GALIUM BOREALE	NORTHERN BEDSTRAW	G5	S2S3		
GALIUM HISPIDULUM	COAST BEDSTRAW	G5	S2		
GAYLUSSACIA BRACHYCERA	BOX HUCKLEBERRY	G2	S1S2	3C	
GENTIANA AUSTROMONTANA	APPALACHIAN GENTIAN	G3Q	S2?	3C	
GENTIANA AUTUMNALIS	PINE-BARREN GENTIAN	G3	S1	3C	
GENTIANA LINEARIS	NARROW-LEAVED GENTIAN	G4G5	S1		
GENTIANOPSIS CRINITA	FRINGED GENTIAN	G4	S1		
=GENTIANA CRINITA					
GERANIUM ROBERTIANUM	HERB-ROBERT	G5	S1		
GEUM ALEPPICUM	YELLOW AVENS	G5	SH		
GEUM LACINIATUM	ROUGH AVENS	G5	S2		
GLYCERIA CANADENSIS VAR LAXA	NORTHERN MANNA GRASS	G5TUQ	S2?		
=G. LAXA					
GLYCERIA GRANDIS	AMERICAN MANNA GRASS	G5	S1		
GNAPHALIUM ULIGINOSUM	A CUDWEED	G5	S1		
GNAPHALIUM VISCOSUM	WINGED CUDWEED	G3G5	S1		
GORDONIA LASIANTHUS	LOBLOLLY BAY	G5	SR		
GYMNOCARPIUM SP 1	AN OAK FERN	G2	S2?	C2	
GYMNOCLADUS DIOICUS	KENTUCKY COFFEE-TREE	G5	S2		
GYMNOPOGON BREVIFOLIUS	BROAD-LEAVED BEARDGRASS	G5	SH		
HELENIUM BREVIFOLIUM	SHORTLEAF SNEEZEWEED	G4	S2		
HELENIUM VIRGINICUM	VIRGINIA SNEEZEWEED	G2	S2	C1	LE
HELIANTHEMUM BICKNELLII	PLAINS FROSTWEED	G5	S1		
HELIANTHEMUM PROPINQUUM	LOW FROSTWEED	G4	S1		
HELIANTHUS HIRSUTUS	STIFF-HAIR SUNFLOWER	G5	S1		
HELIANTHUS OCCIDENTALIS	MCDOWELL SUNFLOWER	G5	S1		
HELIOTROPIUM CURASSAVICUM	SEASIDE HELIOTROPE	G5	S1		
HELONIAS BULLATA	SWAMP-PINK	G2	S2	LT	LE
HEUCHERA ALBA	WHITE ALUMROOT	G2Q	S2?		
UNDER H. PUBESCENS IN KARTESZ (IN PRESS)					
HEUCHERA LONGIFLORA	LONG-FLOWER ALUMROOT	G3	S2		
HEUCHERA PARVIFLORA	LITTLE-LEAVED ALUMROOT	G4	S2		
HEXASTYLIS LEWISII	A HEARTLEAF	G3	S2S3	3C	
HEXASTYLIS SHUTTLEWORTHII	LARGE-FLOWERED HEARTLEAF	G4	S2		
HIERACIUM TRAILLII	A HAWKWEED	G4?Q	S2S3		
=H. GREENII, UNDER H. X MARIANUM IN RADFORD ET AL. (1968)					
HONKENYA PEPLOIDES	SEA-BEACH SANDWORT	G5	S1		
=ARENARIA PEPLOIDES					
HOUSTONIA CANADENSIS	LONGLEAF BLUETS	G4G5	S1		
=HEDYOTIS CANADENSIS					
HUPERZIA POROPHILA	ROCK CLUBMOSS	G4	S1		
=LYCOPODIUM POROPHILUM					
HUPERZIA SELAGO VAR SELAGO	FIR CLUBMOSS	G5TU	S2		
=LYCOPODIUM SELAGO					
HYDROCOTYLE BONARIENSIS	COASTAL-PLAIN PENNY-WORT	G5	S1		
HYPERICUM ADPRESSUM	CREeping ST. JOHN'S-WORT	G2G3	SH		
HYPERICUM DRUMMONDII	DRUMMOND ST. JOHN'S-WORT	G5	S1		
HYPERICUM MITCHELLIANUM	BLUE RIDGE ST. JOHN'S-WORT	G3	S1		
HYPERICUM SETOSUM	A ST. JOHN'S-WORT	G3G5	S2		

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HYPOXIS SESSILIS INCLUDES H. LONGII	LONG'S YELLOW STAR-GRASS	G4	SH	3C	
ILEX COLLINA =NEMOPANTHUS COLLINUS	LONG-STALKED HOLLY	G3	S2	3C	LE
ILEX CORIACEA	BAY-GAIL HOLLY	G5	S1		
ILIAMNA COREI UNDER I. RIVULARIS VAR RIVULARIS IN KARTESZ (IN PRESS)	PETER'S MOUNTAIN MALLOW	G1Q	S1	LE	LE
ILIAMNA REMOTA UNDER I. RIVULARIS VAR RIVULARIS IN KARTESZ (IN PRESS)	KANKAKEE GLOBE-MALLOW	G1	S1	C2	
IREGINE RHIZOMATOSA	EASTERN BLOODLEAF	G5	S1S2		
IRIS VERSICOLOR	BLUEFLAG	G5	S2		
ISOETES LACUSTRIS =I. MACROSPORA	LAKE QUILLWORT	G5	S1?		
ISOETES VIRGINICA UNDER I. MELANOPODA IN RADFORD ET AL. (1968), KARTESZ (IN PRESS)	VIRGINIA QUILLWORT	G1G2Q	S1?	C2	
ISOPYRUM BITERMATUM =ENEMION BITERMATUM	FALSE RUE-ANEMONE	G5	S1		
ISOTRIA MEDEOLOIDES	SMALL WHORLED POGONIA	G2	S2	LE	LE
IVA IMBRICATA	SEA-COAST MARSH-ELDER	G5?	S1S2		
JUNCUS ABORTIVUS	PINE-BARREN RUSH	G4G5	S1		
JUNCUS ARTICULATUS	JOINTED RUSH	G5	S2		
JUNCUS BALTICUS	BALTIC RUSH	G5	S1		
JUNCUS CAESARIENSIS	NEW JERSEY RUSH	G2	S2	C2	
JUNCUS ELLIOTTII	BOG RUSH	G4G5	S1S2		
JUNCUS GRISCOMII UNDER J. EFFUSUS VAR SOLUTUS IN KARTESZ (IN PRESS)	GRISCOM'S RUSH	GHQ	SH		
JUNCUS MEGACEPHALUS	BIG-HEAD RUSH	G4G5	S2		
JUNCUS NODOSUS	KNOTTED RUSH	G5	S1		
JUNCUS PELOCARPUS	BROWN-FRUITED RUSH	G5	S1		
JUNCUS TORREYI	TORREY'S RUSH	G5	S2		
JUNCUS TRIFIDUS	HIGHLAND RUSH	G5	S1		
JUNCUS VALIDUS =J. CRASSIFOLIUS	A RUSH	G?	S2		
JUNIPERUS COMMUNIS INCLUDES VAR DEPRESSA	GROUND JUNIPER	G5	S1		
JUSTICIA OVATA =J. LANCEOLATA	OVATE WATER-WILLOW	G5	S1		
KALMIA ANGUSTIFOLIA INCLUDES VAR CAROLINIANA	SHEEP-LAUREL	G5	S2S3		
KRIGIA CAESPITOSA =K. OPPOSITIFOLIA	DWARF DANDELION	G?	S1		
KRIGIA MONTANA	FALSE DANDELION	G3	S1		
LACHNANTHES CAROLINIANA =L. CAROLINIANA, =L. TINCTORIA	CAROLINA REDROOT	G4	SH		
LACHNOCAULON ANCEPS	BOG-BUTTONS	G5	S2		
LATHYRUS PALUSTRIS	VETCHLING	G5	S1		
LEERSIA HEXANDRA	CLUB-HEAD CUTGRASS	G5	SH		
LEMNA TRISULCA	STAR DUCKWEED	G5	S1		
LEUCOTHOE FONTANESIANA =L. EDITORUM, =L. AXILLARIS VAR EDITORUM	HIGHLAND DOG-HOBBLE	G5	S1S2		
LIATRIS ASPERA	TALL GAY-FEATHER	G4G5	S1		
LILAEOPSIS ATTENUATA =L. CAROLINENSIS	CAROLINA LILAEOPSIS	G3	S1S2	3C	
LILIUM CATESBAEI	SOUTHERN RED LILY	G4	S1		
LILIUM GRAYI	GRAY'S LILY	G2	S2	C2	

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LIMOSELLA AUSTRALIS	MUDWORT	G4	SH		
=L. SUBULATA					
LINDERA SUBCORTICEA	BOG SPICEBUSH	G2	SU	C2	
LINUM SULCATUM	GROOVED YELLOWFLAX	G5	S2		
LIPARIS LOESELII	LOESEL'S TWAYBLADE	G5	S2		
LIPOCARPHA MICRANTHA	DWARF BULRUSH	G4	S1		
=HEMICARPHA MICRANTHA					
LISTERA AUSTRALIS	SOUTHERN TWAYBLADE	G4	S2S3		
LISTERA CORDATA	HEARTLEAF TWAYBLADE	G5	S1		
LITHOSPERMUM CAROLINIENSE	GOLDEN PUCCOON	G4G5	S1		
LITHOSPERMUM LATIFOLIUM	AMERICAN GROMWELL	G3G5	S1		
LITHOSPERMUM TUBEROSUM	TUBEROUS GROMWELL	G4	S2		
LITSEA AESTIVALIS	PONDSPICE	G3G4	SH	3C	
LOBELIA ELONGATA	ELONGATED LOBELIA	G3G5	S1		
LONICERA CANADENSIS	AMERICAN FLY-HONEYSUCKLE	G5	S2		
LOTUS UNIFOLIATUS VAR HELLERI	HELLER'S TREFOIL	G?T4T5	S1		
=L. HELLERI					
LUDWIGIA ALATA	WINGED SEEDBOX	G3G4	S1		
LUDWIGIA BREVIPES	LONG BEACH SEEDBOX	G4G5	S2		
LUDWIGIA PILOSA	HAIKY SEEDBOX	G5	SH		
LUDWIGIA REPENS	CREEPING SEEDBOX	G5	S1		
LUDWIGIA VIRGATA	SAVANNA SEEDBOX	G5	SH		
LYCOPODIELLA CAROLINIANA VAR CAROLINIANA	SLENDER CLUBMOSS	G5T4	S1		
=LYCOPODIUM CAROLINIANUM					
LYCOPODIELLA INUNDATA	NORTHERN BOG CLUBMOSS	G5	S1		
=LYCOPODIUM INUNDATUM					
LYONIA LIGUSTRINA VAR FOLIOSIFLORA	SOUTHERN MALEBERRY	G5T?	S1		
LYSIMACHIA QUADRIFLORA	FOUR-FLOWERED LOOSESTRIPE	G5?	S1		
LYSIMACHIA RADICANS	TRAILING LOOSESTRIPE	G4G5	S1		
LYTHRUM ALATUM VAR ALATUM	WINGED LOOSESTRIPE	G5T5	S2		
=L. ALATUM					
LYTHRUM ALATUM VAR LANCEOLATUM	LANCE-LEAVED LOOSESTRIPE	G5T?	S1		
=L. LANCEOLATUM					
MAGNOLIA MACROPHYLLA	BIGLEAF MAGNOLIA	G5	S1		
MAIANTHEMUM STELLATUM	STARFLOWER FALSE SOLOMON'S-SEAL	G5	S2		
=SMILACINA STELLATA					
MALAXIS SPICATA	FLORIDA ADDER'S-MOUTH	G3G4	S2		
=M. FLORIDANA					
MANFREDIA VIRGINICA	FALSE ALOE	G5	S1		
=AGAVE VIRGINICA					
MARSHALLIA OBOVATA	OBOVATE MARSHALLIA	G4G5	S2		
MATELEA DECIPIENS	OLD-FIELD MILKVINE	G5	S1		
MATTEUCCIA STRUTHIOPTERIS	OSTRICH FERN	G5	S1		
=M. PENSYLVANICA, =PTERETIS PENSYLVANICA					
MELICA NITENS	THREE-FLOWER MELIC GRASS	G5	S1		
MENYANTHES TRIFOLIATA	BUCKBEAN	G5	S1		
MICRANTHEMUM MICRANTHEMOIDES	NUTTALL'S MICRANTHEMUM	GH	SH	C1*	C
MICRANTHEMUM UMBROSUM	SHADE MUDFLOWER	G5	S1		
MILIMUM EFFUSUM	TALL MILLET-GRASS	G5	S1		
MINUARTIA CAROLINIANA	PINE-BARREN SANDWORT	G5	SX		
=ARENARIA CAROLINIANA					
MINUARTIA GROENLANDICA	MOUNTAIN SANDWORT	G5	S1		
=ARENARIA GROENLANDICA, DOES NOT INCLUDE VAR GLABRA					
MINUARTIA PATULA	PITCHER'S STITCHWORT	G4	S1		
=ARENARIA PATULA					

