

# **SOUTHERN BLUE RIDGE ECOREGIONAL CONSERVATION PLAN**

**Summary and Implementation Document**

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**THE NATURE CONSERVANCY  
and the  
SOUTHERN APPALACHIAN FOREST COALITION**

# **Southern Blue Ridge Ecoregional Conservation Plan Summary and Implementation Document**

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**This document was produced in partnership by the following three conservation organizations:**

**The Nature Conservancy is a nonprofit conservation organization with the mission to preserve plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.**

**The Southern Appalachian Forest Coalition is a nonprofit organization that works to preserve, protect, and pass on the irreplaceable heritage of the region's National Forests and mountain landscapes.**

**The Association for Biodiversity Information is an organization dedicated to providing information for protecting the diversity of life on Earth. ABI is an independent nonprofit organization created in collaboration with the Network of Natural Heritage Programs and Conservation Data Centers and The Nature Conservancy, and is a leading source of reliable information on species and ecosystems for use in conservation and land use planning.**

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## EXECUTIVE SUMMARY

This first iteration of an ecoregional plan for the Southern Blue Ridge is a compendium of hypotheses on how to conserve species nearest extinction, rare and common natural communities and the rich and diverse biodiversity in the ecoregion. The plan identifies a portfolio of sites that is a vision for conservation action, enabling practitioners to set priorities among sites and develop site-specific and multi-site conservation strategies. The plan also identifies data and knowledge gaps, primarily gaps in taxonomy and inventory, and ways to effectively manage species, ecological communities and landscapes. The primary goal of the ecoregional planning process is to set the stage for implementation, to guarantee that planning is not an end unto itself, but the first steps of wise conservation action.

The Southern Blue Ridge Ecoregion (SBR) is one of the most biologically significant ecoregions in the United States. Its 9.4 million acres spans portions of five states: Virginia, Tennessee, North Carolina, South Carolina, and Georgia. The spatial heterogeneity of the ecoregion's geology and topography and its unique geologic history has resulted in a broad array of biodiversity. 136 natural terrestrial communities have been identified in the region and over 90% of these are considered endemic or limited to the ecoregion. There are nearly 400 rare plant species while the forests are some of the most diverse in the U.S. The ecoregion is the center of the world's salamander diversity and has the highest number of terrestrial snail species of any ecoregion in the U.S. Lastly, the freshwater systems are exceptionally rich in species diversity, with 66 at-risk aquatic species occurring in the ecoregion, 20 of which are federally-listed as threatened or endangered.

Through a process of working with nearly 100 experts and the combined efforts of Natural Heritage Programs, Nature Conservancy Field Offices, and the Southern Appalachian Forest Coalition, 310 conservation targets (188 plant and animal species and 122 natural terrestrial communities) were identified. These conservation targets were the basis for planning, with the best available information collected on location, distribution and viability. Conservation goals were established for each species and terrestrial community as estimates of the number of viable populations or sites necessary to ensure long-term survival.

The planning team used these conservation targets and goals to develop the ecoregional portfolio. The portfolio contains 217 sites that represent over 2,200,000 acres of the SBR ecoregion or roughly 23% of the total area. Of these, 109 sites protect terrestrial elements, 29 protect aquatic or riparian elements, 54 protect bogs and non-alluvial wetlands and their associated elements, and 12 are a combination of terrestrial with aquatic or non-alluvial wetlands. 68% of the acreage in the portfolio is publicly owned, with the majority owned by the U.S. Forest Service (38%) and the National Park Service (25%). 32% is privately owned. The sites on public lands represent roughly half of the total public land in the ecoregion while the sites on private land represent 12% of the all private lands.

For each site an appropriate conservation strategy was identified. Four different conservation strategies were recognized based on two factors: site size (whether it was a moderately sized functional site or larger functional landscape) and primary land ownership. The four conservation approaches are:

**Private-lands Functional Site:** Small to medium size sites primarily privately owned where traditional Conservancy protection tools (acquisition, easements) may be the optimal strategy.

**Public-lands Functional Site:** Small to medium size sites primarily on public lands where working with the public agency is the primary strategy.

**Community-based Functional Landscape Site:** Large scale sites with a mix of private and public ownership where using the broad tools of community-based conservation is the optimal strategy.

**Public-lands Partnership Functional Landscape Site:** Large scale sites primarily managed by one or more public agencies with whom partnerships are forged to ensure the conservation of target species and communities.

Nearly half of the 217 sites fall into the private-lands functional site category with an average size of 66 acres, representing only 3% of the total area within the portfolio. Functional sites on public land are the second largest category in number of sites with 59. While larger on average than the private-lands functional sites (~3,000 acres), they constitute only 7% of the total area of the portfolio. The 42 public-lands partnership sites constitute almost 60% of the total portfolio area and provide opportunities for efficient and effective, large-scale conservation action in the ecoregion. There are 16 community-based functional landscape sites identified in the ecoregion, containing 31% of the total area in the portfolio.

Seventeen “Action Sites” were selected to focus immediate conservation work in the ecoregion (Table A). Overall these sites protect numerous target occurrences and represent many exemplary habitat types across the ecoregion. 43% of all occurrences of the conservation targets in the ecoregion are found in these sites. Two of the sites focus on river systems, but all contain high quality headwater streams. Four focus on protecting bogs and seeps, some of the most threatened habitats in the ecoregion. Eleven include significant elevation gradients, ranging from 2000 to 4000 feet, while four sites have peaks over 6000 feet with extensive spruce-fir forests. The sites also represent a substantial portion of the portfolio, 621,412 acres or 28% of the total portfolio acreage.

The most imminent threats in terms of both their severity and frequency throughout the ecoregion were loss and fragmentation of natural habitat due to development activities, degradation of aquatic habitat by sedimentation and pollution, and threat to native species and communities due to exotic invasive species.

Table A. Action Sites with total acreage, state(s) of occurrence, and conservation approach (see above for a description of the approaches). The column “TNC/NHP” indicates if The Nature Conservancy or state Natural Heritage Programs are currently involved in conservation actions at a given site.

<b>Site Name</b>	<b>Acres</b>	<b>State</b>	<b>Conservation Approach</b>	<b>TNC/NHP</b>
Amphibolite Mountains	23658.0	NC	Community-based Site	Yes
Black Mountains	116811.9	NC	Community-based Site	Yes
Buck Forest/Mt. Bridge	49607.7	NC/SC	Public-lands Partnership	Yes
Buffalo Mountain	3783.9	VA	Functional Site – private	Yes
Conasauga River Watershed	66836.4	TN/GA	Community-based Site	Yes
Escarpment Gorges	62597.4	NC/SC	Community-based Site	Yes
Grandfather Mountain	70095.0	NC	Public-lands Partnership	Yes
Green River Gorge/Tryon Peak	29312.8	NC	Public-lands Partnership	Yes
Hiawassee Seeps	778.1	NC/GA	Functional Site – private	Yes
Hickory Nut Gorge	34008.0	NC	Community-based Site	Yes
Little Tennessee River	10061.3	NC	Community-based Site	Yes
Mt. Rogers	20222.5	VA	Public-lands Partnership	Yes
Roan Mountain	28521.4	NC/TN	Public-lands Partnership	Yes
S. Alleghany Bog Cluster	132.2	NC	Functional Site – private	Yes
Shady Valley	38029.5	TN	Community-based Site	Yes
Standing Indian/Nantahala Headwaters	57409.7	NC	Public-lands Partnership	No
The Glades	7546.1	VA	Functional Site – private	Yes

The implementation of the Southern Blue Ridge Ecoregional Conservation Plan will be a complex, long-term process. It will involve the dedicated actions of numerous conservation organizations, creative conservation approaches, successful partnerships, wide public support, and extensive financial resources. Overall, this ecoregional plan provides a vision of conservation success in the SBR. It provides guidance for implementation, a focus for fundraising, direction for partnerships, prediction of capacity needs and insights into protection, stewardship and conservation science needs at state and national levels.

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# CHAPTER 1      INTRODUCTION TO THE SOUTHERN BLUE RIDGE ECOREGIONAL CONSERVATION PLAN

## 1.1      Ecoregional Planning in The Nature Conservancy

The mission of The Nature Conservancy (TNC) is “to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.” Traditionally, The Nature Conservancy’s practice of conservation has been to acquire, protect and manage discrete sites that contain habitat for particular rare species or communities. However, as natural ecological systems have become increasingly fragmented and degraded, and science has brought expanded understanding to the functioning of these ecological systems, newer approaches are being implemented to more effectively conserve biodiversity. These approaches have departed from a single species site-based approach to one that recognizes that the viability of species and ecological communities are dependent on larger ecological processes and patterns. Therefore, consideration of the larger scale landscape context is critical to successfully conserving biodiversity.

Reflecting these changes, The Nature Conservancy has developed a planning strategy that involves assessing functional conservation areas at the scale of ecoregions (The Nature Conservancy 1996, 1997). Ecoregions are large geographical units of land and water defined by distinct physiographic and climatic parameters and unique assemblages of ecological communities (Map 1). Functional conservation areas are sites that provide the necessary environmental parameters and ecological processes for the long-term survival of selected species and ecological communities (Poiani and Richter 1999). The goal of ecoregional planning is to conserve viable examples of all native species and natural terrestrial communities characteristic of an ecoregion through the evaluation and identification of a portfolio of functional conservation sites (The Nature Conservancy 1996, 1997).

The portfolio of sites provides a vision for conservation action in an ecoregion, enabling conservation practitioners to set priorities among sites and develop site-specific and multi-site strategies. In addition, plans identify actions needed to fill inventory gaps and conduct further research on given species and communities. Conservation strategies, assessment of threats and guidelines for implementation are established as part of the planning effort. Partnerships with federal and state agencies, industry and land trusts that own or manage significant portions of the portfolio are identified to successfully implement the plan.

One of the most important tenets of ecoregional planning is that it is an iterative process. No ecoregion has a complete inventory of species and communities. Ecoregional plans identify the most significant sites based on the best available biological information, but overtime need to be updated to incorporate new information into the portfolio.

Given this, the three main products of a first iteration ecoregional plan include (The Nature Conservancy 1997):

1. A portfolio of sites that collectively represent the vulnerable, viable native species and natural terrestrial communities in the ecoregion. The portfolio is a vision of what biodiversity conservation success looks like and focuses limited resources on the most significant, feasible, complementary, and highest leverage conservation sites.
2. A list of data and knowledge gaps, primarily in taxonomy and inventory. Efforts to fill these gaps will improve the comprehensiveness and quality of conservation efforts in the future.
3. An implementation plan to protect and conserve the portfolio of sites, including priorities for conservation action, site conservation plans, partnerships and the identification of threats.

## **1.2 Ecoregional Planning in the Southern Blue Ridge**

Interest in a regional approach to conservation in the Southern Appalachians has existed for several decades. The Nature Conservancy began approaching conservation at this scale nearly ten years ago. In 1996, the Southern Appalachian Man and the Biosphere Program (SAMAB) published the Southern Appalachian Assessment, a comprehensive analysis of the natural systems, natural resources, economics and social make-up of the region (SAMAB 1996a-d). Efforts by The Wilderness Society, Southern Appalachians Highlands Conservancy, the Southern Environmental Law Center, and the establishment of the Southern Appalachian Forest Coalition (SAFC) have also approached conservation at a regional scale.

The first iteration of the Southern Blue Ridge Ecoregional Plan is a compendium of hypotheses on how to conserve species nearest extinction, rare and common natural communities and the rich and diverse biodiversity of the ecoregion. The objective of planning is to select the species and communities that should drive conservation in the ecoregion, compile the most comprehensive information available and identify sites that collectively conserve the vulnerable, viable native species and all viable ecological communities in the ecoregion. The supposition is that through protection of sites where these elements occur and the application of appropriate management and monitoring biological diversity in the Southern Blue Ridge will be conserved.

The impetus for this project occurred with the initiation of the Conservancy's ecoregional planning approach, a partnership between The Nature Conservancy and the Southern Appalachian Forest Coalition and the significant financial support from the Moriah Fund. Planning efforts were directed by the three project leaders, a core planning team representing Conservancy state field offices, Natural Heritage Programs and the Southern Appalachian Forest Coalition, and technical teams of experts. The core planning team made all major planning and budget decisions and directed the design of the portfolio. Technical teams addressed specific species groups and communities, updated and refined data, and identified significant data gaps. The process began in

September of 1996. The products of this plan represent the state of inventory knowledge in the ecoregion as of April 1998.

### **1.3 Ecological Description of the Southern Blue Ridge Ecoregion**

The Southern Blue Ridge Ecoregion (SBR) is one of the most biologically significant ecoregions in the United States. A World Wildlife Fund study identified this ecoregion as globally outstanding, requiring immediate protection or restoration based on the extraordinary endemism and species richness of the forests (Ricketts et al. 1999). The SBR and surrounding Southern Appalachian mountains have been found to have some of the highest concentrations of endangered species in the United States (Dobson et al. 1997). In addition, the ecoregion's ecosystems and species are considered at extreme risk for biotic impoverishment due to the risk of development (Noss and Peters 1995).

The SBR ecoregion is over 9.4 million acres in size and spans portions of Virginia, Tennessee, South Carolina, and Georgia, with the greatest portion falling in North Carolina (Map 2). Almost 35% of the ecoregion is owned and managed by public agencies. The largest land management agency is the U.S. Forest Service (USFS), managing 26% of the land in the SBR. The extensive land ownership by public agencies and the re-growth of the forest from turn of the century logging has resulted in an ecoregion that is predominately forested. The human population of the ecoregion is an estimated 1.3 million and the economy is dependent primarily on tourism, timber production, the nursery industry, and agriculture and grazing in the lowlands (SAMAB 1996c).

Geographically, the SBR is part of the larger Southern Appalachian chain which stretches from Virginia to Alabama (Map 3). The SBR is bounded on the east by the Piedmont Ecoregion and to the west by the Cumberlands and Southern Ridge and Valley Ecoregion. The eastern boundary is the Blue Ridge Escarpment that runs from Virginia into Georgia, with the western boundary being the metamorphic/sedimentary rock interface near the North Carolina - Tennessee border (Pittillo et al. 1998). The SBR ecoregion is unique because of the spatial and temporal heterogeneity of its geology, topography (slope, aspect and elevation) and floristics. This ancient remnant mountain region has undergone a myriad of geologic processes from the uplift of the earth's crust to volcanic intrusions and alluvial depositions, while escaping glaciation in the Pleistocene Period. These processes have produced a landscape of extreme variation with elevations ranging from 1500 feet to 6684 feet at the peak of Mt. Mitchell, the highest point in the eastern United States. The substrate includes a wide range of metamorphic, acid rocks with occasional inclusions of mafic and ultramafic rocks. Moreover, the region receives the highest rainfall in the U.S. east of the Cascades, and is home to a range of climate types from warm temperate to boreal. The combination of these conditions and the fact that this region escaped glaciation has provided specialized habitat for the evolution and persistence of a vast flora and fauna, including over 400 endemic species—the most found in any ecoregion in North America (Weakley, personal communication).

The SBR is one of the most biologically significant ecoregions in the U.S. for vascular and nonvascular plants, natural communities, amphibians, snails and neotropical migrant birds. Of the approximately 4,000 plant species occurring in the ecoregion, there are nearly 400 rare plant species and over 250 endemics. The SBR ecoregion has the second highest hardwood and conifer diversity in North America as well as the third highest number of hardwood and conifer endemics (Ricketts et al. 1999). It is the center of the world's salamander diversity, having the highest number of snail species and endemics of any ecoregion in the U.S. (Petranka 1998). Moreover, 136 natural terrestrial communities have been defined using the U.S. National Vegetation Classification (Grossman et al. 1998), and over 90% of these are considered endemic or limited to the ecoregion. Overall, 66 at-risk aquatic species occur in the ecoregion, 20 of which are federally-listed as threatened or endangered.

### 1.3.1 Terrestrial Systems

Several unique ecological communities are characteristic of the SBR, providing the wide diversity of habitat which supports the rich biodiversity of the ecoregion. For example, the communities found in association with the highest peaks of the SBR include relicts of the most recent Ice Age, when spruce and fir spread throughout the southern Appalachian highlands, and alpine tundra occupied slopes and peaks above 4000 feet. Some of the notable high elevation communities include spruce/fir forests, beech gap forests, high elevation rocky summits, heath and grass balds. These communities harbor plants and animals characteristic of more northern latitudes as well as many species that are endemic to the Southern Appalachians. Another significant community type is the mountain cove forest found in cool, moist, sheltered valleys and low slopes with highly fertile soil, comprising the most diverse forests in Eastern North America. Geologic substrate define other rare communities such as serpentine barrens, shale barrens, mafic glades and woodlands, and granitic domes which provide habitat for many rare endemic and disjunct species. Non-alluvial wetlands provide habitat diversity in an ecoregion dominated by steep topography and upland habitats. These communities, including spray cliffs, mafic and calcareous fens, bogs, forested seeps, swamp-forest bog complexes, and upland pools, serve as important nodes of species diversity, and despite their very small acreage in the ecoregion, are among the most important habitats for rare plant and animal species.

