Ecoregions of Alabama and Georgia

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregions are directly applicable to the immediate needs of state agencies, including the development of biological criteria and water quality standards and the establishment of management goals for nonpoint-source pollution. They are also relevant to integrated ecosystem management, an ultimate goal of many federal and state resource management agencies.

The approach used to compile this map is based on the premise that ecological regions can be identified through the analysis of the spatial patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity (Wiken 1986; Omernik 1987, 1995). These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level. A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I is the coarsest level, dividing North America into 15 ecological regions. Level II divides the continent into 52 regions (Commission for Environmental Cooperation Working Group 1997). At level III, the continental United States contains 104 ecoregions and the conterminous United States has 84 ecoregions (United States Environmental Protection Agency [USEPA] 2000). Level IV is a further subdivision of level III ecoregions. Explanations of the methods used to define the USEPA's ecoregions are given in Omernik (1995), Omernik and others (2000), Griffith and others (1994), and Gallant and others (1989).

Alabama and Georgia contain barrier islands and coastal lowlands, large river floodplain forests, rolling plains and plateaus, forested mountains, and a variety of aquatic habitats. Ecological and biological diversity is enormous. There are 7 level III ecoregions and 44 level IV ecoregions in Alabama and Georgia and most continue into ecologically similar parts of adjacent states.

The level III and IV ecoregion map on this poster was compiled at a scale of 1:250,000 and depicts revisions and subdivisions of earlier level III ecoregions that were originally compiled at a smaller scale (USEPA 2000; Omernik 1987). This poster is part of a collaborative project primarily between USEPA Region IV, USEPA National Health and Environmental Effects Research Laboratory (Corvallis, Oregon), Alabama Department of Environmental Management (ADEM), Georgia Department of Natural Resources (GA DNR), and the United States Department of Agriculture-Natural Resources Conservation Service (NRCS). Collaboration and consultation also occured with the United States Department of Agriculture-Forest Service (USFS), United States Department of the Interior-Geological Survey (USGS)-Earth Resources Observation Systems (EROS) Data Center, and with other State of Alabama and State of Georgia agencies.

The project is associated with an interagency effort to develop a common framework of ecological regions. Reaching that objective requires recognition of the differences in the conceptual approaches and mapping methodologies applied to develop the most common ecoregion-type frameworks, including those developed by the USFS (Bailey and others, 1994), the USEPA (Omernik 1987, 1995), and the NRCS (U.S. Department of Agriculture-Soil Conservation Service, 1981). As each of these frameworks is further refined, their differences are becoming less discernible. Regional collaborative projects such as this one in Alabama and Georgia, where some agreement has been reached among multiple resource management agencies, is a step toward attaining consensus and consistency in ecoregion frameworks for the entire nation.

Literature Cited:

Bailey, R.G., Avers, P.E., King, T., and McNab, W.H., eds., 1994, Ecoregions and subregions of the United States (map) (supplementary table of map unit descriptions compiled and edited by McNab, W.H. and Bailey, R.G.): Washington, D.C., U.S. Department of Agriculture-Forest Service, scale 1:7,500,000.

Commission for Environmental Cooperation Working Group, 1997, Ecological regions of North America - toward a common perspective: Montreal, Quebec, Commission for Environmental Cooperation, 71 p.

Gallant, A.L., Whittier, T.R., Larsen, D.P., Omernik, J.M., and Hughes, R.M., 1989, Regionalization as a tool for managing environmental resources: Corvallis, Oregon, U.S. Environmental Protection Agency, EPA/600/3-89/060, 152 p.

Griffith, G.E., Omernik, J.M., Wilton, T.F., and Pierson, S.M., 1994, Ecoregions and subregions of Iowa - a framework for water quality assessment and management: The Journal of the Iowa Academy of Science, v. 101, no. 1, p. 5-13.

Omernik, J.M., 1987, Ecoregions of the conterminous United States (map supplement): Annals of the Association of American Geographers, v. 77, no. 1, p. 118-125, scale 1:7,500,000.

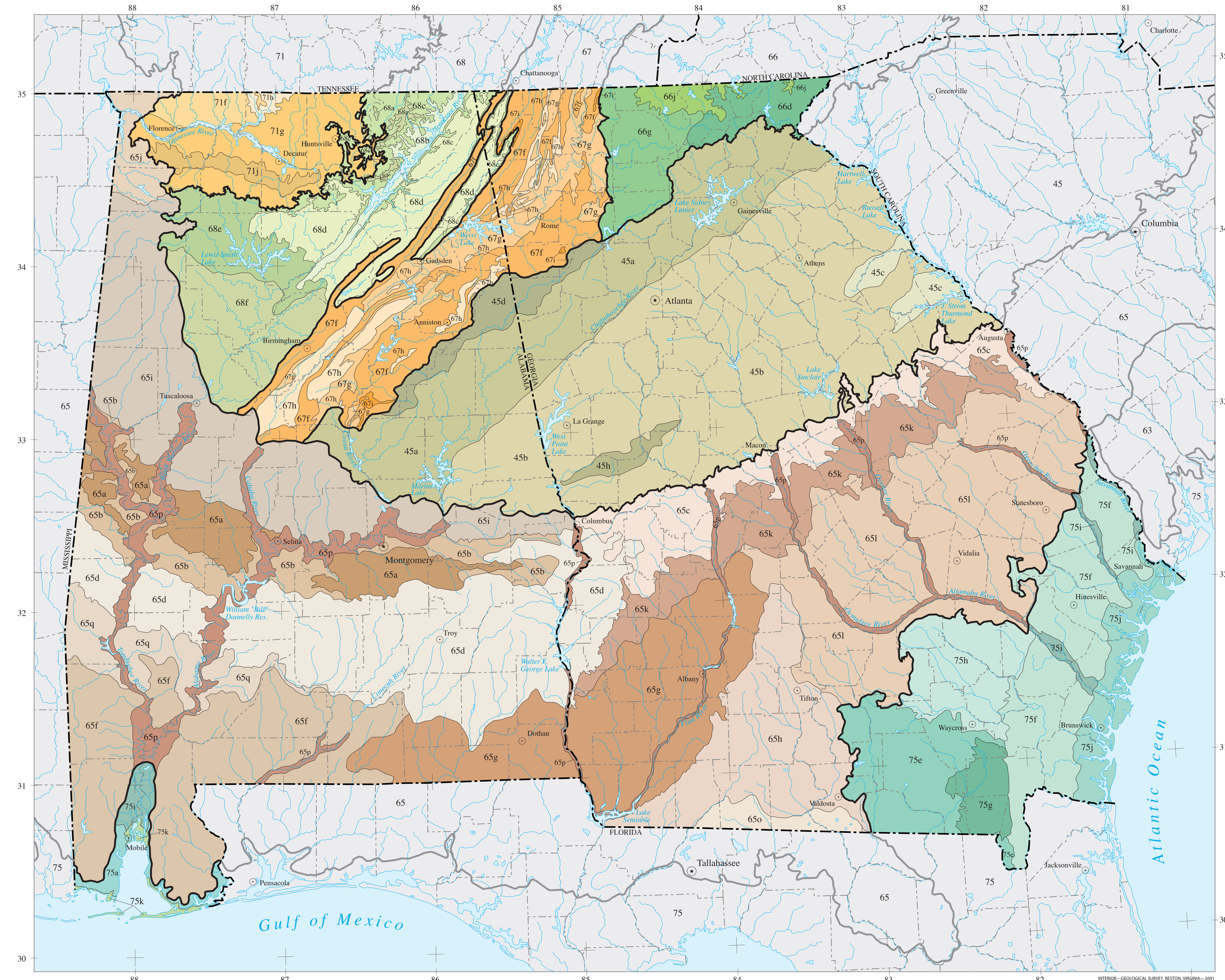
Omernik, J.M., 1995, Ecoregions - a framework for environmental management, *in* Davis, W.S. and Simon, T.P., eds., Biological assessment and criteria-tools for water resource planning and decision making: Boca Raton, Florida, Lewis Publishers, p. 49-62.

