Biological Evaluation
for
Sensitive Species

Jefferson National Forest
Revised Land and Resource Management Plan

Introduction

A Biological Evaluation (BE) is prepared in compliance with policy outlined at FSM 2670, designed to avoid negative impacts that may cause a trend towards the listing of a species under the Endangered Species Act, or loss of species viability. A comprehensive analysis of effects of Jefferson National Forest Land and Resource Plan revision alternatives on habitats, and the implication of these effects to species viability, is included in the Final Environmental Impact Statement (FEIS) prepared with the Revised Land and Resource Management Plan (RLRMP or Plan). This BE relies heavily on that analysis, but incorporates additional species-specific considerations as contained in the Plan and addresses expected effects at a programmatic level under the preferred alternative (Alternative I) only. Relative effects of additional alternatives on Sensitive species and other species of potential viability concern can be found in the Chapter 3 and Appendix E and F of the FEIS.

To support terrestrial species viability analysis in the FEIS, a database was prepared through a Participating Agreement with NatureServe (previously the science information branch of The Nature Conservancy). The database provides information on the status and habitat relationships of Sensitive species and is incorporated in analysis of this BE. Similarly, for the aquatic species viability analysis, a database was prepared and incorporated in analysis that identified species' sensitivity to environmental factors, their distribution by watershed, and an assessment of indicators of watershed condition by watershed.

The direction in the revised Forest Plan is general and does not preclude or replace the requirement for specific, project-level consideration of Sensitive species (Region 8 supplement to the Forest Service Manual §2672). Project level consideration provides another facet of conservation and protection for Sensitive species in addition to Plan direction. Analysis of programmatic Plan revision effects in this BE assumes project-level analysis will be conducted where necessary during Plan implementation.

The Jefferson National Forest (hereafter referred to as Forest) supports known occurrences and/or suitable habitat for 121 Sensitive species, all of which are considered in this analysis. This BE documents analysis of potential impacts of Plan implementation to Sensitive species and their associated habitat(s).

Area of Consideration

The geographic scope of this BE for terrestrial and aquatic plants and animals is the entire Jefferson National Forest. A full description of the Forest and its setting is found in Chapter 1 of the Plan and Chapter 1 of the FEIS.

Historical events have played a significant role in creating the vegetative condition that exists today on the Forest. Most of the area, prior to National Forest acquisition, was extensively harvested for lumber, pulpwood, charcoal production, and clearing for small farms during the latter part of the 1800's and the early 1900's. During this time, wildland fires occurred more extensively than had probably occurred in the previous 200 years. The chestnut blight during the 1920's and '30's removed American chestnut from the overstory and created openings that enabled other tree species, primarily oaks, to replace the American chestnut in the overstory. Over the past 50+ years, wildfires have been excluded from much of the Forest due to an aggressive fire suppression policy. This policy allowed shade tolerant and fire intolerant tree species such as red maple, striped maple, white pine, and yellow poplar to become more common in all strata of the forest. These species are likely to become more dominant than oaks in future stand composition since oaks are shade intolerant and fire tolerant. The gypsy moth and hemlock wooly adelgid, both introduced pest insects, are likely to continue to infest much of the Forest in future years causing increased tree defoliation and mortality. This coupled with lack of periodic, and often frequent, fire plus browsing from an increasing whitetail deer population has exacerbated the decline of oak throughout the Forest.

Species Considered

Sensitive species are species "identified by a Regional Forester for which population viability is a concern…" (FSM 2670.5(19)). The Regional Forester's list of Sensitive species is periodically updated to reflect improved knowledge of species' status and to focus on those species most at risk. The most recent Sensitive species list was issued August 7, 2001. All species on that list that occur, or potentially occur, on the Forest based on distribution within the species range are evaluated in this BE (see Appendix A).

Southern Region sensitive species that may potentially be affected by Forest plan implementation were examined using the following existing available information:

1. Reviewing the list of sensitive plant and animal species known or likely to occur on the Forest, and their habitat preferences.
2. Consulting element occurrence records (EOR's) for sensitive species as maintained by the Virginia Division of Natural Heritage (VDNH) and West Virginia Natural Heritage Program (WVNHP) and which Plan prescriptions those occurrences are found in.
3. Reviewing sources listed in the reference portion of this evaluation.

Most sensitive species known to occur on the Forest have unique habitat requirements, such as shale barrens, rock outcrops, bogs, caves, spruce/fir forests, and natural ponds. Information gathered, analyzed, and presented in the Southern Appalachian Assessment (July 1996) states

that approximately 74% of sensitive species are associated with rare or unique habitats, often referred to as rare communities. For the Forest, 87% of the sensitive species are associated with rare ecological communities or aquatic habitats (57% rare communities and 30% aquatic). The remaining 13% are found in more commonly occurring and widespread habitat such as those oak forests found on acidic soils.

Appendix A of this BE lists all 121 TES species currently known or expected to occur on or near the Jefferson National Forest. Additionally, 25 species known or expected to occur only on the George Washington National Forest are included for completeness. Potential impacts to these 25 species are not considered in this BE, but all species on the list for the Jefferson National Forest were considered during this analysis.

Species Evaluation and Determinations

For analysis in this BE Sensitive species are grouped and addressed according to habitats they share in common. These groups are discussed in terms of: 1) their status, distribution, and trend on the Forest, 2) potential effects of management to the habitat, and 3) a determination of effect for the Sensitive species and supporting rationale.

Status, distribution, and trend information is based on a variety of sources that represent the best information currently available. It is expected that the quality of information will be maintained or improved during Plan implementation, in compliance with FSM 2670.45(4), through inventory and monitoring programs conducted by the Forest Service and cooperators.

Habitat relationships of Sensitive species were also defined during species viability evaluation for the FEIS. Each terrestrial Sensitive species was linked to habitat elements, and each aquatic Sensitive species was linked to watersheds and key environmental factors. This BE is based on these habitat relationships, which is appropriate for a Plan level analysis. Risks from these habitat relationships are assessed, along with other non-habitat factors to identify what are believed to be the most critical factors limiting populations of Sensitive species.

The FEIS includes analysis of management effects to habitats important to Sensitive species. Each terrestrial habitat element was analyzed for current and future distribution and abundance, the general likelihood they would be limiting to associated species, and effects of management. Similarly, each watershed was analyzed for potential effects relative to key environmental factors related to aquatic species. Details of these analyses are not repeated here, but can be found in Appendix E and F of the FEIS. Overall effects to habitats are disclosed, as are the general likelihood that activities conducted as part of Plan implementation will directly impact individuals. The role of Forest management activities in cumulative effects to Sensitive species is also addressed.

Determinations represent the overall expected effect of plan implementation on Sensitive species. Unlike viability evaluations in the FEIS, which focus on risk from overall habitat outcomes across landscapes and watersheds, determinations in this BE reflect effects of Forest management actions only. As a result, analysis from the FEIS may indicate habitats are potentially limiting and resulting in risk to species in spite of positive effects of Forest management. This situation is in most cases due to factors beyond the control of the Agency,

including extensive modification of habitats across the larger landscapes within which the Forest occurs, the infeasibility of quickly restoring all of the habitats on Forest lands, and invasive species and epidemic insects and diseases for which no effective controls exist. However, because ecological sustainability and species viability were primary objectives used to define plan goals, objectives, and standards, it is expected that effects to Sensitive species will be beneficial as a result of Plan implementation.

The following is an analysis of effects to Sensitive species by habitat group. Descriptions of numbers and symbols under the "Rare Ecological Community" and "Prescriptions with Known Occurrences" columns are found at the end of Appendix A, page 25.

#1 Aquatic (flowing water)

The following Sensitive species are found in aquatic habitats consisting of flowing water (Table 1). Most of these species are known to occur in the upper reaches of the Tennessee River system and are not found on Forest managed land, but occur downstream. These aquatic habitats are not considered a rare community but all aquatic habitats are managed in the RLRMP under standards in Prescription 9.A.4 – Aquatic Habitat Areas and Prescription 11 - Riparian Areas. Management actions most likely to create adverse effects to aquatic species are those that change the hydrology, disturb soil or litter thereby potentially leading to sedimentation, and those that reduce vegetative cover over streams, potentially leading to increased water temperature. Adverse effects likely to occur off the Forest include changes to environmental conditions that are beyond the control of the Forest (e.g. acidic precipitation) and activities on private lands. The Riparian Prescription provides direction designed to maintain or enhance water quality and associated beneficial uses. Overall, implementation of the Plan is expected to be positive for these species because protection measures for streams and riparian zones will provide maintenance of water quality flowing from the Forest to sites occupied by these species and opportunities exist for the Riparian Prescription to improve existing water quality and riparian area conditions. However, as stated above, an aquatic species may be impacted due to management actions that disturb soil or streamside vegetation in the watershed. Therefore the determination is made that Plan implementation may impact individuals but will not cause a trend to federal listing or a loss in viability.

Table 1. Sensitive Species Associated With Aquatic (flowing water):

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Acroneuria kosztarabi	Virginia stonefly	Aquatic-streams	*	11
Ammocrypta clara	Western sand darter	Aquatic-rivers	*	11
Cottus baileyi	Black sculpin	Aquatic-streams	*	11
Cumberlandia monodonta	Spectacle case	Aquatic-rivers	*	11
Elliptio lanceolata	Yellow lance	Aquatic-rivers	*	11
Epioblasma triquetra	Snuffbox	Aquatic-rivers	*	11
Etheostoma acuticeps	Sharphead darter	Aquatic-rivers	*	11
Etheostoma osburni	Candy darter	Aquatic-streams	*	9.A.4, 11
Etheostoma suzanae	Cumberland Johnny darter	Aquatic-streams	*	11
Etheostoma tippecanoe	Tippecanoe darter	Aquatic-rivers	*	11
Fusconaia barnesiana	Tennessee pigtoe	Aquatic-rivers	*	11
Fusconaia masoni	Atlantic pigtoe	Aquatic-rivers	*	11

