

IV. Conservation Landscape Assessments and Conservation Strategies

Southwestern Appalachians/Ridge & Valley

Ecoregional Overview

The Southwestern Appalachians and Ridge & Valley ecoregions cover approximately 1,982,245 acres in northwestern Georgia. Approximately 124,825 acres (six percent of the total area) are in some form of permanent conservation ownership. Georgia DNR manages approximately 22,250 acres owned in fee simple by the State of Georgia and an additional 35,300 acres in short-term leases or management agreements. Federal land ownership includes 66,160 acres managed by the U.S. Forest Service, 6,363 acres managed by the National Park Service, and 95 acres managed by the Department of Defense. These two ecoregions are treated as one unit in this report because they share many characteristics relating to geology, topography, soils, and vegetation.

The Southwestern Appalachian region stretches from Kentucky to Alabama and is characterized by low, flat-topped mountains containing a mosaic of forest and woodland with some cropland and pasture. The eastern boundary of this ecoregion is relatively smooth and notched by small eastward flowing streams; the western boundary has a rougher escarpment that is more deeply incised. The deeper ravines and escarpment slopes of this ecoregion contain mixed mesophytic forest, while the top of the plateau has more xeric mixed pine-oak forests and woodlands characterized by mixed oaks. Subdivisions of the Southwestern Appalachians include the Plateau Escarpment and the Southern Table Plateaus.

The Plateau Escarpment is characterized by steep, forested slopes and high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvanian-age shale, siltstone, sandstone, and conglomerate. Vegetation in the ravines and gorges includes mixed oak and chestnut oak forests on the upper slopes and more mesic forests on the middle and lower slopes and along streams and floodplain terraces.

The Southern Table Plateaus include Sand Mountain, Lookout Mountain, and Pigeon Mountain. While similar in some respects to the Cumberland Plateau in Tennessee, this region is lower in elevation, has a slightly warmer climate, and has more agriculture. It is mostly forested with mixed oak and oak-hickory communities. The plateau surface is less dissected with lower relief compared to the Plateau Escarpment, and it has slightly cooler temperatures and higher precipitation than the adjacent Ridge and Valley.

The Ridge & Valley is a relatively low-lying region situated between the Blue Ridge and the Southwestern Appalachians. Its roughly parallel ridges and valleys contain a variety of geologic materials, including limestone, dolomite, shale, siltstone, sandstone, chert, mudstone, and marble. Springs and caves are relatively numerous in this ecoregion. Ridges and slopes in this ecoregion are mostly forested, while pasture and row crops dominate the valleys. Subdivisions of the Ridge & Valley in Georgia include the

Southern Limestone/Dolomite Valleys and Low Rolling Hills, the Southern Shale Valleys, the Southern Sandstone Ridges, and the Southern Dissected Ridges and Knobs.

The Southern Limestone/Dolomite Valleys and Low Rolling Hills comprise a heterogeneous region underlain primarily by limestone and cherty dolomite. Landforms are mostly undulating valleys and rounded ridges and hills, with many caves and springs. Soil productivity is variable and land cover includes oak-hickory and oak-pine forests, pasture, row crops, and urban/industrial.

The Southern Shale Valleys consist of undulating to rolling valleys and low, rounded hills and knobs underlain by shale. The soils in this area formed from shale, shaly limestone, and clayey sediments, and tend to be deep, acidic, moderately well-drained, and slowly permeable. The steeper slopes are used for pasture or have reverted to brush and mixed forest. Small fields of hay and row crops are grown on the toe slopes and along streams.

The Southern Sandstone Ridges encompass the major sandstone ridges of the Ridge & Valley, but also include areas of shale, siltstone, and conglomerate. The steep, forested ridges tend to have smooth, narrow crests, and soils are typically stony, sandy, and low in fertility. The chemistry of streams flowing down the ridges varies greatly depending on underlying geologic material. Oak-hickory-pine forests are the dominant land cover.

The Southern Dissected Ridges and Knobs contain interrupted or hummocky ridges. Although shale is common, there is a mixture and interbedding of geologic materials, including cherts, siltstone, sandstone, and quartzose limestone. Oak forests and pine forests are typical for the higher elevations of the ridges, with more mesic forests on the lower slopes, knobs, and draws.

The predominant land cover types in the Southwestern Appalachian/Ridge & Valley ecoregions are deciduous forest, mixed forest and row crop/pasture (Kramer and Elliott, 2004). An analysis of land use changes from 1974 to 1998 based on satellite imagery indicate the following general trends:

- A decrease in row crop/pasture (from 32.94% of total land cover to 27.90%)
- An increase in high-intensity and low-intensity urban (from 4.41% of total land cover to 6.42%)
- An increase in deciduous and mixed forest (from 37.21% of total land cover to 44.18%)
- A decrease in evergreen forest (from 18.30% of total land cover to 14.52%)
- A decrease in clearcut/sparse vegetation (from 6.54% of total land cover to 5.82%)

These trends indicate a general decline in the total acreage devoted to active agricultural uses, an increase in hardwood and mixed forest types, an increase in residential and commercial development, and a decline in evergreen (pine and redcedar) forest types.

High Priority Species and Habitats

The technical teams identified 121 high priority animal species in the Southwestern Appalachians/Ridge & Valley ecoregions. These include 8 birds, 3 reptiles, 2 mammals, 7 amphibians, 52 mollusks, 36 fish, and 13 aquatic arthropods. These species are listed in Table 1, with information on global and state rarity ranks, protected status (if any) under federal or state law, and habitat and range in Georgia. In addition, 59 species of high priority plants were identified for the Southwestern Appalachians/Ridge & Valley. These are listed in Table 2.

High priority habitats for the Southwestern Appalachians/Ridge & Valley ecoregions are described below:

1. Acidic Meadows Over Sandstone or Shale

Open, grassy habitats over shallow acidic soils; edaphic factors control species composition and diversity. May be moist or dry, depending on topographic setting. These small patch habitats are relatively rare in Georgia.

2. Calcareous Flatwoods (Hardwood Flats)

Relatively open, flat, shallowly and seasonally wet forested habitats dominated by hardwoods and including rare or uncommon species such as nutmeg hickory and Alabama leatherflower. Shrub and herb diversity is high. A small patch habitat restricted to low-lying areas with clayey calcareous soils.

3. Calcareous Prairies (Coosa Valley Prairies)

Open grass- and forb-dominated communities over clayey calcareous soils that inhibit growth of woody species. Groundlayer plant species diversity is high, and includes disjunct species known primarily from midwestern prairies. Includes wet and dry prairie subtypes. These habitats require periodic fire for maintenance.

4. Canebrakes

Thickets of native river cane found along rivers and creeks under sparse to full tree cover. Canebrakes represent important wildlife habitat for a variety of neotropical birds and insects. These habitats require periodic fire or other form of disturbance for maintenance.

5. Caves, Rock Shelters, Talus Slopes

These habitats share certain structural characteristics, such as a bedrock component with a variety of microhabitats that provide cover for priority animal species. They are typically embedded in a larger matrix of forest habitats. Caves are unique in their lack of sunlight and vegetation and dependence on outside materials for energy flows. Rock shelters can be found under cliffs (vertical exposures of rock). Talus slopes are accumulations of rock beneath cliffs and steep slopes. This region contains the majority of Georgia's caves and provides habitat for rare species such as gray and Indiana myotis.

6. Forested Limestone Slopes and Terraces

This forest type is found at middle elevations along Lookout and Pigeon Mountain. Characterized by submesic hardwood forest, with species composition dependent on aspect and slope position. Includes partially forested limestone ledges along streams.

7. High Gradient First- and Second-Order Streams

Small, clear, cold, tumbling streams with bedrock riffles and sandy pools. Found at higher elevations and upper ends of steep ravines and slopes. These streams typically experience wide seasonal variations in flow; some receive substantial input from groundwater.

8. Limestone Glades and Barrens (Cedar Glades)

Open habitats dominated by grasses or forbs, with scattered eastern redcedars and other trees. These habitats contain a large number of endemic plant species. Glades occur on thin, rocky soils, and are typically dominated by forbs; barrens are in areas with deeper soils and are dominated by grasses. The largest and most important area of cedar glades/barrens in Georgia is centered on Chickamauga-Chattanooga National Military Park.

9. Mesic Hardwood Forests

Mesic forests of bluffs, ravines, and colluvial flats, characterized by a diverse canopy of hardwood species such as yellow poplar, black cherry, white oak, shagbark hickory, northern red oak, bigleaf magnolia, sugar maple, and American beech. Hemlock and loblolly pine may be minor components in some areas. Mature examples are characterized by a rich understory of shrubs and herbaceous plants. This large patch habitat includes a rich mesic hardwood forest subtype found on calcareous soils.

10. Medium to Large Rivers

Lower gradient streams of valley bottoms, characterized by sandy, silty, or gravelly substrates. Typically surrounded by agricultural lands on the broad, fertile floodplains. Nearly all examples of large river floodplain forest in the Ridge & Valley region have been converted to other types of land cover.