Omernik, J.M., Chapman, S.S., Lillie, R.A., and Dumke, R.T., 2000, Ecoregions of Wisconsin: Transactions of the Wisconsin Academy of Sciences, Arts and Letters, v. 88, no. 2000, p. 77-103.

U.S. Department of Agriculture-Soil Conservation Service, 1981, Land resource regions and major land resource areas of the United States: Agriculture Handbook 296, 156 p.

U.S. Environmental Protection Agency, 2000, Level III ecoregions of the continental United States (revision of Omernik, 1987): Corvallis, Oregon, U.S. Environmental Protection Agency-National Health and Environmental Effects Research Laboratory, Map M-1, various scales.

Wiken, E., 1986, Terrestrial ecozones of Canada: Ottawa, Environment Canada, Ecological Land Classification Series no. 19, 26 p.



45 Piedmont
- 45a Southern Inner Piedmont
- 45b Southern Outer Piedmont
- 45c Carolina Slate Belt
- 45d Talladega Upland
- 45h Pine Mountain Ridges

65 Southeastern Plains
- 65a Blackland Prairie
- 65b Flatwoods/Blackland Prairie Margins
- 65c Sand Hills
- 65d Southern Hilly Gulf Coastal Plain
- 65f Southern Pine Plains and Hills
- 65g Dougherty Plain
- 65h Tifton Upland
- 65i Fall Line Hills
- 65j Transition Hills
- 65k Coastal Plain Red Uplands
- 65l Atlantic Southern Loam Plains
- 65o Tallahassee Hills/Valdosta Limesink
- 65p Southeastern Floodplains and Low Terraces
- 65q Buhrstone/Lime Hills

66 Blue Ridge
- 66d Southern Crystalline Ridges and Mountains
- 66g Southern Metasedimentary Mountains
- 66j Broad Basins

67 Ridge and Valley
- 67f Southern Limestone/Dolomite Valleys and Low Rolling Hills
- 67g Southern Shale Valleys
- 67h Southern Sandstone Ridges
- 67i Southern Dissected Ridges and Knobs

68 Southwestern Appalachians
- 68a Cumberland Plateau
- 68b Sequatchie Valley
- 68c Plateau Escarpment
- 68d Southern Table Plateaus
- 68e Dissected Plateau
- 68f Shale Hills

71 Interior Plateau
- 71f Western Highland Rim
- 71g Eastern Highland Rim
- 71h Outer Nashville Basin
- 71j Little Mountain

75 Southern Coastal Plain
- 75a Gulf Coast Flatwoods
- 75e Okefenokee Plains
- 75f Sea Island Flatwoods
- 75g Okefenokee Swamp
- 75h Bacon Terraces
- 75i Floodplains and Low Terraces
- 75j Sea Islands/Coastal Marsh
- 75k Gulf Barrier Islands and Coastal Marshes

SCALE 1:1 700 000

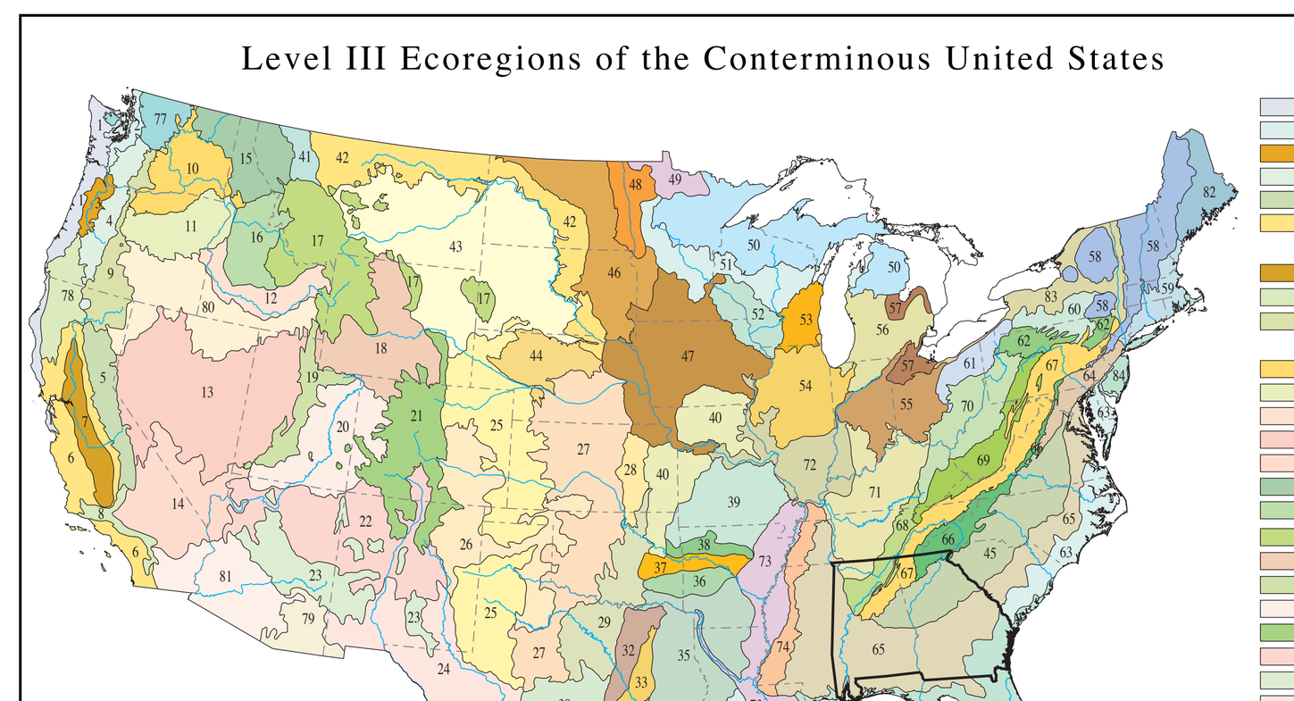
15 10 5 0 30 60 mi

30 20 10 0 60 120 km

Albers Equal Area Projection
Standard parallels 31 N and 34 N

Level III ecoregion — Level IV ecoregion — County boundary — State boundary

Level III Ecoregions of the Conterminous United States



Map source: USEPA, 2000

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45. Piedmont

Several major land cover transformations have occurred in the Piedmont over the past 200 years, from forest to farm, back to forest, and now in many areas, spreading urban- and suburbanization. *Photo: Joe and Monica Cook*

Considered the nonmountainous portion of the old Appalachians Highland by physiographers, the northeast-southwest trending Piedmont ecoregion comprises a transitional area between the mostly mountainous ecoregions of the Appalachians to the northwest and the relatively flat coastal plain to the southeast. It is a complex mosaic of Precambrian and Paleozoic metamorphic and igneous rocks with moderately dissected irregular plains and some hills. Once largely cultivated, much of this region has reverted to pine and hardwood woodlands. The soils tend to be finer-textured than in coastal plain regions.