Gomphus viridifrons	Green-faced clubtail	Aquatic-rivers	*	11
Hydrotheria venosa	Aquatic lichen	Aquatic - streams	*	11
Icthyomyzon greeleyi	Mountain brook lamprey	Aquatic-rivers	*	11
Io fluvialis	Spiny riversnail	Aquatic-rivers	*	11
Isoperla major	Big stripetail stonefly	Aquatic-streams	*	11
Lasmigona holstonia	Tennessee heelsplitter	Aquatic-streams	*	9.A.4, 11
Lasmigona subviridis	Green floater	Aquatic-streams	*	11
Leptophlebia johnsoni	Johnson's pronggill mayfly	Aquatic-streams	*	11
Lexingtonia dolabelloides	Slabside pearlymussel	Aquatic-rivers	*	11
Megaleuctra williamsae	Smokies needlefly	Aquatic-streams	*	11
Notropis ariommus	Popeye shiner	Aquatic-rivers	*	11
Notropis semperasper	Roughhead shiner	Aquatic-rivers	*	11
Noturus gilberti	Orangefin madtom	Aquatic-streams	*	11
Ophiogomphus alleghaniensis	Allegheny snaketail	Aquatic-streams	*	11
Percina burtoni	Blotchside darter	Aquatic-rivers	*	11
Percina macrocephala	Longhead darter	Aquatic-rivers	*	11
Phenacobius crassilabrum	Fatlips minnow	Aquatic-rivers	*	11
Phenacobius teretulus	Kanawha minnow	Aquatic-streams	*	11
Phoxinus tennesseensis	Tennessee dace	Aquatic-streams	*	9.A.4, 11
Plethobasus cyphyus	Sheepnose	Aquatic-rivers	*	11
Pleurobema cordatum	Ohio pigtoe	Aquatic-rivers	*	11
Pleurobema oviforme	Tennessee clubshell	Aquatic-streams	*	11
Pleurobema rubrum	Pyramid pigtoe	Aquatic-rivers	*	11
Taeniopteryx nelsoni	Cryptic willowfly	Aquatic-streams	*	11
Toxolasma lividus	Purple lilliput	Aquatic-rivers	*	11

 # 2,3,4 Aquatic (standing water), Riparian (includes springs/seeps, streamsides, and pond margins), Wetlands (includes bogs, fens, and beaver ponds/meadows)

The following Sensitive species are found in aquatic habitats consisting of “standing” or gently flowing water, riparian areas, and/or wetlands (Table 2). These habitats are known to occur throughout the Forest. These aquatic habitats are all considered rare communities and are in included in the rare mountain wetland and rock outcrop and cliff (specifically spray cliffs) communities. Prescriptions with known occurrences include Riparian Areas – 11, Crest Zone Special Area – 4.K.3, Whitetop Mountain Special Area – 4.K.4, and Designated Wilderness – 1.A. Management actions most likely to create adverse effects to these riparian and wetland species are those that change the hydrology, disturb soil on adjacent areas (potentially leading to sedimentation), and those that reduce vegetative cover over streams (potentially leading to increased water temperature). The Riparian Prescription provides direction designed to maintain or enhance water quality and associated beneficial uses. The other Prescriptions provide direction that maintains and enhances the rare biological features found in that area. Opportunities exist for the Riparian Prescription to improve existing water quality and riparian area conditions along all streams and water bodies. Overall, implementation of the Plan is expected to be positive for these species because protection measures for streams, riparian zones, and rare communities will provide maintenance of water quality and habitat conditions in areas occupied by these species and opportunities exist for the Riparian Prescription to improve existing water quality and riparian area conditions. However, as stated above, an aquatic, riparian, or wetland species may be impacted due to management actions that disturb soil or streamside vegetation in the watershed. Therefore the determination is made that Plan

implementation may impact individuals but will not cause a trend to federal listing or a loss in viability.

Table 2. Sensitive Species Associated With Aquatic (standing water), Riparian, and Wetlands:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Aconitum reclinatum	Trailing white monkshood	Rich cove sites, streambanks, seepages all with high pH	2	* *
Brachypanorpa jeffersoni	Jefferson's short-nosed scorpionfly	Moist soil around seeps. Only known from high elevation. Larvae use short burrows in loose soil and moss.	2	1.A, 4.K.3, 4.K.4, 5.B, 11
Cardamine clematitis	Mountain bittercress	Riparian, spring seeps, rocky streamsides	2	4.K.4, 5.B
Carex schweinitzii	Schweinitz's sedge	Bogs, limestone fens, marl marshes	2	* *
Chelone cuthbertii	Cuthbert turtlehead	Bogs, wet meadows, boggy woods and thickets	2	* *
Cicindela ancocisconensis	Riverbank tiger beetle	Riparian - sandy/silty edges of streams and rivers	2	11
Erynnis persius	Persius duskywing	Bogs, wet meadows, open seepages in boreal forests	2	4.J, 7.E.2, 7.D, 11
Euphorbia purpurea	Glade spurge	Rich, swampy woods and thickets	2	* *
Hasteola suaveolens	False Indian-plantain	Riverbanks, open, rich woods, wet woodlands, wet meadows	2	* *
Hypericum mitchellianum	Blue Ridge St. John's-wort	Grassy balds, forest seepages, moderate to high elevations	2,3	4.K.3
Ilex collina	Long-stalked holly	Bogs, shrubby streamheads > 3100'	2	4.K.3, 1.A
Iliamna remota	Kankakee globe-mallow	Open, disturbed riverbanks and roadsides	2	* *
Lilium grayi	Gray's lily	Bogs, open seeps, wet meadows, grassy balds	2, 3	4.K.3, 4.K.4
Nardia lescurii	A liverwort	Riparian, wet rocks, spray cliffs	7	11
Plagiochila austinii	A liverwort	Riparian, wet rocks, spray cliffs	7	11
Plagiochila sullivantii var sullivantii	A liverwort	Riparian, wet rocks, spray cliffs	7	11
Poa paludigena	Bog bluegrass	Shrub swamps and seeps, usually under shade	2	9.F
Potamogeton tennesseensis	Tennessee pondweed	Ponds, back water of streams and rivers	2	11
Sphagnum flavicomans	A peatmoss	Bogs, seeps	2	4.K.4
Sida hermaphrodita	Virginia mallow	Riverbank glades with loose rock or sandy soil	2	* *
Speyeria idalia	Regal fritillary	Riparian, grasslands-shrublands	2	* *
Stygobromus estesi	Craig County cave amphipod	Caves, seeps	2, 10	4A, 7.E.2, 11, FW
Vitis rupestris	Sand grape	Scoured banks of rivers and streams over calcareous bedrock	2	11

#5 Caves

The following Sensitive species are found in cave habitats (Table 3). Some species may spend all their lives in caves (i.e. most cave associated invertebrates) while others depend on caves for a significant portion of their life cycle (i.e. most bats). Some cave species are aquatic, where they live in underground streams or drip-pools, and may occasionally be flushed to surface springs and seeps during periods of high flow. Currently, over 4,100 caves are known in Virginia, but fewer than 60 caves are known on the Forest. They occur on all Ranger Districts of the Forest and are associated with limestone bedrock geology. Most of these Sensitive species are not known to occur on the Forest at the present time, but are found on adjacent private lands. All caves and surrounding karst topography are considered rare communities. Caves are protected by Forestwide Standards designed to maintain and enhance their occurrences.

Management actions most likely to result in adverse effects are those that change the hydrology, disturb soil on adjacent areas (potentially leading to sedimentation from surface runoff), and those that reduce vegetative cover over cave entrances or streams that flow into caves (potentially leading to increased water temperature). Streams that flow into or out of caves and spring seeps are managed under Riparian Area – 11 Prescription, which provides direction designed to maintain or enhance water. Other Prescriptions provide direction designed to maintain and enhance the rare biological features found in that area. These Prescriptions include Appalachian Trail Corridor – 4.A, Geological Area (unsuitable) – 4.C.1, Indiana bat Primary – 8.E.4a, Indiana bat secondary – 8.E.4b, and Rare Communities – 9.F. Overall, implementation of the Plan is expected to be positive for these Sensitive species because Forestwide Standards and protection measures for caves, streams, riparian areas, and rare communities will provide maintenance of water quality and habitat conditions in all areas occupied by these species. However, as stated above, a cave species may be impacted due to management actions that disturb soil or streamside vegetation in the watershed. Therefore the determination is made that Plan implementation may impact individuals but will not cause a trend to federal listing or a loss in viability.

Table 3. Sensitive Species Associated With Caves:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Arrhopalites carolynae	A cave springtail	Caves	10	* *, FW
Arrhopalites commorus	A cave springtail	Caves	10	* *, FW
Caecidotea incurva	Incurved cave isopod	Caves	10	4.C.1
Kleptochthonius orpheus	Orpheus Cave pseudoscorpion	Caves	10	* *, FW
Miktoniscus racovitzai	Racovitza's terrestrial cave isopod	Caves	10	* *, FW
Myotis leibii	Eastern small-footed bat	Caves, crevices in large rock outcrops	7, 10	7.E.2, 8.E.4a, 8.E.4b, 9F
Stygobromus abditus	James Cave amphipod	Caves	10	* *, FW
Stygobromus cumberlandus	Cumberland cave amphipod	Caves	10	* *, FW
Stygobromus estesi	Craig County cave amphipod	Caves, seeps	2, 10	4A, 7.E.2, 11, FW
Stygobromus fergusoni	Montgomery County cave amphipod	Caves	10	* *, FW

#6 Spruce/Fir Forests (includes adjacent northern hardwoods)

The following Sensitive species are found in forested habitats dominated by red spruce and/or Fraser fir (Table 4). In some cases they are also found in northern hardwood forests that are typically intermixed or adjacent to spruce/fir forests. These forests in the Central and Southern Appalachians are only found at higher elevations, generally over 5,400 feet. On the Forest, they are found in the Whitetop Mtn. – Mt. Rogers section of the Mount Rogers National Recreation Area. Two other less extensive areas on the Forest support a red spruce forest, but lack Fraser fir as an associated tree species. These areas are Beartown Mountain west of Burkes Garden and Mountain Lake, both on the New River Valley Ranger District. All spruce/fir forests are considered rare communities and are protected by Forestwide Standards designed to maintain and enhance their occurrences. Conditions most likely to result in adverse effects are those that change forest vegetation composition and structure which may then result in increased sunlight or drying of the forest floor. These include insects (e.g., balsam wooly adelgid), disease (e.g., beech bark disease), and environmental conditions that are beyond the control of the Forest (e.g.,

acidic precipitation). Prescriptions in areas of spruce/fir forests provide direction designed to increase the acreage of spruce/fir forests and maintain and enhance the rare biological features found in those communities. These Prescriptions include Designated Wilderness - 1.A, Crest Zone Special Area – 4.K.3, and Whitetop Mountain Special Area – 4.K.4. Overall, implementation of the Plan is expected to have beneficial effects to these species because standards and protection measures for Mt. Rogers, Whitetop Mountain, and the Crest Zone along with the rare communities found there will provide restoration and maintenance of habitat conditions in all areas occupied by these species.