Overall, the SBR ecoregion is one of the more ecologically functional and intact ecoregions in the U.S. Natural disturbances such as fire, ice storms, and wind have historically been determinants of complex landscape patterns at different spatial and temporal scales. However, over the course of the past century, its ecosystems and ecological communities have been adversely affected and continue to be threatened by several anthropogenic disturbances. For example, almost all of the forests of the SBR were rapidly and intensely logged in the earlier part of the century, abruptly shifting temporal patterns of forest succession. Moreover, these patterns were forever altered by the dramatic decline of the former dominant canopy species American chestnut (*Castanea dentata*) over the past century due to the Chestnut blight (*Endothia parasitica*)—an introduced exotic pest from Asia.

In the latter half of the twentieth century, pollution produced in regions as far away as the Ohio River Valley has affected the SBR, resulting in acid rain and significant degradation of air quality. Evidence has shown that forest health has been weakened by the decline in air quality, particularly due to increased levels of ozone (SAMAB 1996b). Moreover, acid rain is considered as one of the sources contributing to the decline of the spruce-fir forests at high elevations. These forests have been decimated in certain locations primarily by the balsam woolly adelgid, another exotic pest introduced a couple of decades ago (Hoffard et al. 1995). Other exotic pests that have contributed to the decline of the forests include the beech bark disease, butternut canker, dogwood anthracnose, gypsy moth, hemlock woolly adelgid, and red oak decline.

Conversion of the valley and floodplain areas to row crop production, pastures and residential development in addition to road building has fragmented and destroyed many lowland and wetland communities.

### **1.3.2 Aquatic Systems**

The SBR Ecoregion is home to the headwaters of six major freshwater drainage systems which are exceptionally rich in species diversity: the Ohio River, Tennessee River, the Mobile River, the Appalachian, South Atlantic, and Pamlico-Ablemarle Sound. Each of these drainage systems rank in the top 12 freshwater systems with at-risk fish and mussel species in the U.S., while the Tennessee and Mobile river basins top the list with 104 and 65 at-risk species, respectively (Master et al. 1998). On a smaller scale, the headwaters of 19 watersheds are located in the SBR. Roughly half of these 19 watersheds are considered U.S. watershed hotspots—defined as USGS hydrologic units or sub-basins with “10 or more at-risk freshwater fish and mussel species” (Master et al. 1998). The Conasauga watershed is at the top of this list--8<sup>th</sup> out of 87 watersheds in the U.S.--with 21 at-risk aquatic species. Moreover, six of the estimated 327 critical watersheds necessary to conserve populations of *all* at-risk aquatic species in the U.S. occur in the SBR ecoregion (Master et al. 1998).

As in other ecoregions, the freshwater ecosystems of the SBR have suffered more than terrestrial systems over the past century (Richter et al. 1997). Much of the decline (at least two thirds) is due to non-point source pollution from agricultural and silvicultural practices, residential and second home development, road construction and mining activities, while point pollution sources and industrial and municipal waste are significant components (SAMAB 1996a). In addition, aquatic diversity has been impacted by impoundments for hydroelectric power and the invasion of exotic species, such as the zebra mussel (Ritcher et al. 1997). The stresses include increased nutrient loadings, altered sediment loadings, toxic contamination from pesticides, effluents, and acid drainage as well as habitat loss and alteration to hydraulic regimes. The water quality and aquatic habitat of two rivers of the SBR, the French Broad and the Pigeon, has been significantly degraded over the past quarter of century. However, due to a lack of

monitoring, there is little data to assess the actual rate of population declines for specific species.

## **CHAPTER 2            DEVELOPING AN ECOREGIONAL PORTFOLIO**

The process of developing an ecoregional portfolio is a complex sequence of data collection, assessment and analysis. We only summarize the process here. More detailed discussion on each of the steps is included in the document that details the process of completing this ecoregional plan (The Nature Conservancy 2000).

There are 6 major elements in the development of an ecoregional portfolio:

1. Selection of the species, natural vegetation communities and ecological systems as the conservation targets that drive the planning process;
2. Identification of the major inventory and taxonomic data gaps by species group and geographic area and information gaps in procedures to effectively manage and conserve populations, communities and ecological systems;
3. Assessment of the viability of the occurrences for species and natural vegetation communities;
4. Establishment of conservation goals for each species and vegetation community;
5. Delineation of sites containing viable occurrences of species and communities; and
6. Assessment of the portfolio of sites for completeness and complementarity, and meeting the conservation goals.

### **2.1    Selection of Species and Community Targets**

The first step towards developing an ecoregional conservation plan is to assess the current data on rare species and natural communities. Ecological information on the occurrences, distribution and viability of species and natural communities is the basis for design of the portfolio of sites. Technical teams of experts were formed to address specific species groups and natural communities (see Box 2.1). The processes used to evaluate elements, select conservation targets and set conservation goals differed for species and communities due to the unique set of issues involved with community data. Individual technical team reports for species groups and natural communities can be found in the document on the planning process (The Nature Conservancy 2000).

To identify species conservation targets, the technical teams independently assessed the status of species in their respective taxonomic group, updated data on known and new occurrence information, and added data on species not currently tracked in Natural Heritage Program databases. To initiate this process, the teams began with a list of all species in specific taxonomic groups that were tracked by Natural Heritage Programs and occurred in the ecoregion. This list was compiled from each state and agency Natural Heritage Program and then divided into the respective taxonomic groups for technical team use. In addition, species occurrences were mapped, using their latitude and longitude data, to visually show the distribution of species across the ecoregion. The technical team then assessed the global rank, ecoregional distribution, abundance and the viability and quality of each species occurrence. For groups that had limited

species information, teams delineated bird hotspots and high quality watersheds (Maps 6 & 7).

Compiling and preparing information on the natural terrestrial communities was more challenging. Unlike species, communities have no long established taxonomic standard and have been less of a focus for most Natural Heritage Program and academic researchers. In order to evaluate community information across state lines, the team first had to agree on the taxonomy to use for ecological community targets. The use of a standard taxonomy for community conservation targets allows for comparison and consistency across multiple ecoregions and facilitates communication with Natural Heritage Programs and federal agencies, about natural community and ecosystem conservation. The team used two primary and inter-linked taxonomic levels of community targets, the relatively fine-scale **community association** and the coarser **ecological group**. The association is a standardized unit widely used by TNC, Natural Heritage Programs and federal agencies as part of the National Vegetation Classification System (Grossman et al. 1998). The ecological group represents an aggregation of community associations with similar ecological settings and is used as a target only when association information is lacking or when the team encountered insurmountable classification issues. Through a series of meetings state classification units were linked to the standard taxonomy. Additional units were created or types consolidated, modified, or split as needed, based on careful consideration of new information. All natural communities were considered conservation targets.

A total of 188 species and 122 communities were selected as conservation targets (Appendices A and B). Of the species, 99 are plants and 89 are animals. These are a subset of all the species that are currently tracked by state Natural Heritage Programs. A third of the species targets are endemic to the ecoregion, 11% are disjunct, almost 40% are peripheral and 17% widespread, while 42% have global ranks of G1 or G2 (Tables 1 and 2). 92% of the communities are endemic/limited and 70% have G1 or G2 status.

Table 1. Number of conservation targets by global ranking category. Please refer the “Key to Definitions and Acronyms” on page 28 of this document for G rank definitions.

Major Taxonomic Group	Global Ranking							totals
	G?	G1(T1)	G2(T2)	G3(T3)	G4(T4)	G5(T5)	N/A	
<i>Terrestrial Communities</i>	3	44	42	18	7	4	4	122
<i>Vascular Plants</i>	0	14	20	14	11	15	0	74
<i>Non-Vascular Plants</i>	0	7	7	9	1	1	0	25
<i>Amphibians</i>	0	1	1	2	1	9	0	13
<i>Birds</i>	0	0	0	0	4	21	0	25
<i>Fishes</i>	0	5	8	2	0	0	0	15
<i>Mammals</i>	0	1	2	5	3	3	0	14
<i>Reptiles</i>	0	0	0	1	2	1	0	4
<i>Invertebrates</i>	2	8	5	3	0	0	0	18
<b>Totals</b>	5	80	85	54	29	53	4	310

Table 2. Number of conservation targets by ecoregional distribution. (N= narrow endemic, E = endemic, L = long distance disjunct, P = peripheral, R = regional, W = widespread.)

Species Group	Ecoregional Distribution						totals
	E	L	P	R	W	N/A	
<i>Communities</i>	112	0	4	0	2	4	122
<i>Vascular Plants</i>	27	5	42	0	0	0	74
<i>Non-Vascular Plants</i>	7	1	17	0	0	0	25
<i>Amphibians</i>	3	0	0	3	7	0	13
<i>Birds</i>	6	0	0	0	19	0	25
<i>Fishes</i>	9	4	2	0	0	0	15
<i>Mammals</i>	2	4	8	0	0	0	14
<i>Reptiles</i>	0	0	0	1	3	0	4
<i>Invertebrates</i>	10	6	2	0	0	0	18
<b>Totals</b>	176	20	75	4	31	4	310

### **Box 1. The Value of Technical Teams.**

The process of identifying conservation targets and inventory gaps through the use of technical teams of experts was extremely valuable for improving our overall knowledge and understanding of selected species and communities from an ecoregional perspective. The technical teams made two major contributions to the conservation planning process. They:

- Improved the accuracy of the data for conservation planning by updating Natural Heritage Program data through re-assessing global ranks for targets, refining occurrence quality information, adding new locations for rare species or communities, standardizing community classification and suggesting new species and communities be added to the database--some of which were new to science.
- Provided a large scale spatial and landscape assessment of conservation data. This was especially significant in the Aquatic Vertebrate and Invertebrate Technical Team where watersheds and sub-watersheds were assessed for biological significance, in the Bird Technical Team where areas were assessed for viable populations and in the Invertebrate Technical Team where little species-specific data exist.

Equally important are the long-term contributions of the technical teams for the future iterations of the portfolio and conservation in the SBR in general. The technical teams provide an opportunity to educate experts about ecoregional planning, while also giving them ownership of the process that in turn increases the credibility of the portfolio. Teams also provide opportunities to create ecoregional networks among experts that strengthen the ties among Natural Heritage Programs, Conservancy field offices and academics.

## **2.2 Identification of Data Gaps**

Each species technical team assessed data gaps for their species groups. Data gaps were identified in two ways: 1) by geographic area and 2) by species, group of species, or genera. A few of the teams (Bird, Aquatic, Mammal, Terrestrial Invertebrates) also discussed information needs about the management and restoration of targets. The lists

of data gaps can be found in the technical team reports (The Nature Conservancy 2000).

The SBR community technical team evaluated inventory gaps in two ways: 1) by identifying areas in each state that are priorities for community inventory and 2) by summarizing the completeness of the inventory for each target. Priority areas in need of ecological community inventory were identified and inventory gaps and classification needs were summarized by ecological group (The Nature Conservancy 2000).

### **2.3 Assessing the Viability of Target Occurrences**

Viability is defined as a population's capacity to live, reproduce, disperse and grow (Lincoln et al. 1982). Viability is dependent on the degree to which the larger ecological patterns and processes are functioning in a given ecosystem. The primary threat to population viability is reduction, fragmentation and degradation of natural habitats by human activities. Often times, populations may have been reduced to levels where their genetic diversity may not be enough to allow adaptation to changing environmental conditions.

The Nature Conservancy and Natural Heritage Programs have developed a qualitative viability ranking method for element occurrences based on three factors: size, condition, and landscape context (The Nature Conservancy 1998). **Size** is a quantitative measure of the area and/or abundance of an occurrence. Attributes include the spatial extent of a population and its ecological patterns as well as population abundance, density, and fluctuation. **Condition** is an integrated measure of the quality of biotic and abiotic factors, structures, and processes *within* the occurrence, and the degree to which they affect the continued existence of the occurrence. **Landscape context** is an integrated measure of the quality of biotic and abiotic factors, structures, and processes *surrounding* the occurrence. Components of this factor include landscape structure and extent and condition of the surrounding landscape. These three rank factors are integrated (with relative weighting dependent on the element) into the occurrence viability rank.

By definition, an ecoregional plan must base portfolio sites on viable occurrences.

### **2.4 Establishing Conservation Goals for Targets**

The goal of ecoregional planning is to protect multiple viable occurrences of all conservation targets (The Nature Conservancy 1996). To do so requires two assessments: 1) assessing the viability of each occurrence and 2) determining how many viable occurrences should be conserved in an ecoregion to ensure long-term persistence. The latter includes determining how occurrences should be stratified across the ecoregion to capture genetic and environmental variation.

The core planning team set goals for the species conservation targets based on their global abundance and ecoregional distribution (Table 3). Ecoregional distribution was

determined for each target, indicating its status as endemic, peripheral, widespread, regional or long-distance disjunct. Individual occurrences for the targets were evaluated based on their viability ranking as described above.

Species target occurrences that are considered irreplaceable were automatically included in the portfolio. The core team set conservation planning goals based on a best guess, agreeing that at least 15 to 25 populations are necessary to protect genetic and environmental variability in populations of a given species as well as the species diversity inherent in ecological communities over a multiple century time frame.

Table 3. Goals for target species, including pre-selected occurrences.

<b>Target</b>	<b>Occurrence Goals</b>	<b>Pre-selected Occurrences</b>
G1-G2 (T1 -T2) species	<i>All viable occurrences</i>	<i>All viable occurrences</i>
G3 (T3) species	<i>Endemics: at least 25 viable EORs</i> <i>Non-Endemic: at least 15 viable EORs</i>	<i>Endemics with &lt; 25 viable EORs</i> <i>Non-Endemic with &lt; 15 viable EORs</i>
G4-G5 (T4-T5) species	<i>At least 5 of the best viable EORs</i>	<i>Targets with &lt; 5 viable EORs</i>

The Community Technical Team developed guidelines for setting conservation goals for community targets based on the following factors:

- Overall distribution relative to ecoregion (endemic/limited, widespread, peripheral)
- Coarseness or fineness of classification
- Need for geographic and/or environmental stratification
- Global conservation rank

Using these factors and reviewing conservation goals set in other TNC ecoregions, the Community Technical Team put forth a decision matrix (Table 4) for setting default conservation goals.

Table 4. Decision matrix for setting conservation goals for community targets.

<b>Ecoregional Distribution</b>	<b>Global Rank</b>	
	<b>G1 / G2</b>	<b>G3 / G4G5 / G?</b>
<b>Endemic /Limited</b>	All viable examples (AVO)	25 examples of high quality, stratified across the ecoregion, including 8-10 in large functioning landscapes (each representing 500 acres aggregate in a 5,000 acre landscape)
<b>Widespread</b>	All viable examples (AVO)	8 high quality examples
<b>Peripheral</b>	All viable examples (AVO)	0-5; evaluated on a case-by-case basis to determine if “trivially” or “significantly” peripheral

Default goals were then accepted or revised on a target by target basis, taking into account classification issues, additional landscape needs, and the need for additional geographic or environmental stratification. When a community target was at a taxonomic level coarser than the community association (i.e. ecological group) the goal was increased to account for the coarseness or variability of associations within the taxon. When ecological groups were used as targets, selected occurrences were, as much as possible, stratified across geographic sub-units of the ecoregion and represented the taxonomic variation among the component associations.

Overall, the conservation goals set forth are not meant to imply that there is one correct number of occurrences that need to be conserved for each species or community. Rather, they are an estimate based on expert knowledge about populations' and communities' viability. In addition, conservation goals are intended to be met over the course of several iterations of the ecoregional portfolio, not necessarily in the first iteration. While first iteration of the portfolio aims to meet conservation goals with the currently available data, not meeting goals is equally important to the planning process, as this facilitates the identification of data gaps and inventory needs.

## **2.5 Delineation of Sites**

The process of developing the portfolio involved two primary stages. The first was the pre-assembly stage, where sites were generated to encompass all viable occurrences (Map 6). These "proto-sites" were delineated using a computer technique that generated a specific size buffer for each occurrence of a targeted species or vegetation community. The size of the buffer was based on a generalized assessment of the spatial area needed to maintain essential natural processes (e.g. fire, watershed). The conservation targets were colored coded to note taxonomic group and whether it was indispensable to the portfolio. Indispensable occurrences included all viable occurrences of G1 and G2 species, all viable occurrences of G3-G5 species that had fewer known occurrences in the ecoregion than their conservation goal, and the best examples of vegetation community types. These proto-sites became the foundation of the portfolio.

The second portfolio development stage was the review of the proto-sites by state Natural Heritage Programs and Conservancy field offices. Staff from respective TNC field offices and Natural Heritage Programs evaluated each proto-site using sectional 1:250,000 scale maps of the ecoregion that displayed proto-sites and a scorecard listing occurrences at each site. Starting with proto-sites, site boundaries were delineated and refined to include indispensable occurrences as well as additional occurrences needed to meet the conservation goals for targets. Proto-sites were modified, combined, split, or made sub-sites of a larger site. Site boundaries were modified and refined to represent the most current knowledge about the biology and ecology of the elements captured. This was done first on a state by state basis, with states working together to address sites that crossed state boundaries.

## **2.6 Assessment of Portfolio**

The last stage of portfolio development was an ecoregion-wide assessment of sites and conservation goals. In this step, sites were characterized by size, ownership, and conservation approach and then assessed for completeness, complementarity and whether the conservation goals were met.