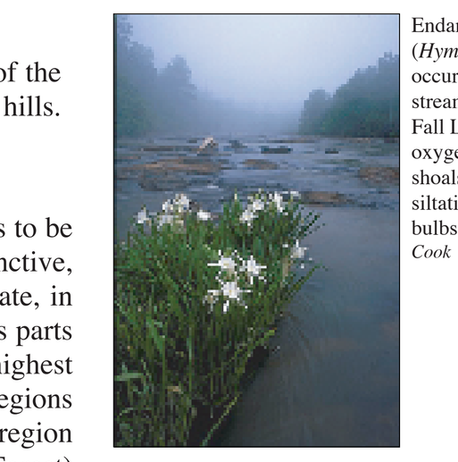
45a The **Southern Inner Piedmont** is mostly higher in elevation with more relief than 45b, but is generally lower and has less relief and contains different rocks and soils than 45d. The rolling to hilly, well-dissected upland contains mostly schist, gneiss, and granite bedrock. In the western portion, west of Atlanta and into Alabama, mica schist and micaceous saprolite are typical. To the east, biotite gneiss is more common. The region is now mostly forested, with major forest types of oak-pine and oak-hickory, with less loblolly-shortleaf pine forest than 45b. Open areas are mostly in pasture, although there are some small areas of cropland. Hay, cattle, and poultry are the main agricultural products. In Georgia, urban/suburban land cover has increased greatly within this ecoregion over the past twenty years.

45b The **Southern Outer Piedmont** ecoregion has lower elevations, less relief, and less precipitation than 45a. Loblolly-shortleaf pine is the major forest type, with less oak-hickory and oak-pine than in 45a. Gneiss, schist and granite are the dominant rock types, covered with deep saprolite and mostly red, clayey subsoils. The majority of soils are Kanhapludults. The southern boundary of the ecoregion occurs at the Fall Line, where unconsolidated coastal plain sediments are deposited over the Piedmont metamorphic and igneous rocks.

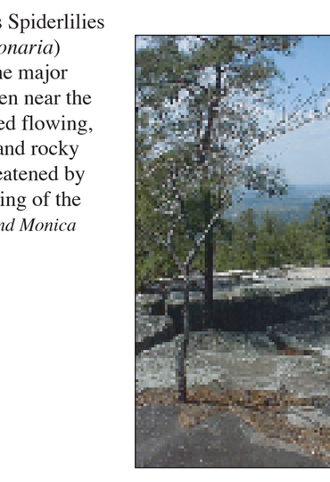
45c The **Carolina Slate Belt** is found primarily in the Carolinas, although a small area extends into Georgia. The mineral-rich metavolcanic and metasedimentary rocks with slatey cleavage are finer-grained and less metamorphosed than most Piedmont regions. It tends to be less rugged and less dissected than other Piedmont areas, and it generally has more silty and silty clay soils.

45d The **Talladega Upland** contains the higher elevations of the Alabama-Georgia Piedmont, and tends to be more mountainous, dissected, and heavily forested than 45a and 45b. The geology is also distinctive, consisting of mostly Silurian to Devonian age phyllite, quartzite, slate, metasiltstone, and metaconglomerate, in contrast to the high-grade metamorphic and intrusive igneous rocks of 45a and 45b. The more mountainous parts of the region, with ridges formed from quartzite, sandstone, and metaconglomerate, contain Alabama's highest point, 2407-foot Cheaha Mountain. The climate of 45d is slightly cooler and wetter than the other ecoregions (45a, b, c) of the Alabama-Georgia Piedmont. Oak-hickory-pine is the natural vegetation type, and the region once contained some unique montane longleaf pine communities. Public land (Talladega National Forest) comprises a large portion of the region in Alabama.

45h The **Pine Mountain Ridges**, a small, narrow region in the southwest portion of the Georgia Piedmont, contains quartzite-capped, steep-sloped ridges that rise 300-400 feet above the Piedmont surface to elevations over 1300 feet. Pine Mountain and Oak Mountain are the primary linear ridges trending southwest to northeast, and several other smaller ridges and mountains between these add to the region's more mountainous appearance. The Flint River has cut some narrow, steep gorges, 400 feet deep, through the ridges. Streams in this region are often of higher gradient than surrounding areas of 45b, and contain more rocky and gravelly substrates.



Endangered Shoals Spiderlilies (*Hymenocallis coronaria*) occur in some of the major streams of 45b, often near the Fall Line. They need flowing, oxygenated water and rocky shoals, and are threatened by siltation and poaching of the bulbs. *Photo: Joe and Monica Cook*



Granite outcrops are scattered throughout the Piedmont and often contain endemic plant species. The domes and flatrocks provide ideal sites to observe processes of soil formation and plant succession from lichens and mosses to herbs, shrubs, and trees. *Photo: Chuck Cochran*

Peach orchards are found in parts of the Outer Piedmont (45b), as well as in some areas of the upper Coastal Plain in Georgia and Alabama.

65. Southeastern Plains

A landscape mosaic of cropland, pasture, and forested riparian areas is a typical feature in many parts of the Southeastern Plains.

Extensive pine planation on the rolling terrain of the Southeastern Plains and Hills ecoregion (65e) within the Conecuh River basin, Alabama.

These irregular plains with broad interstream areas have a mosaic of cropland, pasture, woodland, and forest. Natural vegetation is mostly oak-hickory-pine and Southern mixed forest. The Cretaceous or Tertiary-age sands, silts, and clays of the region contrast geologically with the Paleozoic limestone, shale and sandstone of ecoregions 67, 68, and 71 or with the even older metamorphic and igneous rocks of the Piedmont (45). Elevations and relief are greater than in the Southern Coastal Plain (75), but generally less than in much of the Piedmont. Streams in this area are relatively low-gradient and sandy-bottomed.

65a The flat to undulating **Blackland Prairie** region has distinctive Cretaceous-age chalk, marl, and calcareous clay. The clayey soils tend to shrink and crack when dry and swell when wet. Streams have a high variability in flow and affect some fish species distributions. The natural vegetation had dominant trees of sweetgum, post oak, and red cedar, along with patches of bluestem prairie. Today, the area is mostly cropland and pasture, with small patches of mixed hardwoods. Pond-raised catfish aquaculture has increased in recent years.

65b The **Flatwoods/Blackland Prairie Margins** combines two slightly different areas. The Flatwoods are comprised of a mostly forested lowland area of little relief, formed primarily on dark, massive marine clay. Soils are deep, clayey, somewhat-poorly to poorly drained, and acidic. The Blackland Prairie Margins are undulating, irregular plains, with slightly more relief than the Flatwoods, but also tend to have heavy clay soils that are sticky when wet, hard and cracked when dry, with generally poor drainage.

65c The **Sand Hills** of Georgia form a narrow, rolling to hilly, highly dissected coastal plain belt stretching across the state from Augusta to Columbus. The region is composed primarily of Cretaceous and some Eocene-age marine sands and clays deposited over the crystalline and metamorphic rocks of the Piedmont (45). Many of the droughty, low-nutrient soils formed in thick beds of sand, although soils in some areas contain more loamy and clayey horizons. On the drier sites, turkey oak and longleaf pine are dominant, while shortleaf-loblolly pine forests and other oak-pine forests are common throughout the region.