11. Montane Longleaf Pine-Hardwood Forests

Dry forests composed of longleaf pine and mixed hardwood species, including mountain chestnut oak, southern red oak, and various scrub oaks. Significant examples occur in the Ridge & Valley region near Rome. Nearly all Georgia examples are fire-suppressed and exhibit lower species diversity than corresponding habitats in Alabama.

12. Oak Woodlands

An uncommon subxeric vegetation type found at higher elevations, oak woodlands are usually surrounded by xeric pine or pine-oak forest. Canopy dominants may include southern red oak, scarlet oak, post oak, and blackjack oak, with persimmon, blackgum, and other hardwood species. Probably maintained by a combination of infrequent fire and edaphic factors. Pigeon and Lookout Mountain contain good but narrow ecotonal examples.

13. Pine-Oak Woodlands and Forest

Relatively open subxeric to xeric forest or woodland, typically dominated by shortleaf pine, Virginia pine, and post and blackjack oaks, often with a diverse grass and shrub layer. May also include chestnut oak, scarlet oak, and other dry-site hardwood species. Includes typical shortleaf pine-post oak woodlands as well as mixed pine-oak scrub and dry pine-oak forest.

14. Red Maple/Blackgum Swamps

Nonalluvial or small stream swamp forests dominated by red maple and swamp blackgum. These are often found along small low-gradient streams, in shallow depressions, or on wet flats. Often boggy, with a layer of peat, these wetlands have been impacted by construction of drainage ditches.

15. Sagponds (Isolated Depressional Wetlands)

Depressions formed by subsidence of soil due to groundwater percolation in the underlying rock. Contain a variety of vegetation types from freshwater emergents to swamp forest, depending on hydroperiod and other factors. Forested types are usually dominated by willow oak, swamp blackgum, and red maple. These unusual wetlands may include disjunct coastal plain species.

16. Sandstone Barrens and Outcrops

This edaphic habitat type includes sandstone boulders and outcrops of the Appalachian (Cumberland) Plateau as well as scoured sandstone ledges near streams. These open, rocky habitats are typically bordered by Virginia and shortleaf pine, chestnut oak, and a variety of shrubs.

17. Springs and Spring Runs; Gravelly Seeps

Springs are highly localized points of groundwater discharge that typically feed spring runs, while seeps may be broader or less defined areas of perennial or seasonal flows. The Ridge & Valley region contains a number of high-discharge springs. The waters of springs and associated habitats can be highly variable, depending on hydrology. These perennially cool and clear waters provide important habitat to a number of animal species, particularly salamanders and fish such as the coldwater darter.

18. Streams

Moderate to low gradient streams running through lower coves and valleys. Riffle, pool, and shoal habitats may be present. Substrates include gravel, pebbles, boulders, and bedrock. Aquatic plants may also be present. Pools are often silt-bottomed. These streams become turbid after rain. These are generally more productive than headwater streams because of limestone valley bottoms.

19. Underground Streams

Includes streams of all sizes flowing through caves and other underground passages. These aquatic systems are important for rare species such as the southern cavefish and Tennessee cave salamander.

Problems Affecting Wildlife Diversity

One of the factors impacting wildlife diversity in the Southwestern Appalachians/Ridge & Valley region is an increase in residential and commercial development along major highways and on the outskirts of metropolitan areas. This has resulted in loss of both agricultural and forest land, and has resulted in habitat fragmentation as new roads and utility corridors have been constructed. Much of the development of industrial and commercial sites has occurred along Interstate Highway 75 and other major highways. Expansion of the Chattanooga metropolitan area has resulted in significant residential development in several counties in Northwest Georgia, with associated subdivisions, roads, utility corridors, and retail centers. Other metropolitan areas experiencing significant growth in this region include Rome, Dalton, Calhoun, Chatsworth and Trenton. Much of the industrial development in this region has occurred in the valleys near major streams and roads. Residential development has occurred in these same areas, but increasingly houses and subdivisions are being constructed in more remote locations, including secluded coves, steep forested slopes and along the brows of Lookout Mountain and Sand Mountain.

Past conversion of forest and woodland habitats to agricultural uses has resulted in the loss of virtually all river floodplain forest and associated habitats such as canebrakes in this region. The fertile valleys and river bottoms are employed for a wide variety of agricultural uses, including row crops, pasture, and hay fields. In several watersheds (e.g., West Chickamauga Creek) vegetated stream buffers are often too narrow to provide adequate erosion control, and in some areas livestock have unrestricted access to streams. These practices result in a general degradation of water quality and habitat for aquatic species. Expanding vegetated stream buffers and restricting livestock access to streams would provide significant benefits to some of Georgia's most imperiled aquatic species.

Based on Environmental Protection Division monitoring data for 2002, approximately 46% of monitored streams in the Southwestern Appalachians/Ridge & Valley ecoregions support designated uses (as measured by percent of total monitored stream miles); 20% partially support designated uses, and 34% do not support designated uses. The percentage of monitored stream miles not supporting designated uses is the second highest of all ecoregions, surpassed only by the Southern Coastal Plain. Point-source discharges into streams in this region include effluent from carpet mills and other industrial facilities and treated wastewater from municipal treatment facilities. Other stressors of water quality include sedimentation from roads, cultivated fields, and pastures. Given the high number of imperiled mollusks in this ecoregion, improvements in water quality are a high priority for maintenance of wildlife diversity.

Groundwater withdrawals for industrial, municipal, and residential uses as well as contamination of groundwater represent potential impacts to sensitive karst environments such as caves. This region contains the vast majority of Georgia's 400+ caves. Most of these caves are found on private land, and only a few have been adequately surveyed for rare cave fauna. However, occurrences of several rare species have been documented from these caves, including gray myotis, Tennessee cavefish, and Tennessee cave

salamander. All of these species are particularly sensitive to changes in the quantity or quality of water in underground streams.

Construction of dams or other structures altering stream flow represents another significant problem for aquatic species in this region. Most of the major river impoundments (e.g., Lake Allatoona, Carter's Lake, Weiss Lake) affecting streams in this area lie outside the Southwestern Appalachians/Ridge & Valley ecoregions, but the impacts of these impoundments extend upstream and downstream of the dams. These impacts include loss of stream habitat, creation of migration barriers, isolation of subpopulations, and degraded water quality (low dissolved oxygen, altered water temperatures).

Conversion of upland hardwood and pine-hardwood forests to pine plantations has also resulted in impacts to wildlife diversity. While not as prevalent in this region as in other areas of the state, this conversion has resulted in a decrease in habitat for a number of declining bird species. Specific problems associated with this forest conversion include loss of vegetative structure and nesting sites, decline in hard and soft mast production, loss of understory and groundcover diversity, and physical disturbance of habitat for organisms found in leaf litter or soil.

Fire suppression is a significant problem in this region. Extension of residential and commercial development from urban centers into surrounding suburbs has resulted in many fire-dependent habitats being surrounded by highways, subdivisions, or retail centers. Concerns about smoke management, air quality, and damage to structures make it difficult to implement prescribed burn plans for some of these important habitats. For example, while a fire plan has been developed for Chickamauga-Chattanooga National Military Park, concerns about smoke management problems along heavily traveled U.S. Highway 27 and potential damage to historic structures and monuments in the park represent impediments to implementation of the plan. Throughout the region, a lack of fire has resulted in the decline in the extent and quality of habitats such as limestone terrace woods, sagponds, longleaf pine-mixed hardwood forest, oak and pine-oak woodlands and forests, calcareous prairies, canebrakes, and limestone glades and barrens.

Invasive/alien species pose significant problems to habitats in this region. The red shiner is an introduced fish suspected of having a serious impact on several native fish in the Coosa River system through competition and hybridization. Other exotic aquatic species of concern include the Asiatic clam and the zebra mussel (the latter is currently not known from Georgia, but is a very serious aquatic pest in other states, including Tennessee). Notable examples of exotic plant species of concern in this region include Nepalese browntop, Chinese privet, Japanese honeysuckle, oriental bittersweet, royal paulownia, silvergrass, and autumn olive.

For some high priority species and habitats, unmanaged recreational use represents a serious problem. High levels of use by rock climbers may threaten habitats such as sandstone barrens and limestone ledges and impact associated rare species. Similarly, cave exploration by careless or inexperienced cavers can result in significant impacts to

cave formations and populations of rare cave fauna. Indiscriminant use of all-terrain vehicles (ATVs) and other vehicles in or adjacent to streams, springs, calcareous flatwoods, or rare edaphically controlled communities such as calcareous prairies and limestone glades can result in significant impacts to high priority species and habitats.

Incompatible road and utility corridor management pose problems for some high priority plant species such as Cumberland rose gentian, royal catchfly, and prairie purple coneflower. For these species, use of herbicides and other vegetation management tools should be planned and implemented in a way that minimizes impacts to rare plant populations occurring in the road right-of-way or utility corridor.