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MITREOLA PETIOLATA	LAX HORNPOD	G5	S1		
=CYNOCTONUM MITREOLA					
MITREOLA SESSILIFOLIA	A MITREWORT	G4G5	SH		
=CYNOCTONUM SESSILIFOLIUM					
MOEHRINGIA LATERIFLORA	GROVE SANDWORT	G5	S1		
=ARENARIA LATERIFLORA					
MONOTROPSIS ODORATA	SWEET PINE SAP	G3	S2S3		
MUHLENBERGIA BUSHII	BUSH'S MUHLY	G5	SH		
MUHLENBERGIA CAPILLARIS VAR TRICHOPODES	CUT-OVER MUHLY	G5T5	SH		
=M. EXPANSA					
MUHLENBERGIA CUSPIDATA	PLAINS MUHLY	G4	S2		
MUHLENBERGIA GLABRIFLORUS	SMOOTH-LEAVED MUHLY	G3G4	SH		
MUHLENBERGIA GLOMERATA	MARSH MUHLY	G4	S2		
MYRICA CERIFERA VAR PUMILA	SOUTHERN BAYBERRY	G5T?	S1		
UNDER M. CERIFERA IN KARTESZ (IN PRESS)					
MYRIOPHYLLUM HUMILE	LOW WATER-MILFOIL	G5	S1		
MYRIOPHYLLUM TENELLUM	SLENDER WATER-MILFOIL	G5	S1		
NESTRONIA UMBELLULA	NESTRONIA	G3G4	S1S2	C2	LE
NOTHOSCORDUM BIVALVE	CROW-POISON	G4	S2		
=ALLIUM BIVALVE					
NUPHAR LUTEUM SSP SAGITTIFOLIA	YELLOW COWLILY	G5T3	S1		
=N. SAGITTIFOLIUM, =N. SAGITTIFOLIA					
NYMPHOIDES AQUATICA	BIG FLOATING-HEART	G5	S1		
OLDENLANDIA BOSCHII	BOSCH'S BLUET	G5	S1		
=HEDYOTIS BOSCHII					
ONOSMODIUM MOLLE SSP HISPIDISSIMUM	SHAGGY FALSE-GROMWELL	G4?T4	S2		
=O. HISPIDISSIMUM					
OPHIOGLOSSUM PETIOLATUM	LONGSTEM ADDER'S-TONGUE	G5	S1		
OPHIOGLOSSUM PUSILLUM	ADDER'S-TONGUE	G5	S1		
=O. VULGATUM VAR PSEUDOPODUM					
ORBEXILUM ONOBRYCHIS	FRENCH-GRASS	G5	S1		
=PSORALEA ONOBRYCHIS					
ORTHILIA SECUNDA	ONE-SIDED WINTERGREEN	G5	SH		
=PYROLA SECUNDA					
ORYZOPSIS ASPERIFOLIA	WHITE-GRAINED MOUNTAIN-RICEGRASS	G5	S1		
OSMANTHUS AMERICANUS	WILD OLIVE	G5	S1		
OXYPOLIS FILIFORMIS	WATER COWBANE	G5	SH		
PANICUM HEMITOMON	MAIDENCANE	G5?	S1		
PARNASSIA GRANDIFOLIA	LARGE-LEAVED GRASS-OF-PARNASSUS	G2G3	S2		
PARONYCHIA VIRGINICA VAR VIRGINICA	YELLOW NAILWORT	G4T1Q	S2	C2	
PASPALUM BIFIDUM	PITCHFORK PASPALUM	G5	S1		
PASPALUM DISSECTUM	WALTER PASPALUM	G3G4	S1		
PASPALUM DISTICHUM	JOINT PASPALUM	G5	S1		
PASPALUM PRAECOX	EARLY PASPALUM	G4	SH		
PAXISTIMA CANBYI	CANBY'S MOUNTAIN-LOVER	G2	S2	C2	
=PACHISTIMA CANBYI					
PEDIOMELUM CANESCENS	HOARY SCURFPEA	G2G4	S1		
=PSORALEA CANESCENS					
PENSTEMON CALYCOSUS	LONG-SEPAL BEARDTONGUE	G5	S1		
PENSTEMON HIRSUTUS	HAIRY BEARDTONGUE	G4	S2		
PHACELIA FIMBRIATA	FRINGED SCORPION-WEED	G2G3	S2		
PHACELIA RANUNCULACEA	BLUE SCORPION-WEED	G4	S1		
PHALARIS CAROLINIANA	MAY GRASS	G5?	SH		
PHILADELPHUS HIRSUTUS	STREAMBANK MOCK-ORANGE	G5	S2		
PHLOX AMPLIFOLIA	LARGE-LEAVED PHLOX	G3G5	S2		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
PHLOX BUCKLEYI	SWORD-LEAVED PHLOX	G2G3	S2	3C	
PHLOX NIVALIS	TRAILING PHLOX	G4	S1		
PHLOX PILOSA	DOWNY PHLOX	G5	S2		
PHYLA NODIFLORA	COMMON FROG-FRUIT	G5	S1		
=LIPPIDIA NODIFLORA					
PHYSALIS VISCOSA SSP MARITIMA	STICKY GROUND-CHERRY	G4G5T4T5	S2		
=P. MARITIMA					
PHYSOSTEGIA LEPTOPHYLLA	SLENDER-LEAVED DRAGON-HEAD	G4G5	S2	C2	
=DRACOCEPHALUM PURPUREUM IN HARVILL ET AL. (1986) AND RADFORD ET AL. (1968)					
PINUS PALUSTRIS	LONG-LEAF PINE	G4G5	S1		
=P. AUSTRALIS					
PLANTAGO CORDATA	HEART-LEAVED PLANTAIN	G3	SH	3C	
PLANTAGO MARITIMA	SEASIDE PLANTAIN	G5	S1		
PLATANThERA BLEPHARIGLOTTIS	WHITE-FRIDGE ORCHIS	G4G5	S2		
=HABENARIA BLEPHARIGLOTTIS					
PLATANThERA GRANDIFOLIA	LARGE PURPLE-FRIDGE ORCHIS	G5	S1		
=HABENARIA FIMBRIATA, =H. PSYCODES VAR GRANDIFOLIA					
PLATANThERA LEUCOPHAEA	PRAIRIE WHITE-FRIDGE ORCHIS	G2	S1	LT	
=HABENARIA LEUCOPHAEA					
POA PALUDIGENA	BOG BLUEGRASS	G2	S2	C2	
POA PALUSTRIS	FOWL BLUEGRASS	G5	S1S2		
POA SALUENSIS	A BLUEGRASS	G5?	S1		
INCLUDES P. LANGUIDA					
POA WOLFII	WOLF BLUEGRASS	G3G4	S1		
POLANISIA DODECANDRA	COMMON CLAMMY-WEED	G5Q	S1		
POLYGALA BREVIFOLIA	LITTLE-LEAF MILKWORT	G4G5	S1		
POLYGALA RAMOSA	LOW PINE-BARREN MILKWORT	G5	SH		
POLYGONELLA POLYGAMA	OCTOBER-FLOWER	G4	S1		
POLYGONUM GLAUCUM	SEA-BEACH KNOTWEED	G3	S2		
PORTERANTHUS STIPULATUS	AMERICAN IPECAC	G5	S1		
=GILLENIA STIPULATA					
PORTULACA SMALLII	SMALL'S PURSLANE	G2G3	S1	3C	
POTAMOGETON AMPLIFOLIUS	LARGE-LEAF PONDWEED	G5	S1S2		
POTAMOGETON OAKESIANUS	OAKES PONDWEED	G4	S1		
POTAMOGETON ROBBINSII	FLATLEAF PONDWEED	G5	SH		
POTAMOGETON SPIRILLUS	SPIRAL PONDWEED	G5	S1		
POTAMOGETON STRICTIFOLIUS	STRAIGHT-LEAF PONDWEED	G5	S1		
POTAMOGETON TENNESSEENSIS	TENNESSEE PONDWEED	G3	S1		
POTAMOGETON ZOSTERIFORMIS	FLATSTEM PONDWEED	G5	SH		
POTENTILLA ARGUTA	TALL CINQUEFOIL	G5	S1		
PRENANTHES AUTUMNALIS	SLENDER RATTLESNAKE-ROOT	G4G5	S2		
PRENANTHES ROANENSIS	MOUNTAIN RATTLESNAKE ROOT	G3	S2	3C	
PRUNUS ALLEGHANIENSIS	ALLEGHANY PLUM	G3	S2S3	3C	
PRUNUS NIGRA	CANADA PLUM	G4G5	S1		
PRUNUS PUMILA	SAND CHERRY	G5	S1		
PUCCINELLIA FASCICULATA	SALT MARSH GOOSEGRASS	G3	S1		
PYCNANTHEMUM MONOTRICHUM	A MOUNTAIN-MINT	GHQ	S1?	3A	
PYCNANTHEMUM TORREI	TORREY MOUNTAIN-MINT	G2G3	S1?		
PYROLA CHLORANTHA	GREENISH-FLOWERED WINTERGREEN	G5	SH		
=P. VIRENS					
PYROLA ELLIPTICA	SHINLEAF	G5	S2		
PYXIDANTHERA BARBULATA	FLOWERING PIXIE-MOSS	G4	S1		
QUERCUS HEMISPHERICA	DARLINGTON'S OAK	G5	S2		
UNDER Q. LAURIFOLIA IN RADFORD ET AL. (1968)					
QUERCUS INCANA	BLUE JACK OAK	G5	S2		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
QUERCUS LAEVIS	TURKEY OAK	G5	S2		
QUERCUS MACROCARPA	BUR OAK	G5	S1		
QUERCUS MARGARETTAE	SAND POST OAK	G5	S2		
=Q. STELLATA VAR MARGARETTA					
QUERCUS PRINOIDES	DWARF CHINQUAPIN OAK	G5	S2		
QUERCUS SHUMARDII	SHUMARD'S OAK	G5	S2		
RANUNCULUS AQUATILIS	WHITE WATER BUTTERCUP	G5	S1		
=R. TRICHOPHYLLUS					
RANUNCULUS HEDERACEUS	LONG-STALKED CROWFOOT	G5	SH		
RANUNCULUS LAXICAILIS	MISSISSIPPI BUTTERCUP	G5?	S1		
RANUNCULUS LONGIROSTIS	WHITE WATER CROWFOOT	G5	S1		
RHAMNUS ALNIFOLIA	ALDERLEAF BUCKTHORN	G5	S1		
RHAMNUS LANCEOLATA	LANCE-LEAVED BUCKTHORN	G4G5	S1S2		
RHEXIA ARISTOSA	AWNED MEADOWBEAUTY	G2	SR		C2
RHEXIA PETIOLATA	CILIATE MEADOWBEAUTY	G3G5	S1		
RHODODENDRON ARBORESCENS	SMOOTH AZALEA	G4G5	S2		
RHODODENDRON CUMBERLANDENSE	CUMBERLAND RHODODENDRON	G3Q	S2		
RHYNCHOSPORA ALBA	WHITE BEAKRUSH	G5	S1		
RHYNCHOSPORA CAPILLACEA	CAPILLARY BEAKRUSH	G5	S1		
RHYNCHOSPORA CEPHALANTHA	CAPITATE BEAKRUSH	G5	S2		
RHYNCHOSPORA COLORATA	WHITE-TOPPED SEDGE	G4G5	S1		
=DICHROMENA COLORATA					
RHYNCHOSPORA DEBILIS	SAVANNAH BEAKRUSH	G4?	S1		
RHYNCHOSPORA FASCICULARIS	FASCICULATE BEAKRUSH	G5	S2		
RHYNCHOSPORA FILIFOLIA	THREAD-LEAVED BEAKRUSH	G5	SH		
RHYNCHOSPORA GRAYI	GRAY'S BEAKRUSH	G4	SH		
RHYNCHOSPORA HARVEYI	HARVEY BEAKRUSH	G4	SH		
RHYNCHOSPORA INUNDATA	DROWNED HORNEDRUSH	G3G4	SR		
RHYNCHOSPORA MILIACEA	MILLET BEAKRUSH	G5	SH		
RHYNCHOSPORA NITENS	SHORT-BEAKED BALDRUSH	G3	S1		
=PSILOCARYA NITENS					
RHYNCHOSPORA OLIGANTHA	FEW-FLOWERED BEAKRUSH	G5	S1		
RHYNCHOSPORA PALLIDA	PALE BEAKRUSH	G2G3	SH		
RHYNCHOSPORA PERPLEXA	A BEAKRUSH	G5	S1		
RHYNCHOSPORA SCIRPOIDES	LONG-BEAKED BALDRUSH	G4	S1		
=PSILOCARYA SCIRPOIDES					
RHYNCHOSPORA WRIGHTIANA	WRIGHT'S BEAKRUSH	G5	SR		
RIBES AMERICANUM	WILD BLACK CURRANT	G5	SH		
RIBES GLANDULOSUM	SKUNK CURRANT	G5	S2		
RIBES LACUSTRE	BRISTLY BLACK CURRANT	G5	S1		
RORIPPA SESSILIFLORA	STALKLESS YELLOWCRESS	G3G5	S1		
ROSA SETIGERA	PRAIRIE ROSE	G5	S1		
RUBUS IDAEUS	COMMON RED RASPBERRY	G5	S2		
RUDBECKIA HELIOPSISIDIS	SUN-FACING CONEFLOWER	G2	S1		C2
RUDBECKIA TRILOBA VAR PINNATILOBA	PINNATE-LOBED BLACK-EYED SUSAN	G4T1T2	S1		C2
SABATIA BRACHIATA	NARROW-LEAF PINK	G5?	S1		
SABATIA CALYCINA	COAST ROSE-GENTIAN	G3G5	S1S2		
SABATIA CAMPANULATA	SLENDER MARSH PINK	G5	S2		
SABATIA DIFFORMIS	TWO-FORMED PINK	G4G5	S1		
SACCHARUM BREVIBARBE	SHORT-BEARD PLUMEGRASS	G3G5	S1		
=ERIANTHUS BREVIBARBIS					
SAGITTARIA CALYCINA VAR CALYCINA	LONG-LOBE ARROWHEAD	G5T5?	S1		
=S. CALYCINA, =LOPHOTOCARPUS CALYGINUS					
SAGITTARIA CALYCINA VAR SPONGIOSA	AN ARROWHEAD	G5T4	S1		
=S. SPATHULATA, =LOPHOTOCARPUS SPONGIOSUS					

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
SAGITTARIA ENGELMANNIANA	ENGELMANN ARROWHEAD	G5?	SH		
SAGITTARIA RIGIDA	SESSILE-FRUITED ARROWHEAD	G5	S1		
SALIX EXIGUA	SANDBAR WILLOW	G5	S1		
=S. INTERIOR					
SALIX LUCIDA	SHINING WILLOW	G5	S1		
SANGUISORBA CANADENSIS	CANADA BURNET	G5	S2		
SANICULA TRIFOLIATA	LARGE-FRUITED SANICLE	G4	S2		
SARRACENIA FLAVA	YELLOW PITCHER-PLANT	G4G5	S1		
SARRACENIA PURPUREA	NORTHERN PITCHER-PLANT	G5	S2		
SAXIFRAGA CAREYANA	CAREY SAXIFRAGE	G3	S2	3C	
SAXIFRAGA CAROLINIANA	CAROLINA SAXIFRAGE	G2	S2	C2	
UNDER S. CAREYANA IN HARVILL ET AL. (1986)					
SCHIZACHNE PURPURASCENS	PURPLE OAT-GRASS	G5	S1		
SCHRANKIA MICROPHYLLA	LITTLE-LEAF SENSITIVE-BRIARS	G5	S2		
SCHWALBEA AMERICANA	CHAFFSEED	G2	SH	PE	
SCIRPUS ACUTUS	HARD-STEMMED BULRUSH	G5	S2		
SCIRPUS ANCISTROCHAETUS	NORTHEASTERN BULRUSH	G2	S2	LE	LE
SCIRPUS ETUBERCULATUS	CANBY'S BULRUSH	G3G4	S1		
SCIRPUS FLACCIDIFOLIUS	RECLINING BULRUSH	G1?G	S1	3C	
=S. ATROVIRENS VAR FLACCIDIFOLIUS					
SCIRPUS FLUVIATILIS	RIVER BULRUSH	G5	S1		
SCIRPUS SUBTERMINALIS	WATER BULRUSH	G4G5	S1		
SCIRPUS TORREYI	TORREY'S BULRUSH	G5?	S1		
SCLERIA MINOR	SLENDER NUTRUSH	G4G5	S2		
SCLERIA VERTICILLATA	WHORLED NUTRUSH	G4?	S1		
SCLEROLEPIS UNIFLORA	ONE-FLOWER SCLEROLEPIS	G4	S1		
SCUTELLARIA GALERICULATA	HOODED SKULLCAP	G5	S1		
=S. EPILOBIFOLIA					
SCUTELLARIA INCANA	HOARY SKULLCAP	G5	S1		
SCUTELLARIA PARVULA VAR PARVULA	SMALL SKULLCAP	G4T?	S2		
DOES NOT INCLUDE VAR LEONARDII					
SENECIO MILLEFOLIUM	YARROW-LEAVED RAGWORT	G2?	S1	3C	
SEYMERIA CASSIODES	SEYMERIA	G5	S1S2		
SIBBALDIOPSIS TRIDENTATA	THREE-TOOTHED CINQUEFOIL	G5	S2		
=POTENTILLA TRIDENTATA					
SIDA ELLIOTTII	ELLIOTT SIDA	G4G5	S2		
SIDA HERMAPHRODITA	VIRGINIA MALLOW	G3	S1	3C	
SIDA INFLEXA	VIRGINIA PINE SIDA	GHQ	SH	C2*	
SILENE NIVEA	SNOWY CAMPION	G3G4	S1		
SILENE OVATA	OVATE CATCHFLY	G3	S1	C2	
SILENE ROTUNDIFOLIA	ROUNDLEAF CATCHFLY	G4?	S2		
SILPHIUM TEREBINTHINACEUM	PRAIRIE ROSINWEED	G4G5	S1		
SISYRINCHIUM ALBIDUM	WHITE BLUE-EYED-GRASS	G?	S1		
SMILAX ECIRRATA	UPRIGHT GREENBRIER	G5?	S1		
=S. ECIRRATA					
SMILAX SMALLII	SMALL'S GREENBRIER	G5?	S1		
SOLIDAGO ARGUTA VAR HARRISII	SHALE-BARREN GOLDENROD	G5T3	S2	3C	
=S. HARRISSII, =S. HARRISII					
SOLIDAGO LATISSIMIFOLIA	ELLIOTT GOLDENROD	G5	S1		
=S. ELLIOTTII					
SOLIDAGO PATULA VAR STRICTULA	ROUND-LEAVED GOLDENROD	G5T5	S1		
=S. SALICINA					
SOLIDAGO RADULA	WESTERN ROUGH GOLDENROD	G5?	S1		
SOLIDAGO RIGIDA	STIFF GOLDENROD	G5	S2		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
SOLIDAGO RUPESTRIS	ROCK GOLDENROD	G2?Q	S1		
UNDER S. ALTISSIMA IN RADFORD ET AL. (1968)					
SOLIDAGO SIMPLEX VAR RACEMOSA	STICKY GOLDENROD	G?T3T4	S1		
=S. RACEMOSA					
SOLIDAGO SIMPLEX VAR RANDII	RAND'S GOLDENROD	G?T3?	S2		
=S. RANDII					
SOLIDAGO STRICTA	WANDLIKE GOLDENROD	G5	S1		
SOLIDAGO TORTIFOLIA	A GOLDENROD	G3G5	S1		
SOLIDAGO ULIGINOSA	BOG GOLDENROD	G4G5	S2		
SPARGANIUM ANDROCLADUM	BRANCHING BURREED	G4G5	S1		
SPARGANIUM ANGUSTIFOLIUM	NARROW-LEAF BURREED	G5	S1		
=S. CHLOROCARPUM					
SPARTINA PECTINATA	FRESH WATER CORDGRASS	G5	S2		
SPHENOPHOLIS FILIFORMIS	LONG-LEAF WEDGESCALE	G3G4	SH		
SPIRAEA VIRGINIANA	VIRGINIA SPIRAEA	G1	S1	LT	LE
SPIRANTHES LUCIDA	SHINING LADIES'-TRESSES	G5	S1		
SPIRANTHES OCHROLEUCA	YELLOW NODDING LADIES'-TRESSES	G4	S2		
SPIRANTHES ODORATA	SWEETSCENT LADIES'-TRESSES	G5	S2		
=S. CERNUA VAR ODORATA					
SPOROBOLUS ASPER	LONGLEAF DROPSEED	G5	S1		
SPOROBOLUS JUNCEUS	A DROPSEED	G5	S1		
SPOROBOLUS NEGLECTUS	SMALL DROPSEED	G5	S2		
SPOROBOLUS VIRGINICUS	SEASHORE DROPSEED	G5	SH		
STACHYS PALUSTRIS	MARSH HEDGE-NETTLE	G5	S1		
STEINCHISMA HIANIS	GAPING PANIC GRASS	G5	S1		
=PANICUM HIANIS					
STELLARIA COREI	TENNESSEE CHICKWEED	G3	S1		
STEWARTIA MALACHODENDRON	SILKY CAMELLIA	G4	S2		
STEWARTIA OVATA	MOUNTAIN CAMELLIA	G4	S2		
STILLINGIA SYLVATICA	QUEEN'S DELIGHT	G4G5	S1		
STIPULICIDA SETACEA	PINELAND SCALY-PINK	G5	S1		
STREPTOPUS AMPLEXIFOLIUS	WHITE MANDARIN	G5	S1		
STROPHOSTYLES LEIOSPERMA	SLICK-SEED WILD-BEAN	G5	S1		
STROPHOSTYLES UMBELLATA VAR PALUDIGENA	A WILD-BEAN	G5T?	S1?		
UNDER S. UMBELLATA IN KARTESZ (IN PRESS)					
STYLOPHORUM DIPHYLLOM	CELANDINE POPPY	G5	S2		
SUAEDA MARITIMA	LOW SEA BLITE	G5	S1		
SULLIVANTIA SULLIVANTII	SULLIVANTIA	G3Q	S1	3C	
SYNANDRA HISPIDULA	GYANDOTTE BEAUTY	G4	S2	3C	
TETRAGONOTHECA HELIANTHOIDES	PINELAND SQUAREHEAD	G5	S1		
THALICTRUM MACROSTYLUM	PIEDMONT MEADOW-RUE	G4?	S1		
THELYPTERIS SIMULATA	BOG FERN	G5	S1		
TILLANDSIA USNEOIDES	SPANISH MOSS	G5	S2		
TOFIELDIA GLUTINOSA	STICKY TOFIELDIA	G5	S1		
=T. RACEMOSA VAR GLUTINOSA					
TOFIELDIA RACEMOSA	COASTAL FALSE-ASPHODEL	G5	S1		
TRAGIA URTICIFOLIA	NETTLE-LEAF NOSEBURN	G5	S1S2		
TRIADENUM TUBULOSUM	LARGE MARSH ST. JOHN'S-WORT	G3G5	S1		
=HYPERICUM TUBULOSUM					
TRICHOSTEMA SETACEUM	NARROW-LEAVED BLUE-CURLS	G5	S2		
TRIDENS STRICTUS	LONG-SPIKE FLUFF-GRASS	G5	S1		
=TRIDENS STRICTA					
TRIFOLIUM REFLEXUM	BUFFALO CLOVER	G5	S1		
TRIFOLIUM SP 1	LEO'S CLOVER	G1?	S1	C2	

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TRIFOLIUM VIRGINICUM	KATE'S-MOUNTAIN CLOVER	G3	S3	3C	
TRILLIUM CERNUUM	NODDING TRILLIUM	G5	S1		
TRILLIUM FLEXIPES	DROOPING TRILLIUM	G5	S1		
TRILLIUM NIVALE	SNOW TRILLIUM	G4	S1		
TRILLIUM PUSILLUM VAR VIRGINIANUM	VIRGINIA LEAST TRILLIUM	G3T2	S2	C2	
INCLUDES VAR MONTICULUM					
TRIPHORA TRIANTHOPHORA	NODDING POGONIA	G4	S1		
TRISETUM SPICATUM	NARROW FALSE OATS	G5	S1		
UTRICULARIA CORNUTA	HORNED BLADDERWORT	G5	S1		
UTRICULARIA FIBROSA	FIBROUS BLADDERWORT	G4G5	S1		
UTRICULARIA GEMINISCAPA	HIDDEN-FRUITED BLADDERWORT	G4G5	S2		
UTRICULARIA JUNCEA	SOUTHERN BLADDERWORT	G5	S2		
UTRICULARIA MACRORHIZA	GREATER BLADDERWORT	G5	S2		
=U. VULGARIS					
UTRICULARIA PURPUREA	PURPLE BLADDERWORT	G5	S2		
VACCINIUM CRASSIFOLIUM	CREEPING BLUEBERRY	G4G5	S1		
VACCINIUM MACROCARPON	LARGE CRANBERRY	G4	S2		
VACCINIUM MYRTILLOIDES	VELVETLEAF BLUEBERRY	G5	S1S2		
VALERIANA PAUCIFLORA	VALERIAN	G3G4	S2		
VERBENA SCABRA	SANDPAPER VERVAIN	G5	S2		
VERONICA SCUTELLATA	MARSH-SPEEDWELL	G5	S2		
VIBURNUM LENTAGO	NANNYBERRY	G5	S1		
VICIA AMERICANA	AMERICAN PURPLE VETCH	G5	S1		
VIOLA ESCULENTA	SALAD VIOLET	G4G5	S1		
UNDER V. SEPTEMLOBA IN RADFORD ET AL. (1968) AND HARVILL ET AL. (1986)					
VIOLA WALTERI	PROSTRATE BLUE VIOLET	G4G5	S2		
VITIS RUPESTRIS	SAND GRAPE	G3Q	S1		
WISTERIA FRUTESCENS	AMERICAN WISTERIA	G5	S2		
WOLFFIA COLUMBIANA	COLUMBIA WATER-MEAL	G5	S1		
XYRIS CAROLINIANA	CAROLINA YELLOW-EYED-GRASS	G4G5	S1		
XYRIS FIMBRIATA	FRINGED YELLOW-EYED-GRASS	G5	SH		
XYRIS LAXIFOLIA VAR IRIDIFOLIA	A YELLOW-EYED-GRASS	G3G5T?	S1		
=X. IRIDIFOLIA					
ZANTHOXYLUM AMERICANUM	NORTHERN PRICKLY-ASH	G5	S2S3		
ZENOBI A PULVERULENTA	DUSTY ZENOBI A	G5	S1		
ZIGADENUS DENSUS	BLACK SNAKEROOT	G5	S1		
ZIGADENUS ELEGANS SSP GLAUCUS	WHITE CAMASS	G5T4?	S2		
=Z. GLAUCUS					
ZIGADENUS GLABERRIMUS	LARGE-FLOWERED CAMASS	G5	S1		
ZIGADENUS LEIMANTHOIDES	DEATH-CAMASS	G4Q	S1		
ZORNIA BRACTEATA	VIPERINA	G5?	S1		