Table 4: Sensitive Species Associated With Spruce/Fir:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Bazzania nudicaulis	A liverwort	Spruce-Fir forests	9	1.A, 4.K.4
Cleidogona lachesis	A millipede	Beech leaf litter, deciduous forests	5	1.A, 4.K.3, 4.K.4
Dixioria pela coronata	A millipede	Altitudinally restricted > 5000'. Leaf litter, northern hardwood and spruce-fir forests	5, 9	1.A
Escaryus cryptorobius	Montane centipede	Upper soil horizon, Spruce - Birch forests	5, 9	4.K.4
Escaryus orestes	Whitetop Mountain centipede	Dark moist soil and litter, Spruce - Birch forests	5, 9	4.K.4
Frullania oakesiana	A liverwort	Spruce-Fir forests	9	1.A, 4.K.4
Gentiana austromontana	Blue Ridge gentian	High elevation forests and grassy balds; S. App. endemic	3, 9	1.A, 4.K.3, 4.K.4
Hypotrachyna virginica	A foliose lichen	Spruce-Fir forests	9	1.A, 4.K.4
Mertzgeria fruitculosa	A liverwort	Spruce-Fir forests	9	4.K.4
Plethodon welleri	Weller's salamander	Spruce-Fir Forests and adjacent northern hardwoods	9	1A, 4.K.4
Sphenolobopsis pearsonii	A liverwort	Spruce-Fir forests	9	1.A, 4.K.4

#7 Rock Outcrops (includes acid and calcareous, both sheltered and exposed, and shale barrens extending into surrounding open oak woodlands)

The following Sensitive species are found in rock outcrop habitats (Table 5). Rock outcrops include those that are acidic (e.g. sandstone or quartzite) or calcareous (e.g. limestone or dolomite), sheltered (i.e. under a forest canopy) or exposed (i.e. no vegetative cover), and shale barrens along with the adjacent open oak woodlands. Rock outcrops vary in size and degree of exposure and occur on all Ranger Districts of the Forest. Almost half (10 of 22) of these species are not known to occur on the Forest, but are found on adjacent private lands, and may occur based on distribution and associated habitat. All rock outcrops are considered rare communities and are protected by Forestwide Standards designed to maintain and enhance their occurrences. Management actions most likely to result in adverse effects are those that reduce vegetative cover or alter the outcrop altogether, such as road construction or quarry operations. Rock outcrops are known to occur in a large number of Prescriptions, including Designated Wilderness – 1.A, Recommended Wilderness Study Area – 1.B, Appalachian Trail Corridor – 4.A, Geological Area (unsuitable) – 4.C.1, Botanical and Zoological Area – 4.D, Whitetop Laurel Special Area – 4.K.5, Old Growth Fire Dependent – 6.B, Old Growth with Disturbance – 6.C, Dispersed Recreation Area (suitable) – 7.E.2, Indiana bat Primary – 8.E.4a, Indiana bat secondary – 8.E.4b, Rare Communities – 9.F, Riparian Area – 11, and Backcountry (non-motorized) – 12.B. Overall, implementation of the Plan is expected to be positive for these

species because Forestwide Standards for rare communities and Standards in associated Prescriptions will provide for maintenance and enhancement of habitat conditions in all areas occupied by these species.

Table 5. Sensitive Species Associated With Rock Outcrops:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Allium oxyphilum	Nodding onion	Shale barrens, sandstone glades	1	* *
Berberis canadensis	American barberry	Calcareous open woods, bluffs, cliffs, and along fencerows	1	4.C.1, 7.D, 9.F
Cicindela patruela	Barrens tiger beetle	Eroded slopes of exposed sandstone and conglomerate	7	4.D
Clematis addisonii	Addison's leatherflower	Open, rich woods over limestone	1, 6	* *
Clematis coactilis	Virginia white-haired leatherflower	Shale barrens, rocky calcareous woodlands	1	9.F
Delphinium exaltatum	Tall larkspur	Dry calcareous soil in open grassy glades or thin woodlands	1	* *
Falco peregrinus	Peregrine Falcon	Nests on ledges or cliffs, buildings, bridges, quarry walls. Nonbreeding sites, farmland, open country, lakeshores, broad river valleys, airports. Prefers pigeons, ducks	7	* *
Glyphyalinia raderi	Maryland glyph	Calciphile, edge of seeps within leaf litter	6	* *
Helicodiscus triodus	Talus coil	Calciphile, limestone rubble on wooded hillsides and caves	6	* *
Hypericum mitchellianum	Blue Ridge St. John's-wort	Grassy balds, forest seepages, moderate to high elevations	2,3	4.K.3
Liatris turgida	Shale barren blazing star	Shale barrens, mountain hillsides, openings	1	* *
Lilium grayi	Gray's lily	Bogs, open seeps, wet meadows, grassy balds	2, 3	4.K.3, 4.K.4
Myotis leibii	Eastern small-footed bat	Caves, crevices in large rock outcrops	7, 10	7.E.2, 8.E.4a, 8.E.4b, 9F
Nardia lescurii	A liverwort	Riparian, wet rocks, spray cliffs	7	11
Paravitrea reesi	Round supercoil	Calcareous woodlands and glades	6	* *
Paxistima canbyi	Canby's mountain lover	Calcareous cliffs and bluffs, usually undercut by stream	7	* *
Phlox buckleyi	Sword-leaf phlox	Open, often dry oak woodlands and rocky slopes, usually over shale in humus rich soil, often along roadsides	1	1.A, 1.B, 4.A, 6.B, 6.C, 9.F, 12.B
Pycnanthemum torrei	Torrey's mountain-mint	Open, dry rocky woods, and roadsides, and thickets near streams, heavy clay soil over calcareous rock	1	9.F
Pyrgus wyandot	Appalachian grizzled skipper	Shale barrens, open shaley oak woods	1,8	7.E.2
Rudbeckia triloba var. pinnatiloba	Pinnate-lobed coneflower	Dry calcareous soil of open woods and roadsides	1	* *
Saxifraga caroliniana	Carolina saxifrage	Moist, shaded rocks and cliffs	7	4.D, 7.E.2, 7.D, 4.K.5, 6.C, 11
Scutellaria saxatilis	Rock skullcap	Rich, dry to mesic ridgetop woods, 32 cos. in VA, likely G4/G5	1	1.A, 1.B, 4.A, 6.B, 6.C, 9.F, 12.B
Senecio millefolium	Piedmont ragwort	Open limestone outcrops and cedar barrens	1	4.K.5
Tsuga caroliniana	Carolina hemlock	Rocky ridges and slopes, usually dry and well drained	4	1A, 9.F, 4.C.1

#8 Grasslands (grassy balds, old fields, grassy meadows, utility ROW)

These Sensitive species are found in grassland habitats (Table 6). Grasslands include high elevation grassy balds, old fields, meadows, and utility rights-of-way. Any dry, upland habitat dominated by grasses and forbs with little, if any, shrub or tree canopy could potentially support these Sensitive species. Rare communities with grasslands include Glades, Barrens, and Associated Woodlands plus High Elevation Balds and Rocky Summits. Grasslands occur on all Ranger Districts of the Forest with the most extensive on Mt. Rogers and Whitetop Mountain, where grassy balds are well developed. Two species in this group (Dixie grapefern and Bewick's Wren) are not known to occur on the Forest but are found (or were found) on adjacent private lands. Their most recent occurrences were in or around old farm fields and pastures that had lain fallow and are therefore not associated with a rare community. Another habitat that mimics a naturally occurring grassland are utility rights-of-way (powerlines and pipelines) and at least one butterfly (frosted elfin) is associated with these areas. Rare communities are protected by Forestwide Standards designed to maintain and enhance their occurrences. Management actions most likely to result in adverse effects are those that allow vegetative cover to develop shrub and/or tree cover that reduces the open grassy cover. Fire, mowing, and grazing are among management actions that restore or maintain grassland habitats. Grasslands occur in

several prescriptions, including Designated Wilderness – 1.A, Crest Zone Special Area – 4.K.3, Whitetop Mountain Special Area – 4.K.4, Administrative Site – 5.A, Source Water Protection – 9.A.1, and Riparian Area – 11. Overall, implementation of the Plan is expected to have beneficial effects to these species because Forestwide Standards for rare communities and Standards in Prescriptions are designed to provide for restoring and maintaining open grassland habitat conditions in many areas occupied or potentially occupied by these species.

Table 6. Sensitive Species Associated With Grasslands:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Botrychium jennmanii	Dixie grapefern	Open woods, old fields, and pastures	*	* *
Callophrys irus	Frosted elfin	Dry, open woods, clearings, and road/powerline ROWs w/ abundant Baptisia tinctoria	1	5.A
Delphinium exaltatum	Tall larkspur	Dry calcareous soil in open grassy glades or thin woodlands	1	* *
Gentiana austromontana	Blue Ridge gentian	High elevation forests and grassy balds; S. App. endemic	3, 9	1.A, 4.K.3, 4.K.4
Hypericum mitchellianum	Blue Ridge St. John's-wort	Grassy balds, forest seepages, moderate to high elevations	2, 3	4.K.3
Lilium grayi	Gray's lily	Bogs, open seeps, wet meadows, grassy balds	2, 3	4.K.3, 4.K.4
Prenanthes roanensis	Roan Mountain rattlesnake-root	Grassy balds, open high elevation forests and outcrops	3	1.A, 4.K.3, 4.K.4
Speyeria diana	Diana fritillary	Grasslands-shrublands, usually near streams with thistles and milkweeds, larval host plants, violets	*	9.A.1, 11
Thryomanes bewickii altus	Appalachian Bewick's wren	Thickets, old fields, fencerows, gardens, old home sites	*	* *

#9 Pine/Oak/Heath Woodlands (xeric to dry)

The following Sensitive species are found in woodlands dominated by pines, oaks, and heath family (Ericaceous) vegetation (Table 7). These woodlands are found on dry rocky ridgetops and slopes with a southeast to southwest aspect. The open structure of these woodlands are maintained by dry edaphic conditions and periodic fire. They occur on all Ranger Districts of the Forest but are most prevalent on the New Castle and New River Valley Ranger Districts. One of these species (Herodias underwing moth) is not known to occur on the Forest but is found on adjacent private land. Table mountain pine woodlands are considered a rare community and the Herodias underwing moth and grizzled skipper are associated with this community. Rare communities are protected by Forestwide Standards designed to restore and maintain their occurrences. Management actions most likely to result in adverse effects are those that alter forest composition and structure. Generally this is the result of no active management since these habitats are maintained by periodic (often frequent) fire. In the absence of such disturbance these woodlands lose their pine component and become dominated by an abundance of oak, white pine, and red maple. They also lose their open savannah-like structure as the midstory becomes thick with trees and shrubs. Pine/oak/heath woodlands are known to occur in a large number of prescriptions. These prescriptions include Botanical and Zoological Area – 4.D, Old Growth with Disturbance – 6.C, Dispersed Recreation Area (suitable) – 7.E.2, Early Successional Habitat – 8.B, Indiana bat secondary – 8.E.4b, and Rare Communities – 9.F. Overall, implementation of the Plan is expected to have beneficial effects to these species because Forestwide standards for rare communities and standards in prescriptions will provide for restoring and maintaining habitat conditions in areas currently or potentially occupied by these species.