High Priority Sites and Landscape Features

The current assessment and previous conservation planning efforts have identified a number of important sites and landscape features in this region of the state. A recent assessment of the Cumberlands/Southern Ridge & Valley ecoregion conducted by The Nature Conservancy in cooperation with state natural heritage programs in Alabama, Georgia, Kentucky, Tennessee, Virginia, and West Virginia identified 29 high priority terrestrial conservation areas in Georgia representing approximately 459,428 acres (The Nature Conservancy, 2003). In addition, this study identified 16 aquatic conservation areas comprising over 1,289,800 acres and 16 high priority cave sites totaling approximately 385,625 acres. The following are some of the most important sites and landscape features of the Southwestern Appalachians/Ridge & Valley ecoregions.

Blacks Bluff

This steep-sloped bluff located along the Coosa River near Rome contains populations of limerock arrowwood (*Viburnum bracteatum*) and large flowered skullcap (*Scutellaria montana*), as well as examples of mesic hardwood forest. The Nature Conservancy owns and manages this site as Blacks Bluff Preserve. Similar environments are found nearby and are in need of long-term protection.

Carbondale Swamp

This relatively small wetland site surrounded by residential and industrial development is notable for containing the state's only known population of least trillium (*Trillium pusillum*) and an example of calcareous flatwoods habitat. This habitat is considered globally rare, and no examples are currently protected in Georgia.

Chickamauga-Chattanooga National Military Park

This 5,100-acre tract is owned and managed by the National Park Service. Important natural communities contained in this site include examples of cedar glades and open redcedar woodlands. High priority species include *Leavenworthia exigua* var. *exigua*, *Dalea candida*, and several other rare calciphiles found in Georgia only from this area. Cedar glade habitats in this area are suffering from fire suppression, which results in the

encroachment of woody vegetation (redcedars and shrubs) and reduction in the extent of limestone glade and barren habitats.

Coosa Valley Prairies

These remnant patches of prairie habitat contain several globally rare species of plants. Both dry prairie and wet prairie types are present within the area; these represent very distinctive and imperiled natural communities. The best examples of these prairies known in Georgia are now protected through a conservation easement donated by the landowner, Temple-Inland Forest. A long-term monitoring and management plan developed by staff of The Nature Conservancy will help restore these prairies along with adjacent shortleaf pine-post oak woodland habitats.

Drummond Swamp/Sagponds

Drummond Swamp is an 700+ acre site containing a large sagpond as well as the only Georgia population of seaside alder (*Alnus maritima*). A portion of this site is protected through a conservation easement. Other sagponds are located in scattered locations in the Southern Shale Valleys area of the Ridge and Valley and are in need of long-term protection and restoration.

Lavender Mountain/Horseleg Mountain

This landscape feature contains examples of montane longleaf pine-hardwood forest, pine-oak woodland and forest, limestone glades and barrens, and mesic hardwood forest. Rare species known from this area include flatwoods rattlesnake-root (*Prenanthes barbata*), Alabama leather-flower (*Clematis socialis*), large-flowered skullcap (*Scutellaria Montana*), and Tennessee yellow-eyed grass (*Xyris tennesseensis*).

Lookout/Sand Mountain

These two mountains make up the main portion of the Southern Table Plateaus in Georgia. Important conservation sites within this 50,000+ acre landscape include Johnson Crook, Cloudland Canyon State Park, and Zahnd Natural Area. The Johnson Crook area contains approximately twenty caves, reportedly the highest density of separate caves in Georgia. The slopes of Johnson Crook also contain limestone outcrops, mesic hardwood forest, and redcedar-pine woodland. At least five rare plant species have been documented from this area and the potential for discovering other rarities is high. Cloudland Canyon, owned by the State of Georgia and managed as a state park, contains many rare plants and animals. Significant natural communities include limestone outcrops, caves, mesic hardwood forest, redcedar-pine woodland, seeps and springs. Zahnd Natural Area, the largest state-owned natural area in North Georgia, contains examples of sandstone barrens/outcrop, sagponds, pine-oak woodlands and forest, and underground streams.

Pigeon Mountain

Pigeon Mountain represents the easternmost segment of the Appalachian Plateau in Georgia. This site is approximately 20,000 acres, 13,300 acres of which is owned by the Georgia DNR and managed as Crockford-Pigeon Mountain Wildlife Management Area. More than two dozen rare plant species are known from this site. High priority habitats include forested limestone slopes and terraces, high gradient first- and second-order streams, mesic hardwood forests, sagponds, sandstone outcrops, underground streams, and caves. The Pigeon Mountain salamander (*Plethodon petraeus*), a state-protected animal, is known only from the eastern slopes of Pigeon Mountain. Other high priority species include green salamander (*Aneides aeneus*), limerock arrowwood (*Viburnum bracteatum*), three-flowered hawthorn (*Crataegus triflora*), and Alabama snow-wreath (*Neviusia alabamensis*).

Southern Sandstone Ridges

The Southern Sandstone Ridges, also known as Armuchee Ridges, comprise the major sedimentary ridges of the Ridge & Valley; notable examples include Dick Ridge and Taylor Ridge. Much of this area is owned by the federal government and managed as the Armuchee Ranger District of the Chattahoochee National Forest. These steep, forested ridges are typically stony, sandy, and low in fertility. Oak-hickory-pine forests are the dominant land cover, but at least one example of montane longleaf pine-hardwood forest is known on Taylor Ridge. Rare species known from these landscape features include Frasier loosestrife (*Lysimachia fraseri*) and large-flowered skullcap (*Scutellaria montana*). Problems affecting this landscape feature include forest conversion, residential development, and fire suppression.

High Priority Waters

Figure 9 shows the high priority streams and watersheds identified by the Fishes and Freshwater Invertebrates team. These streams were chosen on the basis of documented occurrences of high priority aquatic species, high water quality rankings based on Index of Biotic Integrity scores, and designation as exemplary streams in a previous study by The Nature Conservancy. Examples include Conasauga River, Holly Creek, Mills Creek, Rock Creek, Sugar Creek, Sumac Creek, Little Armuchee Creek, West Armuchee Creek, Johns Creek, Teloga Creek, Euharlee Creek, Chatooga River, Cedar Creek, Chattanooga Creek, Crawfish Creek, Dry Branch, East Chickamauga Creek, West Chickamauga Creek, South Chickamauga Creek, Peavine Creek, and Tiger Creek. Refer to Table 1 of the Fishes and Freshwater Invertebrates Technical Team report in Appendix B.

Conservation Goals

- Maintain known viable populations of all high priority species and function examples of all high priority habitats through land protection, incentive-based habitat management programs on private lands, and habitat restoration and management on public lands.

- Increase public awareness of high priority species and habitats by developing educational messages and lesson plans for use in environmental education facilities, local schools, and other facilities.
- Encourage restoration of important wildlife habitats through reintroduction of prescribed fire, hydrologic restoration, and revegetation efforts.
- Combat the spread of invasive/noxious species in high priority natural habitats by identifying problem areas, providing technical and financial assistance, developing specific educational messages, and managing exotic species populations on public lands.
- Minimize impacts from residential and commercial development on high priority species and habitats by providing input on environmental assessments
- Continue efforts to recover federally listed species by implementation of recovery plans and restore populations of other high priority species.
- Improve water quality throughout the region, with special emphasis on high priority streams

Conasauga River

The Conasauga River watershed, which covers over 750 square miles, is home to 76 species of native fish, 26 species of freshwater mussels, 20 snails, and 20 salamanders. Priority species include Cherokee clubtail (*Gomphus consanguis*), the federally threatened blue shiner (*Cyprinella caerulea*), and the federally threatened finelined pocketbook (*Lampsilis altilis*). The river flows out of the Chattahoochee National Forest in Georgia up into the Cherokee National Forest in Tennessee. It then drops out of public land into private lands and flows back south into Georgia, passing Dalton, before merging with the Oostanaula River near Resaca.

The Nature Conservancy has been working in the Conasauga River Watershed since 1997. A large portion of the organization's focus is on restoration of key reaches of the river mainstem as well as significant tributary streams such as Holly and Sumac Creeks. Restoration projects include activities such as riparian buffer re-planting, bank sloping, cattle fencing, alternative watering sources for cattle, and access controls. All of these activities are directed toward the reduction of erosion and sedimentation entering streams. Protection is also an important focus of work in the watershed. Since 1997, The Nature Conservancy has protected over 150 acres on Holly Creek and over 80 acres on the Jacks River, with upcoming protection of over 630 acres on Holly Creek in 2005. Annual aquatic insect surveys take place to assess the health of the river. The Nature Conservancy provides annual funding to the Tennessee Aquarium Research Institute for salaries and mussel propagation, and is in its second year of funding sediment toxicity research through North Carolina State University. The Nature Conservancy also participates in education and outreach in the watershed community, serves on the board of Keep Dalton/Whitfield Beautiful, and co-coordinates the annual river cleanup. It is hoped that through these efforts the species diversity of the watershed and the well-being of the people that utilize the river can benefit together.