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RARE AMPHIBIANS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
AMBYSTOMA MABEEI	MABEE'S SALAMANDER	G4	S1		LT
AMBYSTOMA TALPOIDEUM	MOLE SALAMANDER	G5	SU		
AMBYSTOMA TIGRINUM	TIGER SALAMANDER	G5	S1		LE
ANEIDES AENEUS	GREEN SALAMANDER	G3G4	S3	3C	
BUFO QUERCICUS	OAK TOAD	G5	S1		
CRYPTOBRANCHUS ALLEGANIENSIS	HELLBENDER	G4	S3	C2	
DESMOGNATHUS WRIGHTI	PIGMY SALAMANDER	G4	S2		
HYLA GRATIOSA	BARKING TREEFROG	G5	S1		LT
LEUROGNATHUS MARMORATUS	SHOVELNOSE SALAMANDER	G4	S2?		
LIMNAEODUS OCULARIS	LITTLE GRASS FROG	G5	S3		
NECTURUS MACULOSUS	MUDPUPPY	G5	SU		
NECTURUS PUNCTATUS	DWARF WATERDOG	G4	SU		
PLETHODON DORSALIS	ZIGZAG SALAMANDER	G5	SU		
PLETHODON HUBRICHTI	PEAKS OF OTTER SALAMANDER	G2	S2	C2	
PLETHODON KENTUCKI	CUMBERLAND PLATEAU SALAMANDER	G3	S3		
PLETHODON PUNCTATUS	WHITE-SPOTTED SALAMANDER	G3	S2	C2	
PLETHODON SHENANDOAH	SHENANDOAH SALAMANDER	G1	S1	LE	LE
PLETHODON WELLERI	WELLER'S SALAMANDER	G4	S2		
PLETHODON YONAHLOSSEE	YONAHLOSSEE SALAMANDER	G4	S3		
RANA VIRGATIPES	CARPENTER FROG	G5	S3		
SIREN INTERMEDIA	LESSER SIREN	G5	SU		
SIREN LACERTINA	GREATER SIREN	G5	SU		
STEREOCHILUS MARGINATUS	MANY-LINED SALAMANDER	G5	S3		

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RARE BIRDS OF VIRGINIA

COMMON NAME	SNAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
PIED-BILLED GREBE	PODILYMBUS PODICEPS	G5	S3		
BROWN PELICAN	PELECANUS OCCIDENTALIS	G5	SB1SN4		
DOUBLE-CRESTED CORMORANT	PHALACROCORAX AURITUS	G5	S1		
AMERICAN BITTERN	BOTAURUS LENTIGINOSUS	G4	SU		
LEAST BITTERN	IXOBRYCHUS EXILIS	G5	S2		
GREAT BLUE HERON	ARDEA HERODIAS	G5	S3		
GREAT EGRET	CASMERODIUS ALBUS	G5	SB2SN4		
SNOWY EGRET	EGRETTA THULA	G5	S2		
LITTLE BLUE HERON	EGRETTA CAERULEA	G5	SB2SN4		
TRICOLORED HERON	EGRETTA TRICOLOR	G5	SB2SN4		
BLACK-CROWNED NIGHT-HERON	NYCTICORAX NYCTICORAX	G5	S3		
YELLOW-CROWNED NIGHT-HERON	NYCTANASSA VIOLACEA	G5	S1		
WHITE IBIS	EUDOCIMUS ALBUS	G5	S1		
GLOSSY IBIS	PLEGADIS FALCINELLUS	G5	S2		
GREEN-WINGED TEAL	ANAS CRECCA	G5	SU		
NORTHERN PINTAIL	ANAS ACUTA	G5	S1		
BLUE-WINGED TEAL	ANAS DISCORS	G5	S1		
GADWALL	ANAS STREPERA	G5	S2		
HOODED MERGANSER	LOPHODYTES CUCULLATUS	G5	S1		
COMMON MERGANSER	MERGUS MERGANSER	G5	S1		
BALD EAGLE	HALIAEETUS LEUCOCEPHALUS	G3	S2S3	LE	LE
NORTHERN HARRIER	CIRCUS CYANEUS	G5	S1S2		
COOPER'S HAWK	ACCIPITER COOPERII	G4	S1S2		
GOLDEN EAGLE	AQUILA CHRYSAETOS	G4	SH		
PEREGRINE FALCON	FALCO PEREGRINUS	G3	S1	LE	LE
BLACK RAIL	LATERALLUS JAMAICENSIS	G4?	SU	C2	
KING RAIL	RALLUS ELEGANS	G4Q	S2		
VIRGINIA RAIL	RALLUS LIMICOLA	G5	S2		
SORA	PORZANA CAROLINA	G5	S1		
COMMON MOORHEN	GALLINULA CHLOROPUS	G5	S1		
AMERICAN COOT	FULICA AMERICANA	G5	S1		
WILSON'S PLOVER	CHARADRIUS WILSONIA	G5	S1		LE
PIPING PLOVER	CHARADRIUS MELODUS	G3	S2	LT	LT
BLACK-NECKED STILT	HIMANTOPUS MEXICANUS	G5	S1		
AMERICAN AVOCET	RECURVIROSTRA AMERICANA	G5	S1SZN		
SPOTTED SANDPIPER	ACTITIS MACULARIA	G5	S2		
UPLAND SANDPIPER	BARTRAMIA LONGICAUDA	G5	S1S2		LT
GULL-BILLED TERN	STERNA NILOTICA	G5	S2		LT
CASPIAN TERN	STERNA CASPIA	G5	S1		
ROYAL TERN	STERNA MAXIMA	G5	S2		
SANDWICH TERN	STERNA SANDVICENSIS	G4	S1		
ROSEATE TERN	STERNA DOUGALLII	G3	SH	LE	LE
COMMON TERN	STERNA HIRUNDO	G5	S3		
LEAST TERN	STERNA ANTILLARUM	G4	S2		
BLACK SKIMMER	RYNCHOPS NIGER	G5	S2		
LONG-EARED OWL	ASIO OTUS	G5	S1		

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RARE BIRDS OF VIRGINIA

COMMON NAME	SNAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
SHORT-EARED OWL	ASIO FLAMMEUS	G5	S1		
NORTHERN SAW-WHET OWL	AEGOLIUS ACADICUS	G5	S1		
YELLOW-BELLIED SAPSUCKER	SPHYRAPICUS VARIUS	G5	S1		
RED-CKOADED WOODPECKER	PICOIDES BOREALIS	G2	S1	LE	LE
OLIVE-SIDED FLYCATCHER	CONTOPUS BOREALIS	G5	SH		
YELLOW-BELLIED FLYCATCHER	EMPIDONAX FLAVIVENTRIS	G5	S1		
ALDER FLYCATCHER	EMPIDONAX ALNORUM	G5	S2		
RED-BREASTED NUTHATCH	SITTA CANADENSIS	G5	S2		
BROWN CREEPER	CERTHIA AMERICANA	G5	S3		
APPALACHIAN BEWICK'S WREN	THRYOMANES BEWICKII ALTUS	G5T?	SU	C2	LE
WINTER WREN	TROGLODYTES TROGLODYTES	G5	S2		
SEDGE WREN	CISTOTHORUS PLATENSIS	G5	S1		
GOLDEN-CROWNED KINGLET	REGULUS SATRAPA	G5	S2		
SWAINSON'S THRUSH	CATHARUS USTULATUS	G5	S1		
HERMIT THRUSH	CATHARUS GUTTATUS	G5	S1		
LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	G4	S2	C2	LT
NASHVILLE WARBLER	VERMIVORA RUFICAPILLA	G5	S1		
MAGNOLIA WARBLER	DENDROICA MAGNOLIA	G5	S2		
BLACKBURNIAN WARBLER	DENDROICA FUSCA	G5	S2		
SWAINSON'S WARBLER	LIMNOTHLYPIS SWAINSONII	G4	S2		
NORTHERN WATERTHRUSH	SEIURUS NOVEBORACENSIS	G5	S1		
MOURNING WARBLER	OPORORNIS PHILADELPHIA	G5	S1		
DICKCISSEL	SPIZA AMERICANA	G4	S1		
BACHMAN'S SPARROW	AIMOPHILA AESTIVALIS	G3	S1	C2	LT
LARK SPARROW	CHONDESTES GRAMMACUS	G5	SH		
HENSLOW'S SPARROW	AMMODRAMUS HENSLOWII	G4	S1	C2	LT
SHARP-TAILED SPARROW	AMMODRAMUS CAUDACUTUS	G5	S2		
SWAMP SPARROW	MELOSPIZA GEORGIANA	G5	S1		
BOBOLINK	DOLICHONYX ORYZIVORUS	G5	S1		
PURPLE FINCH	CARPODACUS PURPUREUS	G5	S1		
RED CROSSBILL	LOXIA CURVIROSTRA	G5	S1		

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RARE FISHES OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
ACANTHARCHUS POMOTIS	MUD SUNFISH	G5	S3		
ACIPENSER BREVIROSTRUM	SHORTNOSE STURGEON	G3	SX	LE	LE
ACIPENSER OXYRHYNCHUS	ATLANTIC STURGEON	G3	S2		
ALOSA MEDIOCRIS	HICKORY SHAD	G5	S3		
AMBLOPLITES CAVIFRONS	ROANOKE BASS	G3	S3		
AMEIURUS BRUNNEUS	SNAIL BULLHEAD	G4	S2		
AMEIURUS PLATYCEPHALUS	FLAT BULLHEAD	G4?	S3		
AMMOCRYPTA CLARA	WESTERN SAND DARTER	G3	S1		LT
APLODINOTUS GRUNNIENS	FRESHWATER DRUM	G5	S2		
CHOLOGASTER CORNUTA	SWAMPFISH	G5	S3		
COTTUS BAILEYI	BLACK SCULPIN	G2	S2?		
COTTUS CAROLINAE	BANDED SCULPIN	G5	S3		
COTTUS COGNATUS	SLIMY SCULPIN	G5	S2		
COTTUS GIRARDI	POTOMAC SCULPIN	G4	S3		
CYPRINELLA GALACTURA	WHITETAIL SHINER	G5	S3		
=NOTROPIS GALACTURA					
CYPRINELLA LABROSA	THICKLIP CHUB	G3	SH		
CYPRINELLA MONACHA	SPOTFIN CHUB	G2	S1	LT	LT
CYPRINELLA WHIPPLEI	STEELCOLOR SHINER	G5	S2		LT
=NOTROPIS WHIPPLEI					
ENNEACANTHUS CHAETODON	BLACKBANDED SUNFISH	G5	S1		LE
ERIMYSTAX CAHNI	SLENDER CHUB	G2	S1	LT	LT
=HYBOBOSIS CAHNI					
ERIMYSTAX DISSIMILIS	STREAMLINE CHUB	G4?	S3		
=HYBOBOSIS DISSIMILIS					
ERIMYSTAX INSIGNIS	BLOTCHED CHUB	G4?	S3		
=HYBOBOSIS INSIGNIS					
ERIMYZON SUCETTA	LAKE CHUBSUCKER	G5	S2		
ETHEOSTOMA ACUTICEPS	SHARPHEAD DARTER	G3G4	S1	3C	LE
ETHEOSTOMA CAERULEUM	RAINBOW DARTER	G5	S2		
ETHEOSTOMA CAMURUM	BLUEBREAST DARTER	G3	S2		
ETHEOSTOMA CHLOROBANCHIUM	GREENFIN DARTER	G3	S1		LT
ETHEOSTOMA CINEREUM	ASHY DARTER	G2	SH		
ETHEOSTOMA COLLIS	CAROLINA DARTER	G3	S2		LT
ETHEOSTOMA JESSIAE	BLUESIDE DARTER	G4Q	S1		LE
=E. STIGMAEUM JESSIAE					
ETHEOSTOMA KANAWHAE	KANAWHA DARTER	G2	S2		
ETHEOSTOMA LONGIMANUM	LONGFIN DARTER	G3	S3		
ETHEOSTOMA MEADIAE	SPECKLED DARTER	G5	S1		
=E. STIGMAEUM					
ETHEOSTOMA OSBURNI	CANDY DARTER	G3	S1	C2	
ETHEOSTOMA PODOSTEMONE	RIVERWEED DARTER	G3	S3		
ETHEOSTOMA RUFILINEATUM	REDLINE DARTER	G5	S3		
ETHEOSTOMA SANGUIFLUUM	BLOODFIN DARTER	G4	S3		
=E. MACULATUM					
ETHEOSTOMA SERRIFER	SAWCHEEK DARTER	G5	S3		
=E. SERRIFERUM					

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
ETHEOSTOMA SIMOTERUM	TENNESSEE SNUBNOSE DARTER	G5	S3		
ETHEOSTOMA SP 3 =E. PERCNURUM	DUSKYTAIL DARTER	G3	S1	C2	LE
ETHEOSTOMA SWANNANO	SWANNANO DARTER	G4	S2		
ETHEOSTOMA TIPPECANOE	TIPPECANOE DARTER	G3	S1		LT
ETHEOSTOMA VARIATUM	VARIEGATE DARTER	G4	S1		LE
ETHEOSTOMA ZONALE	BANDED DARTER	G5	S3		
FUNDULUS CATENATUS	NORTHERN STUDEFISH	G5	S3		
FUNDULUS LINEOLATUS	LINED TOPMINNOW	G5	S1		
FUNDULUS RATHBUNI	SPECKLED KILLIFISH	G4	S2		
HYPENTELIUM ROANOKENSE	ROANOKE HOG SUCKER	G3?	S3		
ICHTHYOMYZON BDELLIUM	OHIO LAMPREY	G3	S2		
ICHTHYOMYZON GREELEYI	MOUNTAIN BROOK LAMPREY	G3	S2		
LABIDESTHES SICCOLUS	BROOK SILVERSIDE	G5	S2		
LAMPETRA AEPYPTERA	LEAST BROOK LAMPREY	G5	S3		
LAMPETRA APPENDIX	AMERICAN BROOK LAMPREY	G5	S3		
LUXILUS CHRYSOCEPHALUS =NOTROPIS CHRYSOCEPHALUS	STRIPED SHINER	G5	S3		
LUXILUS COCCOGENIS =NOTROPIS COCCOGENIS	WARPAINT SHINER	G5	S3		
LYTHRURUS LIRUS =NOTROPIS LIRUS	MOUNTAIN SHINER	G4	S3		
MORONE CHRYSOPS	WHITE BASS	G5	S3		
MOXOSTOMA ARIOMMUM	BIGEYE JUMPROCK	G2	S2		
MOXOSTOMA CARINATUM	RIVER REDHORSE	G4	S3		
MOXOSTOMA DUQUESNEI	BLACK REDHORSE	G5	S3		
MOXOSTOMA HAMILTONI =THOBURNIA HAMILTONI	RUSTYSIDE SUCKER	G2	S2	3C	
MOXOSTOMA ROBUSTUM	SMALLFIN REDHORSE	G3G4	SH		
NOTROPIS ALBORUS	WHITEMOUTH SHINER	G4	S1		LT
NOTROPIS ALTIPINNIS	HIGHFIN SHINER	G5	S3		
NOTROPIS AMBLOPS	BIGEYE CHUB	G4?	S3		
NOTROPIS ARIOMMUS	POPEYE SHINER	G3	S3		
NOTROPIS ATHERINOIDES	EMERALD SHINER	G5	S3		LT
NOTROPIS BIFRENATUS	BRIDLE SHINER	G5	S3		
NOTROPIS BUCCATUS	SILVERJAW MINNOW	G5	S3		
NOTROPIS CHALYBAEUS	IRONCOLOR SHINER	G5	S3		
NOTROPIS CHILITICUS	REDLIP SHINER	G4	S3		
NOTROPIS HYPISINOTUS	HIGHBACK CHUB	G4	S3		
NOTROPIS RUBRICROCEUS	SAFFRON SHINER	G4?	S3		
NOTROPIS SEMPERASPER	ROUGHHEAD SHINER	G3	S3	C2	
NOTROPIS SPECTRUNCULUS	MIRROR SHINER	G4	S2		
NOTROPIS STRAMINEUS	SAND SHINER	G5	S2		
NOTURUS ELEUTHERUS	MOUNTAIN MADTOM	G5	S3		
NOTURUS FLAVIPINNIS	YELLOWFIN MADTOM	G2	S1	LTXN	LT

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RARE FISHES OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
NOTURUS FLAVUS	STONECAT	G5	S3		
NOTURUS GILBERTI	ORANGEFIN MADTOM	G2	S1	C2	LT
PERCINA AURANTIACA	TANGERINE DARTER	G3G4	S3		
PERCINA BURTONI	BLOTCHSIDE DARTER	G2	S1		
PERCINA CAPRODES	LOGPERCH	G5	S3		
PERCINA COPELANDI	CHANNEL DARTER	G5	S2		
PERCINA CRASSA	PIEDMONT DARTER	G4	S1		
PERCINA EVIDES	GILT DARTER	G4	S2		
PERCINA MACROCEPHALA	LONGHEAD DARTER	G3	S1S2	C2	LT
PERCINA MACULATA	BLACKSIDE DARTER	G5	SX		
=P. GYMNOCEPHALA (NEW RIVER)					
PERCINA OXYRHYNCHUS	SHARPNOSE DARTER	G4	S3		
PERCINA REX	ROANOKE LOGPERCH	G2	S1S2	LE	LE
PERCINA SCIERA	DUSKY DARTER	G5	S3		
PERCOPSIS OMISCOMAYCUS	TROUT-PERCH	G5	SX		
PHENACOBIOUS CRASSILABRUM	FATLIPS MINNOW	G3	S2		
PHENACOBIOUS MIRABILIS	SUCKERMOUTH MINNOW	G5	S2		
PHENACOBIOUS TERETULUS	KANAWHA MINNOW	G3	S3	C2	
PHENACOBIOUS URANOPS	STARGAZING MINNOW	G4	S3		
PHOXINUS TENNESSEENSIS	TENNESSEE DACE	G2G3	S1		
PIMEPHALES VIGILAX	BULLHEAD MINNOW	G5	S1		
POLYODON SPATHULA	PADDLEFISH	G4	S1	3C	LT
SEMOTILUS MARGARITA	PEARL DACE	G5	S3		
STIZOSTEDION CANADENSE	SAUGER	G5	S3		