Table 7. Sensitive Species Associated With Pine/Oak/Heath Woodlands:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Catocala herodias gerhardi	Herodias underwing	Pitch pine/bear oak scrub woodlands >3000'	8	* *
Cleistes bifaria	Small spreading pogonia	Well drained, rather open, scrubby hillsides, oak-pine-heath woodlands, acidic soils	*	4.D, 6.C, 7.E.2, 8.B, 8.E.4.b, 9.F
Pyrgus wyandot	Appalachian grizzled skipper	Shale barrens, open shaley oak woods	1,8	7.E.2

#10 Rich Cove Forests

Sensitive species associated with Rich Cove Forests are generally found in closed canopy forests dominated by some combination of yellow poplar, basswood, white ash, buckeye, red oak, and sugar maple (Table 8). These mixed hardwood forests are found throughout western Virginia at elevations ranging from approximately 1,000 feet to 3,600 feet. They are strongly associated with moist, sheltered landforms such as coves, ravines, and concave lower slopes. Soils may be weathered from various substrates and range from strongly acidic to moderately alkaline, but all with high base saturation. In these forests soil fertility appears to be strongly correlated with high base cation levels rather than high pH. They occur on all Ranger Districts of the Forest but are most prevalent on the Mt. Rogers NRA, Clinch, and Glenwood Ranger Districts. One of the Sensitive species (trailing white monkshood) is not known to occur on the Forest, but is found on private land, and is commonly found north in the Shenandoah National Park. This species is also associated with seepage slopes and coves, which is considered a rare community. Rare communities are protected by Forestwide Standards designed to restore and maintain their occurrences. Management of butternut is covered in a Forestwide Standard that recognizes and protects healthy trees wherever they are located. Rich Cove Forests and associated Sensitive species are known to occur in several Prescriptions. These prescriptions include Designated Wilderness – 1.A, Appalachian Trail Corridor – 4.A, North Creek Special Area – 4.K.1, Old Growth with Disturbance – 6.C, Mix of Successional Habitats – 8.A.1, Peaks of Otter Salamander Primary – 8.E.2a, Peaks of Otter Salamander Secondary – 8.E.2b, and Backcountry (few roads) – 12.A. Management actions most likely to result in adverse effects are those that alter forest composition and structure resulting in increased sunlight and drying of the forest floor along with direct physical disturbance of the ground surface such as with road construction or timber harvest activities. Implementation of the Forest Plan may potentially impact some individual Sensitive species, but is not likely to cause a trend toward listing or loss of viability. Impacts to individuals are expected because some species occur in Prescriptions where management actions that may be detrimental to them are likely to be implemented. Project-level analysis, conducted in compliance with agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. However, overall implementation of the Plan is expected to be positive for these species because Forestwide Standards for rare communities and Standards in most Prescriptions are designed to provide for restoring and maintaining habitat conditions in areas currently or potentially occupied by these species.

Table 8. Sensitive Species Associated With Rich Cove Forests:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Aconitum reclinatum	Trailing white monkshood	Rich cove sites, streambanks, seepages all with high pH	2	* *
Cimicifuga rubifolia	Appalachian bugbane	Moist, rich wooded bluffs over limestone	6	6.C, 8.A.1
Juglans cinerea	Butternut	Well-drained bottomland and floodplain, rich moist mesophytic forests mostly along toeslopes	*	FW

Plethodon hubrichti	Peaks of Otter salamander	Mixed oak, late successional with loose rocks and logs	*	1.A, 4.A, 8.E.2a, 8.E.2b, 12.A
Semionellus placidus	A millipede	Leaf litter, deciduous forests	*	4.K.1

#11 Acidic Oak Forests

Sensitive species associated with Acidic Oak Forests are generally found in closed canopy forests dominated by various species of oaks including red oak, white oak, black oak, chestnut oak, scarlet oak, and hickory (shagbark and pignut) (Table 9). This habitat group also includes more mesic forests that may be referred to as Acidic Cove Forests where there is a component of eastern hemlock, white pine, magnolia, and/or red maple in the overstory, in addition to red oak, along with more ericaceous shrubs, such as rhododendron, in the understory. These hardwood forests are widely distributed throughout the mountains of western Virginia. This habitat group includes the most common and widespread of forest types found in the mountains and on the Jefferson National Forest. Soils on these mesic to subxeric habitats may be weathered from various substrates such as sandstone, shale, or various metamorphic rocks. Soil pH is typically strong to extremely acidic. They occur on all Ranger Districts of the Forest. All Sensitive species in this group are found on the Forest in at least one, and up to six, different prescriptions. Only one (Carolina hemlock) is associated with a rare ecological community. The Carolina hemlock may occur as small, scattered trees on slopes and ridge crests, but a forested area dominated by Carolina hemlock is considered a rare community. Rare communities are protected by Forestwide Standards designed to restore and maintain their occurrences. Management of Carolina hemlocks is also covered in a Forestwide Standard that precludes cutting of live trees, except in specific circumstances, no matter where they are located. Carolina hemlocks are most threatened by the hemlock wooly adelgid which also infests eastern hemlocks, and for which there is little control in a forested setting. Other Sensitive species in this group are not associated with rare communities and may occur in widely separated areas but typically they are found in the same general area where there are known occurrences. Acidic forests and associated Sensitive species are known to occur in numerous Prescriptions. These prescriptions include: Designated Wilderness – 1.A, Geological Area (unsuitable) – 4.C.1, Botanical and Zoological Area – 4.D, North Creek Special Area – 4.K.1, Crest Zone Special Area – 4.K.3, Whitetop Mountain Special Area – 4.K.4, Whitetop Laurel Special Area – 4.K.5, North Fork Pound Special Area – 4.K.6, Old Growth with Disturbance – 6.C, Concentrated Recreation Area – 7.D, Dispersed Recreation Area (suitable) – 7.E.2, Early Successional Habitat – 8.B, Black Bear – 8.C, Peaks of Otter Salamander Primary – 8.E.2.a, Peaks of Otter Salamander Secondary – 8.E.2.b, Indiana bat secondary – 8.E.4.b, Rare Communities – 9.F, and Backcountry (few roads) – 12.A. Several species in this group (i.e. piratebush, small spreading pogonia, and sweet pinesap) occur in areas with recent disturbances and appear to depend on periodic disturbance (such as fire) that alters the cover of the forest overstory and understory thereby maintaining more open conditions conducive for growth and reproduction. Management activities mimicking such disturbances will benefit these species. Management actions most likely to result in adverse effects are those with direct physical disturbance of the ground surface such as road construction or timber harvest activities. This habitat group covers approximately 72% of the Forest (523,700 of 723,300 acres). Of the 523,700 acres, 189,200 acres (36%) is considered suitable for timber production. Therefore 64% (334,500 acres) is unsuitable and unlikely to be disturbed by timber management. Adverse impacts to Sensitive species are therefore unlikely since two-thirds of the Forest will not have regulated timber harvest activities.

However, implementation of the Plan may still impact some individual Sensitive species in this group, but is not likely to cause a trend toward listing or loss of viability. Impacts to individuals are expected because some species occur in Prescriptions where management actions that may be detrimental to them are likely to be implemented. Project-level analysis, conducted in compliance with Agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. However, overall implementation of the Plan is expected to be positive for these species because Forestwide Standards for Carolina hemlock and Carolina hemlock rare communities along with Standards in most Prescriptions are designed to provide for restoring and maintaining appropriate habitat conditions in areas currently or potentially occupied by these species.

Table 9. Sensitive Species Associated With Acidic Oak Forests:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Brachoria dentata	A millipede	Leaf litter, deciduous forests	*	4.K.6, 7.D, 9.F
Brachoria eutypa ethotela	Hungry Mother millipede	Leaf litter, deciduous forests	*	4.K.3
Buckleya distichophylla	Piratebush	Open oak and hemlock woods	*	4D
Buotus carolinus	A millipede	Beech leaf litter, deciduous forests	*	1.A, 4.K.4
Cleidogona hoffmani	Hoffman's cleidogonid millipede	Mountaintop species, leaf litter, deciduous forests	*	1.A, 4.K.3, 4.K.4
Cleistes bifaria	Small spreading pogonia	Well drained, rather open, scrubby hillsides, oak-pine-heath woodlands, acidic soils	*	4.D, 6.C, 7.E.2, 8.B, 8.E.4.b, 9.F
Coralloriza bentleyi	Bentley's coalroot	Dry, acid woods, along roadsides, well-shaded trails	*	1.A, 8.C
Cyclotrachelus incisus	A ground beetle	Dry, well drained site, red maple, magnolia, mtn laurel	*	9.F
Dixioria fowleri	A millipede	Leaf litter, deciduous forests	*	1.A
Monotropsis odorata	Sweet pinesap	Dry to mesic upland woods with abundant heaths, soil usually sandy	*	4.C.1, 9.F, 12.B
Plethodon hubrichti	Peaks of Otter salamander	Mixed oak, late successional with loose rocks and logs	*	8.E.2a, 8.E.2b
Semionellus placidus	A millipede	Leaf litter, deciduous forests	*	4.K.1
Tsuga caroliniana	Carolina hemlock	Rocky ridges and slopes, usually dry and well drained	4	1A, 9.F, 4.C.1