## CHAPTER 3            THE ECOREGIONAL PORTFOLIO: A PLAN FOR CONSERVATION IN THE SOUTHERN BLUE RIDGE

The goal of ecoregional planning is to produce a portfolio of sites that provide a vision for conservation in the ecoregion (Map 5). The objective of the portfolio is to capture a selected number of exemplary, viable occurrences of rare and declining plants and animals and all natural communities characteristic of ecoregion. These sites, if protected and managed for conservation, will ensure the long-term persistence of these species and communities.

### 3.1    Summary of Portfolio Sites

217 sites were included in the ecoregional portfolio (Map 5, Appendix C). The sites represent over 2,200,000 acres of the SBR ecoregion or roughly 23% of the total area. Of these, 109 sites protect terrestrial species and communities, 29 protect aquatic or riparian species and communities, 54 protect bogs and non-alluvial wetlands and their associated species, and 12 are a combination of terrestrial with aquatic or non-alluvial wetlands. Sites were characterized and assessed in terms of ecological function, ownership, and recommended conservation approach.

### 3.2    Ecological Function

Functional conservation areas have been defined (Poiani and Richter 1999) as sites of various scales which sustain the habitat and natural systems for selected conservation targets. For the SBR, two types of function areas were recognized: functional sites and functional landscapes. The purpose of **functional sites** is to protect selected species or communities that are dependent on fine-scaled habitats and small scale ecological processes for long term persistence (e.g. non-alluvial bog communities, rock outcrop species). **Functional landscapes**, on the other hand, are larger, capturing large-scale ecosystem patterns and processes (e.g. watersheds, elevational gradients, fire) and protecting a wide-ranging suite of species and communities and ecological systems.

The SBR portfolio identified 57 functional landscape sites, representing nearly 90% of the total portfolio area, and 160 functional sites. Functional landscapes are generally larger than 10,000 acres, while functional sites are usually smaller than 1000 acres. The range between 1000 and 10,000 acres is a mix of functional sites and landscapes depending on the conservation targets and their associated ecological processes. The set of functional landscapes contains at least one viable example of almost all conservation targets.

### 3.3    Site Ownership

64% of the total portfolio area is publicly owned, primarily by the U.S. Forest Service (37.75%) and National Park Service (24.9%). 36% is privately owned (Table 5, Map 2). The sites on public land represent almost half of the total public land in the ecoregion,

while the sites on private land represent 12% of the total. The high percentage of the sites that fall on public land reflects both an inventory bias (administrative interest/mandate, funding availability, accessibility) and the more natural conditions (higher likelihood of rare elements) of the public land areas. The SBR has a higher percentage of public land than most ecoregions.

Table 5. Ownership breakdown of portfolio sites. Ownership categories are summarized by their total area in the ecoregion, the portfolio and the percentage of the total ecoregion in the sites.

Ownership	# of Acres in Total Ecoregion	% of Total Ecoregion	# Acres in Site Portfolio	% of Total Site Acreage	% of Total Ownership Class represented by Sites
USFS	2481493.3	26.34%	836954.6	37.92%	33.73%
NPS	583500.2	6.19%	546402.5	24.75%	93.64%
State	156126.6	1.66%	105008.7	4.76%	67.26%
Cherokee	45418.2	0.48%	968.5	0.04%	2.13%
Other (TVA, FWS)	660.7	0.01%	488.6	0.02%	73.95%
Private	6155371.0	65.33%	717566.1	32.51%	11.66%
Totals	9422570	100.00%	2207389.05	100.00%	23.43%

### 3.4 Conservation Approaches

During the assembly process, each site was assessed to determine the most appropriate conservation approach or strategy. Four different conservation approaches were identified based on two factors: site size (whether it was a functional site or functional landscape as discussed above) and primary land ownership. The four conservation approaches are:

**Private-lands Functional Site:** Small to medium size sites primarily privately owned where traditional protection tools, such as acquisition and easements, may be the optimal strategy.

**Public-lands Functional Site:** Small to medium size sites primarily on public lands where working with the public agency is the primary strategy. Ownership of land by a conservation entity may or may not be appropriate.

**Community-based Functional Landscape Site:** Large scale sites with a mix of private and public ownership where using the broad tools of community-based conservation may be the optimal strategy. Ownership of land by a conservation entity may or may not be appropriate.

**Public-lands Partnership Functional Landscape Site:** Large scale sites primarily managed by one or more public agencies with whom partnerships are forged to ensure the conservation of target species and communities. Ownership of land by a conservation entity may or may not be appropriate.

Nearly half of the 217 sites fall into the private-lands functional site category (Table 6), with an average size of 66 acres. These sites represent 3% of the total area captured

by the portfolio. The Nature Conservancy and Natural Heritage Programs are already working in almost 20% of these 101 privately owned functional sites.

Functional sites on public land are the second largest category in terms of number of sites. While larger on average than the private functional sites (~3,000 acres), they constitute only 7% of the total area of the portfolio. Many of these sites are already managed for the protection of one or more rare elements, although the management of these lands is not guaranteed.

Table 6. Summary of the total number of sites in the portfolio by conservation approach, including their acreage and relative proportions; the number of sites falling within each state and their respective conservation approaches; and the number of sites where TNC and Natural Heritage Programs (NHP) are involved currently, in terms of total area and distribution across states.

<b>Conservation Approach</b>	<b># of Sites</b>	<b>Acres</b>	<b>% of Total Site Area</b>	<b>GA</b>	<b>NC</b>	<b>SC</b>	<b>TN</b>	<b>VA</b>	<b>Sites w/TNC-NHP Involvement</b>
<b>Functional Sites—Private-lands</b>	101 <sup>1</sup>	66,070	3%	12	69	1	10	14	19
<b>Public-lands Sites</b>	59	175,459	7%	14	31	4	12	1	7
<b>Public-lands Partnerships</b>	42	1,386,364	62%	6	25	7	13	1	16
<b>Community-based Sites</b>	17	624,037	28%	2	12	2	5	2	11
<b>Sites w/TNC-HP Involvement</b>	53	1,066,838	47%	6	36	9	5	5	53
<b>Sites w/in State</b>	194	1,296,304	58%	27	116	9	26	17	42
<b>Sites on Border</b>	23	955,626	42%	7	21	5	13	0	10
<b>Total<sup>2</sup></b>	217	2,251,930	100%	34	137	14	39	17	53

As expected, functional landscapes contain almost 90% of the acreage of the portfolio. Public-lands partnership sites, with over 60% of the total portfolio area, are essential sites for the conservation of many of the ecoregional conservation targets. Because there are one to several landowners, these sites provide opportunities for efficient and effective large-scale conservation action in the ecoregion. The current multi-agency management team for Roan Mountain is an excellent example of this conservation approach (White and Sutter 1998). The Nature Conservancy and Natural Heritage Programs are already involved in roughly 40% of the public-lands partnership sites.

<sup>1</sup> This number double counts for one site, the GSMNP macrosite, which was divided into both “Public Lands Partnership” and “Community Based”. The same was the case with the Lower New River which was divided into both a “Community-Based” site and a “Private” site. Therefore, though the column for “Number of Sites” will add up to 219 sites, the true total is 217 as shown.

<sup>2</sup> Please note that the totals for each state do not add up to the totals for the ecoregion. This inconsistency is due to the fact that sites found on state borders are double counted in the totals for each state in which they occur. The total sites for the ecoregion eliminates double counting.

Community-based functional landscape sites also provide unique opportunities for conservation work (Low 1999). There are 17 of these sites identified in the ecoregion, slightly less than 10% of the all sites, containing 28% of the total area in the portfolio. Community-based conservation brings together both public and private landowners to work together to conservation selected conservation targets. At present, TNC and Natural Heritage Programs are involved, at some level, in over 65% of these sites.

## **CHAPTER 4            IMPLEMENTATION OF THE ECOREGIONAL CONSERVATION PLAN**

The implementation of the Southern Blue Ridge Ecoregional Conservation Plan will be a complex, long-term process. It will involve the dedicated actions of numerous conservation organizations, creative conservation approaches, successful partnerships, wide public support and extensive financial resources.

Implementation has been addressed in several ways. The planning team identified 17 portfolio sites that require immediate conservation action, assessed ecoregional threats and developed preliminary strategies for abatement, evaluated current conservation lands in the ecoregion, assessed selected conservation partners, reviewed the need for public communication, evaluated future resources, and planned for future iterations of the ecoregional plan.

### **4.1    Identification of Action Sites**

The portfolio identifies the sites needed to conserve selected conservation targets and a significant portion of the ecoregion's biodiversity. Given that it is impossible to work in all of these sites at one time, initial priority or "Action Sites" were selected to focus immediate conservation action in the ecoregion. 17 Action Sites were identified by the planning team (Table 7, Map 5). Action sites were chosen primarily for their high biodiversity significance, both in terms of rare species and communities and the clustering of occurrences, their predicted viability, the risk of degradation, as well as the feasibility for effective conservation action.

Overall these sites protect numerous target occurrences and represent many exemplary habitat types across the ecoregion. 43% of all occurrences in the ecoregion occur in these sites. Two of the sites focus on river systems, but all contain high quality headwater streams. Four focus on protecting bogs and seeps, some of the most threatened habitats in the ecoregion. Eleven include significant elevation gradients, ranging from 2000 to 4000 feet, while four sites have peaks over 6000 feet with extensive spruce-fir forests. The sites also represent a substantial portion of the portfolio, 621,412 acres or 28% of the total portfolio acreage. Thirteen of the sites are landscape scale sites, with a conservation approach of either a public-lands partnership or community-based conservation, while four are smaller functional. The Nature Conservancy and Natural Heritage Programs are involved or already working at all Action Sites except the Standing Indian/Nantahala Headwaters. The Southern Appalachian Forest Coalition is also actively involved in assessing the management of all U.S. Forest Service (USFS) lands. The USFS manages large portions of land in 10 of the 17 Action Sites. Moreover, site conservation plans have been initiated or completed for the Amphibolite Mountains, Grandfather Mountain, Roan Mountain, Escarpment Gorges and Shady Valley.

Table 7. Action Sites with total acreage, state(s) of occurrence, and conservation approach (see section 3.4 for a description of the approaches). The column “TNC/NHP” indicates if TNC or Natural Heritage Programs are currently involved with conservation actions at a given site.

Site Name	Acre	State	Conservation Approach	TNC/NHP
Amphibolite Mountains	23658.0	NC	Community-based Site	Yes
Black Mountains	116811.9	NC	Community-based Site	Yes
Buck Forest/Mt. Bridge	49607.7	NC/SC	Public-lands Partnership	Yes
Buffalo Mountain	3783.9	VA	Functional Site – private	Yes
Conasauga River Watershed	66836.4	TN/GA	Community-based Site	Yes
Escarpment Gorges	62597.4	NC/SC	Community-based Site	Yes
Grandfather Mountain	70095.0	NC	Public-lands Partnership	Yes
Green River Gorge/Tryon Peak	29312.8	NC	Public-lands Partnership	Yes
Hiwassee Seeps	778.1	NC/GA	Functional Site – private	Yes
Hickory Nut Gorge	34008.0	NC	Community-based Site	Yes
Little Tennessee River	10061.3	NC	Community-based Site	Yes
Mt. Rogers	20222.5	VA	Public-lands Partnership	Yes
Roan Mountain	28521.4	NC/TN	Public-lands Partnership	Yes
S. Alleghany Bog Cluster	132.2	NC	Functional Site – private	Yes
Shady Valley	38029.5	TN	Community-based Site	Yes
Standing Indian/Nantahala Headwaters	57409.7	NC	Public-lands Partnership	No
The Glades	7546.1	VA	Functional Site – private	Yes

## 4.2 Threat Assessment and Threat Abatement Strategies

Ecoregional planning provides a unique opportunity to assess threats that impact multiple sites across the SBR ecoregion. Many of the strategies addressing the abatement of ecoregional threats will maintain an ecoregional approach to conservation. This process also provides the basis for threat assessments done at the site level as part of site conservation planning. Finally, the recognition of ecoregional threats provide opportunities for partnerships and funding to abate threats across multiple sites.

The core planning team brainstormed and ranked threats in a meeting format then more thoroughly reviewed the priority threats through a questionnaire. The brainstorming session resulted in a list of 11 multi-site and/or ecoregional threats (Table 8). These threats were also cross-referenced by ecological community groupings to illustrate the types of habitat most impacted (Table 9). Each threat was ranked for the severity and frequency of its impact on conservation targets, biodiversity and ecological processes (Box 2).

**Box 2: Severity and frequency criteria for ranking threats**

**Severity:**

- Low:** target and ecological processes functional and viable, but maybe not for long term  
**Medium:** target and processes functional, viability questionable, long term survival threatened  
**High:** target and processes impaired, deteriorating, non-viable, long term survival imperiled

**Frequency:**

- Low:** target and ecological processes impacted only at local, specific sites  
**Medium:** target and ecological processes impacted on a more widespread scale in sub-regions  
**High:** all sites threatened regardless of location or scale

Five threats have the highest severity rankings: loss of natural habitat due to development activities, pollution and alteration of aquatic habitat, loss of native species and communities due to exotic invasive species, mining, and the effect of agriculture and grazing on habitats. The four most widespread (frequent) threats were loss of natural habitat due to development activities, degradation of aquatic habitat by sedimentation and pollution, loss to native species and communities due to exotic invasive species, and fragmentation and degradation of habitat due to timber harvesting. The threats with the highest scores when severity is multiplied by frequency are loss and fragmentation of natural habitat due to development activities, pollution and alteration of aquatic habitat, and loss of native species and communities due to exotic invasive species. Agriculture and grazing, air pollution and timber harvesting follow with intermediate scores for both severity and frequency. The other threats vary in their severity and extent such as fire suppression and mining, requiring site-specific strategies developed during site conservation planning.

A list of stresses and sources of stress and threat abatement strategies were developed for the three threats with the highest combined score (Boxes 3-5). These strategies should be addressed at a multiple-site scale by The Nature Conservancy, Southern Appalachian Forest Coalition and Natural Heritage Programs and will involve working with many partners like USFS and National Park Service as well as local and regional governments and private landowners.

Table 8. List of threats and their ranking in terms of severity and frequency (1 = lowest, 3 = highest) and their product, severity\*frequency (1 = lowest, 9 = highest).

<b>Threats</b>	<b>Severity</b>	<b>Frequency</b>	<b>Severity*Frequency</b>
Development (primary and secondary home building, infrastructures, malls, golf courses, etc.)	2.8	2.4	6.5
Pollution and alteration of aquatic habitat	2.6	2.4	6.1
Exotics (invasive species and pests)	2.4	2.4	5.6
Agriculture and grazing	2.3	2.0	4.5
Air pollution	2.0	2.1	4.3
Silviculture	1.9	2.3	4.2
Fire suppression	1.9	1.6	3.0
Mining	2.4	1.1	2.8
Animal and plant poaching	2.0	1.4	2.8
Recreation	1.5	1.6	2.4
Research impacts	1.0	1.0	1.0

Table 9. General ecological community groupings with associated threats.

<b>Habitat Type</b>	<b>Threats</b>
Spruce-Fir Forests	Exotics, Air Pollution, Recreation
Northern Hardwoods/Boulderfields	Air Pollution, Development
Beech Gap Forests	Exotics, Air Pollution
High Elevation Oak Forests	Exotics, Fire Suppression, Silviculture, Development
White Pine Forests	Exotics
Carolina Hemlock Forests	Exotics
Table Mountain/Pitch Pine Woodlands	Fire Suppression, Recreation
Low Elevation Pine Forests	Fire Suppression, Silviculture
Cove Forests	Silviculture
Canadian Hemlock Forests	Exotics
Low Elevation Oak Forests	Exotics, Fire Suppression, Development, Silviculture
Glades and Barrens	Mining, Recreation
Rock Outcrops and Cliffs	Recreation
Grassy Balds	Recreation, Succession
Heath Balds	Fire Suppression
Non-alluvial Wetlands	Succession, Altered hydrology, Grazing, Agriculture
Alluvial Forests	Exotics, Altered hydrology, Grazing, Agriculture, Silviculture
Aquatic Habitats	Pollution, Altered hydrology, Exotics
Caves	Recreation
Human-Dominated Matrix	Exotics, Development, Pollution Recreation, Grazing, Agriculture

**Box 3. Threat profile for the loss of natural habitat due to development.**

**STRESS:** Alteration (canopy removal, selected species removal, change in soil moisture/hydrology), destruction (removal of vegetation and/or soil A horizon) and fragmentation (increase in forest edge, reduction of interior forest area, and restricting or eliminating connection with other forest areas) of natural habitats

**SOURCES OF STRESS:** Population growth is the root cause of habitat loss, resulting in rural and urban development, including primary and secondary home development, commercial and industrial development, and associated infrastructure (roads, malls, etc.). In addition, a lack of adequate regional planning and zoning laws affects the degree to which these sources of stress damage natural habitat and ecological processes.