65d The dissected irregular plains and gently rolling low hills of the **Southern Hilly Gulf Coastal Plain** ecoregion developed over diverse east-west trending bands of sand, clay, and marl formations. Broad cuestas with gentle south slopes and steeper north-facing slopes are common, and the heterogeneous region has a mix of clayey, loamy, and sandy soils. It has more rolling topography, higher elevations, and more relief than 65a, 65b, 65f, 65g, and streams have increased gradient. The natural vegetation of oak-hickory-pine forest grades into southern mixed forest to the south. Land cover is mostly forest and woodland, with some cropland and pasture.

65f The **Southern Pine Plains and Hills** have a different mix of vegetation and land use compared to 65d, and streams tend to be darker tea-colored and more acidic as one moves south. The oak-hickory-pine forest of the north in 65d grades into Southern mixed forest and longleaf pine forest in this region. The longleaf pine forest provided habitat for now rare or endangered species such as the red-cockaded woodpecker, gopher tortoise, eastern indigo snake, and Florida pine snake. Loblolly and slash pine plantations now cover wide areas.

65g The **Dougherty Plain** is mostly flat to gently rolling and influenced by the near-surface limestone. The karst topography contains sinkholes, springs, and fewer streams in the flatter part of the plain. The northwestern boundary is gradational, as more gentle slopes and lower relief are found towards the center of the region. Crops such as peanuts and pecans are common, and cotton production has increased dramatically in recent years. Many of the limesink ponds and marshes act as biological oases in the mostly agricultural landscape.

65h The **Tifton Upland** of Georgia has more rolling, hilly topography compared to 65g and 75e, with a mosaic of agriculture, pasture, and some mixed pine/hardwood forests. Soils are well-drained, brownish, and loamy, often with iron-rich or plinthic layers. They support crops of cotton, peanuts, soybeans, and corn. On the west side of the region, the Pelham Escarpment has bluffs and deep ravines with cool microclimates that support several rare plants and animals, as well as species with more northern affinities.

65i The **Fall Line Hills** are composed primarily of Cretaceous-age loamy and sandy sediments. It is mostly forested terrain of oak-hickory-pine on hills with 200-400 feet of relief. Longleaf pine is being reintroduced in many parts of the region, and the area around the Talladega National Forest in west Alabama provides a major stronghold for the endangered red-cockaded woodpecker.

65j The **Transition Hills** have some of the higher elevations in Ecoregion 65, and contain characteristics of both the Southeastern Plains and the Interior Plateau (71) ecoregions. Many streams in this transition area have cut down into the Mississippian, Devonian, and Silurian-age rocks and can look similar to those of the Interior Plateau. Cretaceous-age coastal plain deposits of silt, sand, clay, and gravel, however, overlie the older limestone, shale, and chert. It is a mostly forested region of oak-hickory-pine, with small areas of cropland and pasture in narrow valley bottoms and on gently sloping ridges.

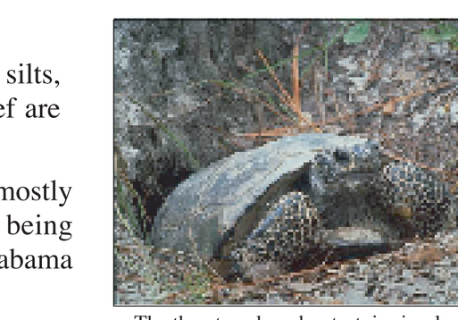
65k In contrast to the more forested Sand Hills (65c) that formed mostly on light-colored Cretaceous sands, the **Coastal Plain Red Uplands** formed on reddish Eocene sand and clay formations. Soils are mostly well-drained with a brown or reddish brown loamy or sandy surface layer and red subsoils. The majority of the area is in cropland or pasture, with some woodland on steeper slopes.

65l Also called the Vidalia Upland in Georgia, the **Atlantic Southern Loam Plains** ecoregion is generally lower, flatter, and more gently rolling than 65k, and has more cropland and finer-textured soils than 75f. Similar to 65h, it has an abundance of the agriculturally important Tifton soils, but the region also contains forested areas that are more sloping or are low, flat and poorly drained. Parallel to some of the major stream courses are some excessively-drained, dunal sand ridges with xeric vegetation such as longleaf pine / turkey oak forests, and some distinctive evergreen shrubs, such as rosemary and woody mints.

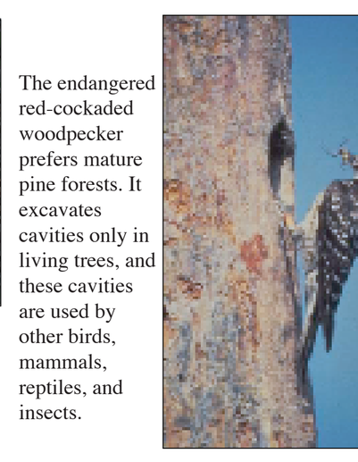
65o The **Tallahassee Hills/Valdosta Limesink** ecoregion combines two slightly different areas, both influenced by underlying limestone. The Floridan aquifer is thinly confined in this region, and streams are often intermittent or in parts flow underground in the karst landscape. In the west, the Tallahassee Hills portion has rolling, hilly topography that is more forested than 65h. Clayey sands weathered to a thick red residual soil are typical. Relief decreases towards the east, and the Valdosta Limesink area has more solution basins with ponds and lakes, and more cropland. The soils are typically brownish.

65p **Southeastern Floodplains and Low Terraces** comprise a riverine ecoregion of large sluggish rivers and backwaters with ponds, swamps, and oxbow lakes. River swamp forests of bald cypress and water tupelo and oak-dominated bottomland hardwood forests provide important wildlife corridors and habitat. In Alabama, cropland is typical on the higher, better-drained terraces, while hardwood forests cover the floodplains. In Georgia, the terraces are not as broad and are primarily in bottomland hardwood forest.

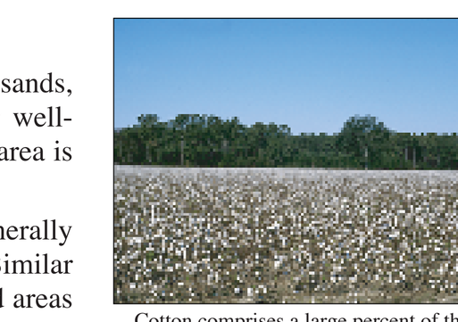
65q The **Buhrstone/Lime Hills** region has some of the most rugged terrain of the Alabama coastal plain. The rough, hilly topography is attributed to the hardened beds of claystone, sandstone, and resistant limestones. Many of the streams have relatively high gradients and hard-rock bottoms. Some fish species that are generally found above the Fall Line are also found in this region because of its streams with upland characteristics. The Red Hills salamander, a threatened species, is also found mostly within 65q on cool, shady, moist ravines and bluffs located



The threatened gopher tortoise is a keystone species found in parts of ecoregion 65 and 75 in longleaf pine communities. Many different animal species use the gopher tortoise burrows during various stages of their life cycle. The gopher tortoise population is declining.