Strategies and Partnerships to Achieve Conservation Goals

- Provide financial incentives and technical expertise to encourage prescribed burns, through Interagency Burn Team and other means
- Work with NRCS staff to identify high priority habitats and sites for implementation of habitat enhancement/restoration projects through Farm Bill programs (e.g., restoration of oak and shortleaf pine-oak woodlands, longleaf pine-hardwood forest, and stream buffers.)
- Use state lands and other public lands (USFS, NPS) to showcase habitat restoration efforts.
- Control invasive exotic species populations on public lands and provide technical assistance to private landowners to discourage use of invasive exotics
- Work with GDOT and local governments to minimize direct impacts to high priority species and habitats from road construction and maintenance.
- Work with Georgia Power and private landowners to identify and conserve populations of rare species in and adjacent to utility corridors
- Develop educational materials on high priority species and habitats in the ecoregion and provide these to environmental educators at WRD facilities (e.g., Arrowhead Education Center) and other facilities
- Work with NRCS, GFC, and GFA to revise forestry BMPs for better protection of streams and wetlands and maintenance of important wildlife habitats
- Utilize Landowner Incentive Program (LIP) funds to implement programs to establish or expand vegetated stream buffers along high priority streams.
- Work with the Georgia Land Trust Service Center to apply monies from the Georgia Wetlands Trust Fund to provide protection for high priority wetlands and stream corridors

Highest Priority Conservation Actions

Highest priority conservation actions (ranked “Very High” or “High”) identified by the technical teams, Steering Committee, and other stakeholders specifically for these two ecoregions include the following (see Appendix L for details):

- Continue and expand monitoring of rare species throughout the Coosa Basin and evaluate this approach for use in other basins. Participate in TNC’s “Measures of Success” analysis for the Etowah River. Continue DNR’s Stream Team surveys throughout the Coosa River Basin and UGA fish distributional surveys in the Etowah and Conasauga River systems.
- Continue long-term monitoring of Pigeon Mountain salamander populations as well as surveys for other high priority cave and outcrop species (e.g., green salamander). Conduct seasonal counts of salamanders at caves on Pigeon Mountain. Establish and implement long-term monitoring protocols at known Pigeon Mountain salamander sites.
- Monitor populations of gray bats in caves. Conduct annual summertime monitoring of caves that harbor this species and assess threats to these bat populations.

- Restore lake sturgeon populations in Georgia. Reestablish lake sturgeon to its former range and conduct appropriate research into habitat uses, growth, survival, food habits, etc., to assure success in restoration efforts.

For highest priority conservation actions of statewide scope, see Section V of this report.

Bird Conservation in the Southwestern Appalachians/Ridge & Valley Ecoregions

The greatest bird conservation issue in these ecoregions is conversion of hardwood and mixed pine/hardwood forest to loblolly pine plantations, residential or commercial developments, or agricultural uses. A large percentage of natural vegetation has been converted for other uses, and mature forest and the birds dependent on mature forest are less secure here than in any other region in the Southern Appalachians. The long-term health of populations of priority birds including Acadian Flycatcher, Wood Thrush, and Yellow-throated Warbler will depend on maintenance and management of remnant forest stands as well as aggressive restoration efforts. It is recommended that at least eight upland hardwood forest patches greater than 4,000 hectares be sustained and that the number of such patches in the 4,000 to 40,000 hectare range be increased. More than 80% of the mixed mesophytic hardwood acreage within these patches should be managed for long rotation or old growth.

Existing short-rotation pine, while of less benefit to birds than mature forest, is nevertheless much more valuable than more intensive land uses, and it is recommended that the current percentage of land in this cover type be retained. All existing southern yellow pine and mixed pine hardwood habitats should be actively and appropriately managed with fire to improve habitat quality, and acreage should be increased where possible by reforestation of abandoned agricultural fields. Priority species associated with mature pine forests in the Ridge and Valley include Bachman's Sparrow and Brown-headed Nuthatch.

Table 1. Southwestern Appalachians/Ridge & Valley High Priority Animals (121 Records)

Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
AA	<i>Acroneuria arida</i>	Elegant stonefly	G3	S3			Streams/ivers in the northern portion of the state	Known from Chattooga Co., Summerville; Cherokee Co., Ball Ground; Clayton Co., Jonesboro; Gordon Co., Ranger
AA	<i>Apobaetis Etowah</i>	A mayfly	G1	S1			Known only from adults, Etowah River, Rome, GA and Chickamauga River, Ringgold, GA	Known in GA from two locations
AA	<i>Cambarus cymatilis</i>	Conasauga blue burrower	G1	S1			Sandy clay burrows up to 1 mile from nearest stream	Murray County, GA; Bradley Co, TN
AA	<i>Cambarus distans</i>	Faraway crayfish	G4G5	S1			Clear cool streams under debris	Known from 2 sites in Murphy Hollow Creek system (Dade Co.)
AA	<i>Cambarus extraneus</i>	Chickamauga crayfish	G2	S2			Small to medium shallow rocky streams with moderate current	Chickamauga Creek drainage
AA	<i>Cambarus fasciatus</i>	A crayfish	G2	S2			Lotic habitats under rocks in flowing water	Lumpkin, Dawson, Pickens, Cherokee, Bartow, & Polk Counties in Etowah River
AA	<i>Cambarus longirostris</i>	Longnosed crayfish	G5	S1			Riffle areas of streams under rocks	Hobbs (1981) indicated that the range is poorly defined; he reported it from headwaters of the Nottely River (Union Co.), Lookout Creek (Dade Co.), and Cane Creek (trib. to Chattooga River in Walker Co.).
AA	<i>Cambarus parvovulus</i>	Plateau crayfish	G4	S1			Swift clear streams with substrate of bedrock, sand, or gravel	Few localities in Warren Creek (Dade Co.)
AA	<i>Cambarus scotti</i>	A crayfish	G3	S2S3			Rocky riffles in streams with moderate to swift current	Walker and Chattooga Counties
AA	<i>Cambarus unestami</i>	A crayfish	G2	S2			High elevation streams with bedrock or rocks	Dade, Walker, and Chattooga Counties
AA	<i>Gomphus consanguis</i>	Cherokee clubtail	G2G3	S1?			Spring-fed moderately-flowing forest streams, especially where they drain small ponds	Only found in extreme NW corner
AA	<i>Orconectes forceps</i>	Gaping claw crayfish	G4	S1			Prefers riffle areas under rocks in larger streams that flow over limestone deposits	Chickamauga Creek drainage
AA	<i>Stylurus notatus</i>	Elusive clubtail	G3	S1?			Rivers (usually large) and large lakes, often with sandy bottoms, sometimes also with silt and gravel	GA on extreme se corner of species' range
AM	<i>Aneides aeneus</i>	Green salamander	G3G4	S2		R	Moist rock crevices; new information suggests <i>Aneides</i> also frequents canopies of trees; within hardwood forests	Restricted distribution in GA; CU and BR
AM	<i>Cryptobranchus alleganiensis</i>	Hellbender	G3G4	S2*		R	Clear, cool, mountain streams and rivers with large rocky substrates	TN drainage steams in BR, RV, CU
AM	<i>Desmognathus aeneus</i>	Seepage salamander	G3G4	S3			Seepage areas within hardwood forested ravines	Primarily BR and RV, but also PD
AM	<i>Gyrinophilus palleucus</i>	Tennessee cave salamander	G2G3	S1			Streams in caves; substrates include rock, gravel, sand, and mud	CU, one site
AM	<i>Necturus maculosus</i>	Mudpuppy	G5	S1			Medium to large streams and associated impoundments	RV, potentially in CU and BR
AM	<i>Plethodon petraeus</i>	Pigeon mountain salamander	G1G2	S1		R	Moist, rocky woods; rock outcrops; cave entrances	CU, east side of Pigeon Mt., rocky outcrops associated with cave entrances
AM	<i>Pseudacris brachyphona</i>	Mountain chorus frog	G5	S2			Hardwood forests with fishless breeding pools	BR, RV, PD
BI	<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	S3	SAR	R	Open pine or oak woods; old fields; grassy forest regeneration	RV, PD, CP: where appropriate habitat
BI	<i>Ammodramus savannarum</i>	Grasshopper sparrow	G5	S4			Grassland surrounded by open country (ag, grassland etc.)	CP, PD predominantly, less common in CU, RV, rare in BR