**MULTI-SITE STRATEGY:**

1. Work at the local, regional, and state levels with citizens groups and through state-wide initiatives to implement land use planning measures that identify and protect critical natural habitats, conserve natural resources and direct growth. Institute policies at local and state levels that recognize and promote the importance of open space, greenways, natural areas and biodiversity conservation.
2. Work with local land trusts to protect habitats and reduce fragmentation through conservation easements, management agreements or fee-simple acquisition.
3. Assist partners (e.g. USFS) in acquiring in-holdings and adjacent properties that reduce fragmentation and buffer existing natural areas.
4. Provide NHP data to state DOT to minimize direct impacts of road to rare species and natural communities.
6. Use the site conservation planning process to circumscribe the area and conservation actions needed to conserve conservation targets. Develop partnerships with public agencies or communities to reduce the alteration, destruction and fragmentation of natural habitats in portfolio sites.

**Box 4. Threat profile for the loss of biodiversity due to invasive exotic species and pests.**

**STRESS:** Altered competition for resources (light, soil moisture, nutrients, substrate), altered natural processes (fire, hydrology), excessive predation/herbivory (defoliation), and eliminating native species (death by invasive species).

**SOURCE OF STRESS:** Presence of invasive species caused by a deliberate or unintentional introduction. Examples include the zebra mussel, Japanese honeysuckle, Oriental bittersweet, garlic mustard, hemlock wooly adelgid, balsam wooly adelgid, gypsy moth, dogwood anthracnose, chestnut blight, etc.

**MULTI-SITE STRATEGIES:**

1. Develop an ecoregional network for communication and collaboration for the control of non-indigenous species.
2. Develop a multi-dimensional priority list of non-indigenous species for the southern Blue Ridge.
3. Develop ecoregional and site specific strategies, including funding proposals, to control high priority exotics. Use an adaptive management approach on TNC and Heritage preserves to control invasive species. Lend technical and financial support to management teams and agencies attacking exotic pest populations on other high-priority sites within the ecoregion.
4. Work with NC Exotic Plant Pest Council (NCEPPC), TNEPPC, and SEEPPC, and SAMAB to develop and distribute educational materials to encourage private landowners to use native plants for landscaping instead of invasive exotic species and convince nurseries and other distributors to limit new sources of invasive species.

5. Work with state and federal agencies (USFS, USDA, invasive species and pest councils) on development of comprehensive policy and strategies for control of exotics and support for current efforts.
6. Utilize opportunities and momentum generated by President Clinton's Executive Order on Invasive Species to enact the above strategies.

***Box 5. Threat profile for the degradation of aquatic habitat due to alteration of hydrologic regimes and point and non-point water pollution.***

**STRESS:** Siltation, pollution, toxins, habitat alteration (channelization, elimination of riparian buffer)

**SOURCES OF STRESS:** Residential wells lowering water tables, water divergence for industrial and municipality use, alteration of hydraulic regimes (river straightening, dams and water impoundment), agricultural, silvicultural, and road building activities occurring near riparian zones and non-alluvial wetlands, point-source pollution (increased nutrient loadings, effluents, acidification) from homes, industries, and municipalities.

**MULTI-SITE STRATEGY:**

1. Encourage state and local tax incentives and tax breaks to landowners and land managers to establish, restore and/or maintain riverside and streamside buffers in addition to fencing off riparian areas from cattle and stabilizing river banks. As part of this, encourage the revision and implementation of Best Management Practices (BMPs) as well as adherence to management found in the Sustainable Forestry Initiative. In addition, work with local and state governments to ensure that existing BMP are properly enforced.
2. Cooperate with and provide technical assistance to local stream monitoring groups (e.g., Adopt-A-Stream). Encourage careful and frequent monitoring of high-priority streams near potential sources of pollution.
3. Cooperate with local land trusts and wetland mitigation banks to protect riparian and wetland habitats. Provide information on high-priority wetland and aquatic systems in the ecoregion, and emphasize the critical need for protection of these systems.
4. Encourage state and federal agencies to focus on technical and cost-share assistance on biologically important watersheds (not just officially 'degraded' watersheds). EPA and USDA-NRCS are the primary federal partners in this effort—EPA at the national and regional level; USDA-NRCS at the national, state and site level. Relevant programs include Unified Watershed Assessments; the EPA 319 Program for addressing non-point source pollution; and the USDA-NRCS Environmental Quality Incentive Program.
5. Use the site conservation planning process to circumscribe the area and conservation actions needed to conserve conservation targets. Develop partnerships with public agencies or communities to reduce the alteration, destruction and fragmentation of natural habitats in portfolio sites.

### **4.3 Assessment of Existing Conservation Lands**

The SBR has extensive public and private lands dedicated to some level of conservation. The National Park Service owns and manages roughly 600,000 acres, or 6% of the ecoregion, and 94% of these lands are within portfolio sites. The Great Smoky Mountains National Park, at a half million acres, is managed primarily for biodiversity conservation. It has an excellent natural resource staff, has initiated an extensive monitoring system, is currently completing a mapping of vegetation communities, and is developing a partnership to complete an All Taxa Biodiversity Inventory, an effort to document all the species that occur in the park. The Blue Ridge

Parkway has a more complex mandate, being both a roadway and a park, with the parklands being a narrow corridor along the parkway or larger areas developed for recreation. The excellent and expanding natural resource staff is dedicated to managing biodiversity within the constraints of its mandate.

The USFS manages roughly 2.5 million acres in the ecoregion, 26% of the total land area, 33% of which are included in portfolio sites. The USFS has multiple mandates for land management, ranging from biodiversity conservation to timber management. It also has multiple stakeholders that many times have conflicting interests. With so much of the USFS lands in portfolio sites, the proper management of these lands is essential for the conservation of biodiversity in the ecoregion. Currently, all forests in the SBR are completing or initiating their forest plan revision. The forest plan sets the broad management guidelines for each habitat type. SAFC is actively involved in assessing the developing plans and insuring that the management guidelines protect biodiversity in the portfolio sites and across the forests. All Natural Heritage Programs are involved to some extent with conservation on USFS lands. As an example, the Virginia Natural Heritage Program has been involved with designing conservation boundaries, nominating numerous site as Special Interest Areas, and making general management recommendations.

The Nature Conservancy owns 15 preserves in the SBR ecoregion, totaling just over 10,000 acres. While a small amount of the total portfolio, they protect some of the most significant sites. Many of the preserves have completed site conservation plans and are actively managed for target species and communities and biodiversity. For most sites, however, a greater emphasis on site conservation planning and an adaptive management approach is needed.

State agencies managing state parks, gamelands and state forests own relatively small acreage in the ecoregion, approximately 160,000 acres, or 1.7% of the SBR. Most significant among their lands is the recent purchase of a major portion of the Jocassee lands in the Escarpment Gorges, an Action Site and one of the richest areas for occurrences of target species and communities. Generally, these agencies do not have strong adaptive management programs and would benefit from partnerships with Conservancy field offices and Natural Heritage Programs.

Public lands, while providing substantial opportunities for conservation, were not a priori identified as conservation sites. Ecoregional planning is based on assessing sites to maintain viable occurrences of selected conservation targets. Public lands are brought into the assessment when assessing the viability of occurrences. The better the landscape context (one of three criteria used in determining viability) the more viable the occurrence. Thus, occurrences on public lands, especially conservation targets dependent on larger scale ecological processes, were more likely chosen as part of the portfolio.

#### **4.4 Engaging Partners**

A crucial step towards successful implementation of the ecoregional plan is involving partners. A summary of primary partners, their involvement in conservation, and strategies to further these partnerships are listed below.

- ◆ **U.S. Forest Service:** The largest land-managing agency in the ecoregion, owning roughly 2.5 million acres, 33% of which is included in the portfolio sites. TNC and Natural Heritage Programs have close relationships with the USFS at several agency levels, including ranger districts, forest supervisor offices, and regional offices. The ecoregional plan should be shared with USFS supervisors, district rangers, and regional and forest biologists. Portfolio site boundaries should be used to nominate Special Management Areas and develop site specific partnerships. Formal partnerships for the management of functional landscape sites should be established. Coordination of these efforts among Conservancy field offices and Natural Heritage Programs is essential. Management recommendations and assistance should be given for the Forest Plan revision. SAFC will play a major role in the revision of Forest Plans in addition to advising the USFS on ecologically sound forestry practices and acquisition of new lands. SAFC will also play a role in protection efforts in specific public-lands partnership sites.
- ◆ **National Park Service:** The second largest land-managing agency in the ecoregion, owning over a half a million acres, with almost 94% included in the portfolio sites. The ecoregional plan should be shared with park superintendents and biologists and regional staff. Especially important are discussions concerning the community-based conservation site on the Western front of the Smoky Mountains National Park and the value of the Blue Ridge Parkway as a corridor for migration along sections of the Blue Ridge Escarpment as well as an area with significant biodiversity.
- ◆ **U.S. Fish and Wildlife Service:** An important partner for funding, support, expertise for sites containing federally-listed species, especially aquatic species, bats, non-alluvial wetlands, birds, and plants.
- ◆ **Environment Protection Agency:** The EPA has begun an effort to identify high quality watersheds and, through assistance rather than regulation, work with local communities to reduce point and non-point pollution. TNC and Natural Heritage Programs need to strategically assess how to partner with EPA.
- ◆ **Land Trusts and Foundations:** SBR is an ecoregion with several effective local land trusts and private foundations eager to participate in the implementation of the ecoregional plan. TNC and Natural Heritage Programs should work closely with them to identify sites within areas that they are working and to assist them in legal protection, site conservation planning, and adaptive management. TNC has already offered a workshop in Site Conservation Planning for ecoregional land trusts.
- ◆ **Southern Appalachian Man And the Biosphere Program (SAMAB):** SAMAB is a partner that could address ecoregion-wide strategies. They already have

committees addressing invasive species (a high priority threat for the ecoregion), watershed protection, and sustainable development.

- ◆ **Academic and Independent Biologists:** The technical teams identified a substantial list of data gaps in inventory, taxonomy, and site management. TNC and Natural Heritage Programs need to maintain partnerships with academic and independent biologists to help direct their efforts, provide them with funding when available, and obtain results. These partnerships will greatly enhance the comprehensive nature of future iterations of the ecoregional plans. It is also recommended that the technical teams be continued, as a way to help maintain connections with these biologists and focus their work on ecoregional issues.

#### **4.5 Resources For Implementation**

Successful implementation of the ecoregional plan will require extensive resources from many different sources. A key source will be new and expanded partnerships with federal, state, and local government agencies and with other conservation organizations in the region. Portfolio sites have a range of conservation ownership and a wide range of conservation stakeholders. Tapping the interest of other conservation stakeholders will be essential for the long-term conservation of portfolio sites, including funding, expertise, and partnerships. Especially promising are state government initiatives to protect watersheds, parklands, wildlife habitat and natural areas.

Ecoregional planning provides a conservation vision for the region that should increase fundraising potential. Several major private foundations are interested in conservation in this ecoregion, in landscape conservation and in the portfolio that has been developed. Foundations and individuals have been impressed by the thoughtful planning and clear priorities that ecoregional planning provides.

The Nature Conservancy has an excellent history of using their conservation lands as showcases and demonstration sites for conservation action. Maintaining a portfolio of sites in Nature Conservancy ownership has significant leverage among public and private land-managing agencies, both for land protection and land management. We will need to continue these creative and successful protection efforts and the first-class conservation science at these sites, done in an adaptive management context. First-class conservation science is accomplished with well-trained stewards and insightful conservation science leadership. Partnerships with academics and graduate students are also valuable. Conservation leadership needs to come not only from state programs, but also from divisional and national levels. This includes expertise in adaptive management/monitoring, fire management, exotics, hydrology, and site conservation planning. Nature Conservancy conservation lands also become essential fundraising centers, influencing the level of giving from individuals, foundations, and corporations.

The Southern Appalachian Forest Coalition has earned a reputation as a strong science-based advocacy group in the region. Continuing their work with the U.S. Forest

Service will be essential to maintain these lands as a core of biodiversity for the region. SAFC has provided a needed regional scale assessment of species, including the protection of large mammals and neotropical migrants. Additionally, SAFC's leadership in protecting old-growth forests has resulted in more inventory and protection of these remnants of the original southern Blue Ridge forests.

#### **4.6 Ecoregional Action and the Next Iteration**

While much of the conservation action in the SBR ecoregion will be taken at the state and site levels, there will need to be continued leadership at the ecoregional level to address multi-site strategies, obtain resources and maintain coordination among state and site programs. To maintain this ecoregional focus, a decision-making team should continue to meet and oversee technical teams working on specific strategies. Between iterations of the ecoregional plan, objectives should be developed with a time schedule, so that success can be tracked and measured. For the southern Blue Ridge, the North Carolina Field Office, in conjunction with the Southern Appalachian Forest Coalition, will take the lead role to translate this plan to action.

Ecoregional planning is an iterative process. Plans will have to be revisited as conservation action proceeds and more inventory and management knowledge is gained. Future iterations will revise the portfolio of sites based on the viability status of conservation targets over time and new information gathered on their occurrences in the ecoregion.

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## KEY TO DEFINITIONS AND ACRONYMS

The following are some definitions of terms used in the document.

**Adaptive Management:** an approach to conservation that assesses all actions for their impact on the conservation targets, thus learning successful ways of conserving species, communities and ecological systems.

**Element:** a species or community, a unit of biological diversity.

**Global Ranks (GRANK)** provides an estimate of abundance for species and communities. The ranks are numeric as follows:

G1	critically imperiled, usually fewer than 5 occurrences
G2	imperiled, usually between 6 and 20 occurrences
G3	vulnerable, usually between 21 and 100 occurrences
G4	apparently secure, greater than 100 occurrences
G5	secure, many occurrences
G?	no GRANK assigned at this time

**Occurrence:** a population of a species or a location of a vegetative community or ecological system

**Site Conservation Planning:** a framework for determining the strategic actions and the needed area to conserve selected conservation targets.

Common acronyms used in the document include:

EO	Element occurrence
EOR	Element occurrence record
NPS	National Park Service
SAFC	Southern Appalachian Forest Coalition
SBR	Southern Blue Ridge
TNC	The Nature Conservancy
USFS	United States Forest Service

State Natural Heritage Program abbreviations:

GAHP	Georgia Natural Heritage Program
NCHP	North Carolina Natural Heritage Program
SCHP	South Carolina Heritage Trust
TNHP	Tennessee Division of Natural Heritage
TVAHP	Tennessee Valley Authority Regional Natural Heritage Program
VAHP	Virginia Natural Heritage Program

TNC State Field Office abbreviations:

GAFO	Georgia Field Office
NCFO	North Carolina Field Office
SCFO	South Carolina Field Office
TNFO	Tennessee Field Office
VAFO	Virginia Field Office
SRO	Southern Resource Office

## LIST OF ECOREGIONAL MAPS

Map 1. The Nature Conservancy Ecoregions of the Lower 48 United States

Map 2. Southern Blue Ridge Human Context

Map 3. Southern Blue Ridge Ecoregional Context

Map 4. Southern Blue Ridge Target Element Occurrences

Map 5. Southern Blue Ridge Portfolio Sites

Map 6. Southern Blue Ridge Proto-Sites

Map 7. Southern Blue Ridge Significant Aquatic Conservation Areas

Map 8. Significant Bird Conservation Areas

## APPENDIX A. LIST OF SPECIES CONSERVATION TARGETS FOR THE SOUTHERN BLUE RIDGE ECOREGION.

Conservation targets are defined as species that are rare and/or threatened with extinction or endangerment throughout their range or within the ecoregion. This includes G1 and G2 species and declining and disjunct G3, G4, and G5 species.