#12 Basic (calcareous) Oak Forests

Sensitive species associated with Basic (calcareous) Oak Forests are generally found in closed canopy forests dominated by some combination of red oak, chinquapin oak, sugar maple, basswood, white ash, and an occasional red cedar (Table 10). These mixed hardwood forests are found throughout western Virginia and eastern West Virginia most commonly in the Ridge and Valley, but are more localized in the Blue Ridge and Cumberland Mountains. They are found on many landforms and aspects wherever fertile soils have developed over underlying limestone, dolomite, calcareous sandstone, or metabasalt. They occur infrequently on all Ranger Districts of the Forest, but several occurrences are located on the Mt. Rogers NRA, Clinch, and New River Valley Ranger Districts. The lack of occurrences on the Forest is due to the fact that most Forest land is on mountain crests and steeper sideslopes and this habitat is more commonly found at lower elevations in valley, low rolling hills, and toeslope/sideslop positions, due to the erosive nature of the substrate. Seven of the 11 species in this group are not known to occur on the Forest but are found on nearby private lands. All species in this group are associated with rare communities. Rare communities are protected by Forestwide Standards designed to restore

and maintain their occurrences. Basic (calcareous) Oak Forests and associated sensitive species are known to occur in several prescriptions, including Designated Wilderness – 1.A, Recommended Wilderness Study Area – 1.B, Appalachian Trail Corridor – 4.A, Geological Area (unsuitable) – 4.C.1, Old Growth Fire Dependent – 6.B, Old Growth with Disturbance – 6.C, Concentrated Recreation Area – 7.D, Mix of Successional Habitats – 8.A.1, Rare Communities – 9.F, and Backcountry (few roads) – 12.A. Management actions most likely to result in adverse effects are those that alter forest composition and structure resulting in increased sunlight and drying of the forest floor along with direct physical disturbance of the ground surface, such as with road construction or timber harvest activities. Implementation of the Plan may potentially impact some individual Sensitive species, but is not likely to cause a trend toward listing or loss of viability. Impacts to individuals are expected because some species occur in Prescriptions where management actions that may be detrimental to them are likely to be implemented. Project-level analysis, conducted in compliance with Agency policy, will be necessary to ensure that projects do not cause a trend toward listing or loss of viability. However, overall implementation of the Plan is expected to be positive for these species because Forestwide Standards for rare communities and Standards in most Prescriptions are designed to provide for restoring and maintaining habitat conditions in areas currently or potentially occupied by these species.

Table 10. Sensitive Species Associated With Basic (calcareous) Oak Forests:

Species Name	Common Name	Habitat Description	Rare Ecological Community	Prescription with Known Occurrences
Berberis canadensis	American barberry	Calcareous open woods, bluffs, cliffs, and along fencerows	1	4.C.1, 7.D, 9.F
Cimicifuga rubifolia	Appalachian bugbane	Moist, rich wooded bluffs over limestone	6	6.C, 8.A.1
Clematis addisonii	Addison's leatherflower	Open, rich woods over limestone	1, 6	* *
Delphinium exaltatum	Tall larkspur	Dry calcareous soil in open grassy glades or thin woodlands	1	* *
Glyphyalinia raderi	Maryland glyph	Calciphile, edge of seeps within leaf litter	6	* *
Helicodiscus triodus	Talus coil	Calciphile, limestone rubble on wooded hillsides and caves	6	* *
Paravitrea reesi	Round supercoil	Calcareous woodlands and glades	6	* *
Pycnanthemum torrei	Torrey's mountain-mint	Open, dry rocky woods, and roadsides, and thickets near streams, heavy clay soil over calcareous rock	1	9.F
Rudbeckia triloba var. pinnatiloba	Pinnate-lobed coneflower	Dry calcareous soil of open woods and roadsides	1	* *
Scutellaria saxatilis	Rock skullcap	Rich, dry to mesic ridgetop woods, 32 cos. in VA, likely G4/G5	1	1.A, 1.B, 4.A, 6.B, 6.C, 9.F, 12.B
Silene ovata	Mountain catchfly	Rich woodlands and forests over limestone	1	* *

Overall Determination of Effect

Management Prescriptions for rare communities in the Final Revised Plan are designed to provide beneficial conservation measures for Sensitive species that occur, or are likely to occur, in these communities. In addition, Forestwide Standards have been designed to provide additional conservation benefits to Sensitive species that occur, or are likely to occur, outside of designated rare communities on the Jefferson National Forest. Even with these Standards and Prescription, some project-level activities may potentially impact Sensitive species individuals. Impact to individuals can occur in Prescriptions where management activities may be detrimental in the short-term. Project-level analyses, conducted in compliance with Agency policy, are

designed to ensure project-related activities do not cause a trend toward listing or loss of viability. Therefore, it is determined that implementation of the Final Revised Plan may impact individuals, but will not lead to Federal listing, or loss of species viability of Sensitive species occurring on the Jefferson National Forest.

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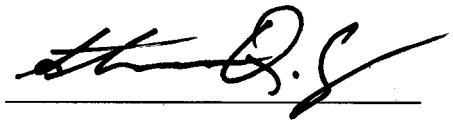

December 5, 2003

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Attachments: References

Appendix A – Jefferson NF Sensitive Species List

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APPENDIX A

Sensitive Species Analysis
for
Jefferson National Forest Plan Revision – Biological Evaluation

GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	GRank	VA SRank	WV SRank	Habitat Group	Rare Ecological Community	Prescriptions with Known Occurrences
		VERTEBRATES									
		Fishes									
	X	Ammocrypta clara	Western sand darter	Clinch R, Powell R	Aquatic-rivers	G3	S1	-	1	*	11
	X	Cottus baileyi	Black sculpin	Little R, Upper Clinch R, S Fork Holston R	Aquatic-streams	G4Q	S2	-	1	*	11
	X	Etheostoma acuticeps	Sharphead darter	S and Middle Fk Holston R	Aquatic-rivers	G3	S1	-	1	*	11
	X	Etheostoma suzanae	Cumberland Johnny darter	Endemic to Upper Cumberland R watershed near VA	Aquatic-streams	G2	S1 (KY)	-	1	*	11
	X	Etheostoma osburni	Candy darter	Big Stony Ck, Laurel Fork in New R watershed	Aquatic-streams	G3	S1	S2	1	*	9.A.4, 11
	X	Etheostoma tippecanoe	Tippecanoe darter	Four sites Clinch R, lower Copper Ck	Aquatic-rivers	G2	S1	S2	1	*	11
	X	Icthyomyzon greeleyi	Mountain brook lamprey	M, N Fk Holston R, Copper Ck, Indian Ck, Clinch R, Powell R	Aquatic-rivers	G3G4	S2	S1	1	*	11
	X	Notropis ariommus	Popeye shiner	N Fk Holston R, Clinch R, Powell R	Aquatic-rivers	G3	S2S3	S2	1	*	11
X	X	Notropis semperasper	Roughhead shiner	Upper James R watershed above Buchanan	Aquatic-rivers	G2G3	S2S3	-	1	*	11
	X	Noturus gilberti	Orangefin madtom	S Fk Roanoke R watershed, Roanoke R above Salem	Aquatic-streams	G2	S2	-	1	*	11
	X	Percina burtoni	Blotchside darter	N Fk Holston R, Clinch R, Copper Ck, Little R	Aquatic-rivers	G2	S1	-	1	*	11
	X	Percina macrocephala	Longhead darter	N Fk Holston R above Saltville, lower Copper Ck	Aquatic-rivers	G3	S1S2	S2	1	*	11
	X	Phenacobius crassilabrum	Fatlips minnow	Unimpounded lower S Fk Holston R, Whitetop Laurel Ck	Aquatic-rivers	G3G4	S2	-	1	*	11
	X	Phenacobius teretulus	Kanawha minnow	Upper New R watershed	Aquatic-streams	G3G4	S2S3	S1	1	*	11
	X	Phoxinus tennesseensis	Tennessee dace	Lick Ck, N Fk Holston R, Beaverdam Ck, M Fk Holston R	Aquatic-streams	G3	S1	-	1	*	9.A.4, 11
		Amphibians									
	X	Plethodon hubrichti	Peaks of Otter salamander	Peaks of Otter, Apple Orchard Mtn, > 1800'	Mixed oak, late successional with loose rocks and logs	G2	S2	-	10, 11	*	8.E.2a, 8.E.2b
X		Plethodon punctatus	Cow Knob salamander	Shenandoah Mtn, VA and WV, >2500'	Mixed oak, late successional with loose rocks and logs	G3	S2	S1	-	-	-
	X	Plethodon welleri	Weller's salamander	Mt. Rogers & Whitetop Mtn	Spruce-Fir Forests and adjacent northern hardwoods	G3	S2	-	6	9	1A, 4.K.4
		Birds									
X	X	Falco peregrinus	Peregrine Falcon	Hack sites late 80s & early 90s - Mt Rogers, Grayson; Cole Mtn, Amherst; Big Schloss, Shenandoah; Elliot Knob, Augusta; High Knob, Rockingham Cos. No nests, current migrant	Nests on ledges or cliffs, buildings, bridges, quarry walls. Nonbreeding sites, farmland, open country, lakeshores, broad river valleys, airports. Prefers pigeons, ducks	G4	S1B/S2N	S1B/S2N	7	7	* *
X		Lanius ludovicianus migrans	Migrant Loggerhead Shrike	Ridge & Valley (Shenandoah Valley)	Open grasslands with trees and shrubs, fencerows	G4	S2B/S3N	S1B/S1N	-	-	-
X	X	Thryomanes bewickii altus	Appalachian Bewick's wren	Historical records in Botetourt, Giles, Highland Cos	Thickets, old fields, fencerows, gardens, old home sites	G5T2Q	S1B/SZN	S1B/S1N	8	*	* *
		Mammals									
X		Microtus chrotorrhinus carolinensis	Southern rock vole	Alleghany Mtn, Bath Co	Cool, moist, mossy talus under oaks/northern hardwoods	G4T3	S1	S2	-	-	-
X	X	Myotis leibii	Eastern small-footed bat	Ridge & Valley	Caves, crevices in large rock outcrops	G3	S1	S1	5, 7	7, 10	7.E.2, 8.E.4a, 8.E.4b, 9F