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Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
BI	<i>Colinus virginianus</i>	Northern bobwhite	G5	S4			Early successional mixed grass/forb habitat; longleaf pine savanna	CP most numerous; uncommon in PD, RV; scattered in CU, BR
BI	<i>Haliaeetus leucocephalus</i>	Bald eagle	G4	S2	(PS:LT, PDL)	E	Edges of lakes & large rivers; seacoasts	CP - primarily and reservoirs and rivers PD, BR, RV
BI	<i>Ixobrychus exilis</i>	Least bittern	G4	S3			Freshwater and brackish marshes with tall, dense emergent vegetation. Nests close to open areas	Probably more common as a breeder in CP due to much more potentially suitable habitat than in PD
BI	<i>Lanius ludovicianus migrans</i>	Loggerhead shrike	G4T3Q	S?	SAR		Open woods; field edges; savannas	CP - primary area of abundance; scattered and low number in the PD (none in 20-county metro Atlanta area); low numbers in RV
BI	<i>Limnothlypis swainsonii</i>	Swainson's warbler	G4	S3	SAR		Dense undergrowth with heavy litter (CP,M); canebrakes in swamps and river floodplains (CP)	Although found widespread, bulk of population restricted to river floodplains of CP and PD; small BR population
BI	<i>Tyto alba</i>	Barn owl	G5	S3/S4			Grassland savanna with large cavity trees, also neighborhoods with large cavity trees, generally needs open country	Local: CP, PD, RV, CU, rare in BR
FI	<i>Acipenser fulvescens</i>	Lake sturgeon	G3	S1			Large freshwater rivers & lakes over clean firm substrate	Coosa drainage in GA
FI	<i>Cyprinella caerulea</i>	Blue shiner	G2	S1	LT	E	Flowing runs and pools in streams with cool water and firm substrates	Current range is confined to upper Conasauga River system; historically known from Coosawattee and Etowah systems
FI	<i>Erimonax monacha</i>	Spotfin chub	G2	SX	LT,PXN		Large creeks to medium-sized rivers; moderate to swift currents over gravel to bedrock	If extant, most likely in Chickamauga Cr system, possibly in Betty Cr (Little TN system)
FI	<i>Etheostoma brevirostrum</i>	Holiday darter	G2	S2		T	Small creeks to moderate sized rivers in gravel and bedrock pools	Four disjunct restricted populations: Con, Coosawattee, Etowah mainstem, Amicalola; range may be much smaller if new taxa recognized (all A's)
FI	<i>Etheostoma cinereum</i>	Ashy darter	G2G3	SH			Medium to large upland streams in slackwater areas with silt-free substrate and cover such as boulders or snags	last collected in S Chickamauga in late 50's
FI	<i>Etheostoma ditrema</i>	Coldwater darter	G1G2	S1		T	Vegetated springs and spring runs or small streams with spring influence	Moseley, Colvard, & Spring Cr PAB
FI	<i>Etheostoma duryi</i>	Black darter	G4	S1		R	Small to medium streams, gravel to cobble bottoms; riffles and pools	Chickamauga Cr. System; two records from Lookout Cr. System; 1 record from Little Chickamauga Creek tributary.
FI	<i>Etheostoma jordani</i>	Greenbreast darter	G4	S2			Medium-sized creeks to rivers in riffle areas over gravel to bedrock substrate	Upper Coosa only
FI	<i>Etheostoma rupestre</i>	Rock darter	G4	S2			Swift rocky riffles often associated with attached vegetation such as <i>Podostemum</i>	Etowah and Conasauga
FI	<i>Etheostoma trisella</i>	Trispot darter	G1	S1		T	Breeding: vegetated spring seepage areas. Nonbreeding: clear streams in vegetated shallow slackwater areas	Endemic to upper Coosa
FI	<i>Etheostoma zonale</i>	Banded darter	G5	S1S2			Swift riffles in medium-sized rivers over large gravel, cobble, or boulder substrate	Toccoa and Chickamauga systems likely only pops in GA; periphery of range
FI	<i>Fundulus catenatus</i>	Northern studfish	G5	S1S2		T	Margins of small to medium streams in areas of sluggish to moderate current	Chickamauga Cr. System; a few records from Lookout Cr. System
FI	<i>Hemitremia flammea</i>	Flame chub	G3	S1		E	Springs & springfed streams	Only known from Chickamauga Cr. System in GA;

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Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
FI	<i>Hiodon tergisus</i>	Mooneye	G5	S1			Usually found near the surface of large streams, rivers, and swift tailwaters of locks and dams	Oostanaula River
FI	<i>Hybopsis amblops</i>	Bigeye chub	G5	S2		R	Small to medium rivers over silty-sandy substrates in slow to moderate current	Many records in Chickamauga Cr. System; also known from Lookout, Nottely, and Hiwassee systems
FI	<i>Hybopsis lineapunctata</i>	Lined chub	G3	S2			Upland creeks over sandy substrate with gentle current	Endemic to Tallapoosa and upper Coosa
FI	<i>Ichthyomyzon bdellium</i>	Ohio lamprey	G3G4	S1S2		R	Medium to large rivers, mud to gravel bottoms; riffles in small tributaries	Chickamauga Cr. System (only 2 records)
FI	<i>Lythrurus lirus</i>	Mountain shiner	G4	S3			Cool, clear streams in flowing water over sandy to rocky substrates	Conasauga, Coosawattee, Oostanaula, Etowah
FI	<i>Macrhybopsis hyostoma</i>	Shoal chub	G5	SP			Swift currents over gravel substrates	Possibly in Chickamauga Cr. System
FI	<i>Macrhybopsis</i> sp. Cf. <i>Aestivalis</i>	Coosa chub		S2			Swift currents over gravel substrates	Mainstem upper Etowah, mainstem Conasauga
FI	<i>Moxostoma carinatum</i>	River redhorse	G4	S2		R	Swift waters of medium to large rivers	Oostanaula, Etowah below Allatoona, Conasauga, and Brasstown Cr of Hiwassee system
FI	<i>Notropis ariommus</i>	Popeye shiner	G3	S1		T	Large streams and small rivers in flowing pools areas over gravel	All post 1980 records are from S. Chickamauga Cr.; historically known from Lookout, Chickamauga, and Brasstown Cr. Systems
FI	<i>Notropis asperifrons</i>	Burrhead shiner	G4	S2			Small streams to medium-sized rivers in pools, riffles, and midwater areas	Restricted to upper Conasauga and Oostanaula tribs
FI	<i>Noturus eleutherus</i>	Mountain madtom	G4	S1		T	Riffle areas in medium to large rivers over coarse gravel and rubble	One recent specimen from S. Chickamauga Dr
FI	<i>Noturus flavipinnis</i>	Yellowfin madtom	G1	SX	LT,XN,P XN		Pools and backwaters of medium-sized creeks; gravel and pebble substrate	One record from W. Chickamauga Cr.
FI	<i>Noturus</i> sp. Cf <i>munitus</i>	Coosa madtom	G3	S1		E	Shoals and riffles of moderate to large streams and rivers	Mainstem of Etowah (upstream of Allatoona) and mainstem of Conasauga River
FI	<i>Percina antesella</i>	Amber darter	G1G2	S1	LE	E	Riffles & runs of medium-sized rivers	Primarily mainstem of Etowah and Conasauga; also known from Holly Cr. (Conasauga), Shoal Cr. (Etowah system) and Sharp Mountain Creek (Etowah system)
FI	<i>Percina jenkinsi</i>	Conasauga logperch	G1	S1	LE	E	Deep, fast-flowing chutes and pools over clean substrates of gravel or cobbles	Mainstem of upper Conasauga River
FI	<i>Percina lenticula</i>	Freckled darter	G2	S1		E	Swift deep runs of main river channels probably over a rocky substrate	Primarily mainstem of Etowah and Conasauga; also known from Coahullah Cr. (Conasauga system)
FI	<i>Percina sciera</i>	Dusky darter	G5	S1S2		R	Large creeks and rivers in moderate current associated with woody debris, undercut banks, or vegetation	Listed for Lookout Creek, Chickamauga Creek, and Toccoa systems in protected animal book; only GNHP record is from Chattanooga Creek
FI	<i>Percina shumardi</i>	River darter	G5	S1		E	Large to medium rivers, deep chutes and riffles, coarse gravel substrate	Conasauga River (near TN state line) and 1 record in Oostanaula River
FI	<i>Percina</i> sp. 9	Upland bridled darter	G1Q	S1			Runs and flowing pools of medium-sized rivers	Etowah, Talking Rock, Conasauga
FI	<i>Percina tanasi</i>	Snail darter	G2G3	SH	LT	T	Large streams to medium-sized rivers in riffle areas with sand or gravel substrate	2 GNHP records (1980) in South Chickamauga Creek
FI	<i>Phenacobius uranops</i>	Stargazing minnow	G4	S1		T	Riffle areas in small to medium rivers	Known from 4 streams in Chickamagua Cr. System
FI	<i>Phoxinus tennesseensis</i>	Tennessee dace	G3	S1			Headwater streams with rocky bed sediments, undercut banks,	Only known in GA from Wauhatchie Br (SST 2002)