Target species	Common name	G Rank	Dist
<b>Amphibians</b>			
<i>Ambystoma talpoideum</i>	Mole salamander	G5	W
<i>Aneides aeneus</i>	Green salamander	G3	R
<i>Eurycea junaluska</i>	Junaluska salamander	G2	N
<i>Eurycea longicauda longicauda</i>	Longtail salamander	G5T5	W
<i>Hemidactylium scutatum</i>	Four-toed salamander	G5	W
<i>Plethodon dorsalis</i>	Northern zigzag salamander	G4	W
<i>Plethodon wehrlei</i>	Wehrle's salamander	G5	R
<i>Plethodon welleri</i>	Weller's salamander	G3	N
<i>Plethodon yonahlossee pop 1</i>	Crevice salamander	G4T1	N
<i>Pseudotriton montanus</i>	Mud salamander	G5	W
<i>Necturus maculosus maculosus</i>	Mudpuppy	G5T5	W
<i>Pseudacris brachyphona</i>	Mountain chorus frog	G5	R
<i>Scaphiopus holbrookii</i>	Eastern spadefoot	G5	W
<b>Birds</b>			
<i>Falco peregrinus</i>	Peregrine falcon	G4	W
<i>Bonasa umbellus monticola</i>	Ruffed grouse	G5TU	E
<i>Aegolius acadicus acadicus</i>	Northern saw-whet owl	G5TU	E
<i>Sphyrapicus varius appalachiensis</i>	Yellow-bellied sapsucker	G5T?	E
<i>Poecile atricapillus</i>	Black-capped chickadee	G5	E
<i>Sitta canadensis</i>	Red-breasted nuthatch	G5	W
<i>Certhia americana nigrescens</i>	Brown creeper	G5	W
<i>Troglodytes troglodytes pullus</i>	Winter wren	G5TU	W
<i>Regulus satrapa</i>	Golden-crowned kinglet	G5	W
<i>Catharus fuscescens</i>	Veery	G5	W
<i>Hylocichla mustelina</i>	Wood thrush	G5	W
<i>Vireo solitarius alticola</i>	Blue-headed vireo	G5	W
<i>Vermivora chrysoptera</i>	Golden-winged warbler	G4	W
<i>Dendroica caerulescens cairnsi</i>	Black-throated blue	G5TU	E
<i>Dendroica virens virens</i>	Black-throated green warbler	G5TU	W
<i>Dendroica fusca</i>	Blackburnian warbler	G5	W
<i>Dendroica cerulea</i>	Cerulean warbler	G4	W
<i>Mniotilta varia</i>	Black-and-white warbler	G5	W
<i>Helmitheros vermivorus</i>	Worm-eating warbler	G5	W
<i>Limnothlypis swainsonii</i>	Swainson's warbler	G4	W
<i>Wilsonia canadensis</i>	Canada warbler	G5	W
<i>Piranga olivacea</i>	Scarlet tanager	G5	W
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	G5	W
<i>Junco hyemalis</i>	Dark-eyed junco	G5	W
<i>Loxia curvirostra complex</i>	Red crossbill	G5	E

Conservation Targets for the Southern Blue Ridge Ecoregional Plan

Target species	Common name	G Rank	Dist
<b>Fish</b>			
<i>Phoxinus tennesseensis</i>	Tennessee dace	G3	E
<i>Cyprinella caerulea</i>	Blue shiner	G2	P
<i>Cyprinella monacha</i>	Spotfin chub	G2	L
<i>Noturus baileyi</i>	Smoky madtom	G1	E
<i>Noturus flavipinnis</i>	Yellowfin madtom	G1	E
<i>Noturus gilberti</i>	Orangefin madtom	G2	E
<i>Etheostoma cinereum</i>	Ashy darter	G2	E
<i>Etheostoma ditrema</i>	Coldwater darter	G1	P
<i>Etheostoma brevirostrum</i>	Holiday darter	G2	E
<i>Etheostoma percnurum</i>	Duskytail darter	G1	E
<i>Percina burtoni</i>	Blotchside darter	G2	L
<i>Percina macrocephala</i>	Longhead darter	G3	L
<i>Percina squamata</i>	Olive darter	G2	L
<i>Percina jenkinsi</i>	Conasauga logperch	G1	E
<i>Percina sp 3</i>	Muscadine darter	G2	E
<b>Mammals</b>			
<i>Sorex palustris punctulatus</i>	Southern water shrew	G5T3	P
<i>Sorex dispar blitchi</i>	Long-tailed or rock shrew	G4T3	P
<i>Parascalops breweri</i>	Hairy-tailed mole	G5	P
<i>Condylura cristata parva</i>	Southern star-nosed mole	G5T4	L
<i>Myotis grisescens</i>	Gray myotis	G3	P
<i>Myotis sodalis</i>	Indiana or social myotis	G2	P
<i>Corynorhinus townsendii virginianus</i>	Virginia big-eared bat	G4T2	L
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G4	L
<i>Glaucomys sabrinus coloratus</i>	Carolina northern flying squirrel	G5T1	E
<i>Neotoma floridana haematoreia</i>	Southern appalachian woodrat	G5T4	L
<i>Neotoma magister</i>	Allegheny woodrat	G3	P
<i>Microtus chrotorrhinus carolinensis</i>	Southern rock vole	G4T3	E
<i>Synaptomys cooperi</i>	Southern bog lemming	G5	P
<i>Mustela nivalis</i>	Least weasel	G5	P
<b>Reptiles</b>			
<i>Clemmys muhlenbergii</i>	Bog turtle	G3	R
<i>Apalone spinifera spinifera</i>	Eastern spiny softshell	G5T5	W
<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	G5T4	W
<i>Crotalus horridus horridus</i>	Timber rattlesnake	G4T4	W
<b>Mussels</b>			
<i>Stygobromus carolinensis</i>	Carolina seep scud	G?	E
<i>Cambarus georgiae</i>	Little tennessee crayfish	G1	E
<i>Cambarus parrishi</i>	A crayfish	G1	E
<i>Ophiogomphus edmodo</i>	Edmund's snaketail	G1	E
<i>Ophiogomphus howei</i>	Pygmy snaketail	G3	E
<i>Macromia margarita</i>	Mountain river cruiser	G2	P
<i>Alasmidonta raveneliana</i>	Appalachian elktoe	G1	E
<i>Epioblasma florentina walkeri</i>	Tan riffleshell	G1T1	E
<i>Fusconaia barnesiana</i>	Tennessee pigtoe	G2	L
<i>Lampsilis altilis</i>	Finelined pocketbook	G2	P

Conservation Targets for the Southern Blue Ridge Ecoregional Plan

Target species	Common name	G Rank	Dist
<i>Lasmigona subviridis</i>	Green floater	G3	L
<i>Lexingtonia dolabelloides</i>	Slabside pearlymussel	G2	E
<i>Medionidus parvulus</i>	Coosa moccasinshell	G1	L
<i>Pegias fabula</i>	Littlewing pearlymussel	G1	E
<i>Pleurobema georgianum</i>	Southern pigtoe	G1	L
<i>Pleurobema oviforme</i>	Tennessee clubshell	G3	L
<i>Villosa trabalis</i>	Cumberland bean	G2	L
<i>Elimia interrupta</i>	Knotty elimia	G?	E
Plants			
<i>Acrobolbus ciliatus</i>	A Liverwort	G3	P
<i>Cheilolejeunea evansii</i>	A Liverwort	G1	L
<i>Drepanolejeunea appalachiana</i>	A Liverwort	G2	E
<i>Gymnomitrium laceratum</i>	A Liverwort	G1	P
<i>Lophocolea appalachiana</i>	A Liverwort	G1	N
<i>Pedinophyllum interruptum</i>	A Liverwort	G5	P
<i>Plagiochila austinii</i>	A Liverwort	G3	P
<i>Plagiochila corniculata</i>	A Liverwort	G3	P
<i>Porella wataugensis</i>	A Liverwort	G1	N
<i>Porella sp 1</i>	A Liverwort	G1	N
<i>Sphenobolopsis pearsonii</i>	A Liverwort	G2	P
<i>Bartramidula wilsonii</i>	Dwarf apple moss	G3	P
<i>Brachydontium trichodes</i>	Peak moss	G2	P
<i>Entodon concinnus</i>	Lime entodon	G4	P
<i>Hygrohypnum closteri</i>	Closter's brook-hypnum	G3	P
<i>Leptodontium excelsum</i>	Grandfather mountain leptodontium	G2	E
<i>Orthodontium pellucens</i>	Translucent orthodontium	G3	P
<i>Rhabdoweisia crenulata</i>	Himalayan ribbed-weissia	G3	P
<i>Schlotheimia lancifolia</i>	Highlands moss	G2	P
<i>Scopelophila cataractae</i>	Agoyan cataract moss	G3	P
<i>Taxiphyllum alternans</i>	Japanese yew-moss	G3	P
<i>Tortula ammoniana</i>	Ammons's tortula	G1	P
<i>Platyhypnidium pringlei</i>	Pringle's Eurynchium	G2	P
<i>Leptohyemium sharpii</i>	Mount leconte moss	G1	N
<i>Gymnoderma lineare</i>	Rock gnome lichen	G2	E
<i>Hexastylis contracta</i>	Southern heartleaf	G3	P
<i>Hexastylis rhombiformis</i>	French broad heartleaf	G2	N
<i>Liatris helleri</i>	Heller's blazing star	G2	N
<i>Pityopsis ruthii</i>	Ruth's golden aster	G1	N
<i>Rudbeckia triloba var pinnatiloba</i>	Pinnate-lobed black-eyed susan	G4T2	P
<i>Senecio millefolium</i>	Blue ridge ragwort	G2	N
<i>Solidago simulans</i>	Granite dome goldenrod	G1	N
<i>Solidago spithamaea</i>	Blue ridge goldenrod	G1	N
<i>Synosma suaveolens</i>	Sweet-scented indian-plantain	G3	P
<i>Cardamine clematidis</i>	Mountain bitter cress	G2	E
<i>Minuartia godfreyi</i>	Godfrey's stitchwort	G1	P
<i>Minuartia groenlandica</i>	Mountain sandwort	G5	P
<i>Silene ovata</i>	Ovate catchfly	G3	P

Conservation Targets for the Southern Blue Ridge Ecoregional Plan

<b>Target species</b>	<b>Common name</b>	<b>G Rank</b>	<b>Dist</b>
<i>Stellaria alsine</i>	Trailing stitchwort	G5	P
<i>Hudsonia montana</i>	Mountain golden-heather	G1	N
<i>Sedum nevii</i>	Nevius' stonecrop	G3	P
<i>Shortia galacifolia</i> var <i>brevistyla</i>	Northern shortia	G2T1	N
<i>Shortia galacifolia</i> var <i>galacifolia</i>	Southern shortia	G2T2	N
<i>Kalmia carolina</i>	Sheep-laurel	G4	L
<i>Vaccinium macrocarpon</i>	Large cranberry	G4	P
<i>Robinia viscosa</i> var <i>hartwegii</i>	Hartwig's locust	G1T1Q	N
<i>Thermopsis mollis</i> var <i>fraxinifolia</i>	Ash-leaved bush-pea	G3T3Q	P
<i>Gentianopsis crinita</i>	Fringed gentian	G4	P
<i>Fothergilla major</i>	Mountain witch-alder	G3	L
<i>Juglans cinerea</i>	Butternut	G4	P
<i>Myrica gale</i>	Sweet bayberry	G5	P
<i>Phlox buckleyi</i>	Sword-leaved phlox	G2	E
<i>Lysimachia fraseri</i>	Fraser loosestrife	G2	E
<i>Dalibarda repens</i>	Robin runaway	G5	P
<i>Filipendula rubra</i>	Queen-of-the-prairie	G4	P
<i>Geum geniculatum</i>	Bent avens	G2	N
<i>Geum radiatum</i>	Spreading avens	G1	N
<i>Spiraea virginiana</i>	Virginia spiraea	G2	L
<i>Houstonia purpurea</i> var <i>montana</i>	Mountain bluet	G1T2	N
<i>Buckleya distichophylla</i>	Piratebush	G2	L
<i>Sarracenia oreophila</i>	Green pitcher plant	G2	P
<i>Sarracenia rubra</i> ssp <i>jonesii</i>	Mountain sweet pitcher-plant	G1T1	N
<i>Parnassia grandifolia</i>	Large-leaved grass-of-parnassus	G3	P
<i>Sagittaria fasciculata</i>	Bunched arrowhead	G1	N
<i>Carex aenea</i>	Fernald's hay sedge	G5	P
<i>Carex oligosperma</i>	Few-seeded sedge	G4	P
<i>Carex schweinitzii</i>	Schweinitz's sedge	G3	P
<i>Carex radfordii</i>	Radford's sedge	G2	N
<i>Carex</i> sp 2	Fen sedge	G1	N
<i>Rhynchospora alba</i>	White beakrush	G5	P
<i>Sisyrinchium dichotomum</i>	Reflexed blue-eyed grass	G2	N
<i>Juncus caesariensis</i>	New jersey rush	G2	P
<i>Juncus trifidus</i>	Highland rush	G5	P
<i>Helonias bullata</i>	Swamp-pink	G3	P
<i>Lilium grayi</i>	Gray's lily	G3	E
<i>Streptopus amplexifolius</i>	White mandarin	G5	P
<i>Tofieldia glutinosa</i>	Sticky false-asphodel	G5	P
<i>Trillium discolor</i>	Faded trillium	G3	L
<i>Trillium persistens</i>	Persistent trillium	G1	N
<i>Trillium pusillum</i> var <i>virginianum</i>	Virginia least trillium	G3T2	P
<i>Trillium pusillum</i> var 1	Least Trillium	G3T3Q	E
<i>Arethusa bulbosa</i>	Swamp-pink	G4	P
<i>Cypripedium reginae</i>	Showy lady's-slipper	G4	P
<i>Isotria medeoloides</i>	Small whorled pogonia	G2	P
<i>Platanthera integrilabia</i>	White fringeless orchid	G2	P

Conservation Targets for the Southern Blue Ridge Ecoregional Plan

<b>Target species</b>	<b>Common name</b>	<b>G Rank</b>	<b>Dist</b>
<i>Spiranthes lucida</i>	Shining ladies'-tresses	G5	P
<i>Agrostis mertensii</i>	Arctic bentgrass	G5	P
<i>Calamagrostis cainii</i>	Cain's reed-grass	G1	E
<i>Deschampsia cespitosa ssp glauca</i>	Tufted hairgrass	G5T5	P
<i>Glyceria nubigena</i>	Smoky mountains manna-grass	G2	N
<i>Glyceria laxa</i>	Northern mannagrass	G5	P
<i>Hierochloe odorata</i>	Holy grass	G5	P
<i>Poa paludigena</i>	Bog bluegrass	G3	P
<i>Sporobolus heterolepis</i>	Northern dropseed	G5	P
<i>Gymnocarpium appalachianum</i>	Appalachian oak fern	G3	P
<i>Grammitis nimbata</i>	Dwarf polypody	G4	P
<i>Hymenophyllum tunbrigense</i>	Tunbridge fern	G4	P
<i>Hymenophyllum tayloriae</i>	Gorge Filmy Fern	G1	N
<i>Trichomanes petersii</i>	Dwarf filmy-fern	G4	P

## APPENDIX B. LIST OF NATURAL COMMUNITY CONSERVATION TARGETS OF THE SOUTHERN BLUE RIDGE ECOREGION.

Conservation targets, or associations, are listed for each ecological group and sub-group along with common names, global rank, states where the community occurs and the ecoregional distribution. The ecological group itself is used as the target where the taxonomy of the associations is not clearly defined. These groups are denoted by a \*\*. Note that the ecoregional distribution code “E (L)” indicates that the original designation was limited (“L”) for the community occurrence defined as typically found in the ecoregion but occurring in several other ecoregions too), but for the purposes of setting conservation planning goals, limited communities were included with endemics; hence, the notation that the community is endemic with reference to the original limited designation.

ECOLOGICAL GROUP/ASSOCIATION	COMMON NAME	G RANK	STATES OF OCCURRENCE	DIST
<b>High Elevation Forests</b>				
<b>Spruce/Fir Forests</b>				
Picea rubens - (Betula alleghaniensis, Aesculus flava) / Rhododendron (maximum, catawbiense) Forest	Red Spruce - Northern Hardwood Forest (Shrub Type)	G1?	NC?, TN, VA?	E
Picea rubens / Rhododendron maximum Forest	Red Spruce Forest (Protected Slope Type)	G2?	NC, TN, VA, WV	E
Picea rubens - (Abies fraseri) / (Rhododendron catawbiense, Rhododendron maximum) Forest	Red Spruce - Fraser Fir Forest (Evergreen Shrub Type)	G1	NC, TN, VA?	E
Abies fraseri / Viburnum lantanoides / Dryopteris campyloptera - Oxalis montana / Hylocomium splendens Forest	Fraser Fir Forest (Deciduous Shrub Type)	G1	NC, TN	E (L)
Picea rubens – Tsuga canadensis / Rhododendron maximum Forest	Red Spruce - Fraser Fir Forest (Hemlock Type)	G2?	NC, TN, VA?, WV	E (L)
Abies fraseri / (Rhododendron catawbiense, Rhododendron carolinianum) Forest	Fraser Fir Forest (Evergreen Shrub Type)	G1	NC, TN	E (L)
Sorbus americana - (Abies fraseri, Picea rubens) Forest	Red Spruce - Fraser Fir Forest (Mountain Ash Type)	G2Q	NC, TN	E (L)
Picea rubens - (Betula alleghaniensis, Aesculus flava) / Viburnum lantanoides / Oxalis montana - Solidago glomerata Forest	Red Spruce - Northern Hardwood Forest (Herb Type)	G2	NC, TN, VA	E
Picea rubens - (Abies fraseri) / Vaccinium erythrocarpum / Oxalis montana - Dryopteris campyloptera / Hylocomium splendens Forest	Red Spruce - Fraser Fir Forest (Deciduous Shrub Type)	G2	NC, TN, VA	E
<b>Beech Gap Forests</b>				
Fagus grandifolia / Carex pensylvanica - Carex brunnescens Forest	Southern Appalachian Beech Gap (South Slope Sedge Type)	G2	NC, TN, VA?	E
Fagus grandifolia / Ageratina altissima var. roanensis Forest	Southern Appalachian Beech Gap (North Slope Tall Herb Type)	G2	GA?, NC, TN, VA?	E
<b>High Elevation Red Oak or White Oak Forests</b>				
Quercus alba / Kalmia latifolia Forest	High Elevation White Oak Forest	G2Q	GA, NC, SC, TN	E

