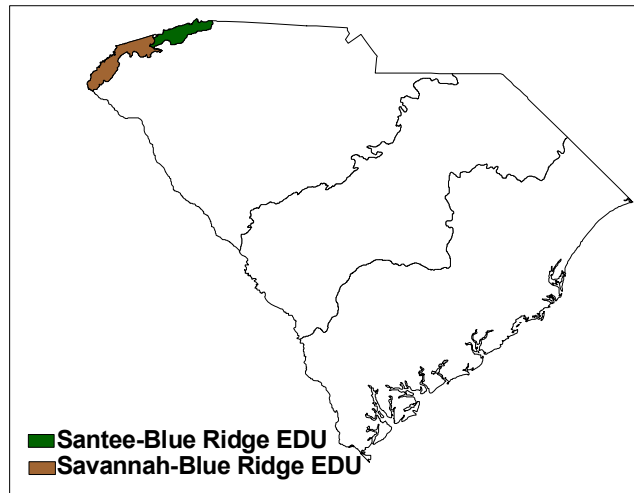


## Blue Ridge Ecoregion Aquatic Habitats

### DESCRIPTION AND LOCATION

The Blue Ridge ecoregion is located in the northwest corner of the state in Oconee, Pickens and Greenville Counties. Although the Blue Ridge is the smallest ecoregion in South Carolina, encompassing only 465 square miles, it harbors a diverse and unique aquatic community. The Blue Ridge Ecoregion cuts across the top of two major South Carolina drainages, the Savannah and the Santee, forming two ecobasins: the Savannah-Blue Ridge and the Santee-Blue Ridge.



#### *Santee-Blue Ridge Ecobasin*

The Blue Ridge portion of the Santee drainage originates in South Carolina as the headwaters of the Saluda River, which flows southeast and is a major tributary to the Santee River. The ecobasin encompasses approximately 175 square miles. Most of the land is privately owned; however, a significant portion (63 square miles) is protected by state, municipal and private entities. Significant protected areas include two Greenville Watershed properties managed by the City of Greenville (under conservation easement to the Nature Conservancy), the Mountain Bridge Wilderness Area and Jocassee Gorges Recreation Area managed by the South Carolina Department of Natural Resources (SCDNR) and Table Rock State Park. The ecobasin encompasses approximately 245 miles of lotic habitat. The largest two impoundments, North Saluda Reservoir and Table Rock Reservoir, total only 1,519 acres.

#### *Savannah-Blue Ridge Ecobasin*

The Blue Ridge portion of the Savannah drainage originates in the mountains of South Carolina, North Carolina and Georgia. Major tributaries in the ecobasin include the Chauga, Chattooga and Toxaway rivers. The ecobasin encompasses approximately 283 square miles. Most of the land is publicly owned (143 square miles), with a significant portion protected by federal and state entities: Sumter National Forest (88 square miles) and Jocassee Gorges Recreation Area (27 square miles). Other protected areas include the Sumter National Forest Wild and Scenic River Corridor along the Chattooga River and Oconee State Park. The ecobasin encompasses approximately 372 miles of lotic habitat and 8,298 acres of impoundments. Most of the impounded area is a result of Lake Jocassee (7,362 acres) and the headwaters of Lake Keowee (547 acres).

## GENERAL CONDITION

The Blue Ridge Ecoregion is the least developed ecoregion in the state and is primarily forested. Nearly 50 percent of the land in the Blue Ridge is protected to some degree. Three large tracts account for most of the protected land. These are the Sumter National Forest, the Jocassee Gorges Recreation Area and the Greenville Watershed Easement.