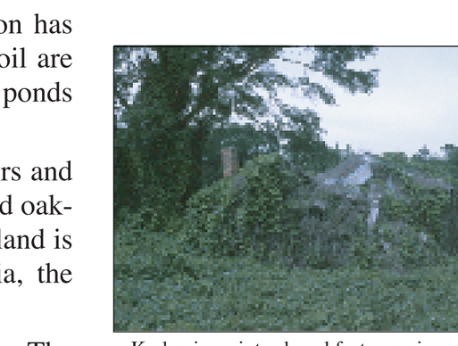


The endangered red-cockaded woodpecker prefers mature pine forests. It excavates cavities only in living trees, and these cavities are used by other birds, mammals, reptiles, and insects.



Cotton comprises a large percent of the harvested cropland of ecoregion 65 in Alabama and Georgia. Cotton production in Georgia peaked in the 1910-1920 period, reached a low in the 1970's and early 1980's, and increased greatly in the 1990s.

Production of peanuts occurs primarily in the Dougherty Plain (65g) of Alabama and Georgia. This region produces about one-half of the nation's domestic peanut supply. *Photo: Don Schuhart, USDA*



Kudzu is an introduced fast-growing vine that was often planted in the 1930's and 1940's to control soil erosion. The vines can grow a foot per day, climbing and covering trees, poles, and buildings. It can kill trees and other native vegetation by blocking sunlight.

Rows of slash pine or loblolly pine in pine plantations are a common land cover in ecoregions 65 and 75. The short-rotation monoculture is biologically less diverse than the original southern mixed forest. *Photo: Bill Tarpenning, USDA*

66. Blue Ridge

The Blue Ridge is part of one of richest temperate broadleaf forests in the world, with a high diversity of flora and fauna. Black bear, whitetail deer, wild boar, turkey, grouse, songbirds, many species of amphibians and reptiles, thousands of species of invertebrates, and a variety of small mammals are found here. *Photo: Ed Jackson, Univ. of GA*

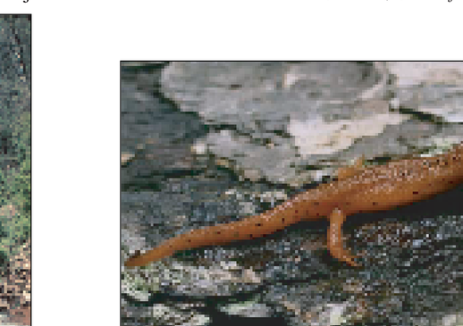
The Blue Ridge extends from southern Pennsylvania to northern Georgia, varying from narrow ridges to hilly plateaus to more massive mountainous areas with high peaks. The mostly forested slopes, high-gradient, cool, clear streams, and rugged terrain occur on a mix of igneous, metamorphic, and sedimentary geology. Annual precipitation of over 80 inches can occur on the well-exposed high peaks. The southern Blue Ridge is one of the richest centers of biodiversity in the eastern U.S. It is one of the most floristically diverse ecoregions, and includes Appalachian oak forests, northern hardwoods, and, at the highest elevations in Tennessee and North Carolina, Southeastern spruce-fir forests. Shrub, grass, and heath balds, hemlock, cove hardwoods, and oak-pine communities are also significant.

66d The **Southern Crystalline Ridges and Mountains** contain the highest and wettest mountains in Georgia. These occur primarily on Precambrian-age igneous and high-grade metamorphic rocks. The common crystalline rock types include gneiss, schist, and quartzite, covered by well-drained, acidic, brownish, loamy soils. Some mafic and ultramafic rocks also occur here, producing more basic soils. Elevations of this rough, dissected region are typically 1800-4000 feet, with Brasstown Bald Mountain, the highest point in Georgia, reaching 4,784 feet. Although there are a few small areas of pasture and apple orchards, the region is mostly forested.

66g The **Southern Metasedimentary Mountains** in Georgia contain rocks that are generally not as strongly metamorphosed as the gneisses and schists of 66d. The geologic materials are mostly late Pre-Cambrian and include slate, conglomerate, phyllite, metagraywacke, metasiltstone, metasandstone, and quartzite, with some schist and gneiss. Although the highest peaks are lower than in 66d, and parts of the region have more open low hills, there are some isolated masses of rugged mountains, such as the biologically-diverse Cohutta Mountains, Rich Mountains, and Fort Mountain.

66j The **Broad Basins** ecoregion is drier, and has lower elevations and less relief than the more mountainous Blue Ridge regions (66g, 66d). It also has less bouldery colluvium than those two surrounding regions and more saprolite. The soils are mostly deep, well-drained, loamy to clayey Ultisols. Although this rolling foothills region is mostly forested, it has more pasture than adjacent regions, and some narrow areas of row crops and truck crops on terraces and floodplains. Much of the pasture and corn crops support local cattle, hog, or poultry operations.

Streams in the Blue Ridge are often high-gradient with rocks, boulders, and cool, clear water. Waterfalls are abundant. Many of these streams eventually supply drinking water for nearby communities, as well as for major cities such as Atlanta. *Photo: Ed Jackson, Univ. of GA*



The red-spotted newt is a common salamander often found in forested areas on floodplains and colluvial flats. The southern Appalachians have the most diverse salamander population in the world.

67. Ridge and Valley

Forested ridges, and valleys with pasture and cropland, are typical in many parts of ecoregion 67. Its diverse habitats contain many unique species of terrestrial and aquatic flora and fauna.

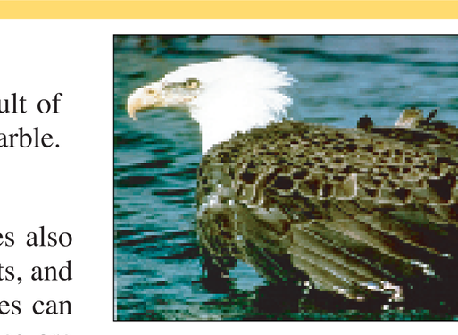
Sometimes called the Great Valley in Georgia or the Coosa Valley in Alabama, this is a relatively low-lying region between the Blue Ridge (66) to the east and the Southwestern Appalachians (68) on the west. As a result of extreme folding and faulting events, the roughly parallel ridges and valleys come in a variety of widths, heights, and geologic materials, including limestone, dolomite, shale, siltstone, sandstone, chert, mudstone, and marble. Springs and caves are relatively numerous. Land cover is mixed and present-day forests cover about 50% of the region. The ecoregion has great aquatic habitat diversity and supports a diverse fish fauna.

67f The **Southern Limestone/Dolomite Valleys and Low Rolling Hills** form a heterogeneous region composed predominantly of limestone and cherty dolomite. Landforms are mostly undulating valleys and rounded ridges and hills, with many caves and springs. Soils vary in their productivity, and land cover includes oak-hickory and oak-pine forests, pasture, intensive agriculture, and urban and industrial. Along the Coosa River floodplain, biota more typical of coastal plain regions can be found due to the valley and riverine connection to ecoregion 65 in Alabama.

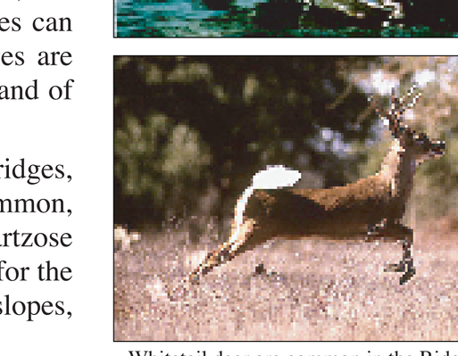
67g The **Southern Shale Valleys** consist of undulating to rolling valleys and some low, rounded hills and knobs that are dominated by shale. The soils formed in materials weathered from shale, shaly limestone, and clayey sediments, and tend to be deep, acidic, moderately well-drained, and slowly permeable. The steeper slopes are used for pasture or have reverted to brush and mixed forest land. Small fields of hay, corn, soybeans, tobacco, and garden crops are grown on the foot slopes and bottom land.