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Group	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
FI	<i>Typhlichthys subterraneus</i>	Southern cavefish	G4	S1		R	Underground streams	Only known from 2 localities in Chickamauga Cr. System (Tennessee drainage)
MA	<i>Myotis grisescens</i>	Gray myotis	G3	S1	LE	E	Caves with flowing water or with large creeks or bodies of water nearby, also storm sewers and artificial caves in other states	Found in and near caves in Catoosa, Walker, and Chattooga counties; also old records from a Polk Co cave, from tunnel in Clarke Co, and one netted in Bartow Co.
MA	<i>Myotis sodalist</i>	Indiana myotis	G2	SA	LE	E	Limestone caves with pools; wooded areas near streams, upland forests, large snags in open areas including ridge tops	Known only from Dade County
MO	<i>Alasmidonta marginata</i>	Elktoe	G2	SH			Small to medium rivers with moderately fast current and substrates to fine gravel and sand.	Historically known from South Chickamauga Creek (Athearn Lot 6392)
MO	<i>Alasmidonta viridis</i>	Slippershell mussel	G3	SH			Small to medium rivers in areas of swift current and stable sand/gravel substrate.	Historically known from South Chickamauga Creek (Athearn Lot 7972)
MO	<i>Amblema elliotii</i>	Coosa fiveridge	G3	S2			Medium sized-to large rivers	Known from Conasauga, lower Coosawattee, and Oostanaula
MO	<i>Campeloma regulare</i>	Cylinder campeloma	G3	S2			Small streams to large rivers and reservoirs	Current records are from Holly Creek, Armuchee Creek, Dykes Cr. (Etowah), Etowah River above Canton, and Conasauga River; historically widespread in Coosa system
MO	<i>Elimia capillaries</i>	Spindle elimia	G1	SU			Riffle areas of clean headwater streams.	Known historically from Coosa River; Etowah river and tributaries at Rome, GA (Goodrich 1944d). Known recently from Etowah River in Bartow co. In GA. This species was once a regional endemic confined to Coosa system of GA & AL; it may now be a narrow end
MO	<i>Elimia ornate</i>	Ornate elimia	G1	S1				Currently know from Conasauga River from GA Hwy 2 to Tibbs Bridge;
MO	<i>Elimia striatula</i>	File elimia	GU	S1			Headwater streams; may live in ponds	Tributaries to Conasauga River and Coahulla Creek, Whitfield Co. GA
MO	<i>Elliptio arca</i>	Alabama spike	G3	S1			Medium to large river shoals	Known from Oostanaula and lower Coosawattee; probably extirpated from the Conasauga River
MO	<i>Elliptio arctata</i> (coosa form)	Delicate spike	G3G4	S1			Rapids under large rocks	Only 2 known localities in GA; both from Conasauga river, probably a single population
MO	<i>Elliptio dilatata</i>	Spike	G5	SH			Firm substrate of coarse sand and gravel in moderately strong current	Historically known from TN basin (Lookout or Chickamauga--See Athearns records
MO	<i>Fusconaia barnesiana</i>	Tennessee pigtoe	G3	S1			medium sized streams to medium sized rivers	Extant in E. Chickamauga Creek; historically known from Lookout Creek and South Chickamauga Creek
MO	<i>Fusconaia subrotunda</i>	Longsolid	G3	SH			Small streams to medium rivers with clean substrate and current	Historically known from TN portion of NW Georgia (see Athearn data)
MO	<i>Lampsilis atilis</i>	Finelined pocketbook	G2	S1S2	LT	T	Gravelly medium to large rivers	Historic range included the Chattooga and Conasauga Rivers, and a few of their tributaries. Present range seems to be restricted to the Conasauga River and Tallapoosa system
MO	<i>Lasmigona complanata alabamensis</i>	Alabama heelsplitter	G5	S1			Slow moving water of medium-sized and large rivers in mud and fine sand substrate	Current record in Oostanaula near mouth of Armuchee, historically known Chattoga, Conasauga and Oostanaula

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MO	<i>Lasmigona complanata complanata</i>	White heelsplitter	G5	SH			Medium-sized rivers to backwater bays and lakes in quiet water with fine sand and mud substrate	Historically known from Lookout creek
MO	<i>Lasmigona costata</i>	Flutedshell	G4	SH			Small streams to large rivers with moderate current and stable substrate	Historically known S. Chickamauga Cr (Athearn record from 1958) and Lookout Creek (1971 Athearn Record)
MO	<i>Lasmigona holstonia</i>	Tennessee heelsplitter	G3	S1			Shallow, sandy/muddy creeks & springs	Historic and present ranges include Coosa, Chattooga, And Etowah River Drainages. lost from mainstem of Conasauga and Chattooga; Tennessee form known historically from tiger creek (S. Chick trib), W. Chickamauga Cr. (Walker Co.), and South Chickamauga Creek
MO	<i>Leptoxis crassa</i>	Boulder snail	G1	SH			Flowing areas of rocky streams	Historic records from South Chickamauga Creek
MO	<i>Leptoxis crassa anthonyi</i>	Anthony's riversnail	G1	SH	LE		Clean cobble-rubble substrate in flowing areas of large streams and rivers	Only known from South Chickamauga Creek (Catoosa Co.); all records predate 1980
MO	<i>Leptoxis foremani</i>	Interrupted rocksnail	G1	S1			Shallow runs with clean, mixed substrate.	Currently known from 7 miles of Oostanaula River (Shipp Island Area); historically known from Coosawattee (Athearn 1980 record)
MO	<i>Leptoxis praerosa</i>	Onyx rocksnail	G5	S1			mainstem of medium to large rivers	Extant in Lookout Creek; may occur in South Chickamauga Cr.
MO	<i>Ligumia recta</i>	Black sandshell	G5	SH			Medium-sized to large rivers with strong current and coarse sand and gravel with cobbles	historically widespread in Coosa basin; no current records; need to examine Athearn records for possible TN basin occurrences
MO	<i>Lioplax cyclostomaformis</i>	Cylindrical lioplax	G1	SX	LE		Occurring in moderate to swift current on mud-flats along streams or under flat rocks.	Historically known from Coosa river system in NW GA (clench and turner 1955). Presently none found in GA in recent gastropod survey of upper Coosa system (Bogan and Pierson 1993).
MO	<i>Medionidus acutissimus</i>	Alabama moccasinshell	G1	S1	LT	T	Gravel-cobble shoals in moderately strong current in medium-sized rivers	Historically occurred in the Coosa River and tributaries, including the Chattooga River. The last known collections from the Coosa River were 4 lots collected by Hurd (1974) (USFWS 1991). Service biologists collected a single specimen from the Conasauga River
MO	<i>Medionidus conradicus</i>	Cumberland moccasinshell	G2	SH			Small large rivers with moderate to strong current	Historically known from Lookout Cr (Athearn record 1971)
MO	<i>Medionidus parvulus</i>	Coosa moccasinshell	G1	S1	LE	E	Gravelly creeks and medium to large rivers	Described from the Chattooga river. Historic sites include the Coosa river and tributaries (Choccolocco Creek, Conasauga River) (USFWS 1991). The present existence of the Conasauga River population has been confirmed by Pierson (1991), Hartfield (pers. com.)
MO	<i>Obovaria subrotunda</i>	Round hickorynut	G4	SH			Medium-sized to large rivers with moderate flow and sand and gravel substrates	Historically known from Lookout Cr. And South Chickamauga Cr (Athearn Records, 1960's and 1970's)
MO	<i>Pleurobema chattanoogaense</i>	Painted clubshell	G1	S1	C		Coarse gravel and sand riffles in medium to large sized rivers	Current records from mainstem of Conasaug river; historically widespread in Coosa system
MO	<i>Pleurobema decisum</i>	Southern clubshell	G1G2	S1	LE	E	Sand, gravel, cobble substrate of small rivers and large streams.	Historical range includes the Coosa River and tributaries (Oostanaula, Conasauga, Etowah, Chattooga, and Coosawattee Rivers) (USFWS 1991). The most recent Coosa river drainage records are from the late 1960's and 1970's in the Conasauga river (USFWS 1991)