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RARE MAMMALS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
BLARINA BREVICAUDA TELMALESTES	DISMAL SWAMP SHORT-TAILED SHREW	G5T3	S3	3C	
CONDYLURA CRISTATA CRISTATA	STAR-NOSED MOLE	G5T5	S3		
CONDYLURA CRISTATA PARVA	STAR-NOSED MOLE	G5T4	S2	3C	
FELIS RUFUS FLORIDANUS	BOBCAT	G5T5	S1		
GLAUCOMYS SABRINUS FUSCUS	VIRGINIA NORTHERN FLYING SQUIRREL	G5T2	S1	LE	LE
LASIONYCTERIS NOCTIVAGANS	SILVER-HAIRED BAT	G5	S3		
LASIURUS CINEREUS	HOARY BAT	G5	SU		
LEPUS AMERICANUS	SNOWSHOE HARE	G5	S1		LE
MARTES PENNANTI	FISHER	G5	S1		
MICROTUS CHROTORRHINUS	ROCK VOLE	G5	S1		LE
MICROTUS CHROTORRHINUS CAROLINENSIS	SOUTHERN ROCK VOLE	G5T3	S1	C2	
MUSTELA NIVALIS	LEAST WEASEL	G5	S1		
MYOTIS GRISESCENS	GRAY BAT	G2	S1	LE	LE
MYOTIS LEIBII	EASTERN SMALL-FOOTED BAT	G3	S1	C2	
MYOTIS SEPTENTRIONALIS	NORTHERN LONG-EARED MYOTIS	G4	S3		
MYOTIS SODALIS	INDIANA OR SOCIAL MYOTIS	G2	S1	LE	LE
PEROMYSCUS GOSSYPINUS	COTTON MOUSE	G5	S3		
PEROMYSCUS LEUCOPUS EASTI	PUNGO MOUSE	G5T1	SH	C2	
PLECOTUS RAFINESQUII	EASTERN BIG-EARED BAT	G4	S1	C2	LE
PLECOTUS TOWNSENDII VIRGINIANUS	VIRGINIA BIG-EARED BAT	G5T2	S1	LE	LE
SCIURUS NIGER CINEREUS	DELMARVA PENINSULA FOX SQUIRREL	G5T2	S1	LEXN	LE
SCIURUS NIGER NIGER	A FOX-SQUIRREL	G5T?	S1		
SOREX DISPAR	LONG-TAILED OR ROCK SHREW	G5	S3	3C	
SOREX LONGIROSTRIS FISHERI	DISMAL SWAMP SOUTHEASTERN SHREW	G5T2Q	S2	LT	LT
SOREX PALUSTRIS PUNCTULATUS	SOUTHERN WATER SHREW	G5T3	S1	C2	
SYLVILAGUS FLORIDANUS HITCHENSI	SMITHS ISLAND COTTONTAIL	G5THQ	SH	C2	
SYLVILAGUS PALUSTRIS	MARSH RABBIT	G5	S2S3		
SYNAPTOMYS COOPERI HELALETES	DISMAL SWAMP BOG LEMMING	G5T3	S3	3C	

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RARE REPTILES OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
CARETTA CARETTA	LOGGERHEAD SEA TURTLE	G3	S1S2	LT	LT
CLEMMYS INSCULPTA	WOOD TURTLE	G4	S2		LT
CLEMMYS MUHLENBERGII	BOG TURTLE	G3	S1	C2	LE
CROTALUS HORRIDUS ATRICAUDATUS	CANEBRAKE RATTLESNAKE	G5TUQ	S1		LE
DEIROCHELYS RETICULARIA	EASTERN CHICKEN TURTLE	G5T5	S1		LE
RETIULARIA					
EUMECES ANTHRACINUS	COAL SKINK	G5	S2?		
GRAPTEMYS GEOGRAPHICA	MAP TURTLE	G5	S3		
KINOSTERNON MINOR	LOGGERHEAD MUSK TURTLE	G5	SU		
LAMPROPELTIS GETULA NIGRA	BLACK KINGSNAKE	G5T?	S2?		
LEPIDOCHELYS KEMPII	KEMP'S RIDLEY SEA TURTLE	G1	S1	LE	LE
OPHEODRYS AESTIVUS CONANTI	BARRIER ISLANDS ROUGH GREEN SNAK	G5T?	S2		
OPHEODRYS VERNALIS	SMOOTH GREEN SNAKE	G5	S3		
OPHISAURUS VENTRALIS	EASTERN GLASS LIZARD	G5	S1		LT
PITUOPHIS MELANOLEUCUS	PINE SNAKE	G5	SU		
PSEUDEMYD CONCINNA HIEROGLYPHICA	HIEROGLYPHIC TURTLE	G5TU	S1?		
PSEUDEMYD FLORIDANA	COOTER	G5	SU		
REGINA RIGIDA	GLOSSY CRAYFISH SNAKE	G5	S1		
TANTILLA CORONATA	SOUTHEASTERN CROWNED SNAKE	G5	S2?		
TRACHEMYS SCRIPTA TROOSTII	CUMBERLAND SLIDER	G5T?	SU		
TRIONYX SPINIFERUS	SPINY SOFTSHELL	G5	SU		
VIRGINIA VALERIAE PULCHRA	MOUNTAIN EARTH SNAKE	G5T5	SU		

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RARE MUSSELS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
ALAS MIDONTA HETERODON	DWARFWEDGE MUSSEL	G1	S1	LE	LE
ALAS MIDONTA MARGINATA	ELKTOE	G5	S2		
ALAS MIDONTA VARICOSA	BROOK FLOATER	G3	S1	C2	LE
ALAS MIDONTA VIRIDIS	SLIPPERSHELL MUSSEL	G4	S1		LE
=A. MINOR					
ANODONTA IMBECILLIS	PAPER PONDSHELL	G5	S2		
CUMBERLANDIA MONODONTA	SPECTACLE CASE	G3	S1	C2	LE
CYPROGENIA STEGARIA	FANSHELL	G1	S1	LE	LE
=C. IRRORATA					
DROMUS DROMAS	DROMEDARY PEARLYMUSSEL	G1	S1	LE	LE
ELLIPTIO CRASSIDENS	ELEPHANT EAR	G4	S1		LE
ELLIPTIO LANCEOLATA	YELLOW LANCE	G4	S2S3	C2	
ELLIPTIO ROANOKENSIS	ROANOKE SLABSHELL	G2Q	S1		
=E. COMPLANATA					
EPIOBLASMA BREVIDENS	CUMBERLAND COMBSHELL	G2	S1	C2	LE
=DYSNOMIA BREVIDENS					
EPIOBLASMA CAPSAEFORMIS	OYSTER MUSSEL	G1G2	S1	C2	LE
=DYSNOMIA CAPSAEFORMIS					
EPIOBLASMA FLORENTINA WALKERI	TAN RIFFLESHELL	G1T1	S1	LE	LE
=DYSNOMIA FLORENTINA WALKERI					
EPIOBLASMA TORULOSA GUBERNACULUM	GREEN-BLOSSOM PEARLY MUSSEL	G2TX	S1	LE	LE
=DYSNOMIA TORULOSA GUBERNACULUM					
EPIOBLASMA TRIQUETRA	SNUFFBOX	G3	S1	C2	LE
=DYSNOMIA TRIQUETRA					
FUSCONAIA BARNESIANA	TENNESSEE PIGTOE	G3	S3		
FUSCONAIA COR	SHINY PIGTOE	G1	S1	LE	LE
=F. EDGARIANA					
FUSCONAIA CUNEOLUS	FINE-RAYED PIGTOE	G1	S1	LE	LE
FUSCONAIA MASONI	ATLANTIC PIGTOE	G2	S2	C2	LT
=PLEUROBEMA MASONI					
HEMISTENA LATA	CRACKING PEARLYMUSSEL	G1	S1	LE	LE
=LASTENA LATA					
LAMPSILIS ABRUPTA	PINK MUCKET	G2	SR	LE	LE
=L. ORBICULATA					
LAMPSILIS CARIOSA	YELLOW LAMP MUSSEL	G4	S2	C2	
LAMPSILIS RADIATA	EASTERN LAMP MUSSEL	G5	S2		
LASMIGONA HOLSTONIA	TENNESSEE HEELSPLITTER	G2	S1	C2	LE
LASMIGONA SUBVIRIDIS	ATLANTIC HEELSPLITTER	G4	S2	C2	
LEMIOX RIMOSUS	BIRDWING PEARLYMUSSEL	G1	S1	LE	LE
=CONRADILLA CAELATA					
LEPTODEA FRAGILIS	FRAGILE PAPERSHELL	G5	S2		LT
LEPTODEA OCHRACEA	TIDEWATER MUCKET	G4	S3		
=LAMPSILIS OCHRACEA					
LEXINGTONIA DOLABELLOIDES	SLABSIDE PEARLYMUSSEL	G2	S2	C2	LT
LEXINGTONIA SUBPLANA	VIRGINIA PIGTOE	G1Q	S1		
LIGUMIA NASUTA	EASTERN POND MUSSEL	G4	S3		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
LIGUMIA RECTA	BLACK SANDSHELL	G5	S2		LT
=L. R. LATISSIMA					
PEGIAS FABULA	LITTLE-WINGED PEARLYMUSSEL	G1	S1	LE	LE
PLETHOBASUS CYPHYUS	SHEEPNOSE	G3	S1		LT
PLEUROBEMA COLLINA	JAMES SPINYMUSSEL	G1	S1	LE	LE
=FUSCONAIA & CANTHYRIA COLLINA					
PLEUROBEMA CORDATUM	OHIO RIVER PIGTOE	G3	S1		LE
PLEUROBEMA OVIFORME	TENNESSEE CLUBSHELL	G3	S3	C2	
=P. MACULATUM					
PLEUROBEMA PLENUM	ROUGH PIGTOE	G1	S1	LE	LE
PLEUROBEMA RUBRUM	PYRAMID PIGTOE	G3	S1	3B	LE
=P. PYRAMIDATUM					
QUADRULA CYLINDRICA STRIGILLATA	ROUGH RABBITS FOOT	G4T2	S2	C2	LT
QUADRULA INTERMEDIA	CUMBERLAND MONKEYFACE	G1	S1	LE	LE
QUADRULA PUSTULOSA	PIMPLE BACK	G5	S2		LT
QUADRULA SPARSA	APPALACHIAN MONKEYFACE	G1	S1	LE	LE
TOXOLASMA LIVIDUM	PURPLE LILIPUT	G2	S1	C2	LE
=CARUNCULINA LIVIDUS; =CARUNCULINA GLANS					
TRUNCILLA TRUNCATA	DEERTOES	G4	S1		LE
VILLOSA PERPURPUREA	PURPLE BEAN	G2	S1	C2	LE
VILLOSA TRABALIS	CUMBERLAND BEAN	G2	S1	LE	LE

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RARE FINGERNAILCLAMS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
MUSCULIUM LACUSTRE	LAKE FINGERNAILCLAM	G5	S3		
MUSCULIUM SECURIS	POND FINGERNAILCLAM	G5	S3		
PISIDIUM ADAMSI	ADAM PEACLAM	G5	S3		
PISIDIUM DUBIUM	GREATER EASTERN PEACLAM	G5	S3		
PISIDIUM EQUILATERALE	ROUND PEACLAM	G5	S2		
PISIDIUM PUNCTATUM	PERFORATED PEACLAM	G5	S3		
PISIDIUM PUNCTIFERUM	STRIATE PEACLAM	G5	S3		
PISIDIUM VARIABLE	TRIANGULAR PEACLAM	G5	S3		
PISIDIUM WALKERI	WALKER PEACLAM	G5	S3		
SPHAERIUM STRIATINUM	STRIATED FINGERNAILCLAM	G5	S3		

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RARE CRUSTACEANS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
AMERIGONISCUS HENROTI	POWELL VALLEY TERRESTRIAL CAVE ISOPOD	G2	S1S2		
ANTROLANA LIRA	MADISON CAVE ISOPOD	G1	S1	LT	LT
CAECIDOTEA HENROTI	HENROT'S CAVE ISOPOD	G2	S1S2		
CAECIDOTEA HOLSINGERI	GREENBRIAR VALLEY CAVE ISOPOD	G3	S1		
CAECIDOTEA INCURVA	INCURVED CAVE ISOPOD	G2	S1S2		
CAECIDOTEA PHREATICA	PHREATIC ISOPOD	G1	S1		
CAECIDOTEA PRICEI	PRICE'S CAVE ISOPOD	G3	S2		
CAECIDOTEA RICHARDSONAE	TENNESSEE VALLEY CAVE ISOPOD	G3G5	S2		
CAECIDOTEA VANDELI	VANDEL'S CAVE ISOPOD	G2	S1S2		
CAMBARUS CAROLINUS	A CRAYFISH	G4?	S3?		
CAMBARUS CHASMODACTYLUS	NEW RIVER RIFFLE CRAYFISH	G4G5	S2?	3C	
CAMBARUS DIOGENES	DEVIL CRAWFISH	G5?	S3		
CAMBARUS LONGIROSTRIS	A CRAYFISH	G4	S3		
CAMBARUS PARVOCULUS	A CRAYFISH	G3G4	S2?		
CAMBARUS SCIOTENSIS	A CRAYFISH	G4	S2?		
CRANGONYX ANTENNATUS	APPALACHIAN VALLEY CAVE AMPHIPOD	G3G5	S3	3C	
FALLICAMBARUS FODIENS	A CRAYFISH	G5	S2		
GAMMARUS PSEUDOLIMNAEUS	NORTHERN SPRING AMPHIPOD	G?	S1		
LIRCEUS CULVERI	RYE COVE ISOPOD	G1	S1	C2	
LIRCEUS USDAGALUM	LEE COUNTY CAVE ISOPOD	G1	S1	PE	
MIKTONISCUS RACOVITZAE	RACOVITZA'S TERRESTRIAL CAVE ISOPOD	G2	S1		
ORCONECTES OBSCURUS	A CRAYFISH	G5	S2		
ORCONECTES SPINOSUS	A CRAYFISH	G4G5	S3		
ORCONECTES VIRGINIENSIS	CHOWAN RIVER CRAYFISH	G2	S2	C2	
STYGOBROMUS ABDITUS	JAMES CAVE AMPHIPOD	G1	S1		
STYGOBROMUS ARAEUS	TIDEWATER INTERSTITIAL AMPHIPOD	G?	S2	C2	
STYGOBROMUS BAROODYI	ROCKBRIDGE COUNTY CAVE AMPHIPOD	G2	S1S2		
STYGOBROMUS BIGGERSI	BIGGER'S CAVE AMPHIPOD	G1G2	S1	C2	
STYGOBROMUS CONRADI	BURNSVILLE COVE CAVE AMPHIPOD	G1	S1	C2	
STYGOBROMUS CUMBERLANDUS	CUMBERLAND CAVE AMPHIPOD	G2	S1S2		
STYGOBROMUS EPHEMERUS	EPHEMERAL CAVE AMPHIPOD	G1	S1	3C	
STYGOBROMUS ESTESI	CRAIG COUNTY CAVE AMPHIPOD	G1	S1		
STYGOBROMUS FERGUSONI	MONTGOMERY COUNTY CAVE AMPHIPOD	G1	S1		
STYGOBROMUS GRACILIPES	SHENANDOAH VALLEY CAVE AMPHIPOD	G2	S1	3C	
STYGOBROMUS HOFFMANI	ALLEGHANY COUNTY CAVE AMPHIPOD	G1	S1		
STYGOBROMUS INDENTATUS	TIDEWATER AMPHIPOD	G?	S1	C2	
STYGOBROMUS INTERITUS	NEW CASTLE MURDER HOLE AMPHIPOD	G1	S1		
STYGOBROMUS KENKI	ROCK CREEK GROUNDWATER AMPHIPOD	G1	S1		
STYGOBROMUS LEENSIS	LEE COUNTY CAVE AMPHIPOD	G1	S1		
STYGOBROMUS MORRISONI	MORRISON'S CAVE AMPHIPOD	G3	S1S2	C2	
STYGOBROMUS MUNDUS	BATH COUNTY CAVE AMPHIPOD	G2	S1S2	C2	
STYGOBROMUS OBRUTUS	PITTSYLVANIA WELL AMPHIPOD	G1	S1		
STYGOBROMUS PHREATICUS	NORTHERN VIRGINIA WELL AMPHIPOD	G2	S1S2		
STYGOBROMUS PIZZINII	PIZZINI'S AMPHIPOD	G2	S1S2	C2	
STYGOBROMUS PSEUDOSPINOSUS	LURAY CAVERNS AMPHIPOD	G1	S1		
STYGOBROMUS SPINOSUS	BLUE RIDGE MOUNTAIN AMPHIPOD	G2	S2		

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RARE CRUSTACEANS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
STYGOBROMUS STEGERORUM	MADISON CAVE AMPHIPOD	G1	S1		LE
STYGOBROMUS TENUIS	A GROUNDWATER AMPHIPOD	G4G5	S2S3		

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RARE GASTROPODS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
ANGUISPIRA FERGUSONI	COASTAL PLAINS DISC	G4	S3		
ANGUISPIRA JESSICA	MOUNTAIN DISC	G3G4	S1		
=A. ALTERNATA JESSICA					
CARYCHIUM EXIGUUM	OBESE THORN	G4G5	S3		
CATINELLA HUBRICHTI	SNOWHILL AMBERSNAIL	G3	S1		
COCHLICOPA LUBRICELLA	THIN PILLAR	G4G5	S2		
DEROCERAS LAEVE	MARSH SLUG	G4G5	S3		
DISCUS CATSKILLENSIS	ANGULAR DISC	G3G5	S3		
DISCUS CRONKHITEI	FOREST DISC	G5	S3		
DISCUS NIGRIMONTANUS	BLACK MOUNTAIN DISC	G4	S1		
ELIMIA ARACHNOIDEA	SPIDER ELIMIA	G?	S3		
ELIMIA CATENARIA	GRAVEL ELIMIA	G?	S3		
EUCHEMOTREMA LEAI	LOWLAND PILLSNAIL	G5	S1		
=STENOTREMA LEAI ALICIA					
EUCONULUS TROCHULUS	SILK HIVE	G5	S2		
FERRISSIA FRAGILIS	FRAGILE ANCYLID	G4	S2S3		
FERRISSIA PARALLELA	OBLONG ANCYLID	G?	S2S3		
=F. PARALLELUS					
FONTIGENS NICKLINIANA	WATERCRESS SNAIL	GU	S3		
FONTIGENS OROLIBAS	BLUE RIDGE SPRINGSNAIL	G3Q	S3		
FOSSARIA DALLI	DUSKY FOSSARIA	G?	S2S3		
GASTROCOPTA CLAPPI	BLUEGRASS SNAGGLETOOTH	G5	S1S2		
=G. ARMIFERA CLAPPI					
GASTROCOPTA CRISTATA	CRESTED SNAGGLETOOTH	G?	S3		
GASTROCOPTA HOLZINGERI	LAMBDA SNAGGLETOOTH	G4G5	S3		
GASTROCOPTA PELLUCIDA	SLIM SNAGGLETOOTH	G4G5	S1		
GASTROCOPTA TAPPANIANA	WHITE SNAGGLETOOTH	G5	S3		
GASTRODONTA FONTICULA	BROWN BELLYTOOTH	G3G4	S1		
=G. INTERNA FONTICULA					
GLYPHYALINIA CUMBERLANDIANA	HILL GLYPH	G4	S3		
GLYPHYALINIA LEWISIANA	PALE GLYPH	G4	S2		
GLYPHYALINIA LUTICOLA	FURROWED GLYPH	G4	S2		
GLYPHYALINIA PICEA	RUST GLYPH	G3	S1		
GLYPHYALINIA PRAECOX	BRILLIANT GLYPH	G4	S1		
GLYPHYALINIA RADERI	MARYLAND GLYPH	G2	S1	C2	
GLYPHYALINIA SCULPTILIS	SUBORB GLYPH	G4	S1		
GLYPHYALINIA VIRGINICA	DEPRESSED GLYPH	G3	S2S3		
HELICODISCUS DIADEMA	SHAGGY COIL	G1	S1	C2	LE
HELICODISCUS INERMIS	OLDFIELD COIL	G4	S2		
HELICODISCUS LIRELLUS	RUBBLE COIL	G1	S1		LE
HELICODISCUS MULTIDENS	CAVE COIL	G3	S2		
HELICODISCUS SHIMEKI	TEMPERATE COIL	G4	S1		
HELICODISCUS SINGLEYANUS	SMOOTH COIL	G4G5	S2		
HELICODISCUS TRIODUS	TALLUS COIL	G2	S1		
HOLSINGERIA UNTHANKSENSIS	AN AQUATIC CAVESNAIL	G1	S1		LE
IO FLUVIALIS	SPINY RIVERSNAIL	G2	S2	C2	LT