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
Quercus rubra / Carex pensylvanica – Ageratina altissima var. roanensis Forest	High Elevation Red Oak Forest (Tall Herb Type)	G2	NC, TN, VA	E
Quercus rubra / (Kalmia latifolia, Rhododendron maximum) / Galax urceolata Forest	High Elevation Red Oak Forest (Evergreen Shrub Type)	G4	GA, NC, SC?, TN, VA?, WV?	E
Quercus rubra / (Vaccinium simulatum, Rhododendron calendulaceum) / (Dennstaedtia punctilobula, Thelypteris noveboracensis) Forest	High Elevation Red Oak Forest (Deciduous Shrub Type)	G4	GA, KY?, NC, TN, VA?, WV?	E
<b>“Northern” Hardwoods Forests</b>				
Aesculus flava – Betula alleghaniensis - Acer saccharum / Acer spicatum / Caulophyllum thalictroides – Laportea canadensis Forest	Southern Appalachian Northern Hardwood Forest (Rich Type)	G3	GA, NC, TN, VA	E (L)
Betula alleghaniensis - Fagus grandifolia - Aesculus flava / Viburnum lantanoides / Aster chlorolepis – Dryopteris intermedia Forest	Southern Appalachian Northern Hardwood Forest (Typic Type)	G3G4	NC, TN, VA	E
<b>Forested Boulderfields</b>				
Betula alleghaniensis / Acer spicatum / Hydrangea arborescens - Ribes cynosbati / Dryopteris marginalis Forest	Southern Appalachian Hardwood Boulderfield Forest (Typic Type)	G3	GA, KY, NC, TN, VA?	E
Betula alleghaniensis / Ribes glandulosum / Polypodium appalachianum Forest	Southern Appalachian Boulderfield Forest (Currant And Rockcap Fern Type)	G3	NC, TN, VA, WV	E
Picea rubens / Ribes glandulosum Forest	Appalachian Red Spruce Boulderfield Forest	G1	NC, TN?, VA?	E
<b>Xeric Ridge Forests</b>				
<b>Carolina Hemlock</b>				
Tsuga caroliniana - (Tsuga canadensis) / Rhododendron maximum Forest	Carolina Hemlock Forest (Mesic Type)	G1G2	NC, TN	E
Tsuga caroliniana - Pinus (rigida, pungens) Forest	Carolina Hemlock Forest (Pine Type)	G2	NC, TN	E (L)
Tsuga caroliniana / Kalmia latifolia – Rhododendron catawbiense Forest	Carolina Hemlock Forest (Typic Type)	G2	NC, SC, TN?, VA?	E (L)
<b>Table Mountain Pine/Pitch Pine Woodlands</b>				
Pinus rigida - (Pinus pungens) / Rhododendron catawbiense - Kalmia latifolia / Galax urceolata Woodland	Blue Ridge Table Mountain Pine - Pitch Pine Woodland (High Elevation Type)	G2	NC, TN?, VA?	E
Pinus (pungens, rigida) / Quercus ilicifolia / Gaylussacia baccata Woodland	Central Appalachian Table Mountain Pine - Pitch Pine - Heath Woodland	G3G4	MD, PA, VA, WV	E
Pinus pungens - Pinus rigida (Quercus prinus) / Kalmia latifolia - Vaccinium pallidum Woodland	Blue Ridge Table Mountain Pine - Pitch Pine Woodland (Typic Type)	G3	GA, NC, SC, TN, VA	E
Pinus virginiana - Pinus (rigida, echinata) - (Quercus prinus) / Vaccinium pallidum Forest	Appalachian Low Elevation Mixed Pine Forest	G4?	AL?, GA, KY, MD?, NC, PA?, SC, TN, VA?, WV?	E
<b>**Shortleaf Pine/ Shortleaf Pine – Oak Woodlands</b>				

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
Pinus echinata - Quercus stellata - Quercus marilandica / Vaccinium pallidum Woodland	Southern Blue Ridge Escarpment Shortleaf Pine - Post Oak Woodland	G4?	GA, KY?, NC, TN?	E
Pinus echinata - Quercus (prinus, falcata) / Oxydendrum arboreum / Vaccinium pallidum Forest	Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest	G3G4?	GA, KY?, NC, SC, TN?	E
Pinus echinata - Quercus prinus / Rhododendron minus / Vaccinium pallidum Forest	Southern Blue Ridge Escarpment Shortleaf Pine - Oak Forest (Tallulah Falls)	G2G3	GA, SC	E
Pinus echinata / Vaccinium (pallidum, stamineum) - Kalmia latifolia Forest	Appalachian Shortleaf Pine Forest	G4?	GA, KY, NC, SC, TN	E (L)
<b>White Pine/White Pine-Oak Forests</b>				
Pinus strobus / Kalmia latifolia - (Vaccinium stamineum, Gaylussacia ursina) Forest	Southern Appalachian White Pine Forest	G2G3	GA, NC, SC, TN	E
Pinus strobus - Quercus alba - (Carya alba) / Gaylussacia ursina Forest	Appalachian White Pine - Mesic Oak Forest	G2G3	GA, NC, SC, TN?	E
Pinus strobus - Quercus (coccinea, prinus) / (Gaylussacia ursina - Vaccinium stamineum) Forest	Appalachian White Pine - Xeric Oak Forest	G3	GA, NC, SC, TN, VA?	E
<b>Chestnut Oak Forests</b>				
Quercus prinus - Quercus rubra / Rhododendron maximum / Galax urceolata Forest	Chestnut Oak Forest (Mesic Slope Heath Type)	G3G5	GA, NC, SC, TN, VA?	E
(Quercus prinus - Quercus coccinea) / Kalmia latifolia / Galax urceolata Forest	Chestnut Oak Forest (Xeric Ridge Type)	G5	GA, KY, NC, SC, TN, VA	E (L)
<b>Low Elevation Topographically Protected Forests</b>				
<b>Mountain Cove Forests</b>				
Liriodendron tulipifera - Tilia americana var. heterophylla - (Aesculus flava) / Cimicifuga racemosa Forest	Southern Appalachian Cove Forest (Typic Foothills Type)	G4?	GA, NC, SC, TN?, VA?	E
Tsuga canadensis - Halesia tetraptera - (Fagus grandifolia, Magnolia fraseri) / Rhododendron maximum / Dryopteris intermedia Forest	Southern Appalachian Acid Cove Forest (Silverbell Type)	G2	NC, TN	E
Liriodendron tulipifera - Aesculus flava - (Fraxinus americana, Tilia americana var. heterophylla) / Cimicifuga racemosa - Laportea canadensis Forest	Southern Appalachian Cove Forest (Typic Montane Type)	G4	GA, NC, TN, VA?	E
Aesculus flava - Acer saccharum - (Fraxinus americana, Tilia americana) / Hydrophyllum canadense - Solidago flexicaulis Forest	Southern Appalachian Cove Forest (Rich Montane Type)	G3G4	GA?, NC?, TN, VA?	E (L)
Tsuga canadensis - Liriodendron tulipifera / Rhododendron maximum / Tiarella cordifolia Forest	Southern Appalachian Acid Cove Forest (Typic Type)	G5	GA, NC, SC, TN, VA, WV?	E (L)
Tilia americana var. heterophylla - Fraxinus americana - (Ulmus rubra) / Sanguinaria canadensis - (Aquilegia canadensis, Asplenium rhizophyllum) Forest	Southern Appalachian Cove Forest (Rich Foothills Type)	G2G3	GA, NC, SC, TN?	E
<b>**Hemlock Forests</b>				

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
Tsuga canadensis / Rhododendron maximum - Leucothoe fontanesiana Forest	Southern Appalachian Eastern Hemlock Forest (Typic Type)	G3G4	GA, KY, NC, SC, TN, VA?	E
Pinus strobus - Tsuga canadensis / Rhododendron maximum - Leucothoe fontanesiana Forest	Southern Appalachian Eastern Hemlock Forest (White Pine Type)	G4	GA, KY?, NC, SC, TN, VA?	E
<b>Montane Oak-Hickory Forests</b>				
Quercus prinus - (Quercus rubra) - Carya spp. / Oxydendrum arboreum - Cornus florida Forest	Appalachian Montane Oak Hickory Forest (Chestnut Oak Type)	G4G5	GA, NC, SC, TN, VA?	E
Quercus alba - Quercus rubra - Quercus prinus / Collinsonia canadensis - Podophyllum peltatum - Sanguinaria canadensis Forest	Appalachian Montane Oak - Hickory Forest (Rich Type)	G3	GA?, NC, SC, TN?	E
Quercus muehlenbergii - Juglans nigra / Asarum canadense - Polymnia canadensis Forest	Appalachian Calcareous Oak - Walnut Forest	G2?	NC, SC?, VA?	E (L)
Quercus alba - Quercus (rubra, prinus) / Rhododendron calendulaceum - Kalmia latifolia - (Gaylussacia ursina) Forest	Appalachian Montane Oak Hickory Forest (Typic Acidic Type)	G5	GA, NC, SC, TN	E (L)
Quercus alba - Quercus coccinea - Quercus falcata / Kalmia latifolia - Vaccinium pallidum Forest	Appalachian Montane Oak - Hickory Forest (Low Elevation Xeric Type)	G2G3	NC, SC?	E (L)
Quercus rubra - Acer rubrum - (Carya spp.) / Thelypteris noveboracensis Forest	Appalachian Montane Oak - Hickory Forest (Red Oak Type)	G3G5	GA, NC, SC, TN, VA	P
<b>Glades and Barrens</b>				
<b>Serpentine Barrens</b>				
Pinus rigida - Quercus stellata / Andropogon gerardii - Senecio pauperculus Woodland	Southern Blue Ridge Ultramafic Woodland (Prairie Type)	G1	VA	E
Quercus alba / Physocarpus opulifolius / Senecio plattensis - Hexastylis arifolia var. ruthii Forest	Southern Blue Ridge Ultramafic Outcrop Barren (Deciduous Forest Type)	G1	NC	E (L)
Pinus rigida - Quercus alba / Sporobolus heterolepis - Andropogon gerardii Woodland	Southern Blue Ridge Ultramafic Outcrop Barren (Pitch Pine Woodland Type)	G1	NC	E
Pinus virginiana - Pinus rigida - Quercus stellata / Ceanothus americanus - Kalmia latifolia / Thalictrum revolutum Woodland	Low Elevation Blue Ridge Serpentine Woodland.	G1	GA, NC	E
<b>Shale Barrens</b>				
Pinus virginiana / Schizachyrium scoparium - Carex pennsylvanica Woodland	Blue Ridge Acid Shale Woodland	G2?	NC, TN	E
Pinus virginiana - Quercus prinus - Quercus rubra / Vaccinium pallidum - Kalmia latifolia Forest	Blue Ridge Acid Shale Forest	G2?	NC, SC?, TN	E
Pinus virginiana - Quercus prinus - Juniperus virginiana / Philadelphus hirsutus - Celtis occidentalis Forest	Blue Ridge Calcareous Shale Slope Woodland (Grassy Type)	G2?	NC, TN	E
Carya glabra - Fraxinus americana - Quercus prinus / Ostrya virginiana / Philadelphus hirsutus Woodland	Blue Ridge Calcareous Shale Slope Woodland	G2	TN?, VA	P
<b>Mafic Glades/Barrens/Woodlands</b>				
Kalmia latifolia / Schizachyrium scoparium / Cladonia spp. Shrub Herbaceous Vegetation	Southern Appalachian High Elevation Mafic Glade (Flatrock Type)	G1	NC	E

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
Saxifraga michauxii - Solidago simplex var. randii - Sibbaldiopsis tridentata Herbaceous Vegetation	Southern Appalachian High Elevation Mafic Glade (Summit Type)	G1	VA	E
Schizachyrium scoparium - Sorghastrum nutans - Aletris farinosa - Senecio pauperculus Herbaceous Vegetation	Southern Appalachian Ultramafic Barren	G1	VA	E
Andropogon gerardii - Liatris spicata - Carex buxbaumii Herbaceous Vegetation	Southern Blue Ridge Mafic Prairie	G2?	VA	E
Juniperus virginiana - Quercus stellata / Schizachyrium scoparium - Castilleja coccinea Wooded Herbaceous Vegetation	Southern Blue Ridge Mafic Barren	G1	VA	E
Carya ovata - Fraxinus americana - Quercus stellata / Helianthus divaricatus Woodland	Southern Blue Ridge Mafic Woodland	G1Q	VA	E (L)
<b>Low Elevation Glades and Summits</b>				
Saxifraga michauxii - Chelianthes lanosa - Sedum telephioides Herbaceous Vegetation	Low Elevation Rocky Summit (Basic Type)	G1	GA?, SC?	E
Schizachyrium scoparium - Danthonia spicata / Cladonia spp. Herbaceous Vegetation	Low Elevation Acidic Glade (Grass Type)	G1G2	SC?	E
Selaginella rupestris - Schizachyrium scoparium - Sedum telephioides - Allium cernuum Herbaceous Vegetation	Low Elevation Basic Glade (Montane Type)	G2	VA?	E (L)
Selaginella rupestris - Crotonopsis elliptica – Cheilanthes tomentosa - (Allium cuthbertii) Herbaceous Vegetation	Low Elevation Basic Glade (Brushy Mountain Type)	G1		E (L)
<b>Rock Outcrops</b>				
<b>**Cliffs and Forested Outcrops</b>				
Asplenium ruta-muraria - Pellaea atropurpurea Sparse Vegetation	Montane Cliff (Calcareous Type)	G3G4	AL, GA?, KY, MD, NC, PA, SC, TN, VA, WV	E
Montane cliff (mafic subtype)	Montane Cliff (Mafic Type)	G?		E
Toxicodendron radicans / Heuchera americana - (Dichantheium depauperatum, Woodsia obtusa) Herbaceous Vegetation	Appalachian Mafic Cliff (Low Elevation Type)	G?	AL, GA?, NC?, TN?, VA?	E (L)
Physocarpus opulifolius / Campanula divaricata - Tradescantia subaspera - (Senecio plattensis) Sparse Vegetation	Appalachian Montane Mafic Cliff (Mid-High-Elevation Type)	G1?	NC	E (L)
Asplenium montanum Felsic Cliff Sparse Vegetation	Southern Blue Ridge Felsic Cliff	G3G4	GA, NC, SC, TN, VA	E (L)
Lasallia papulosa - Umbilicaria caroliniana Nonvascular Vegetation	High Elevation Granitic Dome (High Peak Lichen Type)	G2?	NC, TN	W
Umbilicaria mammulata Nonvascular Vegetation	Montane Cliff (Carolina Rocktripe Type)	G4?	GA, NC, SC, TN, VA, WV	W
Thuja occidentalis Southern Forest	Northern White Cedar Forest (Southern Type)	G2?	KY, TN, VA, WV	P
<b>Granitic Domes</b>				
Carya (glabra, alba) - Fraxinus americana - Juniperus virginiana var. virginiana Woodland	Montane Cedar - Hardwood Woodland	G2	GA?, NC, VA?	E (L)
Carex biltmoreana - Pycnanthemum spp. - Krigia montana Herbaceous Vegetation	Southern Appalachian Biltmore Sedge Granitic Dome	G2G3	GA?, NC, SC	E (L)
Selaginella rupestris - Schizachyrium scoparium - Hypericum gentianoides - Bulbostylis capillaris Herbaceous Vegetation	Low Elevation Granitic Dome	G2	NC, SC?	E (L)

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
Selaginella tortipila - Krigia montana - Houstonia longifolia var. glabra Herbaceous Vegetation Spray Cliffs (waterfall associated)	Southern Appalachian Spikemoss Granitic Dome	G2G3	GA, NC, SC	E
Vittaria appalachiana - Heuchera parviflora var. parviflora - Houstonia serpyllifolia / Plagiochila spp. Herbaceous Vegetation	Southern Blue Ridge Spray Cliff	G2	GA, NC, SC, TN	E
<b>High elevation Rocky summits</b>				
<b>Grass Balds</b>				
Danthonia compressa - Sibbaldiopsis tridentata Herbaceous Vegetation	Southern Appalachian Mountain Cinquefoil Bald	G1	NC, TN, VA	E
Carex pensylvanica Herbaceous Vegetation	Grassy Bald (Sedge Type)	G1	NC, TN	E
Danthonia compressa Herbaceous Vegetation	Grassy Bald (Southern Grass Type)	G1	NC, TN	E
<b>Heath Balds</b>				
Kalmia latifolia - (Rhododendron catawbiense) Shrubland	Southern Appalachian Mountain Laurel Bald	G2G3	AL?, GA, NC, TN	E
Rhododendron carolinianum Shrubland	Southern Appalachian Carolina Rhododendron Heath Bald	G2	NC, TN	E
Vaccinium corymbosum - Rhododendron catawbiense Shrubland	Southern Appalachian Blueberry - Catawba Rhododendron Heath Bald	G2	GA?, NC, TN?, VA?	E
Leiophyllum buxifolium Dwarf-shrubland	Southern Appalachian Sand Myrtle Heath Bald	G1	NC, TN	E
Rhododendron catawbiense - Pieris floribunda Shrubland	Heath Bald (Southern Mixed Type)	G1	NC, TN	E
Rhododendron catawbiense Shrubland	Southern Appalachian Catawba Rhododendron Heath Bald	G2	GA, NC, TN, VA	E
Alnus viridis ssp. crispa / Carex pensylvanica Shrubland	Southern Appalachian Alder Bald	G1	NC, TN	E
Quercus rubra / Rhododendron catawbiense - Rhododendron arborescens Woodland	Granite Dome Heath Bald Oak Woodland	G2	GA, NC, SC?	E
<b>Rocky Summits</b>				
Schizachyrium scoparium - Saxifraga michauxii - Coreopsis major Herbaceous Vegetation	Southern Appalachian High Elevation Rocky Summit (Little Bluestem Type)	G1	NC	E
Saxifraga michauxii - Carex misera - Aster acuminatus - Solidago glomerata Herbaceous Vegetation	Southern Appalachian High Elevation Rocky Summit (High Peak Type)	G1	NC, TN	E
Saxifraga michauxii - Carex misera - Calamagrostis cainii Herbaceous Vegetation	Southern Appalachian High Elevation Rocky Summit (Anakeesta Type)	G1	TN	E
Saxifraga michauxii - Carex misera - Danthonia spicata - Krigia montana Herbaceous Vegetation	Southern Appalachian High Elevation Rocky Summit (Mafic Type)	G2	NC, TN, VA?	E
Saxifraga michauxii Herbaceous Vegetation	Low Elevation Rocky Summit (Acidic Type)	G3?	GA, NC, SC, TN, VA	E
<b>Non-alluvial Wetlands</b>				
<b>Beaver Ponds and Wetland Complex</b>				
Sparganium americanum - Epilobium leptophyllum Herbaceous Vegetation	Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type)	G1?	NC, VA?	E