67h The **Southern Sandstone Ridges** region encompasses the major sandstone ridges, but these ridges also have areas of shale, siltstone, and conglomerate. The steep, forested ridges tend to have narrow crests, and the soils are typically stony, sandy, and of low fertility. The chemistry of streams flowing down the ridges can vary greatly depending on the geologic material. In Georgia and Tennessee, most of the sandstone ridges are relatively narrow, but in Alabama, the region also includes the Coosa and Cahaba ridges that are broader and of younger Pennsylvanian-age sandstone and shale.

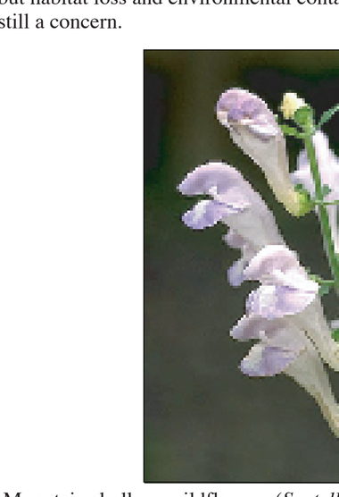
67i The **Southern Dissected Ridges and Knobs** contain more crenulated, broken, or hummocky ridges, compared to the smoother, more sharply crested sandstone ridges of 67h. Although shale is common, there is a mixture and interbedding of geologic materials, including cherts, siltstone, sandstone, quartzose limestone, and in Alabama some slate, quartzite, and metasiltstone. Oak forests and pine forests are typical for the higher elevations of the ridges, with oak-hickory and a number of more mesic forest species on the lower slopes, knobs, and draws.



Bald eagles are attracted to fish in the reservoirs of the Ridge and Valley. Eagle populations have increased, but habitat loss and environmental contaminants are still a concern.



Whitetail deer are common in the Ridge and Valley and throughout Alabama and Georgia.



Mountain skullcap wildflowers (*Scutellaria montana*) are found in parts of ecoregion 67 and 68 in Georgia. They are endangered due to a loss of habitat from agriculture, urban development, and exotic weeds.

68. Southwestern Appalachians

Layers of sandstone, limestone, and shale are exposed on the steep slopes of Cloudland Canyon (Sitton Gulch) in 68c in northwest Georgia. *Photo: Ed Jackson, Univ. of GA*

Stretching from Kentucky to Alabama, these low mountains contain a mosaic of forest and woodland with some cropland and pasture. The eastern boundary of the ecoregion, along the abrupt escarpment next to the Ridge and Valley (67), is relatively smooth and only slightly notched by small eastward flowing stream drainages. The western boundary, next to the Interior Plateau's Eastern Highland Rim (71g), is more crenulated with a rougher escarpment that is more deeply incised. The mixed mesophytic forest is restricted mostly to the deeper ravines and escarpment slopes, and the summit or tableland forests are dominated by mixed oaks with shortleaf pine.

68a The **Cumberland Plateau's** tablelands are about 1000 feet higher than the Eastern Highland Rim (71g) to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. Similar to 68d, the plateau surface has less dissection and relief compared to the Plateau Escarpment (68c). Elevations of the region in Alabama are generally 1500-1700 feet. Pennsylvanian-age sandstone, conglomerate, siltstone, and shale is covered by mostly well-drained, acid soils of low fertility. The region is mostly forested or in pasture, with some cropland in the lower elevation section to the south.

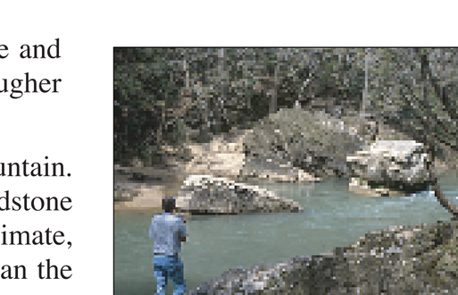
68b From the Tennessee border, the elongated **Sequatchie Valley** extends nearly one hundred miles southwest into Alabama. Structurally associated with an anticline, where erosion of broken rock scooped out the linear valley, it is composed mostly of Mississippian to Ordovician-age limestones, dolomites, and shales, with some low, cherty ridges. In the north, the open, rolling, valley floor, 600 feet in elevation, is nearly 1000 feet below the top of the Cumberland Plateau and Sand Mountain. South of Blountsville, the topography becomes more hilly and irregular with higher elevations. The Tennessee River flows through the Sequatchie Valley in Alabama, until it turns west near Guntersville and leaves the valley. Similar to parts of the Ridge and Valley, this is an agriculturally productive region, with areas of pasture, hay, soybeans, small grain, corn, and tobacco.

68c The **Plateau Escarpment** is characterized by steep, forested slopes and high velocity, 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. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-yellow poplar, sugar maple-basswood-ash-buckeye), with some rare hemlock along rocky streamsides and river birch along floodplain terraces.

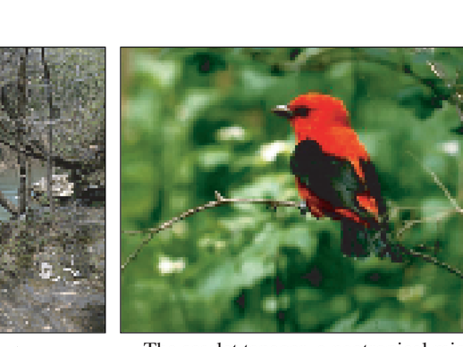
68d The **Southern Table Plateaus** include Sand Mountain, Lookout Mountain, and Brindley Mountain. While it has some similarities to the Cumberland Plateau (68a) with its Pennsylvanian-age sandstone caprock, shale layers, and coal-bearing strata, this ecoregion is lower in elevation, has a slightly warmer climate, and has more agriculture. It is at higher elevations and has more gentle topography with less dissection than the more forested ecoregions of 68e and 68f. Although the Georgia portion is mostly forested, elevations decrease to the southwest in Alabama and there is more cropland and pasture. It is a major poultry production region in Alabama.

68e The **Dissected Plateau** is so strongly dissected that it no longer has a typical plateau appearance. The rugged, mostly forested region contains predominantly strongly sloping land, some steep-sided gorges and sandstone cliffs, and relief of 300-400 feet. The cool canyons and valleys often contain plant and animal species usually found further north. The Bankhead National Forest occupies a large portion of 68e, providing public recreation, wilderness, and forestry areas. Most of the region is drained by the Sipsey Fork of the Black Warrior River. The Sipsey Fork is a National Wild and Scenic River in its headwaters, and downstream is impounded to form Lewis Smith Lake, a hydro-electric generating reservoir, also popular for bass fishing.