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RARE GASTROPODS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
LEPTOXIS PRAEROSA	ONYX ROCKSNAIL	G1G3	SU	C2	
=ANCULOSA SUBGLOBOSA					
MEGAPALLIFERA WETHERBYI	BLOTCHY MANTLESLUG	G3	S1		
MESODON ANDREWSAE	BALSAM GLOBE	G3	S1		
MESODON APPRESSUS LAEVIOR	A FLAT BLADETOOTH	G4T3T4	S1		
MESODON CHRISTYI	GLOSSY COVERT	G3	S1		
MESODON CLAUSUS	YELLOW GLOBELET	G5	S2		
MESODON ELEVATUS	PROUD GLOBE	G5	S2		
MESODON INFLECTUS	SHAGREEN	G5	S3		
MESODON KALMIANUS	BROWN GLOBELET	G3	S1		
MESODON PANSELENUS	VIRGINIA BLADETOOTH	G3G4	S2		
MESODON SAYANUS	SPIKE-LIPPED CRATER	G4G5	S3		
MESODON WHEATLEYI	CINNAMON COVERT	G4	S1		
MESOMPHIX CAPNODES	DUSKY BUTTON	G4G5	S3		
MESOMPHIX PERLAEVIS	SMOOTH BUTTON	G4	S3		
MESOMPHIX RUGELI	WRINKLED BUTTON	G3G4	S3		
MESOMPHIX SUBPLANUS		G3G4	S2		
NESOVITREA ELECTRINA	AMBER GLASS	G5	S2		
OXYLOMA SUBEFFUSUM	CHESAPEAKE AMBERSNAIL	G4	S1		
=O. SUBEFFUSA					
PALLIFERA HEMPHILLI	BLACK MANTLESLUG	G3	S1		
PALLIFERA VARIA	VARIABLE MANTLESLUG	G2	S2		
PARAVITREA BLARINA	SHREW SUPERCOIL	G3	S1		
PARAVITREA DENTILLA	COMB SUPERCOIL	G1	S1		
PARAVITREA HERA	SPIRIT SUPERCOIL	G1	S1		LE
PARAVITREA MIRA	FUNNEL SUPERCOIL	G2	S2		
PARAVITREA PLACENTULA	GLOSSY SUPERCOIL	G3	S1		
PARAVITREA PONTIS	NATURAL BRIDGE SUPERCOIL	G3G4	S2		
PARAVITREA REESI	ROUND SUPERCOIL	G3	S2		
PARAVITREA SEPTADENS	BROWN SUPERCOIL	G1	S1		LT
PARAVITREA SERADENS	BARRED SUPERCOIL	G3	S1		
PARAVITREA SUBTILIS	SLENDER SUPERCOIL	G3	S1		
PHILOMYCUS VENUSTUS	BROWNSPOTTED MANTLESLUG	G4	S3		
PHILOMYCUS VIRGINICUS	VIRGINIA MANTLESLUG	G3	S3		
PLEUROCERA GRADATA	BOTTLE HORNSNAIL	G?	S3		
=P. GRADATUM					
PLEUROCERA UNCIALIS	PAGODA HORNSNAIL	G?	S3		
=P. UNCIALE					
POLYGYRA PLICATA	CUMBERLAND LIPTOOTH	G4	S1	C2	
POLYGYRA PUSTULOIDES	TINY LIPTOOTH	G4	S1		
POLYGYRISCUS VIRGINICUS	VIRGINIA COIL	G1	S1	LE	LE
POMATIOPSIS CININNATIENSIS	BROWN WALKER	G4	S2		
PROMENETUS EXACUOUS	SHARP SPRITE	G?	S3		
PUNCTUM BLANDIANUM	BROWN SPOT	G4	S2		
PUNCTUM SMITHI	LAMELLATE SPOT	G4	S3		
PUNCTUM VITREUM	GLASS SPOT	G4G5	S3		

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RARE GASTROPODS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
PUPILLA MUSCORUM	WIDESPREAD COLUMN	G4	S1		
SOMATOGYRUS PENNSYLVANICUS	SHALE PEBBLESNAIL	G?	S3		
SOMATOGYRUS VIRGINICUS	PIEDMONT PEBBLESNAIL	G?	S1S2		
STAGNICOLA NEOPALUSTRIS	PIEDMONT POND SNAIL	G?	S2S3		
STENOTREMA ALTISPIRA	BLACK MOUNTAINS SLITMOUTH	G3	S1		
STENOTREMA SPINOSUM	CARINATE SLITMOUTH	G4	S2		
STRIATURA EXIGUA	RIBBED STRIATE	G4	S2		
STRIATURA FERREA	BLACK STRIATE	G4G5	S3		
STRIATURA MILIUM	FINE-RIBBED STRIATE	G4	S1		
STROBILOPS TEXASIANUS	SOUTHERN PINECONE	G5	S3		
=S. TEXASIANA					
SUCCINEA CAMPESTRIS	CRINKLED AMBERSNAIL	G4	S3		
SUCCINEA CHITTENANGOENSIS	CHITTENANGO OVATE AMBER SNAIL	G1	S1	LT	
SUCCINEA WILSONI	WILSON AMBERSNAIL	G4	S2		
TRIODOPSIS ALABAMENSIS	ALABAMA THREE-TOOTH	G4	S1		
TRIODOPSIS BURCHI	PITTSYLVANIA THREE-TOOTH	G3G4	S3		
TRIODOPSIS FALLAX AFFINIS	A PINHOLE THREE-TOOTH	G5T4	S1		
TRIODOPSIS MESSANA	PINHOLE SAND THREE-TOOTH	G4	S1		
TRIODOPSIS OBSOLETA	SMOOTH-LIPPED SAND THREE-TOOTH	G4	S3		
TRIODOPSIS PENDULA	HANGING ROCK THREE-TOOTH	G3	S1		
TRIODOPSIS PICEA	SPRUCE KNOB THREE-TOOTH	G3	S1		
TRIODOPSIS RUGOSA	BUTTRESS THREE-TOOTH	G3	S1		
=T. ANTERIDON					
TRIODOPSIS TENNESSEENSIS	BUDDED THREE-TOOTH	G4	S3		
VALLONIA PARVULA	TRUMPET VALLONIA	G4	S1		
VALLONIA PERSPECTIVA	THIN-LIPPED VALLONIA	G4G5	S3		
VALVATA BICARINATA	TWORIDGED VALVATA	G?	S3		
VALVATA TRICARINATA	THREERIDGED VALVATA	G?	S3		
VENTRIDENS ACERRA	GLOSSY DOME	G4	S3		
VENTRIDENS ARCELLUS	GOLDEN DOME	G4	S3		
VENTRIDENS COELAXIS	BIDENTATE DOME	G3	S2		
VENTRIDENS INTERTEXTUS	PYRAMID DOME	G5	S3		
VENTRIDENS LASMODON	HOLLOW DOME	G4	S2		
VENTRIDENS LAWAE	ROUNDED DOME	G4	S1		
VENTRIDENS PILSBRYI	YELLOW DOME	G4	S2		
VENTRIDENS THELOIDES	COPPER DOME	G4G5	S2		
VERTIGO BOLLESIANA	DELICATE VERTIGO	G3G4	S1		
VERTIGO CLAPPI	CUPPED VERTIGO	G2	S1		
VERTIGO GOULDI	VARIABLE VERTIGO	G4G5	S3		
VERTIGO ORALIS	PALMETTO VERTIGO	G5	S1		
VERTIGO OSCARIANA	CAPITAL VERTIGO	G4	S1		
VERTIGO PARVULA	SMALL-MOUTH VERTIGO	G3	S3		
VERTIGO PYGMAEA	CRESTED VERTIGO	G4	S2		
VERTIGO TESKEYAE	SWAMP VERTIGO	G4	S1		
VERTIGO TRIDENTATA	HONEY VERTIGO	G4G5	S3		
VERTIGO VENTRICOSA	FIVE-TOOTH VERTIGO	G4	S1		

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RARE GASTROPODS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
VITRINIZONITES LATISSIMUS	GLASSY GRAPESKIN	G4	S2		
ZONITOIDES ELLIOTTI	GREEN DOME	G4	S1		

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RARE SPIDERS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
AGELENOPSIS KASTONI	A FUNNEL-WEB SPIDER	G4?	S1		
ANTHROBIA MONMOUTHIA		G3G4	S1		
BATHYPHANTES WEYERI	A CAVE SPIDER	G?	S1		
CASTIANEIRA TRILINEATA	A TWO-CLAWED HUNTING SPIDER	G4?	S1		
DRASSYLUS LOUSIANUS	A GNAPHOSID SPIDER	G4?	S1		
GNAPHOSA FONTINALIS	A GNAPHOSID SPIDER	G4?	S1		
ISLANDIANA MUMA	A CAVE SPIDER	G?	S1		
LYCOSA LENTA	A WOLF SPIDER	G4	S1		
NESTICUS HOLSINGERI	HOLSINGER'S CAVE SPIDER	G?	S1S2		
NESTICUS MIMUS	A CAVE SPIDER	G?	S1		
NESTICUS PAYNEI	A CAVE SPIDER	G?	S1		
NESTICUS TENNESSEENSIS	A CAVE SPIDER	G2	S2		
SPHODROS COYLEI	A PURSE-WEB SPIDER	G1?	S1		

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RARE PSEUDOSCORPIONS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
APOCHTHONIUS COECUS	A PSEUDOSCORPION	G1	S1		
APOCHTHONIUS HOLSINGERI	A PSEUDOSCORPION	G1	S1		
CHITRELLA CAVICOLA	A PSEUDOSCORPION	G3	S3		
CHITRELLA SUPERBA	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS ANOPHTHALMUS	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS BINOCULATUS	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS GERTSCHI	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS LUTZI	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS PROXIMOSSETUS	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS REGULUS	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS SIMILUS	A PSEUDOSCORPION	G1	S1		
KLEPTOCHTHONIUS SP 1	A PSEUDOSCORPION	G1	S1		
MICROCREAGRIS VALENTINEI	A PSEUDOSCORPION	G1	S1		
MUNDOCHTHONIUS HOLSINGERI	A PSEUDOSCORPION	G1	S1		

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RARE MILLIPEDES OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATE STATUS	STATUS
ABACION TESSELTUM	A MILLIPEDE	G5	S2		
ANDROGNATHUS CORTICARIUS	A MILLIPEDE	G5	S3		
ANIULUS ORIENTALIS	A MILLIPEDE	G2	S1		
ANIULUS SP 1	A MILLIPEDE (ELM HILL)	G?	S1		
APHELORIA TIGANA	A MILLIPEDE	G5	S3		
APHELORIA VIRGINIENSIS MONTANA	A MILLIPEDE	G5	S3		
APHELORIA VIRGINIENSIS VIRGINIENSIS	A MILLIPEDE	G3T3	S3		
AUTURUS ERYTHROPYGOS	A MILLIPEDE	G3	S1		
BORARIA INFESTA	A MILLIPEDE	G4	S2		
BRACHORIA CEDRA	CEDAR MILLIPEDE	G1	S1		
BRACHORIA DENTATA	A MILLIPEDE	G1	S1		
BRACHORIA ETHOTELA	HUNGRY MOTHER MILLIPEDE	G2	S2		
BRACHORIA FALCIFERA	BIG CEDAR CREEK MILLIPEDE	G1	S1		
BRACHORIA HOFFMANI	HOFFMAN'S XYSTODESMID MILLIPEDE	G2	S2		
BRACHORIA INSOLITA	A MILLIPEDE	G1	S1		
BRACHORIA LAMINATA	KEETON'S MILLIPEDE	G1	S1		
BRACHORIA MENDOTA	COLLINWOOD MILLIPEDE	G1	S1		
BRACHORIA SEPARANDA CALCARIA	A MILLIPEDE	G2T?	S2		
BRACHORIA SEPARANDA HAMATA	A MILLIPEDE	G2T?	S2		
BRACHORIA SEPARANDA VERSICOLOR	A MILLIPEDE	G2T?	S2		
BRACHORIA TURNERI	TURNER'S MILLIPEDE	G1	S1		
BRACHYCYBE LECONTII	A MILLIPEDE	G5	S3		
BUOTUS CAROLINUS	A MILLIPEDE	G1	S1		
CAMBALA HUBRICHTI	A MILLIPEDE	G5	S3		
CAMBALA MINOR	A MILLIPEDE	G5	S3		
CHAETASPIS ALBUS	A MILLIPEDE	G4	S2		
CHEROKIA GEORGIANA LATASSA	A MILLIPEDE	G4T?	S1		
CLEIDOGONA FIDELITOR	FAITHFUL MILLIPEDE	G1	S1		
CLEIDOGONA HOFFMANI	HOFFMAN'S CLEIDOGONID MILLIPEDE	G2	S2		
CLEIDOGONA LACHESIS	A MILLIPEDE	G2	S1		
CLEIDOGONA MEDIALIS	BLOWING ROCK MILLIPEDE	G1	S1		
CONOTYLA AETO	AETO MILLIPEDE	G1	S1		
CONOTYLA CELENO	CELENO MILLIPEDE	G1	S1		
CONOTYLA MELINDA	MELINDA MILLIPEDE	G2	S2		
CONOTYLA SP 1	A MILLIPEDE (BURKES GARDEN)	G1	S1		
CONOTYLA VENETIA	VENETIA MILLIPEDE	G2	S2		
DESMONUS EARLEI	A MILLIPEDE	G5	S1		
DIXIORIA BROOKSI	BROOKS MILLIPEDE	G1	S1		
DIXIORIA CORONATA	A MILLIPEDE	G2	S2		
DIXIORIA FOWLERI	A MILLIPEDE	G2	S2		
EURYURUS LEACHI FRATERNUS	A MILLIPEDE	G4T?	S1		
GYALOSTETHUS MONTICOLENS	A MILLIPEDE	G4	S2		
NAMPABIUS TURBATOR	A CAVE MILLIPEDE	G?	S1		
NANNARIA CONSERVATA	DUKE FOREST XYSTODESMID	G1	S1		
NANNARIA ERICACEA	MCGRAW GAP XYSTODESMID	G2	S2		
NANNARIA LAMINATA	SMITH CREEK XYSTODESMID	G1	S1		

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RARE MILLIPEDES OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
NANNARIA MORRISONI	A MILLIPEDE	G3	S3		
NANNARIA SHENANDOAH	SHENANDOAH MT XYSTODESMID	G1	S1		
NANNARIA SIMPLEX	A MILLIPEDE	G1	S1		
NANNARIA WILSONI	A MILLIPEDE	G3	S3		
NOPOIULUS KOCHI	A MILLIPEDE	G5	S3		
OKEANOBATES AMERICANUS	A MILLIPEDE	G4	S1		
ONOMERIS UNDERWOODI	A MILLIPEDE	G5	S1		
ORINISOBATES NIGRIOR	A MILLIPEDE	G4	S1		
POLYZONIUM ROSALBUM	A MILLIPEDE	G5	S2		
POLYZONIUM STRICTUM	A MILLIPEDE	G5	S1		
PSEUDOPOLYDESMUS PALUDICOLOUS	A MILLIPEDE	G1	S1		
PSEUDOTREMIA ALECTO	A MILLIPEDE	G1	S1		
PSEUDOTREMIA ARMESI	A MILLIPEDE	G2	S2		
PSEUDOTREMIA CAVERNARUM	A MILLIPEDE	G4G5	S4		LT
PSEUDOTREMIA MOMUS	A MILLIPEDE	G2	S2		
PSEUDOTREMIA PRINCEPS	A MILLIPEDE	G1	S1		
PSEUDOTREMIA SUBLEVIS	A MILLIPEDE	G1	S1		
PSEUDOTREMIA TUBERCULATA	A MILLIPEDE	G2	S1S2		
PSEUDOTREMIA VALGA	A MILLIPEDE	G3	S3		
RUDILORIA KLEINPETERI	A MILLIPEDE	G1	S3		
RUDILORIA TRIMACULATA TORTUA	A MILLIPEDE	G2T?	S2		
SCYTONOTUS VIRGINICUS	A MILLIPEDE	G3	S3		
SEMIONELLUS PLACIDUS	A MILLIPEDE	G3	S1		
SIGMORIA LATIOR LATIOR	A MILLIPEDE	G5T?	S3		
SIGMORIA WHITEHEADI	A MILLIPEDE	G1	S1		LT
STRIARIA CAUSEYAE	A MILLIPEDE	G1	S1		
STRIARIA COLUMBIANA	A MILLIPEDE	G2	S2		
STRIARIA GRANULOSA	A MILLIPEDE	G2	S1		
STRIARIA SP 1	A MILLIPEDE	G1	S1		
THALASSISOBATES LITTORALIS	A MILLIPEDE	G5	S1		
TRICHOMERIS SINUATA	A MILLIPEDE	G5	S1		
TRICHOPETALUM DUX	A MILLIPEDE	G1	S1		
TRICHOPETALUM LUNATUM	A MILLIPEDE	G5	S2		
TRICHOPETALUM PACKARDI	A MILLIPEDE	G3Q	S2		
TRICHOPETALUM WEYERIENSIS	A MILLIPEDE	G3Q	S2		
TRICHOPETALUM WHITEI	A MILLIPEDE	G2Q	S2		
UROBLANIULUS CANADENSIS	A MILLIPEDE	G5	S2		
UROBLANIULUS JERSEYI	A MILLIPEDE	G3	S2		
UROBLANIULUS SP 1	A MILLIPEDE (BURKES GARDEN)	G?	S1		
VIRGOIULUS MINUTUS	A MILLIPEDE	G5	S2		

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RARE ANNELIDS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
ANKYRODRILUS LEGACUS	A BRANCHIOBELLID WORM	G1	S1		
CAMBARINCOLA FALLAX	A BRANCHIOBELLID WORM	G1	S1		
SPELAEDRILUS MULTIPORUS	A CAVE LUMBRICULID WORM	G?	S1		
STYLODRILUS BEATTIEI	A CAVE LUMBRICULID WORM	G?	S1		

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RARE PLANARIANS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
GEOCENTROPHORA CAVERNICOLA	A PLANARIAN	G?	S1		
PHAGOCATA GRACILIS	A PLANARIAN	G?	S1		
PHAGOCATA MORGANI	A PLANARIAN	G1	S1		
SPHALLOPLANA CHANDLERI	CHANDLER'S PLANARIAN	G1	S1		
SPHALLOPLANA CONSIMILIS	POWELL VALLEY PLANARIAN	G1G2	S1		
SPHALLOPLANA HOLSINGERI	HOLSINGER'S GROUNDWATER PLANARIAN	GH	SX		3A
SPHALLOPLANA SUBTILIS	BIGGER'S GROUNDWATER PLANARIAN	GH	SX		3A
SPHALLOPLANA VIRGINIANA	ROCKBRIDGE COUNTY CAVE PLANARIAN	G1	S1		C2