GW	J	Species Name	Common Name	Range on or near GWJNFs	Habitat - Detail	GRank	VA SRank	WV SRank	Habitat Group	Rare Ecological Community	Prescriptions with Known Occurrences
X		Sorex palustris punctulatus	Southern water shrew	Alleghany Mtn, Bath Co; & Laurel Fork, Highland Co	Riparian areas w/in spruce-fir forests and northern hardwoods	G5T3	S1S2	S2	-	-	-
		INVERTEBRATES									
		Snails (Mollusks, Class Gastropods)									
X	X	Glyphyalinia raderi	Maryland glyph	Alleghany, Montgomery Cos	Calciphile, edge of seeps within leaf litter	G2	S1S2	S2	7, 12	6	* *
X		Helicodiscus diadema	Shaggy coil	Alleghany, Rockbridge Cos	Calciphile, limestone rubble and talus	G1	S1	-	-	-	-
X		Helicodiscus lirellus	Rubble coil	Rockbridge Co	Calciphile, limestone rubble and talus	G1	S1	-	-	-	-
X	X	Helicodiscus triodus	Talus coil	Alleghany, Botetourt, Rockbridge Cos	Calciphile, limestone rubble on wooded hillsides and caves	G2	S1S2	S1	7, 12	6	* *
	X	Io fluvialis	Spiny riversnail	Clinch R, N Fk Holston R	Aquatic-rivers	G2	S2		1	*	11
	X	Paravitrea reesei	Round supercoil	Monroe & Summers Cos, WV	Calcareous woodlands and glades	G2	S2	S1?	7, 12	6	* *
		Clams and Mussels (Mollusks, Class Bivalvia)									
X		Alasmidonta varicosa	Brook floater	Potomac R drainage	Aquatic-rivers	G3	S1	S2	-	-	-
	X	Cumberlandia monodonta	Spectacle case	2 sites Clinch R	Aquatic-rivers	G2G3	S1	-	1	*	11
X	X	Elliptio lanceolata	Yellow lance	Roanoke R, James R	Aquatic-rivers	G2G3	S2S3	-	1	*	11
	X	Epioblasma triquetra	Snuffbox	Clinch R, Powell R, N. Fk Holston R	Aquatic-rivers	G3	S1	S2	1	*	11
	X	Fusconaia barnesiana	Tennessee pigtoe	Clinch R, Powell R, N. Middle, S Fk Holston R	Aquatic-rivers	G2G3	S2S3	-	1	*	11
	X	Fusconaia masoni	Atlantic pigtoe	Roanoke R, Craig Ck drainage	Aquatic-rivers	G2	S2	-	1	*	11
	X	Lasmigona holstonia	Tennessee heelsplitter	Upper Clinch, N and M Fk Holston R drainages; Wolf Ck in Bland Co below Burkes Garden	Aquatic-streams	G3	S1	-	1	*	9.A.4, 11
X	X	Lasmigonia subviridis	Green floater	Widely distributed in N Fk Shenandoah R, & Pedlar R, New River drainage	Aquatic-rivers	G3	S2	-	1	*	11
	X	Lexingtonia dolabelloides	Slabside pearlymussel	Clinch R, M. & N. Fk Holston R	Aquatic-rivers	G2	S2	-	1	*	11
	X	Plethobasus cyphyus	Sheepnose	Clinch R, Powell R	Aquatic-rivers	G3	S1	S1	1	*	11
	X	Pleurobema cordatum	Ohio pigtoe	Clinch R, extirpated in VA	Aquatic-rivers	G3	S1	S2	1	*	11
	X	Pleurobema oviforme	Tennessee clubshell	Clinch R, Powell R, N, Middle, S Fk Holston R	Aquatic-streams	G3	S2S3	-	1	*	11
	X	Pleurobema rubrum	Pyramid pigtoe	Upper Clinch R	Aquatic-rivers	G2	S1	-	1	*	11
	X	Toxolasma lividus	Purple lilliput	N Fk Holston R, Clinch R	Aquatic-rivers	G2	S1	-	1	*	11
		Pseudoscorpions (Arachnids, Order Pseudoscoriones)									
	X	Kleptochthonius orpheus	Orpheus Cave pseudoscorpion	Patton Cave, Monroe Co, WV	Caves	G1		S1	5	10	* *, FW
		Amphipods (Crustaceans, Order Amphipoda)									
	X	Stygobromus abditus	James Cave amphipod	James & Sam Bells caves, Pulaski Co; Watsons Cave, Wythe Co; & other New River Valley caves	Caves	G2	S2	-	5	10	* *, FW
	X	Stygobromus cumberlandus	Cumberland cave amphipod	Lee, Scott, Wise Cos	Caves	G2G3	S1S2	-	5	10	* *, FW
	X	Stygobromus estesi	Craig County cave amphipod	Caves in Upper Sinking Ck Valley and Potts Ck, Poverty Hollow seeps, Captain seeps	Caves, seeps	G1G2	S1S2	-	3, 5	2, 10	4A, 7.E.2, 11, FW
	X	Stygobromus fergusoni	Montgomery County cave amphipod	Botetourt, Montgomery Cos	Caves	G1G2	S1	-	5	10	* *, FW
X		Stygobromus gracilipes	Shenandoah Valley cave amphipod	Frederick, Rockingham, Shenandoah, Warren Cos	Caves	G2G4	S2S3	S1	-	-	-
X		Stygobromus hoffmani	Alleghany County cave amphipod	Lowmoore Cave in Alleghany Co	Caves	G1	S1	-	-	-	-

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X		Stygobromus mundus	Bath County cave amphipod	Alleghany, Bath Cos	Caves	G2G3	S1S2	-	-	-	-
		Isopods (Crustaceans, Order Isopoda)									
	X	Caecidotea incurva	Incurved cave isopod	Smyth &Wythe Cos	Caves	G2G3	S1S2	-	5	10	4.C.1
X	X	Miktoniscus racovitzai	Racovitza's terrestrial cave isopod	Alleghany, Botetourt, Page, Rockbridge, Shenandoah Cos	Caves	G3G4	S2	-	5	10	* *, FW
		Millipedes (Class Diplopoda)									
	X	Brachoria dentata	A millipede	Known only from Pennington Gap and Cave Spring Rec Area in Lee Co	Leaf litter, deciduous forests	G1	S1	-	11	*	4.K.6, 7.D, 9.F
	X	Brachoria eutypa ethotela	Hungry Mother millipede	Pine Mtn above Troutdale	Leaf litter, deciduous forests	G2	S2	-	11	*	4.K.3
	X	Buotus carolinus	A millipede	Brush Mtn, Whitetop Mtn, Apple Orchard Mtn; Tazewell Beartown	Beech leaf litter, deciduous forests	G1	S1	-	11	*	1.A, 4.K.4
	X	Cleidogona hoffmani	Hoffman's cleidogonid millipede	Mt Rogers, Whitetop Mtn, Elk Garden; Hamilton Cave (private) Bland Co	Mountaintop species, leaf litter, deciduous forests	G2	S2	-	11	*	1.A, 4.K.3, 4.K.4
	X	Cleidogona lachesis	A millipede	Whitetop Mtn & Mt Rogers	Beech leaf litter, deciduous forests	G2	S1	-	6	5	1.A, 4.K.3, 4.K.4
	X	Dixioria pela coronata	A millipede	Endemic to Mt Rogers	Altitudinally restricted > 5000'. Leaf litter, northern hardwood and spruce-fir forests	G?T2	S2	-	6	5, 9	1.A
	X	Dixioria fowleri	A millipede	Walker Mtn; Comers Rock on Iron Mtn; Laurel Ck, Damascas; 1/2 mile west of NRA office; Tazewell Beartown	Leaf litter, deciduous forests	G2	S2	-	11	*	1.A
X		Nannaria shenandoah	Shenandoah Mtn. Xystodesmid millipede	One site, along Long Run Road, Rockingham Co	Leaf litter, mixed oak forest	G1	S1	-	-	-	-
X		Pseudotremia alecto	A millipede	Griffith Knob, Alleghany Co; near Mountain Grove Saltpetre cave, Bath Co	Leaf litter, deciduous forests	G1	S1	-	-	-	-
X	X	Semionellus placidus	A millipede	Hawksbill Mtn, Apple Orchard Mtn, Tomahawk Mtn	Leaf litter, deciduous forests	G3	S2	-	10, 11	*	4.K.1
		Centipedes (Insects, Order Chilopoda)									
X	X	Escaryus cryptorobius	Montane centipede	The Priest, Nelson Co & Whitetop Mtn, Washington Co	Upper soil horizon, Spruce - Birch forests	G2	S2	-	6	5, 9	4.K.4
	X	Escaryus orestes	Whitetop Mountain centipede	Whitetop Mtn in Washington Co	Dark moist soil and litter, Spruce - Birch forests	G1G2	S1S2	-	6	5, 9	4.K.4
X		Nampabius turbator	A cave centipede	One known site, Lowmoore Cave, Alleghany Co	Caves	G1G2	S1	-	-	-	-
		Springtails (Insects, Order Collembola)									
X	X	Arrhopalites carolynae	A cave springtail	Augusta, Bath, Highland, Lee, Wise Cos	Caves	G2G3	S1	-	5	10	* *, FW
	X	Arrhopalites commorus	A cave springtail	Giles, Lee, Wise Cos	Caves	G1G2	S1	-	5	10	* *, FW
X		Arrhopalites sacer	A cave springtail	Bath Co	Caves	G1G2	S1	-	-	-	-
		Mayflies (Insects, Order Ephemeroptera)									
	X	Leptophlebia johnsoni	Johnson's pronggill mayfly	One location, Lewis Fk north slope Mt. Rogers	Aquatic-streams	G4	S1	-	1	*	11
		Dragonflies and Damselflies (Insects, Order Odonata)									
X	X	Gomphus viridifrons	Green-faced clubtail	New R, Craig Ck, Pound R, Locust Spring	Aquatic-rivers	G3	S2	S3	1	*	11
	X	Ophiogomphus alleghaniensis	Allegheny snaketail	Rich Ck in Giles Co	Aquatic-streams	G3Q	S1	S2	1	*	11
		Stoneflies (Insects, Order Plecoptera)									