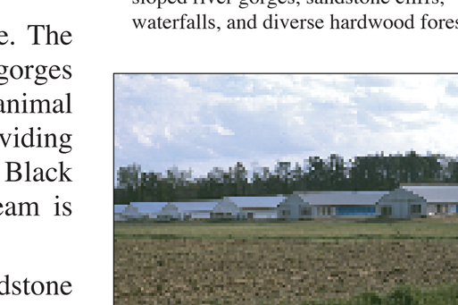
68f The **Shale Hills** ecoregion, sometimes called the Warrior Coal Field, has more shale and less sandstone than 68e. The soils generally have silt loam surfaces rather than sandy loams and have a silty clay or clayey subsoil. Although it has the lowest elevations in ecoregion 68, the surface features are characterized by extensive hills and mostly strongly sloping topography. The shale, siltstone, and sandstone are relatively impermeable, and streams do not have the base flow found in more permeable adjacent areas, such as 65i or 67f. The region is mostly forested, but coal mining is a major industry, and the extensive open-pit mines have altered the landscape, soils, and streams.



The Sipsey Wilderness in 68e offers steep-sloped river gorges, sandstone cliffs, waterfalls, and diverse hardwood forests.



The scarlet tanager, a neotropical migrant, is a summer resident of the mixed oak forests in the northern parts of Alabama and Georgia. *Photo: W.A. Paff*



As the Southern Table Plateau (68d) decreases in elevation to the southwest, agricultural land cover increases, and includes pasture, corn, soybeans, potatoes, hay, and poultry.

Chicken production is especially common in the Alabama portion of ecoregion 68d. Disposal of poultry waste and water quality impacts are a growing concern.

71. Interior Plateau

Pasture and cattle, with some scattered cropland, are typical on the rolling Alabama portion of 71f. To the north in Tennessee the Western Highland Rim becomes more hilly and forested.

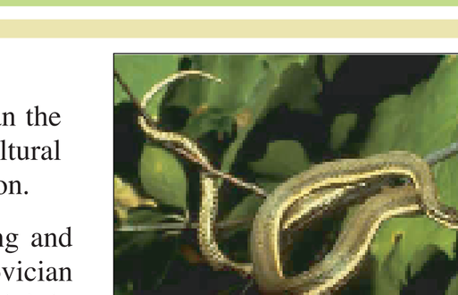
The Interior Plateau is a diverse ecoregion extending from southern Indiana and Ohio to northern Alabama. Rock types are distinctly different from the coastal plain sediments of ecoregion 65, and elevations are lower than the Appalachian ecoregions (66, 67, 68) to the east. Mississippian to Ordovician-age limestone, chert, sandstone, siltstone, and shale compose the landforms of open hills, irregular plains, and tablelands. It is an important agricultural region in Alabama. The natural vegetation is primarily oak-hickory forest, with some mixed mesophytic forest and areas of cedar glades. The springs, lime sinks, and caves contribute to this region's distinctive faunal distribution.

71f The **Western Highland Rim** is characterized by weakly to moderately dissected rolling terrain of irregular plains and open hills. In Alabama, the ecoregion tends to have less relief and dissection than in Tennessee. The limestone, chert, siltstone, and shale is covered by soils that are cherty, acidic, and low to moderate in fertility. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock, low to moderate gradients, and relatively clear water. Although the steeper, more dissected side slopes tend to be forested, most of the natural vegetation has been removed from the broad, level uplands for pasture and cropland. Cattle production is locally significant, and hay, cotton, and soybeans, with some wheat and corn, comprise much of the cropland.

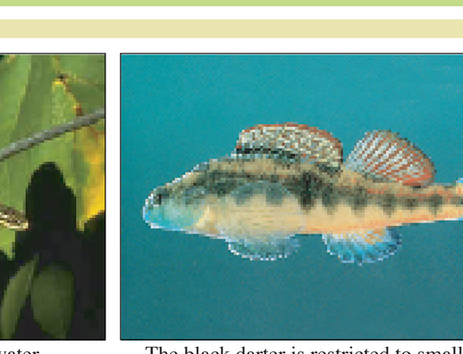
71g The **Eastern Highland Rim** is flatter and has less dissection than the Western Highland Rim (71f). Mississippian-age limestone, chert, shale, and dolomite predominate, and springs, sinks, and caves have formed by solution of the limestone. Cave and spring-associated fish fauna also typify the region. In the southern part of the region, streams flow down from the Pottsville Escarpment of ecoregion 68, cutting north across the Moulton Valley and through narrow valleys of Little Mountain (71j) to the impounded Tennessee River. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions to the east. Much of the original bottomland hardwood forest has been inundated by impoundments. The flatter areas in the east and on both sides of the Tennessee River have deep, well-drained, reddish soils that are intensively farmed.

71h Mostly a dissected escarpment, the **Outer Nashville Basin** is a heterogeneous region with rolling and hilly topography and mixed land use. The region encompasses most of the area containing the Ordovician non-cherty limestone and calcareous shale bedrock. These limestone rocks and the overlying soils can be high in phosphorus. The higher hills and knobs are sometimes capped by the more cherty Mississippian-age Fort Payne Formation typical of the Highland Rim. Oak-hickory and transitional mixed mesophytic deciduous forest covers most of the steeper slopes, with cropland and pasture found in the flatter alluvial plains along the Elk River and its tributaries. Streams are low to moderate gradient, with productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

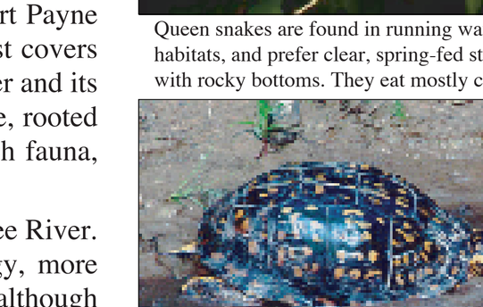
71j **Little Mountain** is a narrow, plateau-like ridge, five to ten miles wide, that parallels the Tennessee River. It is distinguished from the surrounding Eastern Highland Rim (71g) by its sandstone geology, more dissected and hilly topography, and more forest cover. It therefore has some similarities to ecoregion 68, although the elevation is lower and the Hartselle sandstone is Mississippian, not Pennsylvanian-age. The flatter, broad uplands of Little Mountain have mostly well-drained loamy soils and are often in pasture or cropland. The larger streams cut through the ecoregion, flowing from the Moulton Valley in 71g north to the Tennessee River. Some streams are diverted for irrigation and can be dry in their lower reaches in the summer.



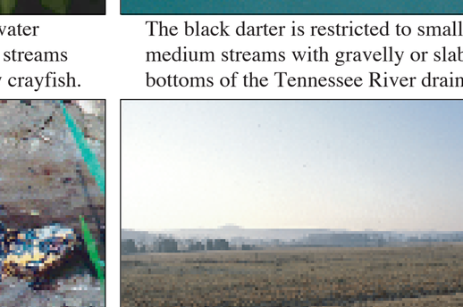
Queen snakes are found in running water habitats, and prefer clear, spring-fed streams with rocky bottoms. They eat mostly crayfish.



The black darter is restricted to small and medium streams with gravelly or slabrock bottoms of the Tennessee River drainage.



In Alabama, the terrestrial eastern box turtle is found mostly in the northern third of the state in moist forest habitats.



The red-clay lands of the Eastern Highland Rim (71g) are agriculturally productive.