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RARE INSECTS OF VIRGINIA

SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** ORDER: COLEOPTERA					
ARIANOPS JEANNELI	A BEETLE	G1	S1		
ATHETA ANNEXA	A BEETLE	G4	S2		
ATHETA TROGLOPHILA	A BEETLE	G1	S1		
BRATHINUS NITIDUS	A BEETLE	G4	S1		
CALLIGRAPHA PUIRSA	LEAF BEETLE	G?	S2		
CICINDELA ABDOMINALIS	ORANGE-BELLIED TIGER BEETLE	G4	S1		
CICINDELA ANCOCISCONENSIS	A TIGER BEETLE	G3	S2		
CICINDELA DORSALIS DORSALIS	NORTHEASTERN BEACH TIGER BEETLE	G4T2	S2		LT
CICINDELA DORSALIS MEDIA	A TIGER BEETLE	G4T4	S3		
CICINDELA FORMOSA GENEROSA	A TIGER BEETLE	G5T5	S1?		
CICINDELA GRATIOSA	A TIGER BEETLE	G5	S1		
CICINDELA LEPIDA	SPECTRAL TIGER BEETLE	G4	S1		
CICINDELA LIMBALIS	A TIGER BEETLE	G5	S1		
CICINDELA PATRUELA	A TIGER BEETLE	G3	S1		
CICINDELA PURITANA	PURITAN TIGER BEETLE	G1G2	SU		LT
CICINDELA PURPUREA	A TIGER BEETLE	G5	S3		
CICINDELA SPLENDIDA	A TIGER BEETLE	G5	S2		
CICINDELA TRIFASCIATA	A TIGER BEETLE	G5	S1		
CICINDELA UNIPUNCTATA	A TIGER BEETLE	G4	S3?		
DELTOCHILUM GIBBOSUM	A SCARAB BEETLE	G4?	S1		
DRYOBIOUS SEXNOTATUS	SIX-BANDED LONGHORN BEETLE	G?	SH		C2
HELLUOMORPHOIDES NIGRIPENNIS	A FLAT-HORNED GROUND BEETLE	G4?	S1		
HYDRAENA MAUREENAE	MAUREEN'S HYDRAENAN MINUTE MOSS BEE	G1G3	S1S3		C2
LORDITHON NIGER	BLACK LORDITHON ROVE BEETLE	G?	SH		C2
MEGACEPHALA CAROLINA	A TIGER BEETLE	G5	S3		
NEMADUS HORNII	A BEETLE	G1	S1		
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	G1	SH		LE
PRIONOCHAETA OPACA	A BEETLE	G1	S1		
PSEUDANOPHTHALMUS AVERNUS	AVERNUS CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS CORDICOLLIS	LITTLE KENNEDY CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS DECEPTIVUS	DECEPTIVE CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS DELICATUS	A CAVE BEETLE	G2	S2		
PSEUDANOPHTHALMUS EGBERTI	NEW RIVER VALLEY CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS GRACILIS	A CAVE BEETLE	G1	S1		
PSEUDANOPHTHALMUS HIRSUTUS	LEE COUNTY CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS HOFFMANI	A CAVE BEETLE	G1?	S1		
PSEUDANOPHTHALMUS HOLSINGERI	HOLSINGER'S CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS HORTULANUS	BURKES GARDEN CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS HUBBARDI	HUBBARD'S CAVE BEETLE	G1	S1		C2
PSEUDANOPHTHALMUS HUBRICHTI	HUBRICHT'S CAVE BEETLE	G1	S1		C2

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
PSEUDANOPHTHALMUS INTERSECTUS	CROSSROADS CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS LIMICOLA	MUD-DWELLING CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS LONGICEPS	LONG-HEADED CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS NELSONI	NELSON'S CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS PARVICOLLIS	THIN-NECK CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS PETRUNKEVITCHI	PETRUNKEVITCH'S CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS PONTIS	NATURAL BRIDGE CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS POTOMACA POTOMACA	SOUTH BRANCH VALLEY CAVE BEETLE	G1T1	S?	C2	
PSEUDANOPHTHALMUS PRAETERMISSUS	OVERLOOKED CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS PUNCTATUS	SPOTTED CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS PUSIO	A CAVE BEETLE	G1?	S1		
PSEUDANOPHTHALMUS QUADRATUS	STRALEY'S CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS ROTUNDATUS	A CAVE BEETLE	G1	S1		
PSEUDANOPHTHALMUS SANCTIPauli	SAINT PAUL CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS SECLUSUS	A CAVE BEETLE	G1	S1		
PSEUDANOPHTHALMUS SERICUS	SILKEN CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS SP 10	(SP. B HUBRICHTI GROUP)	G1	S1		
=P. SP. B (HUBRICHTI GROUP)					
PSEUDANOPHTHALMUS SP 11	(SP. A PUSIO GROUP)	G1	S1		
=P. SP. A (PUSIO GROUP)					
PSEUDANOPHTHALMUS SP 4	(SP. A JONESI GROUP)	G1	S1		
=P. SP. A (JONESI GROUP)					
PSEUDANOPHTHALMUS SP 5	(SP. A PETRUNKEVITCHI GROUP)	G1	S1		
=P. SP. A (PETRUNKEVITCHI GROUP)					
PSEUDANOPHTHALMUS SP 6	(SP. B PETRUNKEVITCHI GROUP)	G1	S1		
=P. SP. B (PETRUNKEVITCHI GROUP)					
PSEUDANOPHTHALMUS SP 7	(SP. C PETRUNKEVITCHI GROUP)	G1	S1		
=P. SP. C (PETRUNKEVITCHI GROUP)					
PSEUDANOPHTHALMUS SP 8	(SP. A HUBBARDI GROUP)	G1	S1		
PSEUDANOPHTHALMUS SP 9	(SP. A HUBRICHTI GROUP)	G1	S1		
=P. SP. A (HUBRICHTI GROUP)					
PSEUDANOPHTHALMUS THOMASI	THOMAS' CAVE BEETLE	G1	S1	C2	
PSEUDANOPHTHALMUS VICARIUS	A CAVE BEETLE	G2	S1		
PSEUDANOPHTHALMUS VIRGINICUS	MAIDEN SPRING CAVE BEETLE	G1	S1	C2	
RHADINE CAUDATA	A CARABID BEETLE	G3	S2		
SPHAERODERUS SCHAUMI	SCHAUM'S GROUND BEETLE	G?	S2	C2	

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** ORDER: COLLEMBOLA					
ARRHOPALITES BENITUS	A SPRINGTAIL	G1	S1		
ARRHOPALITES CLARUS	A SPRINGTAIL	G1?	S1		
PSEUDOSINELLA HIRSUTA	A SPRINGTAIL	G1	S1		
SINELLA BARRI	BARR'S SPRINGTAIL	G5	S3		
SINELLA HOFFMANI	HOFFMAN'S SPRINGTAIL	G4	S1		
TOMOCERUS FLAVESCENS	A SPRINGTAIL	G5?	S1?		
** ORDER: DIPTERA					
LEPTOCERA PARARORALIS	A FLY	G?	S1		
SPELOBIA SEMIOCLATA	A FLY	G?	S1		
SPELOBIA TENEBRARUM	A FLY	G?	S1		
TIPULA LONGIVENTRIS	A FLY	G4?	S1		
** ORDER: EPHEMEROPTERA					
EPHEMERA TRIPLEX	WEST VIRGINIA BURROWING MAYFLY	GH	S?	C2	
** ORDER: HEMIPTERA					
CHELINIDEA VITTIGER	SQUASH BUG	G3G5	S3		
CHLOROCHROA DISMALIA	DISMAL SWAMP GREEN STINK BUG	G1	S1	C2	
PLOIARIA CAROLINA	CAROLINA THREAD-LEGGED BUG	G4?	S1		
PLOIARIA HIRTICORNIS	AN ASSASSIN BUG	G3?	S1		
TOMINOTUS COMMUNIS	A BURROWER BUG	G5	S1		
** ORDER: LEPIDOPTERA					
AMBLYSCIRTES ALTERNATA	BLUE-DUSTED ROADSIDE SKIPPER	G3G4	S1S3		
ANAPLECTOIDES BRUNNEOMEDIA	A NOCTUID MOTH	G4	SH		
APAMEA SMYTHI	SMYTH'S APAMEA MOTH	GH	SH	C2	
APLECTOIDES CONDITA	A NOCTUID MOTH	G4	SH		
ATLIDES HALESUS	GREAT PURPLE HAIRSTREAK	G5	S3		
ATRYTONE AROGOS AROGOS	ARGOS SKIPPER	G4T3	SH	C2	
AUTOCHTON CELLUS	GOLDEN-BANDED SKIPPER	G4	S3		
BOLORIA SELENE MYRINA	SILVER BORDERED FRITILLARY	G5T5	SU		
CALEPHELIS BOREALIS	NORTHERN METALMARK	G3G4	S3S4		
CALEPHELIS VIRGINIENSIS	LITTLE METALMARK	G4	S3		
CATOCALA AGRIPPINA	AN UNDERWING MOTH	G5	SH		
CATOCALA CONSORS SORSCONI	AN UNDERWING MOTH	G4TU	SH		
CATOCALA DULCIOLA	AN UNDERWING MOTH	G2G4	SU		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
CATOCALA HERODIAS GERHARDI	HERODIAS UNDERWING	G3T3	SH		
CATOCALA MARMORATA	MARbled UNDERWING MoTH	G4	SHSU	3C	
CATOCALA MESSALINA	AN UNDERWING MoTH	G4	SH		
CATOCALA PRETIOSA	PRECIOUS UNDERWING MoTH	G4	SH	C2	
CELASTRINA EBENINA	SOOTY AZURE	G4	S3S4		
COLIAS INTERIOR	PINK-EDGED SULPHUR	G5	S1S2		
ERORA LAETA	EARLY HAIRSTREAK	G4	S3S4		
ERYNNIS LUCILIUS	COLUMBINE DUSKYWING	G4	S3S4		
ERYNNIS PERSIUS PERSIUS	PERSIUS DUSKYWING	G4T3	SU		
ERYTHROECIA HEBARDI	HEBARD'S NoCTUID MoTH	GU	SH	C2	
EUCHLAENA MILNEI	A GEOMETER MoTH	GU	SH	C2	
EUCHLOE OLYMPIA	ROSY MARBLE	G4	S3		
EUPHYES BIMACULA	TWO-SPOTTED SKIPPER	G4	S2S4		
EUPHYES CONSPICUA	BLACK DASH	G4	SU		
EUPHYES DUKESI	SCARCE SWAMP SKIPPER	G3G4	S2		
EUPHYES PILATKA	SAW-GRASS SKIPPER	G3G4	S3		
EUXOA IMMITA	A NoCTUID MoTH	GU	SH		
HESPERIA ATTALUS ATTALUS	DOTTED SKIPPER	G4T3	SH		
HESPERIA ATTALUS SLOSSONAE	DOTTED SKIPPER	G4T3	SH		
HYPPA CONTRASTA	A NoCTUID MoTH	G4	SH		
INCISALIA POLIOS	HOARY ELFIn	G5	S1S3		
MEGATHYMUS YUCCAE	YUCCA GIANT SKIPPER	G4	SH		
MEROPLEON COSMION	A NoCTUID MoTH	G4	SH		
MITOURA HESSELI	HESSEL'S HAIRSTREAK	G3G4	S2S3	3C	
NEONYMPHA AREOLATUS AREOLATUS	GEORGIA SATYR	G5T4	S2S4		
PAPAIPEMA CIRCUMLUCENS	A BORER	G4	SHSU		
PHYCIODES BATESII	TAWNY CRESCENTSPOT	G3G4	SH	C2	
PHYCIODES SELENIS	NORTHERN PEARLY CRESCENTSPOT	G5	S1S3		
POANES AARONI AARONI	SAFFRON SKIPPER	G4T4	S3		
POANES YEHL	YEHL SKIPPER	G4	S3		
PROBLEMA BULENTA	RARE SKIPPER	G2G3	S1	C2	
PYRGUS WYANDOT	SOUTHERN GRIZZLED SKIPPER	G3Q	S3	C2	
SATYRIUM KINGI	KING'S HAIRSTREAK	G3G4	S2S3		
SPEYERIA DIANA	DIANA	G3	S3		
SPEYERIA IDALIA	REGAL FRITILLARY	G3	SH	C2	
SPHINX FRANCKII	A SPHINX MoTH	G4	SHSU		
SYNANTHEDON CASTANEAE	CHESTNUT CLEARWING MoTH	GH	SX	C2	
TISCHERIA PERPLEXA	LEAF-MINING MoTH	GH	SX	3A	
XYLOTYPE CAPAX	BARRENS XLOTYPE	G4	SH		
ZANCLOGNATHA GYPSALIS	A NoCTUID MoTH	GU	SU		
ZANCLOGNATHA MARTHA	PINE BARRENS ZANCLOGNATHA	G4	SU		
ZANCLOGNATHA SP 2	A NoCTUID MoTH	G4	SU		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** ORDER: ODONATA: ANISOPTERA					
AESHNA CANADENSIS	CANADA DARNER	G5	S1		
AESHNA CONSTRICTA	LANCE-TAILED DARNER	G5	S1		
AESHNA MUTATA	SPRING BLUE DARNER DRAGONFLY	G3G4	S1		
AESHNA TUBERCULIFERA	BLACK-TIPPED DARNER	G4	S1		
AESHNA VERTICALIS	GREEN-STRIPED DARNER	G5	S1		
ANAX LONGIPES	LONG-LEGGED GREEN DARNER DRAGONFLY	G5	S2		
APHYLLA WILLIAMSONI	A DRAGONFLY	G5	S1		
ARIGOMPHUS FURCIFER	FORKED CLUBTAIL	G5	S1		
ARIGOMPHUS VILLOSIPIES	UNICORN CLUBTAIL	G5	S2		
BOYERIA GRAFIANA	OCELLATED DARNER	G5	S2		
BRACHYMESIA GRAVIDA	FOUR-SPOTTED PENNANT	G5	S1		
CELITHEMIS FASCIATA	BANDED PENNANT	G5	S2		
CELITHEMIS MARTHA	MARTHA SPOTTED SKIMMER	G4	S1		
CELITHEMIS ORNATA	FADED PENNANT	G5	S1		
CELITHEMIS VERNA	DOUBLE-RINGED PENNANT	G5	S1		
CORDULEGASTER DIASTATOPS	DELTA-SPOTTED SPIKETAIL	G5	S2		
=Z. BILINEATA, Z. DIASTATOPS					
CORDULEGASTER ERRONEA	ERRONEOUS BIDDIE	G4	S1		
CORDULEGASTER FASCIATA	A DRAGONFLY	G3Q	S1		
=TAENIOGASTER OBLIQUA FASCIATA					
CORDULEGASTER OBLIQUA	ARROWHEAD SPIKETAIL	G4	S1		
=TAENIOGASTER OBLIQUA OBLIQUA					
CORDULIA SHURTLIFFI	AMERICAN EMERALD	G5	S1		
CORYPHAESCHNA INGENS	REGAL DARNER	G5	S1		
EPITHECA CANIS	BEAVERPOND BASKETTAIL	G5	S1		
=TETRAGONEURIA CANIS					
EPITHECA COSTALIS	STRIPE-WINGED BASKETTAIL	G4	S1		
=TETRAGONEURIA COSTALIS					
EPITHECA SEMIAQUEA	MANTLED BASKETTAIL	G4	S1		
=TETRAGONEURIA SEMIAQUEA					
EPITHECA SPINOSA	ROBUST BASKETTAIL	G3G4	S1		
=TETRAGONEURIA SPINOSA					
ERPETO GOMPHUS DESIGNATUS	A DAMSELFLY	G5	S2		
ERYTHRODIPLAX CONNATA MINUSCULA	BLUE DRAGONLET	G5T?	S2		
GOMPHAESCHNA ANTILOPE	TAPER-TAILED DARNER	G4	S2		
GOMPHAESCHNA FURCILLATA	HARLEQUIN DARNER	G5	S2		
GOMPHUS ABBREVIATUS	SPINE-CROWNED CLUBTAIL	G3G4	S2		
GOMPHUS ADELPHUS	MOUSTACHED CLUBTAIL	G4	S1		3B

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
GOMPHUS APOMYIUS	BANNER CLUBTAIL	G4	S1		
GOMPHUS BOREALIS	BEAVERPOND CLUBTAIL	G4	S1		
=PHANOGOMPHUS BOREALIS					
GOMPHUS CONSANGUIS	CHEROKEE CLUBTAIL DRAGONFLY	G2G3	S1	C2	
=STENOGOMPHUS CONSANGUIS, STENOGOMPHURUS	CONSANGUIS				
GOMPHUS DESCRIPTUS	HARPOON CLUBTAIL	G3G4	S1		
=PHANOGOMPHUS DESCRIPTUS					
GOMPHUS FRATERNUS	MIDLAND CLUBTAIL	G5	S1		
=GOMPHURUS FRATERNUS					
GOMPHUS LINEATIFRONS	SPLENDID CLUBTAIL	G4	S1		
GOMPHUS PARVIDENS	PIEDMONT CLUBTAIL	G4	S1		
GOMPHUS QUADRICOLOR	RAPIDS CLUBTAIL	G3G4	S1		
=PHANOGOMPHUS QUADRICOLOR					
GOMPHUS ROGERSI	ROGER'S CLUBTAIL	G4	S1		
=STENOGOMPHURUS ROGERSI					
GOMPHUS SEPTIMA	SEPTIMA'S CLUBTAIL	G2	SR	C2	
=GOMPHURUS SEPTIMA					
GOMPHUS VASTUS	COBRA CLUBTAIL	G5	S2		
GOMPHUS VENTRICOSUS	SKILLET CLUBTAIL	G3G4	S1		
=GOMPHURUS VENTRICOSUS					
GOMPHUS VIRIDIFRONS	GREEN-FACED CLUBTAIL	G3	S1		
HAGENIUS BREVISTYLUS	DRAGONHUNTER	G5	S2		
HELOCORDULIA SELYSII	SELYS' SUNFLY	G4	S1		
LANTHUS PARVULUS	ZORRO CLUBTAIL	G3G4	S1		
LANTHUS VERNALIS	SINGLE-STRIPED CLUBTAIL	G4	S1		
LEUCORRHINIA FRIGIDA	FROSTED WHITEFACE	G5	S1		
LEUCORRHINIA HUDSONICA	HUDSONIAN WHITEFACE	G5	S1		
LEUCORRHINIA INTACTA	DOT-TAILED WHITEFACE	G5	S2		
LEUCORRHINIA PROXIMA	CANADIAN WHITE-FACED SKIMMER	G5	S1		
LIBELLULA AURIPENNIS	GOLDEN-WINGED SKIMMER	G5	S1		
LIBELLULA AXILENA	BAR-WINGED SKIMMER	G5	S1		
LIBELLULA FLAVIDA	YELLOW-SIDED SKIMMER	G5	S2		
LIBELLULA JULIA	JULIA'S SKIMMER DRAGONFLY	G5	S1		
=LADONA JULIA					
LIBELLULA QUADRIMACULATA	FOUR-SPOTTED SKIMMER	G5	S1		
LIBELLULA EXUSTA	CORPORAL SKIMMER	G4	S1		
=LADONA EXUSTA					
MACROMIA ALLEGHANIENSIS	ALLEGHENY RIVER SKIMMER	G4	S1		
MACROMIA GEORGINA	GEORGIA RIVER CRUISER	G5	S1		
MACROMIA MARGARITA	NANTAHALA BELTED SKIMMER	G2G3	S1	C2	