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MO	<i>Pleurobema georgianum</i>	Southern pigtoe	G1	S1	LE	E	Gravelly creeks and medium to large rivers	Historically widespread in the Coosa; only recent collections are from Conasauga River and Holly Creek
MO	<i>Pleurobema hanleyianum</i>	Georgia pigtoe	G1	S1	C		Medium-sized rivers in coarse sand and gravel with slow to moderate current	Unknown
MO	<i>Pleurobema perovatum</i>	Ovate clubshell	G1	S1	LE	E	Sand and fine gravel with moderate current in small to medium-sized rivers	Currently occurs in 5 mile stretch of Conasauga River; Historically widespread in Upper Coosa system
MO	<i>Pleurocera foremani</i>	Rough hornsnail	G1Q	SH			Clean gravel and cobble in moderate currents	Historically known from the Cahaba river and the Coosa River basin from Etowah River downstream, and at the mouths of a few side streams (Goodrich, 1944d). None found in a recent survey of upper Coosa (Bogan and Pierson, 1993).
MO	<i>Pleurocera pyrenella</i>	Skirted hornsnail	G2	SH			Mountain streams	Historical sites include little Chickamauga Creek; also Crawfish and Peavine Creeks. No recent observations made. Survey work needed, then reassessment
MO	<i>Pleurocera showalteri</i>	Upland hornsnail	G1Q	S1			Riffles and pools of medium sized rivers.	Current range is Oostanaula river and possibly Coosa river below Rome.
MO	<i>Pleurocera trochiformis</i>	Sulcate hornsnail	G2	SH				Historically known from Lookout and W. Chickamauga
MO	<i>Pleurocera vestita</i>	Brook hornsnail	G3	S2				Currently known from Armuchee, Conasauga, and Chattooga
MO	<i>Potamilus purpuratus</i>	Bleufer	G5	S1			Quiet or slow-moving waters in mud or gravel substrate	Historically widespread in Coosa basin; only current record is Coosawattee (Williams and Hughes 1997)
MO	<i>Ptychobranchnus fasciolaris</i>	Kidneyshell	G4	SH			Medium-sized to large rivers with moderately strong current in substrate of coarse gravel and sand	Historically known from Lookout Cr. And Chickamauga Cr. System
MO	<i>Ptychobranchnus greenii</i>	Triangular kidneyshell	G1	S1	LE	E	Gravelly creeks and medium to large rivers	Historic range included the Coosa Tiver and tributaries (Choccolocco Creek, Chattooga, Conasauga, and Etowah Rivers) (USFWS 1991). Current range appears to be restricted to the Conasauga River as documented by Hartfield (pers. com.) and Pierson (1991). Johnson has recent (2003) records from Conasauga River and Holly Creek (shell only)
MO	<i>Quadrula rumphiana</i>	Ridged mapleleaf	G3	S3			medium to large rivers	Currently known from Oostanaula, lower Coosawattee, and Conasauga mainstems; also known from lower Armuchee
MO	<i>Strophitus connasaugaensis</i>	Alabama creekmussel	G3	S1			Small to medium-sized rivers in some current and substrate of fine gravel, sand, and silt	Currently known from mainstem Conasauga River and Holly Creek; historically widespread in Coosa System
MO	<i>Strophitus subvexus</i>	Southern creekmussel	G3	S1			Sand to sandy mud in slow or no current in small to large creeks	Currently known from Rock Creek (Murray Co.); historically widespread in Upper Coosa system
MO	<i>Toxolasma corvunculus</i>	Southern purple lilliput	G1	S1			channel margins of small streams to large rivers	Currently known from 1 unnamed tributary to Coosa River in Floyd Co.; Historically widespread in Upper Coosa system
MO	<i>Toxolasma cylindrellus</i>	Pale lilliput	G1	SX	LE		small to medium sized rivers	Only historic record is Lookout Creek, 1 mile NNE of Skyuka Spring on Chick. Military Park (Dade County Ga, August 12 1957
MO	<i>Toxolasma lividus</i>	Purple lilliput	G2	SH			Small to medium sized rivers in mud, sand, and gravel substrates. Occasionally present on shallow sand/gravel bars in reservoirs.	Athearn has one record from Lookout Creek (pre-1980)

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MO	<i>Toxolasma parvus</i>	Lilliput	G3	SH			Shallow areas of lakes and reservoirs and small to large rivers with mud, sand, and gravel.	Historically known from Chickamauga Cr. System
MO	<i>Truncilla donaciformis</i>	Fawnsfoot	G4	S1			Medium to large rivers at depths of 3 to 18 feet and sand/ mud substrates.	Most recent record in mainstem of Oostanaula in 1997 (JDW)
MO	<i>Villosa nebulosa</i>	Alabama rainbow	G3	S2			Sand and gravel riffle areas in moderate current	Current records from Conasauga mainstem, Conasauga tributaries and a few Etowah River tributaries; probably lost from mainstem Etowah, Coosawattee, and Chattooga
MO	<i>Villosa trabalis</i>	Cumberland bean	G1	SH	LE,XN		Small to medium rivers in swift current with sand and gravel substrates	Historically known from S. Chickamauga Cr. Near Graysville, last seen in 1958
MO	<i>Villosa vanuxemensis umbrans</i>	Coosa creekshell	G4T2	S2			Small creeks to large rivers	Current records are from upper Conasauga River mainstem, Conasauga tributaries (Holly Cr., Rock Creek), Armuchee Creek (Oostanaula System); historically widespread in Upper Coosa System
MO	<i>Villosa vanuxemensis vanuxemensis</i>	Mountain creekshell	G4	S1			Small headwater creeks in gravel and sand riffles	Athearn has many records from Lookout Cr and Chickamauga Cr. System; current record is from E. Chickamauga Cr.
RE	<i>Graptemys geographica</i>	Map turtle	G5	S1		R	Large streams and rivers	RV, Coosa and Tennessee drainage; possible in CU
RE	<i>Graptemys pulchra</i>	Alabama map turtle	G4	S1		R	Rivers & large streams	RV, Coosa drainage
RE	<i>Pituophis melanoleucus melanoleucus</i>	Northern pine snake	G4T4	S2			Dry pine or pine-hardwood forests	BR, PD, RV

Table 2. Southwestern Appalachians/Ridge & Valley High Priority Plants (59 Records)

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
<i>Aesculus glabra</i>	Ohio buckeye	G5	S2			Mesic forests in circumneutral soil	CU, RV, PD
<i>Agastache nepetoides</i>	Yellow giant hyssop	G5	S1				
<i>Alnus maritime</i>	Seaside alder	G3	S1			Ridge and Valley spring runs in standing water	RV
<i>Arabis georgiana</i>	Georgia rockcress	G2	S1	C	T	Rocky or sandy river bluffs and banks, in circumneutral soil	PD, RV, UCP; along Coosa, Oostanaula and lower Chattahoochee Rivers
<i>Asclepias purpurascens</i>	Purple milkweed	G4G5	S1			Openings in calcareous mixed oak-hickory flatwoods	RV, Floyd Co.
<i>Aureolaria patula</i>	Spreading yellow foxglove	G3	S1			Circumneutral alluvial bottoms	RV, limited to Coosa Valley, Floyd Co.
<i>Baptisia australis</i> var. <i>aberrans</i>	Glade blue wild indigo	G5T?	S2			Limestone glades and barrens	RV
<i>Berberis canadensis</i>	American barberry	G3	S1			Cherty, thinly wooded slopes	BR, PD; few sites from Towns Co. sw. to Meriwether Co.
<i>Buchnera americana</i>	American bluehearts	G5?	S1			Wet meadows; seasonally moist barrens and limestone glades	BR, CU, RV, UCP; only coastal plain site on Ft. Benning, Chattahoochee Co.
<i>Carex purpurifera</i>	Purple sedge	G4?	S3		T	Mesic hardwood forests over limestone	CU, RV, BR
<i>Carya myristiciformis</i>	Nutmeg hickory	G4	S1			Calcareous flatwoods	RV, Floyd Co.
<i>Clematis fremontii</i>	Fremont's leatherflower	G5	S1			Moist prairie openings in Coosa Flatwoods	RV, Floyd Co.
<i>Clematis socialis</i>	Alabama leather flower	G1	S1	LE	E	Grassy openings in calcareous oak-red maple flatwoods	RV, Floyd Co.
<i>Coreopsis pulchra</i>	Showy tickseed	G2	SR			Sandstone outcrops	CU, if present at all
<i>Crataegus triflora</i>	Three-flower hawthorn	G2	S2			Hardwood forests on rocky, limestone slopes	CU, PD, RV; NW Georgia in Floyd, Bartow, Walker and Dade Cos.
<i>Cypripedium acaule</i>	Pink lady'slipper	G5	S4		U	Upland oak-hickory-pine forests; piney woods	CU, RV, PD, UCP
<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>	Small-flowered yellow lady'slipper	G5	S3		U	Upland oak-hickory-pine forests; mixed hardwood forests	BR, RV, PD, possibly CU?
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Large-flowered yellow lady'slipper	G5	S3		U	Upland oak-hickory-pine forests; mixed hardwood forests	BR, CU, PD, RV
<i>Desmodium ochroleucum</i>	Cream-flowered tick-trefoil	G2?	S1			Open, calcareous woodlands	CU, UCP
<i>Echinacea simulata</i>	Prairie purple coneflower	G3	S2S3			Remnant prairies in the Coosa flatwoods near Rome	RV
<i>Erigeron strigosus</i> var. <i>calicola</i>	Limerock daisy fleabane	G3	S1			Limestone glades or cedar glades	RV (single Floyd Co. site)
<i>Helianthus verticillatus</i>	Whorled sunflower	G1Q	S1	C		Remnant prairies	RV, Floyd Co., W of Cave Spring
<i>Hydrastis canadensis</i>	Goldenseal	G4	S2		E	Rich woods in circumneutral soil	BR, CU, RV, PD with some sites now naturalized from original cultivated stands
<i>Jamesianthus alabamensis</i>	Jamesianthus	G3	S1			Streambanks, in circumneutral soil	RV
<i>Jeffersonia diphylla</i>	Twinleaf	G5	S1		E	Mesic deciduous forests over limestone	RV