75. Southern Coastal Plain

The web of interrelated coastal environments, including beaches, barrier islands, maritime forests, marshes, and estuaries, is continually changed by wave, tide, wind, and river energy, and has a long history of human alterations. Sapelo Island, GA, has seen Native American cultivation of corn, melons, squash, and beans; a Spanish mission period during the 1500-1600's with crops including citrus, figs, peaches, olives, artichokes, and onions; and a plantation agriculture economy in the late 1700's through the 1800's that produced indigo, rice, sugar cane, and sea island cotton. *Photo: Sapelo Island National Estuarine Research Reserve*

The Southern Coastal Plain extends from South Carolina and Georgia through much of central Florida, and along the Gulf coast lowlands of the Florida Panhandle, Alabama, and Mississippi. From a national perspective, it appears to be mostly flat plains, but it is a heterogeneous region also containing barrier islands, coastal lagoons, marshes, and swampy lowlands along the Gulf and Atlantic coasts. In Florida, an area of discontinuous highlands contains numerous lakes. This ecoregion is generally lower in elevation with less relief and wetter soils than ecoregion 65. Once covered by a variety of forest communities that included trees of longleaf pine, slash pine, pond pine, beech, sweetgum, southern magnolia, white oak, and laurel oak, land cover in the region is now mostly slash and loblolly pine with oak-gum-cypress forest in some low lying areas, citrus groves, pasture for beef cattle, and urban.

75a In Alabama, the **Gulf Coast Flatwoods** is a narrow region of nearly level terraces and delta deposits composed of Quaternary sands and clays. Wet, sandy flats and broad depressions that are locally swampy are usually forested, while some of the better-drained land has been cleared for pasture or crops. Most of the Mobile urban area is also contained in this region.

75e The **Okefenokee Plains** consist of flat plains and low terraces developed on Pleistocene-Pliocene sands and gravels. These plains have slightly higher elevations and less standing water than 75g, although there are numerous swamps and bays. Soils are somewhat-poorly to poorly drained. The region has mostly coniferous forest and young pine plantation land cover, with areas of forested wetland.

75f The **Sea Island Flatwoods** are poorly-drained flat plains with lower elevations and less dissection than 65l. Pleistocene sea levels rose and fell several times creating different terraces and shoreline deposits. Spodosols and other wet soils are common, although small areas of better-drained soils add some ecological diversity. Trail Ridge is in this region, forming the boundary with 75g. Loblolly and slash pine plantations cover much of the region. Water oak, willow oak, sweetgum, blackgum and cypress occur in wet areas.

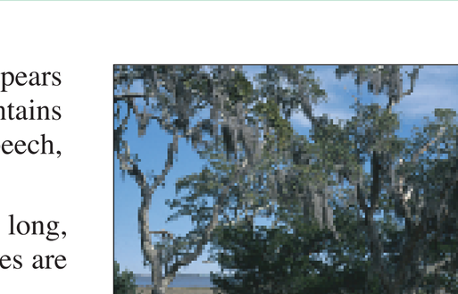
75g The **Okefenokee Swamp** is a mixture of forested swamp and freshwater marsh with some pine uplands. With Trail Ridge at its eastern boundary, the swamp drains to the south and southwest and contains the headwaters for the St. Marys and Suwannee Rivers. The swamp contains numerous islands, lakes, and thick beds of peat. The slow-moving waters are tea-colored and acidic. Cypress, blackgum, and bay forests are common, with scattered areas of prairie, which are comprised of grasses, sedges, and various aquatic plants. Most of this region is within the Okefenokee National Wildlife Refuge.

75h The **Bacon Terraces** include several relatively flat, moderately dissected terraces with subtle east-facing scarps. The terraces, developed on Pliocene-Pleistocene sands and gravels, are dissected in a dendritic pattern by much of the upper Satilla River basin. Cropland is mostly on the well-drained soils on the long, narrow, flat to gently sloping ridges paralleling many of the stream courses. The broad flats of the interfluves are often poorly drained and covered in pine, while bottomland forests are found in the wet, narrow floodplains.

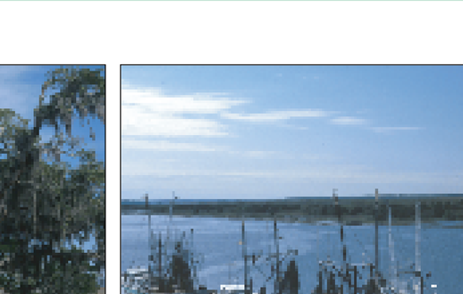
75i **Floodplains and Low Terraces** are a continuation of the riverine 65p ecoregion across the Southern Coastal Plain. The broad floodplains and terraces of major rivers, such as the Savannah, Ogeechee, Altamaha, and Mobile-Tensaw, comprise the region. Composed of stream alluvium and terrace deposits of sand, silt, clay, and gravel, along with some organic muck and swamp deposits, the region includes large sluggish rivers and backwaters with ponds, swamps, and oxbow lakes. River swamp forests of bald cypress and water tupelo and oak-dominated bottomland hardwood forests provide important wildlife habitat.

75j The **Sea Islands/Coastal Marsh** region contains the lowest elevations in Georgia and is a highly dynamic environment affected by ocean wave, wind, and river action. Mostly sandy soils occur on the barrier islands, while organic and clayey soils occur in the freshwater, brackish, and salt marshes. Maritime forests of live oak, red cedar, slash pine, and cabbage palmetto grow on parts of the sea islands, and various species of cordgrass, saltgrass, and rushes are dominant in the marshes. The coastal marshes are important nursery areas for fish, crabs, shrimp, and other marine species.

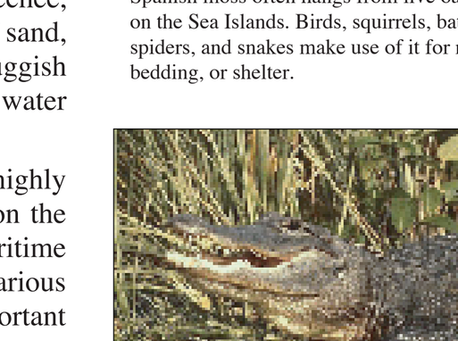
75k The **Gulf Barrier Islands and Coastal Marshes** region contains salt and brackish marshes, dunes, beaches, and barrier islands that enclose the Mississippi Sound and Mobile Bay. Cordgrass and saltgrass are common in the intertidal zone, while xeric coastal strand and pine scrub vegetation occurs on parts of the dunes, spits, and barrier islands. Dauphin Island, one of Alabama's best birding sites, is known for the many trans-gulf migrant bird species that can be seen in spring and fall.



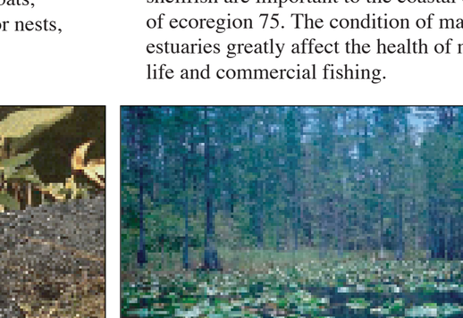
Spanish moss often hangs from live oak trees on the Sea Islands. Birds, squirrels, bats, spiders, and snakes make use of it for nests, bedding, or shelter.



Deep water ports and harvesting of finfish and shellfish are important to the coastal economy of ecoregion 75. The condition of marshes and estuaries greatly affect the health of marine life and commercial fishing.



Alligators, removed from the endangered species list in 1987, are an integral component of many wetland ecosystems in the Southern Coastal Plain (75). *Photo: Tom Atwood*



Standing water is common in many parts of ecoregion 75 for all or parts of the year. The Okefenokee Swamp is a rainfall-dependent system, and cycles of drought and fire affect both its vegetation and wildlife distributions. *Photo: USGS Florida Caribbean Science Center*