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
NANNOTHEMIS BELLA	DWARF SKIMMER	G4	S1		
NASIAESCHNA PENTACANTHA	CYRANO DARNER	G5	S1		
NEUROCORDULIA OBSOLETA	UMBER SHADOWFLY	G4	S2		
NEUROCORDULIA VIRGINIENSIS	CINNAMON SHADOWFLY	G4	S1		
NEUROCORDULIA YAMASKANENSIS	NORTHERN TWILIGHT SKIMMER	G5	S1		
OPHIOGOMPHUS ASPERSUS	BROOK SNAKETAIL	G3G4	S1		
=OPHIONURUS ASPERSUS					
OPHIOGOMPHUS CAROLUS	RIFFLE SNAKETAIL	G5	S1		
OPHIOGOMPHUS HOWEI	HOWE'S OR PYGMY SNAKETAIL	G2G3	S1	C2	
=OPHIONUROIDES HOWEI					
OPHIOGOMPHUS INCURVATUS	ALLEGHANY SNAKETAIL	G3G4	S1		
=OPHIONURUS INCURVATUS					
OPHIOGOMPHUS INCURVATUS ALLEGHANIENSIS	ALLEGHANY SNAKETAIL DRAGONFLY	G3G4T3	S1	C2	
=OPHIONURUS ALLEGHANIENSIS					
OPHIOGOMPHUS MAINENSIS	TWIN-HORNED SNAKETAIL	G3G4	S1		
=OPHIONURUS MAINENSIS					
OPHIOGOMPHUS RUPINSULENSIS	RUSTY SNAKETAIL	G5	S2		
SOMATOCHLORA ELONGATA	SLENDER BOG SKIMMER	G5	S1		
SOMATOCHLORA FILOSA	FINE-LINED EMERALD	G5	S1		
SOMATOCHLORA GEORGIANA	COPPERY EMERALD	G3G4	S1		
SOMATOCHLORA LINEARIS	MOCHA EMERALD	G5	S2		
SOMATOCHLORA PROVOCANS	STRIPED EMERALD	G3G4	S1		
SOMATOCHLORA WILLIAMSONI	WILLIAMSON'S BOG SKIMMER	G5	S1		
STYLURUS AMNICOLA	RIVER CLUBTAIL	G3G4	S1		
STYLURUS LAURAE	APACHE SPIKETAIL	G3G4	S1		
STYLURUS NOTATUS	ELUSIVE OR MARKED CLUBTAIL	G3G4	S1	C2	
=GOMPHUS NOTATUS					
STYLURUS PLAGIATUS	RUSSET-TIPPED CLUBTAIL	G5	S2		
STYLURUS SCUDDERI	SCUDDER'S CLUBTAIL	G3G4	S1		
STYLURUS SPINICEPS	ARROW CLUBTAIL	G5	S2		
SYMPETRUM AMBIGUUM	BLUE-FACED MEADOWFLY	G5	S1		
SYMPETRUM CORRUPTUM	VARIEGATED MEADOWFLY	G5	S1		
=TARNETRUM CORRUPTUM					
SYMPETRUM INTERNUM	CHERRY-FACED MEADOWHAWK	G5	S1		
SYMPETRUM OBTRUSUM	WHITE-FACED MEADOWFLY	G5	S1		
TACHOPTERYX THOREYI	GRAY PETALTAIL	G4	S1		
TRAMEA ONUSTA	RED-MANTLED GLIDER	G5	S1		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** ORDER: Odonata: Zygoptera					
AMPHIAGRION SAUCIUM	EASTERN RED DAMSEL	G5	S2		
ARCHILESTES GRANDIS	GIANT SPREADWING	G5	S1		
ARGIA BIPUNCTULATA	TWO-SPOTTED DANCER	G4	S2		
ARGIA SEDULA	A DAMSELFLY	G5	S2		
ARGIA TIBIALIS	EASTERN DANCER	G5	S2		
ARGIA TRANSATA	A DAMSELFLY	G5	S2		
CALOPTERYX AEQUABILIS	BLACK-BANDED BANDWING	G5	S2		
CALOPTERYX AMATA	A DAMSELFLY	G3G4	S1		
CALOPTERYX ANGUSTIPENNIS	A DAMSELFLY	G4	S1		
CALOPTERYX DIMIDIATA	A DAMSELFLY	G5	S2		
CHROMAGRION CONDITUM	AURORA DAMSELFLY	G5	S2		
ENALLAGMA BASIDENS	A DAMSELFLY	G5	S2		
ENALLAGMA CYATHIGERUM	NORTHERN BLUET	G5	S1		
ENALLAGMA DAECKII	A DAMSELFLY	G4	S1		
ENALLAGMA DOUBLEDAYI	A DAMSELFLY	G5	S2		
ENALLAGMA DUBIUM	A DAMSELFLY	G5	S2		
ENALLAGMA DURUM	A DAMSELFLY	G5	S2		
ENALLAGMA EBRIUM	MARSH BLUET	G5	S1		
ENALLAGMA GEMINATUM	SKIMMING BLUET	G5	S2		
ENALLAGMA HAGENI	HAGEN'S BLUET	G5	S1		
ENALLAGMA PALLIDUM	A DAMSELFLY	G4	S1		
ENALLAGMA TRAVIATUM WESTFALLI	A DAMSELFLY	G5T5	S2		
ENALLAGMA VESPERUM	A DAMSELFLY	G5	S2		
ENALLAGMA WEEWA	A DAMSELFLY	G5	S1		
HETAERINA TITIA	TITAN RUBY-SPOT	G5	S1		
ISCHNURA KELLICOTTI	A DAMSELFLY	G5	S1		
ISCHNURA PROGNATA	A DAMSELFLY	G4	S1		
ISCHNURA RAMBURI	A DAMSELFLY	G5	S2		
LESTES DISJUNCTUS AUSTRALIS	A DAMSELFLY	G5T5	S2		
LESTES DISJUNCTUS DISJUNCTUS	A DAMSELFLY	G5T5	S1		
LESTES DRYAS	A DAMSELFLY	G5	S1		
LESTES EURINUS	AMBER-WINGED SPREADWING	G4	S1		
LESTES FORCIPATUS	SWEETFLAT SPREADWING	G5	S2		
LESTES INAEQUALIS	ELEGANT SPREADWING	G5	S1		
LESTES VIGILAX	SWAMP SPREADWING	G5	S2		
NEHALENNIA GRACILIS	SPHAGNUM SPRINT	G5	S2		
NEHALENNIA INTEGRICOLLIS	A DAMSELFLY	G5	S1		
NEHALENNIA IRENE	SEDGE SPRINT	G5	S1		

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SCIENTIFIC NAME	COMMON NAME	GLOBAL RANK	STATE RANK	FEDERAL STATUS	STATE STATUS
** ORDER: ORTHOPTERA					
CARIBLATTA LUTEA	LITTLE YELLOW COCKROACH	G4	S1		
** ORDER: THYSANURA					
LITOCAMPA BARRINGERORUM	A DIPLURAN	G1	S1		
LITOCAMPA BIFURCATA	A DIPLURAN	G?	S1		
LITOCAMPA COOKEI	A DIPLURAN	G?	S1		
LITOCAMPA HOLSINGERI	A DIPLURAN	G2	S1S2		
PLUSIOCAMPA SP 2	UNDESCRIBED DIPLURAN, SCOTT CO	G?	S?		
PLUSIOCAMPA SP A					
PLUSIOCAMPA SP 3 SSP 1	UNDESCRIBED DIPLURAN, WARD'S COVE,	G?T?	S?		
PLUSIOCAMPA SP 8 SSP A					
PLUSIOCAMPA SP 3 SSP 2	UNDESCRIBED DIPLURAN, WARD'S COVE,	G?T?	S?		
PLUSIOCAMPA SP 8 SSP B					
PLUSIOCAMPA SP 3 SSP 3	UNDESCRIBED DIPLURAN, BURKE'S GARDE	G?T?	S?		
PLUSIOCAMPA SP 8 SSP C					
PLUSIOCAMPA SP 4	UNDESCRIBED DIPLURAN	G?	S?		
PLUSIOCAMPA SP C					

APPENDIX 3:

A CLASSIFICATION OF VIRGINIA'S INDIGENOUS BIOTIC COMMUNITIES

A CLASSIFICATION OF VIRGINIA'S INDIGENOUS BIOTIC COMMUNITIES:

PHASE 1. UPPER LEVELS OF THE HIERARCHY

REVIEW DRAFT, May 9, 1990

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INTRODUCTION

Virginia contains a remarkable diversity of natural ecosystems - ecosystems that support thousands of species, renewable natural resources, and myriad opportunities for recreation and aesthetic appreciation. While some ecosystems have fared well since colonial times, others have been degraded or destroyed by human activity. In some cases, this damage can be characterized as indirect. For example, introduced pathogens devastated the American Chestnut and American Elm, the introduced Asiatic Clam is rapidly increasing in our rivers to the detriment of native freshwater mollusks, and the introduced plant, Japanese Honeysuckle, is supplanting native herbaceous vegetation across much of the Commonwealth. Outright habitat destruction is a serious and direct consequence of human activity, and a notable example is the destruction of 63,000 acres of coastal and inland wetlands in Virginia between the years 1956 and 1977 (Tiner 1987).

Recognizing the vital link between natural ecosystems and our cultural heritage, the Virginia Department of Conservation and Recreation's Division of Natural Heritage has undertaken a long-term project to classify and inventory exemplary and rare "Indigenous Biotic Communities". These communities are the units of functioning ecosystems. As a first step, the communities will be named and described; this is classification. The classification, in turn, will permit an inventory of the exemplary occurrences. The goal of the inventory is to accumulate information on the status, distribution, and ecology of each community element, and utilize this information as a tool for conservation planning and natural areas management.

Communities are ideal units of inventory, protection, and management that not only have intrinsic values, but also contain species too cryptic or poorly known to be catalogued and prioritized individually. Thus, the community inventory is an expedient and effective "coarse filter" approach to biological conservation. Most species in the Commonwealth will likely be protected if we are successful in identifying and protecting the best examples of each community type.

As discussed by Damman (1964), criticism has been directed toward the classification of vegetation, primarily because changes in nature are gradual and the vegetation forms a continuum. Damman's insightful response to this criticism is worthy of repeating here because it is applicable to the Virginia community classification project:

"Quite evidently there does frequently exist a continuum of habitat conditions, but well-defined vegetation types can occur, owing to competition, mutual intolerance and gregarious occurrence of certain species. However, the sharpness of the boundaries of vegetation types varies greatly, and types exist that grade into each other. ... Although it may seem paradoxical, it is not inconsistent to admit the existence of gradual changes, and at the same time classify the vegetation by defined units. The vegetation can arbitrarily be treated as a recurrent pattern of types, capable of definition and naming, thus making repeated long descriptions unnecessary."

Damman further suggested that a hierarchical system with defined lower units, "better answers our needs of speech and thought than a system of units arranged in ecological series or in a series of co-ordinates."

The present classification is derived in part from three key sources; 1) An Ecological Land Classification Framework for the United States (Driscoll et al. 1984), 2) Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979), and 3) Coastal Ecological Systems of the United States (Odum et al., 1974).

Advice from knowledgeable individuals is crucial at this preliminary stage, and comments received will be gratefully acknowledged. The classification will be revised and expanded to include the actual community elements as new information comes to light.

THE CLASSIFICATION HIERARCHY

Three upper levels of a classification hierarchy are proposed at this time. The first level is called **Ecological System**, the second, **Major Community Type**, and the third, simply **Class**. This third level is somewhat incomplete and provisional.

Terms used to describe Ecological System are defined in Appendix 1, Major Community Type in Appendix 2, and Class in Appendix 3.

The individual community elements will be classified at a later date. Each community element will have a defined species composition, structure, and habitat (see Appendix 4). In the mean time, community occurrences can be classified to a general level using the classification hierarchy. Codes have been assigned throughout the classification to facilitate data management.

<u>CODE</u>	<u>ECOLOGICAL SYSTEM</u>
	<u>Major Community Type</u>
	<u>Class</u>

CT	TERRESTRIAL
----	--------------------

CTF	<u>Forest</u>
-----	---------------

CTFO	Oligotrophic
------	--------------

CTFS	Submesotrophic
------	----------------

CTFM	Mesotrophic
------	-------------

CTFP	Permesotrophic
------	----------------

CTFE	Eutrophic
------	-----------

CTW	<u>Woodland</u>
-----	-----------------

CTWO	Oligotrophic
------	--------------

CTWS	Submesotrophic
------	----------------

CTWM	Mesotrophic
------	-------------

CTWP	Permesotrophic
------	----------------

CTWE	Eutrophic
------	-----------

CTS	<u>Scrub</u>
-----	--------------

CTSO	Oligotrophic
------	--------------

CTSS	Submesotrophic
------	----------------

CTSM	Mesotrophic
------	-------------

CTSP	Permesotrophic
------	----------------

CTSE	Eutrophic
------	-----------

CTD	<u>Dwarf-scrub</u>
-----	--------------------

CTH	<u>Herbaceous</u>
-----	-------------------

CTHL	Low
------	-----

CTHM	Mid-height
------	------------

CTHT	Tall
------	------

CTM	<u>Moss/lichen</u>
-----	--------------------

CTU	<u>Unvegetated</u>
-----	--------------------

CP PALUSTRINE

CPF Forest

CPFA Oligotrophic Saturated
CPFB Oligotrophic Seasonally Flooded
CPFC Mesotrophic Saturated
CPFD Mesotrophic Seasonally Flooded
CPFE Mesotrophic Semipermanently Flooded
CPFF Eutrophic Saturated
CPFG Eutrophic Seasonally Flooded
CPFH Eutrophic Semipermanently Flooded

CPW Woodland

CPWA Oligotrophic Saturated
CPWB Oligotrophic Seasonally Flooded
CPWC Mesotrophic Saturated
CPWD Mesotrophic Seasonally Flooded
CPWE Mesotrophic Semipermanently Flooded
CPFF Eutrophic Saturated
CPWG Eutrophic Seasonally Flooded
CPWH Eutrophic Semipermanently Flooded

CPS Scrub

CPSA Oligotrophic Saturated
CPSB Oligotrophic Seasonally Flooded
CPSC Oligotrophic Semipermanently Flooded
CPSD Mesotrophic Saturated
CPSE Mesotrophic Seasonally Flooded
CPSF Mesotrophic Semipermanently Flooded
CPSG Eutrophic Saturated
CPSH Eutrophic Seasonally Flooded
CPSI Eutrophic Semipermanently Flooded

CPD Dwarf-scrub

CPH Herbaceous

CPHL Low
CPHM Mid-height
CPHT Tall
CPHS Submergent

CPM Moss/lichen

CPA Algal

CPU Unvegetated

CR RIVERINE (riverine system not yet classified; advice sought)

Note: Dorothy Allard recognized the following stream communities in Virginia:

Warm low gradient small creek,
Warm low gradient large creek,
Warm low gradient river,
Warm medium gradient small creek,
Warm medium gradient large creek,
Warm medium gradient river,
Cool medium gradient small creek,
Cool medium gradient large creek,
Cool medium gradient river,
Cool high gradient small creek,
Cold high gradient small creek,
Medium gradient intermittent small creek,
High gradient intermittent small creek,
Warm spring & spring run,
Alkaline cold spring & spring run,
Acidic cold spring & spring run.

Alternatively, one might favor a more biologically based nomenclature such as:

Salmonid fishes stream,
Cyprinid fishes Stream,
Anadromous fishes stream,
Fishless stream,
etc.

Also, a classification based on aquatic invertebrate organisms might also hold promise.

CL LACUSTRINE (lacustrine system not yet classified; advice sought)

CE ESTUARINE

CES Scrub (primarily Baccharis, Juniperus, Myrica)

CEH Herbaceous

CEHL Low

CEHM Mid-height

CEHT Tall

CEHS Submergent

CEA Tide Pools

CEB Oyster Reefs

CEC Worm and Clam Flats

CED Algal

CEE Oligohaline Regime Aquatic

CEF Medium Salinity Aquatic

CEG Estuarine Beach/Shore

NOTE: The 12 vegetated and 5 nonvegetated wetland types recognized by the Virginia Marine Resources Commission in the publication, Wetland Guidelines, can be placed within the Estuarine System hierarchy. Do other distinct estuarine community types exist?

CM MARINE

CMH High Energy Beach/Shore

CMK Algal

CMP Coastal Plankton

CS	SUBTERRANEAN (unvegetated)
CSA	<u>Aquatic</u>
CSAS	Stream
CSAD	Drip/Seep Pool
CSAP	Phreatic Lake
CSAI	Interstitial (beneath streams, beneath floodplains, beneath spring seeps, etc.)
CST	<u>Terrestrial</u>

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APPENDIX 1

1) First Level: Ecological System

The classification hierarchy is based upon readily observed features of the vegetation and habitat. The first level establishes 7 ecological systems, described below:

TERRESTRIAL

DIAGNOSTIC FEATURE: upland environments; wetland soils or obligate wetland vascular plant species (Reed, 1986) lacking.

PALUSTRINE

DIAGNOSTIC FEATURE: fresh to slightly brackish (to 0.5 ppt salinity) wetland and shallow water (< 2 m deep) environments; wetland soils or obligate wetland vascular plant species present.

RIVERINE

DIAGNOSTIC FEATURE: freshwater lotic environments which lack emergent vegetation; streams.

LACUSTRINE

DIAGNOSTIC FEATURE: deep (> 2 m) freshwater lentic water environments lacking emergent vegetation; lakes and deep ponds.

ESTUARINE

DIAGNOSTIC FEATURE: deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land, but have open, partly obstructed, or sporadic access to the open ocean; waters usually diluted by freshwater runoff from the land; extends landward up tidal rivers to the limit of halophytic species such as Spartina cynosuroides and Juncus roemerianus.

MARINE:

DIAGNOSTIC FEATURE: the open ocean and its associated high-energy coastline; salinities exceed 30 ppt, with little or no dilution except outside the mouths of estuaries.

SUBTERRANEAN

DIAGNOSTIC FEATURE: caves and all other underground environments that support life, exclusive of soil environments and mammal burrows.

APPENDIX 2

2) Second Level: Major Community Type

Vegetated communities can display considerable horizontal heterogeneity over a short distance, and the identification of discrete vegetation units can be problematic. To help standardize the identification of the major vegetated community units, a rigid set of naming rules has been developed. The first rule requires careful inspection of vegetation strata. A stratum is a recognizable layer of vegetation that covers at least 5% of the total area. This first rule dictates that the tallest stratum of the vegetation has precedence over the lower strata, even in cases where the tall stratum covers less area than a subtending stratum. The second rule assigns minimum size criteria for the major vegetation types, thereby establishing the scale of the units in the classification. Eight major vegetated community types are named and described below, and minimum size criteria are given.

FOREST

DIAGNOSTIC FEATURE: woody species greater than 6 m tall dominate the upper stratum of the vegetation and cover more than 40% of the total area; patches at least 400 square meters in size.

WOODLAND

DIAGNOSTIC FEATURE: woody species greater than 6 m tall dominate the upper stratum of the vegetation and cover between 5 and 40% of the total area; patches at least 400 square meters in size.

SCRUB

DIAGNOSTIC FEATURE: woody species between 1 and 6 m tall dominate the upper stratum of the vegetation and cover more than 5% of the total area; patches at least 100 square meters in size.

DWARF-SCRUB

DIAGNOSTIC FEATURE: woody species less than 1 m tall dominate the upper stratum of the vegetation and cover more than 5% of the total area; patches at least 100 square meters in size.

HERBACEOUS

DIAGNOSTIC FEATURE: herbaceous species dominate the upper stratum of the vegetation and cover more than 5% of the total area; patches at least 100 square meters in size.

MOSS/LICHEN

DIAGNOSTIC FEATURE: mosses or lichens dominate the upper stratum of the vegetation and cover more than 5% of the total area; patches at least 100 square meters in size.