	<b>Agriculture</b>	<b>Barren</b>	<b>Developed</b>	<b>Forest</b>	<b>Scrub</b>	<b>Water</b>	<b>Total area</b>	<b>Protected</b>
<b>Santee</b>	1,466 1.3%	99 0.1%	478 0.4%	107,116 95.0%	1,636 1.5%	1,997 1.8%	112,793	35.9%
<b>Savannah</b>	7,909 4.4%	131 0.1%	1,169 0.6%	154,219 85.0%	7,776 4.3%	10,193 5.6%	181,400	50.5%
<b>Total area</b>	9,375 3.2%	230 0.1%	1,647 0.6%	261,336 88.8%	9,412 3.2%	12,190 4.1%	294,193	44.9%

Overall water quality in the Blue Ridge Ecoregion is good. In the Savannah-Blue Ridge Ecobasin 5 of 27 sites (19 percent) sampled by the South Carolina Department of Health and Environmental Control were designated as impaired, primarily due to mercury or total phosphorous contamination (SCDHEC 2003). Fish consumption advisories have been issued for Lake Jocassee and the Seneca River arm of Lake Hartwell (SCDHEC 2003). In the Saluda-Blue Ridge Ecobasin only 1 of 13 sites (8 percent) sampled by SCDHEC (1998) was designated as impaired; that impairment was based on absence of aquatic fauna.

## MAJOR CLASSIFICATIONS

### *Wadeable Streams*

Wadeable streams are the dominant aquatic classification in the Blue Ridge Ecoregion. There are 254 miles of wadeable streams in the Santee-Blue Ridge Ecobasin and 364 miles in the Savannah-Blue Ridge Ecobasin.

Wadeable streams are defined as streams with Strahler stream orders of 0 to 3, generally streams that can be waded comfortably throughout most of the year. Wadeable streams in the Blue Ridge are typically high gradient with clear water and a mixture of bedrock, gravel, cobble and sand substrates. These streams contain a variety of habitats including riffles, runs, pools, glides and cascades. At higher elevations, many of these streams contain cascades and waterfalls.

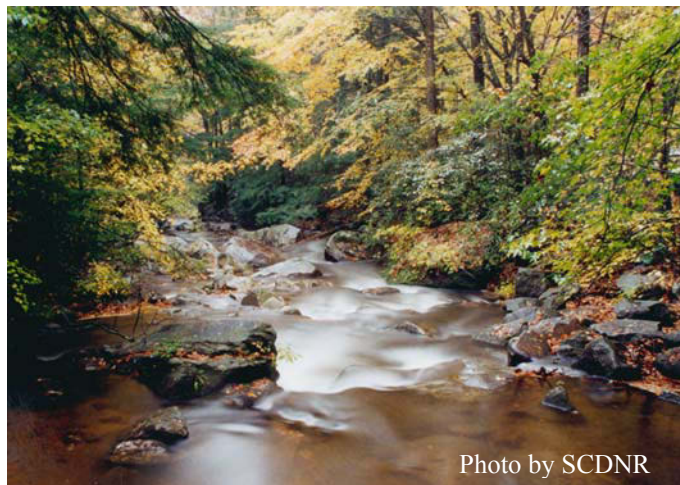


Photo by SCDNR

## *Navigable Streams*

Navigable streams are less common in the Blue Ridge ecoregion with only about 20 miles of free-flowing stream within South Carolina. These streams are generally defined as being large enough to operate watercraft, if only a canoe, and are generally too deep to be waded throughout most of the year. The Chauga and Chattooga Rivers are examples of navigable streams in the Blue Ridge.



Navigable streams in the Blue Ridge contain a myriad of aquatic habitats including riffles, shoals, pools, runs and glides in various combinations. These streams are somewhat more productive than the wadeable streams, despite being generally swift flowing and clear. Substrate in these habitats is primarily bedrock, gravel, cobble and sand.

## PRIORITY SPECIES ASSOCIATIONS

There are 23 fish species on South Carolina's Priority Species List within the Blue Ridge ecoregions; of these, six species occur in both ecobasins, eight species are restricted to the Savannah drainage and nine species are restricted to the Santee drainage. Two priority mussel species occur in the Blue Ridge ecoregion, both in the Santee drainage. However, very few surveys have been conducted in this area for mussels. The paucity of documented priority mussel species found in this ecoregion may be due to lack of information rather than absence of sensitive mussels. Two priority crayfish species and one priority snail species occur in the Blue Ridge and are found in the Savannah drainage, while one priority crayfish species found in the Blue Ridge is in the Santee drainage. Habitat preferences of these species can be found in the species accounts chapters of this Supplemental Volume.

## REGION-WIDE CHALLENGES

Challenges to conservation of aquatic fauna in these two ecobasins are similar to other ecobasins in the state and primarily include impacts associated with impoundments, nonpoint source pollution and introduction of non-native species. Point source pollution is not a significant problem in the Blue Ridge Ecoregion at this time.