ECOLOGICAL GROUP/ASSOCIATION	COMMON NAME	G RANK	STATES OF OCCURRENCE	DIST
<b>Mafic and Calcareous Fens</b>				
Alnus serrulata / Sanguisorba canadensis / Parnassia grandifolia - Helenium brevifolium Shrubland	Southern Appalachian Fen (Muck Type)	G1	NC?, VA	E
Cladium mariscoides - Sanguisorba canadensis / Sphagnum subsecundum Herbaceous Vegetation	Southern Appalachian Ultramafic Fen	G1	NC	E
Alnus serrulata / Sanguisorba canadensis - Calamagrostis canadensis Shrubland	Southern Appalachian Ultramafic Fen (Tall Herb Type)	G1	VA	E
Pinus strobus - Acer rubrum / Spiraea alba var. latifolia / Sanguisorba canadensis Woodland	Southern Blue Ridge Mafic Woodland Seep	G1	NC?, VA	E
Carex leptalea - Parnassia grandifolia - Rhynchospora alba Herbaceous Vegetation	Southern Appalachian Ultramafic Fen (Short Graminoid Type)	G1	NC?, VA	E
Pinus strobus - Physocarpus opulifolius / Rhamnus alnifolia / Parnassia grandifolia Woodland	Southern Appalachian Ultramafic Fen Woodland	G2	VA	E
<b>Sphagnum and Shrub Bogs and Seeps</b>				
Pinus rigida / Toxicodendron vernix / Gaylussacia baccata / Symplocarpus foetidus Woodland	Southern Appalachian Pitch Pine Bog Forest	G1	NC	E
Rhododendron maximum / Sphagnum spp. Shrubland	Southern Appalachian Bog (Rhododendron Type)	G2G3 Q	NC, TN, VA	E
Rhododendron (maximum, catawbiense) - Ilex collina - Salix sericea / Carex trisperma - Eriophorum virginicum Shrubland	Southern Appalachian Shrub Bog (Long Hope Valley Type)	G1	NC, VA	E
Alnus serrulata - Rhododendron arborescens / Sarracenia oreophila - Rhynchospora rariflora Shrubland	Southern Appalachian Low Mountain Seepage Bog	G1	AL?, GA, NC	E
Alnus serrulata - Kalmia carolina - Rhododendron catawbiense - Spiraea alba / Carex folliculata - Lilium grayi Shrubland	Southern Appalachian Shrub Bog (Typic Type)	G1G2	NC, TN?, VA	E
Alnus serrulata - Rhododendron viscosum - Rhododendron maximum / Juncus gymnocarpus - Chelone cuthbertii Shrubland	Southern Appalachian Bog (Low Elevation Type)	G1G2	GA, NC, SC, TN, VA?	E
Alnus serrulata - Viburnum nudum var. nudum - Chamaedaphne calyculata / Woodwardia areolata - Sarracenia rubra ssp. jonesii Shrubland	Southern Appalachian Bog (French Broad Valley Type)	G1	NC	E
Carex (atlantica, echinata) - Eriophorum virginicum - Rhynchospora capitellata - Solidago patula Herbaceous Vegetation [Provisional]	Southern Appalachian Herb Bog (Placeholder)	G?	GA?, SC, TN, WV?	E
Carex atlantica - Rhynchospora alba - Parnassia asarifolia / Sphagnum warnstorffii Herbaceous Vegetation	Southern Appalachian Herb Bog (Long Hope Valley Type)	G1	NC	E
Carex atlantica - Solidago patula var. patula - Lilium grayi / Sphagnum bartlettianum Herbaceous Vegetation	Southern Appalachian Herb Bog (Typic Type)	G1	NC, TN?, VA?	E
Carex gynandra - Platanthera clavellata - Drosera rotundifolia - Carex ruthii - Carex atlantica - Sphagnum spp. Herbaceous Vegetation	Blue Ridge High Elevation Seep (Sedge Type)	G2	NC, TN, VA?	E (L)

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
<b>Swamp Forest-Bog Complex</b>				
Picea rubens / Ilex collina / Carex trisperma Woodland	Swamp Forest-Bog Complex (Long Hope Valley Woodland Type)	G1	NC, VA, WV	E
Picea rubens - (Tsuga canadensis) / Rhododendron maximum Saturated Forest	Swamp Forest - Bog Complex (Spruce Type)	G2?	MD, NC, PA, TN, VA, WV	E (L)
Tsuga canadensis - Acer rubrum - (Liriodendron tulipifera, Nyssa sylvatica) / Rhododendron maximum / Sphagnum spp. Forest	Swamp Forest-Bog Complex (Typic Type)	G2G3	GA, KY, NC, SC, TN, VA	E (L)
<b>Forested Seeps</b>				
Impatiens (capensis, pallida) - Monarda didyma - Rudbeckia laciniata var. humilis Herbaceous Vegetation	Rich Montane Seep (High Elevation Type)	G3	GA, NC, SC?, TN, VA?	E
Diphylleia cymosa - Saxifraga micranthidifolia - Laportea canadensis Herbaceous Vegetation	Rich Montane Seep (Cove Type)	G3	GA, NC, SC?, TN, VA	E
Chrysosplenium americanum Herbaceous Vegetation [Provisional]	Golden-Saxifrage Seep	G3G5	GA?, MD, NC, NH?, NY?, PA, TN, VA, WV	E
Acer rubrum var. trilobum - Nyssa sylvatica / Osmunda cinnamomea – Chasmanthium laxum - Carex intumescens / Sphagnum lescurii Forest	Cumberland Forested Acid Seep	G3?	AL?, KY, TN	P
<b>Upland Pools</b>				
Scirpus cyperinus - Dulichium arundinaceum / Sphagnum spp. Herbaceous Vegetation	Southern Appalachian Montane Upland Pool	G1Q	GA, NC, SC?, VA?	E (L)
Liquidambar styraciflua / Sphagnum spp. Forest	Gum Swamp Upland Pool	G1Q	NC, TN	E
<b>Alluvial Habitats</b>				
<b>River Gravel/Cobble Bar</b>				
Alnus serrulata - Xanthorhiza simplicissima Shrubland	Rocky Bar And Shore (Alder-Yellowroot Type)	G3	KY, NC, SC, TN	E
Justicia americana Herbaceous Vegetation	Water-Willow Wetland	G4G5	AL, AR, DE, GA, MD?, NC, OH, OK, PA, SC?, TN, VA?, WV	E
Podostemum ceratophyllum Herbaceous Vegetation	Rocky Bar And Shore (Riverweed Type)	G5	AL, AR, CT, DE, GA, KY, MA, MD, ME, NC, NH, NJ, NY, OK, PA, RI, SC, TN, VA, VT	E
Carex torta Herbaceous Vegetation	Rocky Bar And Shore (Twisted Sedge Type)	G3G4	AL?, GA, KY?, NC, SC, TN, VA	E (L)
<b>**Montane Alluvial Forests</b>				
Platanus occidentalis - Liriodendron tulipifera - Betula (alleghaniensis, lenta) / Alnus serrulata - Leucothoe fontanesiana Forest	Montane Alluvial Forest (Large River Type)	G2?	NC, SC, TN	E
Platanus occidentalis - Fraxinus pennsylvanica - Acer negundo / Boehmeria cylindrica Forest	Montane Alluvial Forest (Cades Cove)	G3G4	KY, TN	E

<b>ECOLOGICAL GROUP/ASSOCIATION</b>	<b>COMMON NAME</b>	<b>G RANK</b>	<b>STATES OF OCCURRENCE</b>	<b>DIST</b>
Tsuga canadensis - (Pinus strobus) Temporarily Flooded Forest [Provisional]	Montane Alluvial Forest (Small River Type)	G?	GA, KY?, NC, SC, TN, VA	E (L)
Acer rubrum var. trilobum - Fraxinus pensylvanica / Carex crinita – Peltandra virginica Forest	Montane Floodplain Slough Forest	G1G2	NC	E (L)
<b>Floodplain Pool</b>				
Peltandra virginica - Saururus cernuus - Carex crinita / Climacium americanum Herbaceous Vegetation	Floodplain Pool	G2?	DE?, MD?, NC, NJ?, TN?	E
<b>Montane Canebrakes</b>				
Arundinaria gigantea ssp. gigantea Shrubland	Interior Highlands Canebrake	G2?	AL, AR, GA, KY, LA, MS, NC, OK, SC, TN, VA?	E
<b>Caves</b>				
Solution Cave	Solution Cave	G?	NC, TN	W
Fissure Cave	Fissure Cave	G?	GA, SC, TN, NC	W

## APPENDIX C. PORTFOLIO SITES OF THE SOUTHERN BLUE RIDGE ECOREGION

Each site is listed with a polygon identification number (to be cross-referenced with Map 5 – numbers are spatially ordered from north to south and west to east), total acreage, state(s) of occurrence, conservation approach, indication that there is involvement at the site by either The Nature Conservancy or a state Natural Heritage Program (“TNC/HP” column), the total number of elements and the total number of element occurrence records (“Total EORs”). Bolded sites are the priority Action Sites for the ecoregion. Please note that this list includes all individual sub-sites of a given site (e.g. the Amphibolites have 9 sub-sites); these are denoted by a letter attached to the identification number of the site (e.g. 27A, 27B, 27C, etc.). Categories for “State”, “Conservation Approach”, “Total Elements” and “Total EORs” are only listed once for the entire macro-site; however, in some cases the conservation approach differs for sub-sites and is indicated as such.

Site Name	ID	Acres	State	Conservation Approach	TNC/ NHP	Total Elements	Total EORs
Alarka Laurel	124	2126.15	NC	Site on Public Lands		8	8
Amicalola/Little Amicalola Creeks	217	3900.44	GA	Public-lands Partnership	Yes	1	3
<b>Amphibolites</b>	<b>27A</b>	<b>2445.53</b>	<b>NC</b>	<b>Community-based Site</b>	<b>Yes</b>	<b>42</b>	<b>84</b>
<b>Amphibolites</b>	<b>27B</b>	<b>952.12</b>					
<b>Amphibolites</b>	<b>27C</b>	<b>383.80</b>					
<b>Amphibolites</b>	<b>27D</b>	<b>2223.46</b>					
<b>Amphibolites</b>	<b>27E</b>	<b>6376.05</b>					
<b>Amphibolites</b>	<b>27F</b>	<b>7617.26</b>					
<b>Amphibolites</b>	<b>27G</b>	<b>402.09</b>					
<b>Amphibolites</b>	<b>27H</b>	<b>869.72</b>					
<b>Amphibolites</b>	<b>27I</b>	<b>381.74</b>					
<b>Amphibolites</b>	<b>27J</b>	<b>175.21</b>					
<b>Amphibolites</b>	<b>27K</b>	<b>1830.92</b>					
Anthony Creek Swamp Forest-Bog	66	3.95	NC	Functional Site – private		1	1
Bacchus Spiraea Sites	81	93.87	NC/TN	Functional Site – private		1	2
Bald Knob	78	12.24	NC	Functional Site – private		1	1
Bald/Bank Mountain	116	1160.14	NC	Functional Site - private		7	7
Balsam Mountains	115	142835.25	NC	Public-lands Partnership	Yes	58	159
Bates Branch	167	56.36	NC	Functional Site - private		1	1
Beaver Creek Wetlands	16	289.65	VA	Functional Site - private		3	3
Beech Creek Bog	47	98.18	NC	Functional Site - private	Yes	2	2
Bent Creek	110	27.70	NC	Site on Public Lands	Yes	1	1
Big Bald	69	1972.70	NC/TN	Public-lands Partnership		4	4
Big Branch	8	58.83	VA	Functional Site - private		1	1
Big Creek	62	7676.10	NC/TN	Public-lands Partnership		7	7
Big Laurel Branch	37	10061.96	TN	Public-lands Partnership		13	19
Big Pine Creek Bog	25	26.15	NC	Site on Public Lands		3	3
Big Ridge/Spice Cove	158	573.11	NC	Site on Public Lands		3	3
Black Mountain	214	757.27	GA	Site on Public Lands		1	1
<b>Black Mountains</b>	<b>82</b>	<b>116811.87</b>	<b>NC</b>	<b>Community-based Site</b>	<b>Yes</b>	<b>56</b>	<b>154</b>
Blackwell Creek	215	116.33	GA	Site on Public Lands		1	1
Blood Mt./Coosa Bald/ Sosebee Cove	204	3220.52	GA	Public-lands Partnership		3	4
Blowing Rock	57	27.53	NC	Functional Site - private	Yes	1	1
Blue Ridge Assembly	102	123.82	NC	Functional Site - private		1	1
Bog Turtle Macrosite	5	9907.41	VA	Functional Site - private		3	13

**Portfolio Sites for the Southern Blue Ridge Conservation Plan**

Site Name	ID	Acres	State	Conservation Approach	TNC/NHP	Total Elements	Total EORs
Bottom Creek Gorge/S.Fork Roanoke	1	18784.73	VA	Community-based Site	Yes	1	8
Brasstown Bald	192	1700.15	GA	Site on Public Lands		4	4
Brasstown Creek	210	7340.61	SC	Site on Public Lands		5	8
Broad River/ <i>Hexastylis contracta</i>	105	174.92	NC	Functional Site - private		1	2
Brush Creek Bog	30	162.40	NC	Functional Site - private	Yes	4	4
<b>Buck Forest/Mt. Bridge</b>	<b>144</b>	<b>49607.72</b>	<b>NC/SC</b>	<b>Public-lands Partnership</b>	<b>Yes</b>	<b>32</b>	<b>87</b>
Buffalo Creek Poa paludigena	32	53.95	NC	Functional Site - private		1	1
<b>Buffalo Mountain</b>	<b>9</b>	<b>3783.86</b>	<b>VA</b>	<b>Functional Site - private</b>	<b>Yes</b>	<b>13</b>	<b>16</b>
Buffalo Mountain Whorled Pogonia	41	53.29	TN	Site on Public Lands		1	1
Bull Hole Woods	89	7.23	NC	Functional Site - private		1	1
Buzzard Roost	206	7236.84	SC	Site on Public Lands		8	13
Bynum Pell Loosestrife	195	53.41	SC	Functional Site - private		1	1
Camp Branch Falls	137	4.61	NC	Site on Public Lands		1	1
Camp Creek	4	592.04	VA	Functional Site - private		2	2
Cane Creek Silene	128	35.79	NC	Functional Site - private		1	1
Cane River Spiraea	71	124.69	NC/TN	Public-lands Partnership		1	1
Canton Watershed/The Glades	98	32.35	NC	Site on Public Lands	Yes	1	1
Cartoogechaye Creek	155	1352.55	NC	Functional Site - private		2	2
Cashes Valley	194	314.74	GA	Site on Public Lands		1	2
Cedar Cliff Mountain	139	70.98	NC	Functional Site - private		2	2
Cedar Cliff/Little Cedar Mountain	101	1250.78	NC	Functional Site - private		2	3
Cedar Cliff/The Pinnacle	168	562.83	NC	Site on Public Lands		4	5
Cedar Creek Cove	68	913.80	TN	Site on Public Lands		2	3
Celo Natural Area	86	676.15	NC	Functional Site - private	Yes	2	2
Chattooga/Highland Plateau	161	119628.64	NC/SC/GA	Community-based Site	Yes	59	221
Chauga River Gorge	203	6578.70	SC	Public-lands Partnership	Yes	5	11
Cheoah River	113	4582.82	NC	Community-based Site		2	8
Christmount Natural Area	99	358.11	NC	Functional Site - private		1	1
Citico Creek	103	47577.78	TN	Public-lands Partnership		10	29
Cold Spring Bog	93	24.95	NC	Site on Public Lands		2	2
Commissioners Rock Bog	182	569.02	NC/GA	Functional Site - private		2	2
<b>Conasagua River Watershed</b>	<b>174</b>	<b>66836.42</b>	<b>TN/GA</b>	<b>Community-based Site</b>	<b>Yes</b>	<b>9</b>	<b>31</b>
Coward Knob/Judaculla Cliffs	131A	48.97	NC	Functional Site - private		3	7
Coward Knob/Judaculla Cliffs	131B	28.72					
Coward Knob/Judaculla Cliffs	131C	379.68					
Coweeta	172	60.86	NC	Functional Site - private		1	1
Cox Bog	12	690.41	VA	Functional Site - private		7	7
Crabtree Bald	97	28.42	NC	Functional Site - private		1	1
Cranberry Iron Mines	54	81.79	NC	Functional Site - private	Yes	1	1
Cullasaja River	156	67.32	NC	Functional Site - private		1	1
Cumberland Knob	21	1001.74	NC	Public-lands Partnership		4	4
Dark Ridge	117	24.61	NC	Functional Site - private		1	1
Davenport State Natural Area	171	710.72	TN	Functional Site - private	Yes	2	4
Deep Gap Bog	43	10.75	NC	Site on Public Lands	Yes	3	3