ALGAL

DIAGNOSTIC FEATURE: algae dominate the upper stratum of the vegetation and cover at least 5% of the total area; patches at least 100 square meters in size.

SCARCELY VEGETATED

DIAGNOSTIC FEATURE: vegetation lacking, or vegetation very sparse, with no distinct strata present; patches at least 100 square meters in size.

A dichotomous key to the major vegetated community types is shown below to help eliminate any ambiguity regarding the definitions:

- A. Woody species greater than 6 m tall (trees) cover more 5% of the area. (B)
 - B. Trees cover more than 40% of the area. ----- FOREST
 - BB. Trees cover 5 to 40% of the area. ----- WOODLAND
- AA. Trees absent, or cover less than 5% of the area. (C)
 - C. Woody species 1 to 6 m tall cover more than 5% of the area. ----- SCRUB
 - CC. Woody species 1 to 6 m tall absent, or cover less than 5% of the area. (D)
 - D. Woody species less than 1 m tall (dwarf-shrubs) cover more than 5% of the area -- DWARF-SCRUB
 - DD. Dwarf-shrubs absent, or cover less than 5% of the area. (E)
 - E. Herbaceous species cover at least 5% of the area. ----- HERBACEOUS
 - EE. Herbaceous species absent, or cover less than 5% of the area. (F)
 - F. Mosses or lichens cover at least 5% of the area. ----- MOSS/LICHEN
 - FF. Mosses or lichens absent, or cover less than 5% of the area. (G)
 - G. Non-free-floating algae cover at least 5% of the area. ----- ALGAL
 - GG. Non-free-floating algae absent, or cover less than 5% of the area. -- UNVEGETATED

NOTE: Most of major community types of the Estuarine and Marine systems are defined in Odum *et al.* (1974). These definitions will be included in the next phase of the classification. Similarly, the major community types of the Subterranean system will also be defined in the next phase.

APPENDIX 3

3) Third Level: Class

This level of the classification hierarchy is highly provisional and somewhat incomplete. Significant adjustments will likely occur.

TERRESTRIAL SYSTEM

Forests:

Terrestrial forests vary tremendously across the Commonwealth, and establishing this third level of the classification could be approached in many ways. After much thought, my preliminary decision is to establish 5 classes of terrestrial forests based on trophic regime. Trophic regime is not a directly observable feature, but certain observable features can indicate trophic regime. Habitat factors and biological phenomena are both used to define trophic regime, as shown on the chart below.*

CLASS:	(1) OLIGOTROPHIC	(2) SUBMESOTROPHIC	(3) MESOTROPHIC	(4) PERMESOTROPHIC	(5) EUTROPHIC
DEFINITION	very poor nutritional status, very small supply of available nutrients	poor nutritional status, low supply of available nutrients	medium nutritional status, medium supply of available nutrients	rich nutritional status, plentiful supply of available nutrients	very rich nutritional status, abundant supply of nutrients
BEDROCK SOURCE	granite----- rhyolite----- quartzite----- quartz sandstone-----	granodiorite----- dacite----- quartz gneiss----- conglomerate-----	diorite----- andesite----- garnet schist----- graywacke-----	gabbro----- biotite schist----- argillite----- shale-----	peridotite----- basalt----- slate-phyllite-marble dolomite----- limestone
TEXTURE	--very coarse-----	coarse-----	medium-----	fine-----	very fine-----
ORGANIC MATTER CONTENT	----low-----	-----	-----moderate-----	-----	-----high-----
HUMUS FORM	----acid mors-----	-----	-----mor and moders-----	-----	-----moders and mulls-----
SOIL REACTION	extremely acid to medium acid	-----	medium acid to neutral	-----	slightly acid to mildly alkaline
CEC and BASE SATURATION	-----low-----	-----	-----moderate-----	-----	-----high-----
CHARACTERISTIC SLOPE POS.	summits, crests, level	-----	upper convex, regular, level	-----	lower concave, stream bottoms level
CHARACTERISTIC SPECIES					
Ericaceae	----abundant-----	-----	infrequent-----	-----	very rare or absent-----
Caprifoliaceae	----rare or absent-----	-----	infrequent to frequent-----	-----	variable-----
Pinus spp.	----abundant-----	-----	infrequent-----	-----	usually absent-----
Quercus prinus	Tsuga canadensis	Acer barbatum	Hydrophyllum virginia.	Viola canadensis	
Quercus ilicifolia	Ostrya virginiana	Acer saccharum	Trillium erectum	Meehanian cordata	
Quercus marilandica	Viburnum acerifolium	Lindera benzoin	Dicentra canadensis	Hydrastis canad.	
Oxydendrum arboreum	Carex virescens	Asimina triloba	Phlox divaricata	Jeffersonia diph.	
Nyssa sylvatica	Desmodium paniculatum	Adiantum pedatum	Staphylea trifolia	Erigenia bulbosa	
Sassafras albidum	Cunilla origanoides	Carex laxiflora	Carex amphibola	Mertensia virgin.	
Aralia nudicaulis	Geranium maculatum	Athyrium thelypt.	Polymnia canadensis	Viola striata	
Gaultheria procum.	Solidago arguta	Polemonium reptans	Carex sparganioides	Trillium sessile	
Prenanthes trifol.	Antennaria plantag.	Aplectrum hyemale	Verbesina alternifolia	Dryopteris goldi.	
Smilax rotund.	Callicarpa americana	Carpinus caroliniana	Galearis spectabilis	Uvularia grandif.	
Comandra umbellata	Polystichum acrosti.	Festuca obtusa	Dirca palustris	Carex plantaginea	
Deschampsia flexuosa	Brachyelytrum erectum	Collinsonia canad.	Panax quinquefolius	Caulophyllum tha.	
Carex pensylvanica	Carex communis	Aralia racemosa	Allium tricoccum	Trillium grandif.	
Acer rubrum	Uvularia perfoliata	Muhlenbergia tenuifl.	Cypripedium calceolus	Carex albursina	
Lysimachia quadrifol.	Botrychium virgin.	Carex platyphylla		Hydrophyllum can.	
Hamamelis virginiana	Hydrangea arborescens	Cimicifuga racemosa			
Cypripedium acaule	Medeola virginiana	Viburnum rafinesquianum			

* Adapted from Walmsley et al., 1980.

Woodlands and Scrub

The 5 nutrient regime descriptors may be used to subdivide terrestrial woodlands and terrestrial scrub. Because terrestrial woodland and scrub vegetation tends to occur on dry or otherwise harsh environments, the descriptors, Permesotrophic and Eutrophic, will rarely be applicable.

Dwarf-scrub

I have little information about this vegetation type in Virginia, and therefore, subdivision to the third classificatory level is not possible at this time.

Herbaceous

Traditionally, terrestrial herbaceous vegetation has been divided into graminoid versus forb types, or annual versus perennial types. While this division works effectively in many parts of the world, in Virginia, assigning a community to forb versus graminoid, or annual versus perennial type isn't easy due to frequent admixing and patchy dominance of one type over another. To avoid this problem, I recognize three classes of terrestrial herbaceous vegetation, based simply on mean height of the tallest herbaceous stratum. These three classes are:

- 1) Tall (ca. 2 m),
- 2) Mid-height (ca. 1 m), and
- 3) Low (< 0.5 m).

Height class usually corresponds with nutrient status of the soils, and community trophic regime.

Moss/Lichen and Unvegetated

No third-level subdivisions of these terrestrial categories is proposed at the present time.

PALUSTRINE SYSTEM

Forests

Palustrine forests can be subdivided on the basis of trophic regime, using a chart similar to the one shown for terrestrial forests. However, only three nutrient regime descriptors seem appropriate at the present time, Oligotrophic, Mesotrophic, and Eutrophic. Three additional modifying hydrologic parameters, Saturated, Seasonally Flooded, and Semipermanently Flooded, yield a more useful classification. The various classes of palustrine forests are:

Oligotrophic Saturated

DIAGNOSTIC FEATURE: very rarely or never flooded; soils permanently saturated due to nutrient-poor seepage; acidic seepage fosters growth of many ericads and Sphagnum, while nutrient-poor alkaline seepage fosters growth of Caprifoliaceous species; trees do not attain full stature due to stressful growing conditions; a large number of plants indicative of seepage present.

Oligotrophic Seasonally Flooded

DIAGNOSTIC FEATURE: acidic, nutrient-poor surface water is present for extended periods, especially early in the growing season; usually found in closed basins; ericads are abundant; trees do not attain full stature due to stressful growing conditions.

Note: Oligotrophic semipermanently flooded forests apparently do not exist in Virginia. Such habitats tend to support scrub vegetation, frequently dominated by *Cephalanthus occidentalis*.

Mesotrophic Saturated

DIAGNOSTIC FEATURE: very rarely or never flooded; soils permanently saturated due to seepage, but nutrient status is enhanced due to inputs from surface runoff; trees are able to achieve large stature; fewer plants indicative of seepage present.

Mesotrophic Seasonally Flooded

DIAGNOSTIC FEATURE: surface waters derived from seasonal flooding of small streams present for extended periods; moderate nutrient availability, and trees attain full stature; Ericaceous and Caprifoliaceous shrubs both usually present.

Mesotrophic Semipermanently Flooded

DIAGNOSTIC FEATURE: surface waters persist for much or all of the growing seasons; moderate nutrient availability due to inputs from small streams or runoff; only water-tolerant species (such as *Taxodium distichum*, *Nyssa aquatica*, *Itea virginica*, etc.) present, and sometimes full stature is not achieved due to very wet growing conditions.

Eutrophic Saturated

DIAGNOSTIC FEATURE: very rarely or never flooded; soils mucky and very rich due to upslope inputs of colluvium or lateral drainage through rich upslope soils; tall deciduous trees predominate; lush herbaceous layer consists of seepage indicators and eutrophic soils indicators.

Eutrophic Seasonally Flooded

DIAGNOSTIC FEATURE: surface waters derived from seasonal flooding of large streams present for extended periods; high nutrient availability, and trees attain full stature; Ericaceous species very rare or absent; tall, rank, growth of herbaceous understory species present in late summer.

Eutrophic Semipermanently Flooded

DIAGNOSTIC FEATURE: surface waters derived from flooding from adjacent large eutrophic bodies of water persist for much or all of the growing season; high nutrient availability; only water-tolerant species present, and sometimes full stature is not achieved due to very wet conditions; includes fresh tidal swamps.

Woodland

The eight classes used to describe palustrine forests are also be used to classify palustrine woodlands.

Scrub

The eight classes used to describe palustrine forests are also used to classify palustrine scrub. One additional class, Oligotrophic Semipermanently Flooded, is used.

Dwarf-scrub

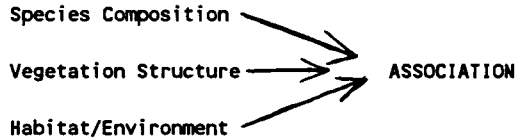
No subdivision of dwarf-scrub wetlands is proposed at this time.

Herbaceous

In addition to low, mid-height, and tall types of herbaceous wetland vegetation, an additional type, Submergent, has been included.

APPENDIX 4

The fundamental unit of the classification is the "Community Element", a loosely defined conceptual entity encompassing both animal-dominated and vegetation-dominated species assemblages and their habitats. For vegetated communities, a more specific term, "Association", can be used. An Association is defined as the fundamental unit for phytosociology, being a plant community of certain floristic composition, of uniform habitat conditions, and of uniform physiognomy (Wildeman 1910). Furthermore, the Association is defined as an abstract plant community identified by its characteristic species assemblage, including one or more local character species or differentiating species (Becking 1957). A visual representation of the Association concept is shown below:



Plant community classification is not a simple matter, and the problems faced in Virginia are the same as those faced in Colorado by Baker (1984):

- 1) there is no central repository of vegetation data (analogous to a herbarium),
- 2) there is no single, widely utilized method of collecting stand data,
- 3) plot data are often not analyzed, or the analysis includes ordination but not classification,
- 4) existing community classifications are often developed for a limited geographical area,
- 5) there is no standard system of community nomenclature,
- 6) there is disagreement about whether the classification should be of existing vegetation, presettlement vegetation, or climax vegetation,
- 7) there is no formal agreement on the appropriate level of detail for classification, and
- 8) no one has attempted to systematically revise classifications on a broad scale, using a monographic approach.

One additional problem, more pronounced in Virginia than in Colorado, is incomplete stand data; too often in the Eastern vegetation literature one finds analyses of just woody or dominant species.

In developing and refining the Virginia Classification of Indigenous Biotic Communities, the Division of Natural Heritage will strive to overcome these obstacles, and will rely heavily on the advice and cooperation of community ecologists throughout the Commonwealth. During the next phase of this classification project, a detailed review of pertinent community literature will be presented to serve as the foundation for more detailed classification.

Community Elements (1990 Draft)

ELCODE..... SNAME:.....

TERRESTRIAL

Forest

CTF0000000 OLIGOTROPHIC FOREST
CTFS0000000 SUBMESOTROPHIC FOREST
CTFM0000000 MESOTROPHIC FOREST
CTFP0000000 PERMESOTROPHIC FOREST
CTFE0000000 EUTROPHIC FOREST

Woodland

CTW0000000 OLIGOTROPHIC WOODLAND
CTWS0000000 SUBMESOTROPHIC WOODLAND
CTWM0000000 MESOTROPHIC WOODLAND
CTWP0000000 PERMESOTROPHIC WOODLAND
CTWE0000000 EUTROPHIC WOODLAND

Scrub

CTS0000000 OLIGOTROPHIC SCRUB
CTSS0000000 SUBMESOTROPHIC SCRUB
CTSM0000000 MESOTROPHIC SCRUB
CTSP0000000 PERMESOTROPHIC SCRUB
CTSE0000000 EUTROPHIC SCRUB
CTD0000000 DWARF SCRUB

Herbaceous

CTH0000000 LOW HERBACEOUS UPLAND VEGETATION
CTHM0000000 MID-HEIGHT HERBACEOUS UPLAND VEGETATION
CTHT0000000 TALL HERBACEOUS UPLAND VEGETATION
CTMO0000000 MOSS/LICHEN UPLAND VEGETATION
CTU0000000 UNVEGETATED UPLANDS

PALUSTRINE

Forest

CPFA0000000 OLIGOTROPHIC SATURATED PALUSTRINE FOREST
CPFB0000000 OLIGOTROPHIC SEASONALLY FLOODED PALUSTRINE FOREST
CPFC0000000 OLIGOTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE FOREST
CPFD0000000 MESOTROPHIC SATURATED PALUSTRINE FOREST
CPFE0000000 MESOTROPHIC SEASONALLY FLOODED PALUSTRINE FOREST
CPFF0000000 MESOTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE FOREST
CPFG0000000 EUTROPHIC SATURATED PALUSTRINE FOREST
CPFH0000000 EUTROPHIC SEASONALLY FLOODED PALUSTRINE FOREST
CPFI0000000 EUTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE FOREST

Woodland

CPWA0000000 OLIGOTROPHIC SATURATED PALUSTRINE WOODLAND
CPWB0000000 OLIGOTROPHIC SEASONALLY FLOODED PALUSTRINE WOODLAND
CPWC0000000 OLIGOTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE WOODLAND
CPWD0000000 MESOTROPHIC SATURATED PALUSTRINE WOODLAND
CPWE0000000 MESOTROPHIC SEASONALLY FLOODED PALUSTRINE WOODLAND
CPWF0000000 MESOTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE WOODLAND
CPWG0000000 EUTROPHIC SATURATED PALUSTRINE WOODLAND
CPWH0000000 EUTROPHIC SEASONALLY FLOODED PALUSTRINE WOODLAND
CPWI0000000 EUTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE WOODLAND

Scrub

CPSA0000000 OLIGOTROPHIC SATURATED PALUSTRINE SCRUB
CPSB0000000 OLIGOTROPHIC SEASONALLY FLOODED PALUSTRINE SCRUB
CPSC0000000 OLIGOTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE SCRUB
CPSD0000000 MESOTROPHIC SATURATED PALUSTRINE SCRUB
CPSE0000000 MESOTROPHIC SEASONALLY FLOODED PALUSTRINE SCRUB
CPSF0000000 MESOTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE SCRUB
CPSG0000000 EUTROPHIC SATURATED PALUSTRINE SCRUB
CPSH0000000 EUTROPHIC SEASONALLY FLOODED PALUSTRINE SCRUB
CPSI0000000 EUTROPHIC SEMIPERMANENTLY FLOODED PALUSTRINE SCRUB

CPD0000000 DWARF-SCRUB PALUSTRINE WETLAND

Herbaceous

CPHL0000000 LOW HERBACEOUS PALUSTRINE WETLAND
CPHM0000000 MID-HEIGHT HERBACEOUS PALUSTRINE WETLAND
CPHT0000000 TALL HERBACEOUS PALUSTRINE WETLAND
CPHS0000000 SUBMERGENT PALUSTRINE WETLAND
CPHO0000000 MOSS/LICHEN PALUSTRINE WETLAND
CPA0000000 ALGAL PALUSTRINE WETLAND
CPU0000000 UNVEGETATED PALUSTRINE WETLAND

RIVERINE

CR100000000 WARM LOW GRADIENT SMALL CREEK
CR200000000 WARM LOW GRADIENT LARGE CREEK
CR300000000 WARM LOW GRADIENT RIVER
CR400000000 WARM MEDIUM GRADIENT SMALL CREEK
CR500000000 WARM MEDIUM GRADIENT LARGE CREEK
CR600000000 WARM MEDIUM GRADIENT RIVER
CR700000000 COOL MEDIUM GRADIENT SMALL CREEK
CR800000000 COOL MEDIUM GRADIENT LARGE CREEK
CR900000000 COOL MEDIUM GRADIENT RIVER
CR110000000 COOL HIGH GRADIENT SMALL CREEK
CR120000000 COLD HIGH GRADIENT SMALL CREEK
CR130000000 MEDIUM GRADIENT INTERMITTENT SMALL CREEK
CR140000000 HIGH GRADIENT INTERMITTENT SMALL CREEK
CR150000000 WARM SPRING & SPRING RUN
CR160000000 ALKALINE COLD SPRING & SPRING RUN
CR170000000 ACIDIC COLD SPRING & SPRING RUN
CR180000000 FRESH TIDAL CREEK
CR190000000 FRESH TIDAL RIVER

LACUSTRINE

CL000000000 LACUSTRINE COMMUNITY

ESTUARINE

CES000000000 ESTUARINE SCRUB
CEHL0000000 LOW HERBACEOUS ESTUARINE WETLAND
CEHM0000000 MID-HEIGHT HERBACEOUS ESTUARINE WETLAND
CEHT0000000 TALL HERBACEOUS ESTUARINE WETLAND
CEHS0000000 SUBMERGENT ESTUARINE WETLAND
CEA00000000 TIDE POOLS
CEB00000000 OYSTER REEFS
CEC00000000 WORM AND CLAM FLATS
CED00000000 ALGAL
CEE00000000 OLIGOHALINE REGIME AQUATIC
CEF00000000 MEDIUM SALINITY AQUATIC
CEG00000000 ESTUARINE BEACH/ShORE

MARINE

CMH0000000 HIGH ENERGY BEACH/ShORE
CHK0000000 ALGAL
CMP0000000 COASTAL PLANKTON

SUBTERRANEAN (unvegetated)

CSAS0000000 SUBTERRANEAN STREAM
CSAD0000000 SUBTERRANEAN DRIP/SEEP POOL
CSAP0000000 SUBTERRANEAN PHREATIC LAKE
CSAI0000000 SUBTERRANEAN INTERSTITIAL
CST0000000 SUBTERRANEAN TERRESTRIAL