Impoundments in the Savannah-Blue Ridge ecobasin have negatively affected a significant portion of habitat for native aquatic species. Nearly 40 miles of historically free-flowing streams within the ecobasin have been impounded; most of the stream habitat lost (25 miles) was due to the impoundment of the Toxaway River to form Lake Jocassee. In the Santee-Blue Ridge Ecobasin, 12.5 miles of stream habitat have been lost to impoundments, including North Saluda Reservoir and Table Rock Reservoir. Impoundments affect native aquatic fauna through direct loss of habitat as lotic habitat is converted to lentic habitat, which favors competitive and often predacious species such as largemouth bass and other centrarchids. In addition, impoundments

Common Name	Scientific Name	Ecobasin	
		Blue Ridge - Santee	Blue Ridge - Savannah
Highest Priority			
<b>Fishes</b>			
Redeye bass	<i>Micropterus coosae</i>	X	X
Christmas darter	<i>Etheostoma hopkinsi</i>		X
<b>Crayfish</b>			
Oconee stream crayfish	<i>Cambarus chaugaensis</i>		X
A crayfish	<i>Cambarus</i> sp. nov. "B"		X
Red Burrowing crayfish	<i>Cambarus carolinus</i>	X	
<b>Snails</b>			
A pebblesnail	<i>Somatogyrus tenax/virginicus</i> (identity uncertain)		X
High Priority			
<b>Fishes</b>			
Santee chub	<i>Hybopsis zanema</i>	X	
"Smoky sculpin"	<i>Cottus bairdii complex</i>		X
Fantail darter	<i>Etheostoma flabellare</i>	X	X
Turquoise darter	<i>Etheostoma inscriptum</i>		X
Seagreen darter	<i>Etheostoma thalassinum</i>	X	
Piedmont darter	<i>Percina crassa</i>	X	
Moderate Priority			
<b>Fishes</b>			
Central stoneroller	<i>Campostoma anomalum</i>	X	X
Greenfin shiner	<i>Cyprinella chloristia</i>	X	
Whitetail shiner	<i>Cyprinella galactura</i>		X
Fieryblack shiner	<i>Cyprinella pyrrhomelas</i>	X	
Highback chub	<i>Hybopsis hypsinotus</i>	X	
Thicklip chub	<i>Hybopsis labrosa</i>	X	
Rosyface chub	<i>Hybopsis rubrifrons</i>	X	X
Warpaint shiner	<i>Luxilus coccogenis</i>		X
Tennessee shiner	<i>Notropis leuciodus</i>		X
Mirror shiner	<i>Notropis spectrunculus</i>		X
Longnose dace	<i>Rhinichthys cataractae</i>		X
Blacknose dace	<i>Rhinichthys atratulus</i>	X	X
V-lip redhorse	<i>Moxostoma pappillosum</i>	X	
Snail bullhead	<i>Ameiurus brunneus</i>		X
White catfish	<i>Ameiurus catus</i>	X	
Brook trout	<i>Salvelinus fontinalis</i>	X	X
<b>Mussels</b>			
Carolina lance	<i>Elliptio congarea</i>	X	
Variable spike	<i>Elliptio icterina</i>	X	

often negatively impact unimpounded stream reaches downstream due to altered hydrologic and thermal regimes (Cushman 1985), modified stream channel morphology and increased erosion and sedimentation (Waters 1995), ultimately reducing suitable habitat for native aquatic fauna (Helfrich et al. 1999; Tiemann et al. 2004).

Sedimentation is the primary form of nonpoint source pollution in the Blue Ridge Ecoregion as it is throughout the state. Erosion from residential and commercial development and transportation and utility construction projects is the primary source of sedimentation in streams. Poor agricultural and silvicultural practices also contribute significantly to stream sedimentation.

Introductions of non-native species also threaten native fauna in the Blue Ridge Ecoregion. Introduced rainbow trout and brown trout displace the native brook trout and may prey on native nongame fishes as well. Introductions of spotted bass to Lakes Jocassee and Keowee have displaced the native redeye bass and further threaten the fish through hybridization.