**Portfolio Sites for the Southern Blue Ridge Conservation Plan**

<b>Site Name</b>	<b>ID</b>	<b>Acres</b>	<b>State</b>	<b>Conservation Approach</b>	<b>TNC/NHP</b>	<b>Total Elements</b>	<b>Total EORs</b>
Die Bend	175	55.90	NC	Site on Public Lands		3	4
Dismal Cave	191	2375.75	GA	Site on Public Lands		1	2
Doe Creek	33	1144.21	TN	Functional Site - private		3	3
Elk Mills Shining Ladies' Tresses	40	48.69	TN	Functional Site - private		1	1
Ellijay Creek	153	83.26	NC	Functional Site - private		1	1
Embreeville Spray Cliff	48	427.88	TN	Site on Public Lands		1	1
<b>Escarpment Gorges</b>	<b>164A</b>	<b>16213.94</b>	<b>NC/SC</b>	<b>Public-lands Partnership</b>	<b>Yes</b>	<b>37</b>	<b>136</b>
<b>Escarpment Gorges</b>	<b>164B</b>	<b>6998.73</b>					
<b>Escarpment Gorges</b>	<b>164C</b>	<b>39384.68</b>					
Etowah	129A	48.51	NC	Functional Site - private	Yes	4	6
Etowah	129B	2.39					
Etowah	129C	46.48					
Etowah River Headwaters	216	4551.29	GA	Public-lands Partnership		1	3
Fall Creek Falls	61	52.69	NC	Functional Site - private		2	2
Fines Creek	95	29.90	NC	Site on Public Lands		1	2
Fires Creek	157	14560.67	NC	Public-lands Partnership		2	5
Fisher Peak Wetlands	20	435.71	VA	Functional Site - private		1	1
Fort Mountain	200	2481.08	GA	Public-lands Partnership	Yes	1	1
Foster Creek	118	6.36	NC	Site on Public Lands		2	2
Franklin Spirea	152	70.11	NC	Functional Site - private		1	1
Gipp Creek	135	1730.22	NC	Site on Public Lands		1	1
<b>Grandfather Mountain</b>	<b>50</b>	<b>70095.04</b>	<b>NC</b>	<b>Public-lands Partnership</b>	<b>Yes</b>	<b>46</b>	<b>123</b>
Grassy Branch Falls and Bog	142	21.54	NC	Functional Site - private		1	1
Grassy Squirrel Gap	146	41.56	NC	Site on Public Lands		1	1
Great Smoky Mountain National Park	83A	508938.37	NC/TN	Public-lands Partnership		86	385
Great Smoky Mountain National Park	83B	111184.67	TN	Community-based Site		86	385
Great Smoky Mountain National Park	83C	3003.79	TN	Community-based Site		86	385
Green Mountain	63	1039.45	TN	Site on Public Lands		2	13
<b>Green River Gorge/Tryon Peak</b>	<b>125</b>	<b>29312.85</b>	<b>NC</b>	<b>Public-lands Partnership</b>	<b>Yes</b>	<b>22</b>	<b>41</b>
Greystone Mountain	59	930.85	TN	Functional Site - private		1	4
Hanging Dog Creek	154	2033.14	NC	Functional Site - private		1	1
Hanging Rock	53	2475.67	NC	Functional Site - private	Yes	13	14
Hendersonville Wetland Flats	130A	81.21	NC	Functional Site - private	Yes	8	15
Hendersonville Wetland Flats	130B	272.90					
Hendersonville Wetland Flats	130C	6.79					
Hendersonville Wetland Flats	130D	47.77					
Hendersonville Wetland Flats	130E	15.77					
Hendersonville Wetland Flats	130F	6.46					
Hendersonville Wetland Flats	130G	46.62					
Hiawasee Church Bluffs	165	60.25	NC	Site on Public Lands		2	2
<b>Hiawasee Seeps</b>	<b>181</b>	<b>778.10</b>	<b>NC/GA</b>	<b>Functional Site - private</b>	<b>Yes</b>	<b>3</b>	<b>5</b>
Hickory Knoll Creek/Little TN R.	169	61.55	NC	Functional Site - private		1	2
<b>Hickory Nut Gorge</b>	<b>109</b>	<b>34007.98</b>	<b>NC</b>	<b>Community-based Site</b>	<b>Yes</b>	<b>36</b>	<b>104</b>

**Portfolio Sites for the Southern Blue Ridge Conservation Plan**

Site Name	ID	Acres	State	Conservation Approach	TNC/ NHP	Total Elements	Total EORs
High Rock	76	367.93	NC/TN	Site on Public Lands		1	2
Hightower Bald	184	411.90	NC/GA	Site on Public Lands		1	1
Hillsville Cranberry	10	351.96	VA	Functional Site - private		1	1
Hunter Marsh	35	393.98	TN	Functional Site - private		1	2
Ivy River Dam Cliffs	90	37.33	NC	Functional Site - private		1	1
Ivylog Meadow	190	237.59	GA	Functional Site - private		1	1
Jenkins Ridge	106	13.98	NC	Functional Site - private		1	2
Jonas Ridge/Cranberry	75A	189.12	NC	Functional Site - private		2	4
Jonas Ridge/Cranberry	75B	156.16				2	4
Kenner Creek	187	1393.20	GA	Site on Public Lands		2	2
Kirby Knob/Bryson Branch	140	450.39	NC	Site on Public Lands		1	2
Lamance Heartleaf	151	166.05	NC	Site on Public Lands		1	2
Laurel Branch Bog	31	45.53	NC	Functional Site - private	Yes	2	2
Laurel Branch Heartleaf	123	4.09	NC	Functional Site - private		1	1
Laurel Creek	23	837.19	TN	Functional Site - private		1	2
Laurel Fork Robin Runaway Site	34	55.95	NC	Site on Public Lands		2	2
Lemon Gap	84	1954.58	NC/TN	Site on Public Lands		2	4
Linville Caverns	80	659.71	NC	Functional Site - private		6	8
Linville Gap (Invershiel) Bog	55	14.36	NC	Functional Site - private	Yes	4	4
Linville Gorge	77	11209.77	NC	Public-lands Partnership	Yes	23	38
Little Glade Creek Wetlands	28	83.21	NC	Site on Public Lands		2	2
<b>Little Tennessee River</b>	<b>122</b>	<b>10061.26</b>	<b>NC</b>	<b>Community-based Site</b>	<b>Yes</b>	<b>8</b>	<b>18</b>
Locust Gap	38	532.11	NC	Functional Site - private		1	1
Lower French Broad	79A	1540.13	NC	Public-lands Partnership		11	18
Lower French Broad	79B	1197.57					
Lower French Broad	79C	331.80					
Lower Hiwasee	134	11887.08	TN	Public-lands Partnership		7	13
Lower New River	7A	17745.51	VA	Community-based Site		6	10
Lower New River	7B	591.64	VA	Functional Site - private			
Lower New River	7C	219.25	VA	Functional Site - private			
Lower New River	7D	442.14	VA	Functional Site - private			
Max Mountain	3	27.91	VA	Functional Site - private		1	1
McDowell Mt.	178	272.06	NC	Functional Site - private		5	5
Middle Creek	176	60.17	NC	Functional Site - private		1	1
Middle Creek Falls	179	240.93	NC	Site on Public Lands		1	1
Mills River Heartleaf	121	53.64	NC	Functional Site - private		2	2
Mitchell River Watershed	24	34551.02	NC	Community-based Site	Yes	9	9
Molly Osbourne Shoals	18	187.32	VA	Functional Site - private		1	1
Moore Knob	147	119.38	NC	Functional Site - private		2	2
Mountaintown Creek	198	3234.95	GA	Functional Site - private		1	5
<b>Mt. Rogers</b>	<b>11</b>	<b>20222.50</b>	<b>VA</b>	<b>Public-lands Partnership</b>	<b>Yes</b>	<b>19</b>	<b>39</b>
Mull Mountain	186	368.20	GA	Functional Site - private		1	1
Mullin Hill Bog	74	158.98	NC	Functional Site - private		2	2
Muskrat Creek	162	70.01	NC	Functional Site - private		1	1
Naked Place Mountain	92	150.48	NC	Site on Public Lands		3	3
Nantahala Bird Habitat	133	27038.36	NC	Public-lands Partnership		1	5

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Site Name	ID	Acres	State	Conservation Approach	TNC/NHP	Total Elements	Total EORs
Nantahala Gorge	127	13310.40	NC	Public-lands Partnership		7	7
Newfound Mountain/Rockyface	100	452.43	NC	Functional Site - private		2	2
Nolichucky Gorge	58	11369.22	NC/TN	Public-lands Partnership		6	11
Nolichucky/Cane/Toe Rivers	45A	5655.64	NC/TN	Community-based Site		7	16
Nolichucky/Cane/Toe Rivers	45B	3607.54					
Nolichucky/Cane/Toe Rivers	45C	42974.46					
North and South Fork New River	22	49705.33	NC	Community-based Site	Yes	3	7
North Prong Sumac Creek	189	750.53	GA	Functional Site - private		1	1
North Shortia Cluster	91A	14.01	NC	Functional Site - private		1	5
North Shortia Cluster	91B	13.29					
North Shortia Cluster	91C	78.26					
North Shortia Cluster	91D	89.24					
North Shortia Cluster	91E	73.16					
North Shortia Cluster	91F	74.28					
Ocoee River	163	4841.85	TN	Community-based Site		4	16
Onion Cliff	149	72.76	NC	Functional Site - private		2	2
Pacolet/Blue Wall	141	15770.38	NC/SC	Community-based Site	Yes	8	19
Paint Rock	73	6065.06	NC/TN	Site on Public Lands		3	9
Painter Creek	56	924.52	TN	Site on Public Lands		1	1
Peter Knob	209	297.44	GA	Site on Public Lands		1	1
Pigeon River Buckleya	85	1331.41	TN	Functional Site - private		2	2
Pigeon River Gorge	88	9027.03	NC	Public-lands Partnership		14	19
Pineola Bog	65	142.34	NC	Functional Site - private	Yes	4	4
Plott Balsam Mountains	111	7193.02	NC	Public-lands Partnership		16	24
Plott Balsams/GSMNP Bird Corridor	104	2335.21	NC	Public-lands Partnership			
Poinette Reservoir	150	19109.99	SC	Public-lands Partnership		7	8
Pond Mountain	19	51.10	TN	Functional Site - private		1	1
Poor Mountain	2A	836.56	VA	Functional Site - private	Yes	2	2
Poor Mountain	2B	82.80					
Pyatte Bog	67	403.74	NC	Functional Site - private		3	6
Rablin Bald	185	1406.72	GA	Site on Public Lands		3	3
Raven Cliff	96	164.86	NC	Functional Site - private		4	5
Rendezvous Mountain	44	167.01	NC	Site on Public Lands		3	3
Rich Mountain	205	4986.39	GA	Public-lands Partnership		3	3
Ripshin Bog	51	593.18	TN	Functional Site - private		1	1
<b>Roan Mountain</b>	<b>52A</b>	<b>26385.82</b>	<b>NC/TN</b>	<b>Public-lands Partnership</b>	<b>Yes</b>	<b>46</b>	<b>154</b>
<b>Roan Mountain</b>	<b>52B</b>	<b>2135.58</b>	<b>NC/TN</b>		<b>Yes</b>		
<b>S. Alleghany Bog Cluster</b>	<b>36A</b>	<b>9.22</b>	<b>NC</b>	<b>Functional Site - private</b>	<b>Yes</b>	<b>4</b>	<b>7</b>
<b>S. Alleghany Bog Cluster</b>	<b>36B</b>	<b>49.14</b>					
<b>S. Alleghany Bog Cluster</b>	<b>36C</b>	<b>5.15</b>					
<b>S. Alleghany Bog Cluster</b>	<b>36D</b>	<b>6.08</b>					
<b>S. Alleghany Bog Cluster</b>	<b>36E</b>	<b>62.63</b>					
Sandy Bottom	107	27.46	NC	Functional Site - private	Yes	3	4
Sandy Mash/Turkey Creek Gorge	94	683.28	NC	Functional Site - private		3	7
Seniard Cr. Swamp Forest-Bog	119	5.62	NC	Site on Public Lands		1	1

**Portfolio Sites for the Southern Blue Ridge Conservation Plan**

Site Name	ID	Acres	State	Conservation Approach	TNC/NHP	Total Elements	Total EORs
Sevenmile Ridge	87	20.53	NC	Site on Public Lands		3	3
<b>Shady Valley</b>	<b>15</b>	<b>38029.47</b>	<b>TN</b>	<b>Community-based Site</b>	<b>Yes</b>	<b>15</b>	<b>26</b>
Sheenah Creek	166	67.32	NC	Functional Site - private		1	1
Soco Falls	108	11.85	NC	Functional Site - private		1	1
Sparta Bog	26	261.23	NC	Site on Public Lands		6	6
Spivey Creek	64	494.15	TN	Site on Public Lands		1	1
<b>Standing Indian/Nantahala Headwaters</b>	<b>159</b>	<b>57409.72</b>	<b>NC</b>	<b>Public-lands Partnership</b>		<b>37</b>	<b>81</b>
Starr Mountain	126	1678.20	TN	Site on Public Lands		4	5
Stone Mountain Escarpment	29	33379.12	NC	Public-lands Partnership	Yes	13	21
Sugar Mountain Bog	60	207.22	NC	Functional Site - private	Yes	6	6
Sugarloaf	70	285.96	NC	Public-lands Partnership		2	2
Sumter Loosestrife	202	797.76	SC	Site on Public Lands	Yes	1	2
Table Rock Reservoir	170	8484.70	SC	Public-lands Partnership	Yes	7	11
Table Rock State Park	177	7813.82	SC	Site on Public Lands		8	17
Tallulah Gorge	212	4883.36	SC/GA	Public-lands Partnership	Yes	9	13
Tellico	120	56448.26	TN	Public-lands Partnership		14	33
Tessentee Creek	173	78.16	NC	Functional Site - private		1	1
<b>The Glades</b>	<b>14</b>	<b>7546.12</b>	<b>VA</b>	<b>Functional Site - private</b>	<b>Yes</b>	<b>20</b>	<b>54</b>
Tiger Creek Cove	46	433.63	TN	Site on Public Lands	Yes	1	1
Toccoa River/Cooper Creek/Flat Creek Bog	207	1455.82	GA	Site on Public Lands		1	2
Toccoa River/Stanley Creek	201	535.25	GA	Site on Public Lands		1	1
Toms Swamp	208	591.29	GA	Site on Public Lands	Yes	1	1
Trackrock Gap	193	416.59	GA	Site on Public Lands		1	1
Tray Mountain	199	1108.40	GA	Site on Public Lands		2	2
Tuckasegee River	114	15682.39	NC	Community-based Site	Yes	5	10
Tuckasegee River Riparian Habitat	138	445.33	NC	Functional Site - private		4	4
Tululah Bog	132	392.97	NC	Functional Site - private		1	1
Turniptown Creek	211	988.53	GA	Functional Site - private		1	2
Unaka Mountain	49	13343.86	NC/TN	Public-lands Partnership		11	28
Unicoi Mountains Cluster	112	43434.93	NC	Public-lands Partnership		16	23
Upper Holly Creek	197	865.82	GA	Functional Site - private		1	1
Upper Little Tennessee River	180	928.11	NC/GA	Functional Site - private		2	4
Upper Tallulah River	183	949.80	NC/GA	Functional Site - private		3	4
Upper Tuckasegee	143	17343.65	NC	Public-lands Partnership	Yes	17	37
Valley River	148	3725.38	NC	Community-based Site		1	1
Watagua River	42	3283.83	NC	Functional Site - private		1	1
Watagua Seep	39	501.62	TN	Site on Public Lands		3	4
Wayah Creek	160	53.80	NC	Functional Site - private		1	1
Whetstone Branch	17	3415.97	TN	Public-lands Partnership		3	5
White Rock/Tamassee	188	11560.59	SC	Public-lands Partnership	Yes	5	10
Whitetop Laurel Slopes	13	460.27	VA	Site on Public Lands		1	1
Wilds Cove	145	112.30	NC	Site on Public Lands		1	2
Willis	6	1139.60	VA	Functional Site - private		2	3
Wilscot Creek	196	754.77	GA	Functional Site - private		1	1

## Portfolio Sites for the Southern Blue Ridge Conservation Plan

Site Name	ID	Acres	State	Conservation Approach	TNC/ NHP	Total Elements	Total EORs
Wolf Creek/Cherry Gap/Brown Mt.	136	783.67	NC	Functional Site - private		3	3
Woody Lake Bog	213	422.20	GA	Functional Site - private		1	1
Yellow Spring	72	236.35	TN	Site on Public Lands		1	1