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	X	Acroneuria kosztarabi	Virginia stonefly	Station Spring Ck in Tazewell Co	Aquatic-streams	G1	S1	-	1	*	11
	X	Isoperla major	Big stripetail stonefly	Burkes Garden in Tazewell Co	Aquatic-streams	G1	S1	-	1	*	11
	X	Megaleuctra williamsae	Smokies needlefly	Mt. Rogers &-Whitetop Mtn	Aquatic-streams	G2	S2	-	1	*	11
	X	Taeniopteryx nelsoni	Cryptic willowfly	Lewis Fk & Grindstone Branch N of Mt Rogers	Aquatic-streams	G1	S1	-	1	*	11
		Beetles (Insects, Order Cloeoptera)									
X	X	Cicindela ancocisconensis	Riverbank tiger beetle	Alleghany, Bath, Highland, Lee, Rockbridge, Washington, Wise Cos	Riparian – sandy/silty edges of streams and rivers	G3	S2	S3	3	2	11
X	X	Cicindela patruela	Barrens tiger beetle	Blue Ridge, Ridge & Valley	Eroded slopes of exposed sandstone and conglomerate	G3	S2	S2S3	7	7	4.D
	X	Cyclotrachelus incisus	A ground beetle	Breaks Interstate Park in Dickenson Co	Dry, well drained site, red maple, magnolia, mtn laurel	G2	S1	-	11	*	9.F
X		Hydraena maureenae	Maureen's shale stream beetle	Upper Cowpasture R headwaters in Bath Co	Riparian-shale substrate at waters edge along streams	G1G3	S1S3	-	-	-	-
		Scorpionflies (Insects, Order Mecoptera)									
	X	Brachypanorpa jeffersoni	Jefferson's short-nosed scorpionfly	Sugar Run Mountain, Giles Co & Whitetop Mtn, Smyth Co	Moist soil around seeps. Only known from high elevation. Larvae use short burrows in loose soil and moss.	G2	S1S2	-	3	2	1.A, 4.K.3, 4.K.4, 5.B, 11
		Butterflies and Moths (Insects, Order Lepidoptera)									
X	X	Callophrys irus	Frosted elfin	Frederick, Montgomery, Page, Roanoke Cos	Dry, open woods, clearings, and road/powerline ROWs w/ abundant Baptisia tinctoria	G3	S2	S1	8	1	5.A
X	X	Erynnis persius	Persius duskywing	Blue Ridge, Ridge & Valley	Bogs, wet meadows, open seepages in boreal forests	G5T2T3	S1		4, 8	2	4.J, 7.E.2, 7.D, 11
X	X	Pyrgus wyandot	Appalachian grizzled skipper	Ridge & Valley	Shale barrens, open shaley oak woods	G2	S1S2	S1	7,9	1	7.E.2
X	X	Speyeria diana	Diana fritillary	Blue Ridge, Ridge & Valley	Grasslands-shrublands, usually near streams with thistles and milkweeds, larval host plants, violets	G3	S3	S2S3	8	*	9.A.1, 11
X	X	Speyeria idalia	Regal fritillary	Blue Ridge, Ridge & Valley	Riparian, grasslands-shrublands	G3	S1	S1	3	2	* *
X	X	Catocala herodias gerhardi	Herodias underwing	Bald Knob, Bath Co; Poverty Hollow, Montgomery Co; Sand Mtn, Wythe Co (non FS property)	Pitch pine/bear oak scrub woodlands >3000'	G3T3	S2S3	SU	9	8	* *
X		Erythroecia hebardi	Hebard's noctuid moth	Bath Co	Rich mesic hardwood forest. Larvae host plant is horsebalm	GU	SH	-	-	-	-
X		Euchlaena milnei	Milne's euchlaena moth	Edinburg Gap in, Shenandoah Co	Moist, forested slopes of mixed pine hardwoods. Acidic oak woods	G2G4	S2	S2	-	-	-
		NON-VASCULAR PLANTS									
		Lichens									
	X	Hydrotheria venosa	Aquatic lichen	Mt. Rogers &-Whitetop Mtn	Aquatic - streams	G3	S1	-	1	*	11
	X	Hypotrachyna virginica	A foliose lichen	Mt. Rogers &-Whitetop Mtn	Spruce-Fir forests	G1G2	S1	-	6	9	1.A, 4.K.4
		Liverworts									
	X	Bazzania nudicaulis	A liverwort	Mt. Rogers &-Whitetop Mtn	Spruce-Fir forests	G2G3	S?	-	6	9	1.A, 4.K.4
	X	Frullania oakesiana	A liverwort	Mt. Rogers &-Whitetop Mtn	Spruce-Fir forests	G3?	S?	-	6	9	1.A, 4.K.4
	X	Mertzgeria fruitculosa	A liverwort	Whitetop Mtn	Spruce-Fir forests	G2Q	S?	-	6	9	4.K.4
	X	Nardia lescurii	A liverwort	Blue Ridge, Ridge & Valley	Riparian, wet rocks, spray cliffs	G3?	SU	-	3, 7	7	11
	X	Plagiochila austinii	A liverwort	Little Stoney Ck – Cascades; Red Ck on Beartown Mtn	Riparian, wet rocks, spray cliffs	G3	S?	-	3	7	11
	X	Plagiochila sullivantii var sullivantii	A liverwort	Whitetop Mtn, Salt Pond Mtn	Riparian, wet rocks, spray cliffs	G2T2	S?	-	3	7	11
	X	Sphenolobopsis pearsonii	A liverwort	Mt. Rogers &-Whitetop Mtn	Spruce-Fir forests	G2	S?	-	6	9	1.A, 4.K.4
		Mosses									
	X	Sphagnum flavicomans	A peatmoss	Whitetop Mtn	Bogs, seeps	G3	SU	-	4	2	4.K.4

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		VASCULAR PLANTS									
X	X	Aconitum reclinatum	Trailing white monkshood	Blue Ridge, Ridge & Valley	Rich cove sites, streambanks, seepages all with high pH	G3	S3	S2S3	3, 10	2	* *
	X	Allium oxyphilum	Nodding onion	Monroe, Summers, Mercer, Greenbrier Cos, WV	Shale barrens, sandstone glades	G2Q		S2	7	1	* *
X		Arabis patens	Spreading rockcress	Frederick, Lee, Page, Shenandoah, Warren Cos	Shaded, calcareous cliffs, bluffs, and talus slopes	G3	S3	S2	-	-	-
X	X	Berberis canadensis	American barberry	Blue Ridge, Ridge & Valley	Calcareous open woods, bluffs, cliffs, and along fencerows	G3	S3S4	S?	7, 12	1	4.C.1, 7.D, 9.F
	X	Botrychium jennmanii	Dixie grapefern	Scott, Wise Cos	Open woods, old fields, and pastures	G3G4	SH	-	8	*	* *
X	X	Buckleya distichophylla	Piratebush	Blue Ridge, S of Roanoke R, Ridge & Valley, S of James R	Open oak and hemlock woods	G2	S2	-	11	*	4D
X	X	Cardamine clematitis	Mountain bittercress	Blue Ridge, Ridge & Valley, S of New R watershed	Riparian, spring seeps, rocky streamsides	G2	S1S2	-	3	2	4.K.4, 5.B
X		Carex polymorpha	Variable sedge	Blue Ridge, Ridge & Valley, N of James R	Open acid soil, oak-heath woodlands, level terrain	G3	S2	S1	-	-	-
X	X	Carex schweinitzii	Schweinitz's sedge	Bath, Montgomery, Pulaski, Washington Cos	Bogs, limestone fens, marl marshes	G3	S1	-	3	2	* *
	X	Chelone cuthbertii	Cuthbert turtlehead	Blue Ridge Plateau, Grayson, Carroll Cos	Bogs, wet meadows, boggy woods and thickets	G3	S2	-	3	2	* *
	X	Cimicifuga rubifolia	Appalachian bugbane	Lower Clinch R watershed	Moist, rich wooded bluffs over limestone	G3	S2	-	10, 12	6	6.C, 8.A.1
	X	Cleistes bifaria	Small spreading pogonia	Craig, Dickenson, Scott, Wise Cos	Well drained, rather open, scrubby hillsides, oak-pine-heath woodlands, acidic soils	G3G4	S1	S1	9, 11	*	4.D, 6.C, 7.E.2, 8.B, 8.E.4.b, 9.F
	X	Clematis addisonii	Addison's leatherflower	Montgomery, Roanoke, Botetourt, Rockbridge Cos	Open, rich woods over limestone	G2	S2	-	7, 12	1,6	* *
X	X	Clematis coactilis	Virginia white-haired leatherflower	Ridge & Valley, Rockbridge Co, S to Wythe Co	Shale barrens, rocky calcareous woodlands	G2G3	S3	-	7	1	9.F
	X	Coralloriza bentleyi	Bentley's coalroot	Monroe Co, WV and Giles Co, VA	Dry, acid woods, along roadsides, well-shaded trails	G1	S1	S1	11	*	1.A, 8.C
X	X	Delphinium exaltatum	Tall larkspur	Blue Ridge, Ridge & Valley	Dry calcareous soil in open grassy glades or thin woodlands	G3	S3	S1	8, 12	1	* *
X		Echinodorus parvulus	Dwarf burhead	Pines Chapel Pond in Augusta Co	Pond margins, wet depressions in sandy soil	G3	SR	-	-	-	-
X	X	Euphorbia purpurea	Glade spurge	Blue Ridge, Ridge & Valley	Rich, swampy woods and thickets	G3	S2	S2	3	2	* *
	X	Gentiana austromontana	Blue Ridge gentian	Mt Rogers, Whitetop Mtn., High Knob	High elevation forests and grassy balds, S. App. endemc	G3	S3	S1	6,8	3,9	1.A, 4.k.3, 4.k.4
	X	Hasteola suaveolens	False Indian-plantain	Giles, Montgomery, Pulaski Cos	Riverbanks, wet meadows	G3	S2	S1	3, 4	2	* *
X		Heuchera alba	White alumroot	Shenandoah Mtn	High elevation rock outcrops, rocky woods and bluffs.	G2Q	S2?	S2	-	-	-
X	X	Hypericum mitchellianum	Blue Ridge St. John's-wort	Blue Ridge, Ridge & Valley	Grassy balds, forest seepages, moderate to high elevations	G3	S3	-	3, 8	2,3	4.K.3
X	X	Ilex collina	Long-stalked holly	Blue Ridge, Ridge & Valley	Bogs, shrubby streamheads > 3100'	G3	S2	S3	3,4	2	4.K.3, 1.A
X	X	Iliamna remota	Kankakee globe-mallow	Alleghany, Botetourt, Rockbridge, Bedford Cos	Open, disturbed riverbanks and roadsides	G1Q	S1	-	3	2	* *
X		Isoetes virginica	Virginia quillwort	Augusta Co	Seasonally dry sinkhole depressions	G1Q	S1?	-	-	-	-
X	X	Juglans cinerea	Butternut	Blue Ridge, Ridge & Valley	Well-drained bottomland and floodplain, rich moist mesophytic forests mostly along toeslopes	G3	S3?	S3	10	*	FW
X	X	Liatris turgida	Shale barren blazing star	Blue Ridge, Ridge & Valley	Shale barrens, mountain hillsides, openings	G3	S3S4	S1	7	1	* *
	X	Lilium grayi	Gray's lily	Mt Rogers, Whitetop Mtn	Bogs, open seeps, wet meadows, grassy balds	G3	S2	-	4,8	2,3	4.K.3, 4.K.4
X		Lycopodiella margueritae	Marguerite's clubmoss	Bath Co	Seasonally moist soils, wet acidic ditches, borrow pits	G2	S1	-	-	-	-
X	X	Monotropsis odorata	Sweet pinesap	Blue Ridge, Ridge & Valley	Dry to mesic upland woods with abundant heaths, soil usually sandy	G3	S2S3	SH	11	*	4.C.1, 9.F, 12.B
X	X	Paxistima canbyi	Canby's mountain lover	Ridge & Valley	Calcareous cliffs and bluffs, usually undercut by stream	G2	S2	S2	7	7	* *
X	X	Phlox buckleyi	Sword-leaf phlox	Blue Ridge, Ridge & Valley	Open, often dry oak woodlands and rocky slopes, usually over shale in humus rich soil, often along roadsides	G2	S2	S2	7	1	1.A, 1.B, 4.A, 6.B, 6.C, 9.F, 12.B
X	X	Poa paludigena	Bog bluegrass	Blue Ridge, Ridge & Valley	Shrub swamps and seeps, usually under shade	G3	S2	S1	4	2	9.F
X		Potamogeton hillii	Hill's pondweed	Bath Co	Clear, cold calcareous ponds	G3	S1	-	-	-	-
X	X	Potamogeton tennesseensis	Tennessee pondweed	Ridge & Valley	Ponds, back water of streams and rivers	G2	S1	S1	2	2	11