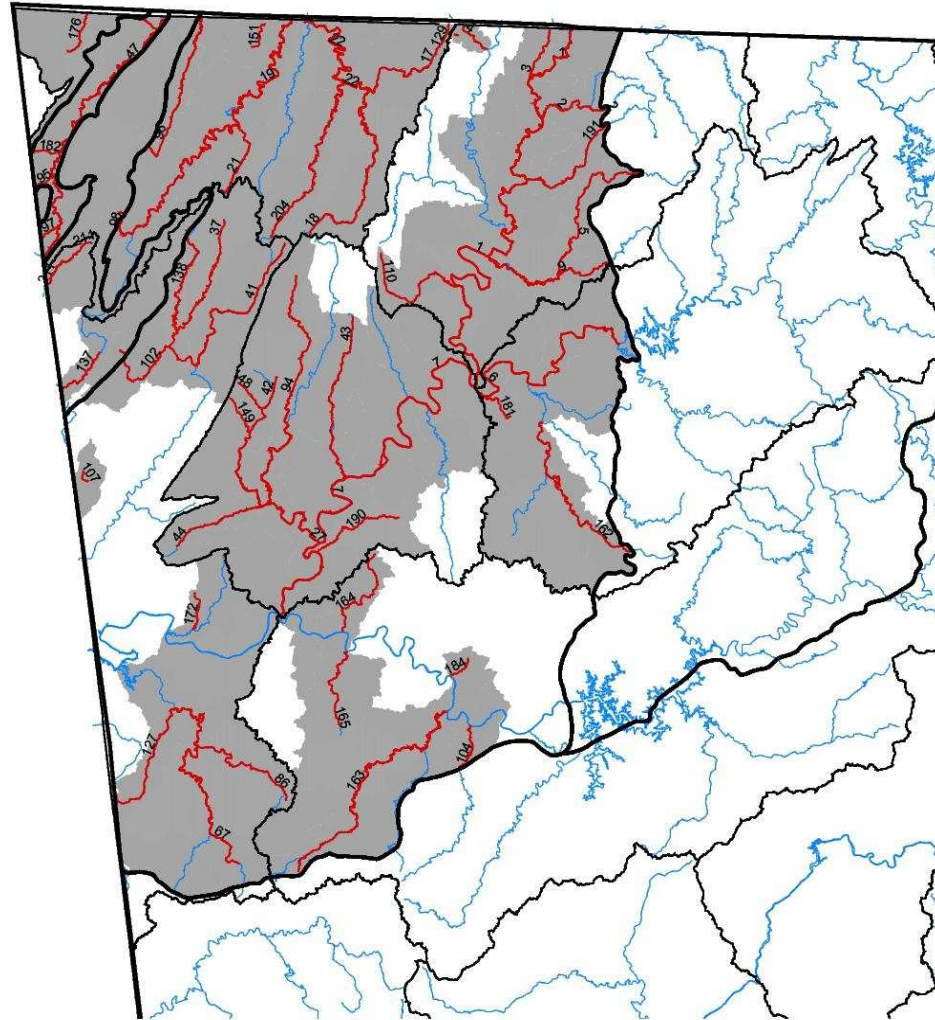
Table 2. Southwestern Appalachians/Ridge & Valley High Priority Plants (59 Records)

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
<i>Juglans cinerea</i>	Butternut	G3G4	S1S2			Floodplain forests, cove hardwoods	RV, BR, PD (barely); known from a few isolated stands; mostly in mountains, southern stations disjunct on Sharp Top Mountain, Pickens Co. and south of C
<i>Leavenworthia exigua</i> var. <i>exigua</i>	Least glade-cress	G4T3	S2		T	Limestone glades	RV, vicinity of Fort Oglethorpe, Catoosa Co.
<i>Lilium michiganense</i>	Michigan lily	G5	S1			Remnant wet prairies and calcareous flatwoods	RV
<i>Lilium philadelphicum</i>	Wood lily	G5	S1			Wet meadows over sandstone	CU
<i>Lysimachia fraseri</i>	Fraser's loosestrife	G2	S1S2		R	Moist, open, bouldery gravel bars and streambanks; edges of sandstone and granite outcrops	CU, BR, PD, RV; widely scattered sites from Currahee Mountain, Stephens Co. To top of Pigeon Mountain, Walker Co.
<i>Marshallia mohrii</i>	Coosa Barbara's-buttons	G3	S2	LT	T	Remnant Coosa Valley prairies; maintained rights-of-way	RV
<i>Marshallia trinervia</i>	Broadleaf Barbara's-buttons	G3	S1S2			Streamsides in open, bouldery gravel bars and washed, sandy banks	CU, RV, PD
<i>Melanthium woodii</i>	Ozark bunchflower	G5	S2		R	Mesic hardwood forests over basic soils	CU, PD, UCP
<i>Neviusia alabamensis</i>	Alabama snow-wreath	G2	S1		T	Along wet weather streams over limestone	CU, (Walker Co.) and RV (Floyd Co.)
<i>Onosmodium molle</i> ssp. <i>occidentale</i>	Western marble-seed	G4G5T4?	S1			Limestone glades and adjacent woods	RV, Catoosa and Walker Cos.;
<i>Panax quinquefolius</i>	American ginseng	G3G4	S3			Mesic hardwood forests; cove hardwood forests	BR, RV, CU, PD, UCP; found, at least formerly, well into the coastal plain; now mostly in PD and across North Georgia
<i>Philadelphus floridus</i>	Florida mockorange	G1Q	S1			Rocky slopes and banks of the Coosa River	RV
<i>Philadelphus pubescens</i>	Hairy mockorange	G5?	S1			Limestone ledges and rocky banks	CU
<i>Platanthera integrilabia</i>	Monkeyface orchid	G2G3	S1S2	C	T	Red maple-gum swamps; peaty seeps and streambanks with <i>Parnassia asarifolia</i> and <i>Oxypolis rigidior</i>	CU, BR, PD ; few sites from Tallulah Gorge to Cumberland Plateau, south to , Carroll Co.
<i>Polymnia laevigata</i>	Tennessee leafcup	G3	S1			Bouldery slopes	RV
<i>Prenanthes barbata</i>	Flatwoods rattlesnake-root	G2	S2			Limestone glades and barrens	RV
<i>Rhynchospora thornei</i>	Thorne's beakrush	G1G2	S2			Margins of limesink ponds; moist limestone barrens, wet prairies	RV, UCP
<i>Rudbeckia fulgida</i> var. <i>umbrosa</i>	Big-leaf black-eyed Susan	G4T4T5	S1?			Limestone woods near springs/seeps	RV
<i>Rudbeckia heliopsisidis</i>	Little River black-eyed Susan	G2	S1			Limestone or sandstone barrens and streamsides	CU, RV, PD
<i>Sabatia capitata</i>	Cumberland rose gentian	G2	S2		R	Meadows over sandstone or shale	CU, RV; from Coosa Valley prairies in Floyd Co. to sandstone caprock meadows in Dade Co
<i>Sagittaria secundifolia</i>	Little River water-plantain	G1	S1	LT	T	Crevice in sandstone in fast flowing streams	CU
<i>Scutellaria montana</i>	Large-flower skullcap	G2	S2S3	LE,PT	E	Mesic hardwood-shortleaf pine forests; usually mature forest with open understory, sometimes without a pine component	CU, RV
<i>Silene regia</i>	Royal catchfly	G3	S1		R	Limestone barrens; remnant prairies	RV, UCP; now found only in Dade Co.; historical in other sites

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Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Habitat in Georgia	Range in Georgia
<i>Silphium mohrii</i>	Cumberland rosinweed	G3?Q	S1?			Rocky hardwood forests	CU
<i>Spiraea virginiana</i>	Virginia spirea	G2	S1	LT	T	Bouldery gravel bars and ledges along major streams	CU, both sides of Lookout Mountain
<i>Spiranthes magnicamporum</i>	Great Plains ladies-tresses	G4	S1		E	Limestone glades	RV, Floyd and Catoosa Cos.
<i>Thalictrum debile</i>	Trailing meadowrue	G2	S1		T	Mesic hardwood forests over limestone	RV, Coosa River watershed; now found only in Gordon Co.
<i>Thaspium pinnatifidum</i>	Cutleaf meadow-parsnip	G2G3	S1			Limestone outcrops and barrens	RV, Catoosa Co.
<i>Thermopsis fraxinifolia</i>	Ash-leaved bush-pea	G3?Q	S2?			Oak and oak-pine ridge forests	BR (only?), perhaps adjacent RV, PD, need summary from Mike Ivey.
<i>Thermopsis villosa</i>	Aaron's rod, Carolina golden-banne	G3?	S1?			Mesic forests, floodplains and roadsides; mostly in sandy soils	CU (only?)
<i>Trillium pusillum</i>	Least trillium	G3	S1			Red maple-blackgum swampy woods in sticky clay soils	RV, Carbondale Swamp, Whitfield Co.
<i>Viburnum bracteatum</i>	Limerock arrowwood	G1	S1		E	Mesic hardwood forests over limestone	CU, RV; extremely local on Pigeon Mtn., Walker Co. and at Blacks Bluff, Floyd Co.
<i>Xerophyllum asphodeloides</i>	Eastern turkeybeard	G4	S1		R	Xeric oak-pine forests	BR, PD
<i>Xyris tennesseensis</i>	Tennessee yellow-eyed grass	G2	S1	LE	E	Seepy margins of limestone spring runs	RV, PD (barely)

High Priority Waters Ridge and Valley/Southwestern Appalachians



- Ecoregion Boundary
- Watershed (HUC8)
- High Priority Stream
- Stream (Not High Priority)
- High Priority Watershed

0 20 Miles

Figure 9. High Priority Waters, Southwestern Appalachians/Ridge & Valley Ecoregions