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	X	Prenanthes roanensis	Roan Mountain rattlesnake-root	Mt Rogers & Whitetop Mtn	Grassy balds, open high elevation forests and outcrops	G3	S3	-	8	3	1.A, 4.K.3, 4.K.4
X	X	Pycnanthemum torrei	Torrey's mountain-mint	Bland, Bath, Giles, Rockbridge, Wythe Cos	Open, dry rocky woods, and roadsides, and thickets near streams, heavy clay soil over calcareous rock	G2	S2?	S1	7, 12	1	9.F
	X	Rudbeckia triloba var. pinnatiloba	Pinnate-lobed coneflower	Wise Co	Dry calcareous soil of open woods and roadsides	G5T3	S1	-	7, 12	1	* *
	X	Saxifraga caroliniana	Carolina saxifrage	Blue Ridge, Ridge & Valley, S of New R	Moist, shaded rocks and cliffs	G2	S2?	S1	7	7	4.D, 7.E.2, 7.D, 4.K.5, 6.C, 11
X	X	Scutellaria saxatilis	Rock skullcap	Blue Ridge, Ridge & Valley	Rich, dry to mesic ridgetop woods, 32 counties in VA, likely G4/S4	G3	S3	S1	7, 12	1	1.A, 1.B, 4.A, 6.B, 6.C, 9.F, 12.B
	X	Senecio millefolium	Piedmont ragwort	Lee, Scott Cos	Open limestone outcrops and cedar barrens	G2	S2	-	7	1	4.K.5
X	X	Sida hermaphrodita	Virginia mallow	Ridge & Valley, James R watersheds	Riverbank glades with loose rock or sandy soil	G2	S1	S2	3	2	* *
	X	Silene ovata	Mountain catchfly	Lee, Wise Cos	Rich woodlands and forests over limestone	G2G3	S1	-	12	1	* *
X		Trillium pusillum var. moniticulum	Mountain least trillium	Great North Mtn & Shenandoah Mtn, VA & WV	Open oak woodlands in well drained soil and margins of thickets	G3T2	S2	S1	-	-	-
	X	Tsuga caroliniana	Carolina hemlock	Blue Ridge N to James R	Rocky ridges and slopes, usually dry and well drained	G3	SR	-	7, 11	4	1A, 9.F, 4.C.1
X	X	Vitis rupestris	Sand grape	Ridge & Valley	Scoured banks of rivers and streams over calcareous bedrock	G3	S1?	SU	3	2	11

List current as of December 5, 2003

LEGEND FOR SENSITIVE SPECIES ANALYSIS:

HABITAT GROUP:

1 – Aquatic (flowing water)	2 – Aquatic (standing water)
3 – Riparian (includes springs/seeps, streamsides, and pond margins)	4 – Wetlands (includes bogs, fens, and beaver ponds/meadows)
5 – Caves	6 – Spruce/fir forests (includes adjacent northern hardwoods)
7 – Rock outcrops (includes acid and calcareous, both sheltered and exposed, and shale barrens extending into surrounding open oak woodlands)	8 – Grasslands (grassy balds, old fields, grassy meadows, utility ROW)
9 – Pine/oak/heath woodlands (xeric to dry)	10 – Rich Cove Forests
11 – Acidic Oak Forests	12 – Basic (calcareous) Oak Forests

RARE ECOLOGICAL COMMUNITIES:

***** = **Species Not Associated with a Rare Community(s)**

1. **Glades, Barrens, and Associated Woodlands (and includes):** 1a. Central Appalachian Shale Barrens 1b. Montane Acidic Woodlands 1c. Montane Dry Calcareous Forests and Woodlands 1d. Low Elevation Basic Outcrop Barrens 1e. Montane Basic Woodlands 1f. Pine-Oak / Heath Woodlands	2. **Rare Mountain Wetland Communities (and includes):** 2a. Appalachian Highlands Bogs, Fens, Seeps, and Ponds 2b. Appalachian Highlands Riverine Vegetation 2c. High Elevation Seepage Swamps 2d. Mountain Ponds 2e. Sinkhole Ponds 2f. Calcareous Fens and Seeps 2g. Montane Basic Seepage Swamps 2h. Appalachian Bogs 2i. Mountain / Piedmont Acidic Seepage Swamps 2j. Beaver Meadows 2k. Rocky Bars and Shores 2l. Riverside Prairies
3. **High Elevation Balds and Rocky Summits**	4. **Carolina Hemlock Forests**

5. **Beech Gap Forests**	6. **Basic Mesic Forests** 6a. Rich Cove and Slope Forests
7. **Rock Outcrops and Cliffs (and includes):** 7a. Talus Slopes 7b. Moss / Lichen Boulderfields 7c. Cliffs and Bluffs 7d. Mountain Acidic Cliffs 7e. Xeric Calcareous Cliffs 7f. Northern White-Cedar Slope Forests 7g. Spray Cliffs 7h. Rock Outcrops 7i. Rocky Summits 7j. Forested Boulderfields	8. **Table Mountain Pine Woodlands**
9. **Spruce-Fir Forests**	10. **Caves and Mines**

PRESCRIPTIONS (NOTE: Most aquatic species in Prescription 11 – Riparian Area, are not on the Forest but are downstream.)

FW = Forest Wide Standards Apply	* * = No known occurrences on Jefferson NF, known occurrences on private land near the Forest	0.B = Custodial – Small Areas
1.A = Designated Wilderness	1.B = Recommended Wilderness Study	2.C.1 = Eligible Wild River
2.C.3 = Eligible Recreational River	4.A = Appalachian Trail Corridor	4.C.1 = Geological Area – Unsuitable
4.D = Botanical and Zoological Area	4.E.1.a = Cultural Area – Unsuitable	4.E.1.b = Cultural Area – Suitable
4.F = Scenic Area	4.J = Urban/Suburban Interface	4.K = Special Areas
4.K.1 = North Creek Special Areas	4.K.2 = Hoop Hole Special Area	4.K.3 = Crest Zone Special Area
4.K.4 = Whitetop Mountain Special area	4.K.5 = Whitetop Laurel Special Area	4.K.6 = North Fork Pound Special Area
5.A = Administrative Site	5.B = Designated Communication Site	5.C = Designated Utility Corridor
6.A = Old Growth Natural Processes	6.B = Old Growth Fire Dependant	6.C = Old Growth with Disturbance
7.A = Scenic Byway Corridor	7.B = Scenic Corridor	7.C = OHV Use Area
7.D = Concentrated Recreation Area	7.E.1 = Dispersed Recreation Area – Unsuitable	7.E.2 = Dispersed Recreation Area – Suitable
7.F = Blue Ridge Parkway Corridor	7.G = Pastoral Landscapes	8.A.1 = Mix of Successional Habitats
8.B = Early Succesional Habitat	8.C = Black Bear	8.E.2.a = Peaks of Otter Salamander Primary
8.E.2.b = Peaks of Otter Salamander Secondary	8.E.4a = Indiana Bat Primary	8.E.4b = Indiana Bat Secondary
8.E.5 = Watchable Wildlife	8.E.6 = Old Field Habitat	9.A.1 = Source Water Protection
9.A.3 = Watershed Restoration	9.A.4 = Aquatic T/E/S Habitats	9.F = Rare Communities
9.G.1 = Bottomland Hardwoods	9.H = Maintenance/Restoration of Forest Communities	11 = Riparian Area
12.A = Backcountry – Few Roads	12.B = Backcountry – Non-Motorized	12.C = Backcountry – Natural Processes

SPECIES: The term "species" includes any subspecies of fish, wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife, which interbreeds when mature. (Endangered Species Act of 1973, as amended through the 100th Congress)

RANGE: The geographical distribution of a species. For use here "range" is expressed as where a species is known or expected to occur on or near the George Washington and Jefferson National Forests in terms of landform (feature name, physiographic province), political boundary (county name), or watershed (river, or stream name).

HABITAT: A place where the physical and biological elements of ecosystems provide a suitable environment and the food, cover and space resources needed for plant and animal livelihood. FSM 2605-91-8, pg 10 of 13

GLOBAL RANK: Global ranks are assigned by a consensus of the network of natural heritage programs, scientific experts, and The Nature Conservancy to designate a rarity rank based on the range-wide status of a species or variety. This system was developed by The Nature Conservancy and is widely used by other agencies and organizations as the best available scientific and objective assessment of taxon rarity and level of threat to its existence. The ranks are assigned after considering a suite of factors including number of occurrences, numbers of individuals, and severity of threats.

G1 = Extremely rare and critical imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
G2 = Very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.
G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.
G4 = Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery.
G5 = Very common and demonstrably secure globally, though it may be rare in parts of its range, especially at the periphery.
GH = Formally part of the world's biota with the exception that may be rediscovered.
GX = Believed extinct throughout its range with virtually no likelihood of rediscovery.
GU = Possibly rare, but status uncertain and more data needed.
G? = Unranked, or, if following a ranking, ranking uncertain (ex. G3?).
G_Q = The taxon has a questionable taxonomic assignment, such as G3Q.
G_T = Signifies the rank of a subspecies or variety. For example, a G5T1 would apply to a subspecies of a species that is demonstrably secure globally (G5) but the subspecies warrants a rank of T1, critically imperiled.

STATE RANK: The following ranks are used by the Virginia Department of Conservation and Recreation to set protection priorities for natural heritage resources. Natural Heritage Resources (NHRs) are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHRs is the number of populations or occurrences, i.e. the number of known distinct localities; 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; the quality of the occurrences, the number of protected occurrences; and threats.

- **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.
- **S#B** - 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.
- **S#N** - Non-breeding status within the state. Usually applied to winter resident species.

- **SR** – Reported for Virginia, but without persuasive documentation that would provide a basis for either accepting or rejecting the report.
- **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.

These ranks should not be interpreted as legal designations.