

11.1 Ecological Significance of the New River Basin

The New River is renowned as one of the oldest existing rivers in North America, and North Carolina contains a significant portion of its headwaters. The area is noted for the rare and endemic aquatic and terrestrial plants and animals it supports. A number of species, and the ecological communities in which they exist, are found nowhere else. While farming and pastureland have heavily altered most of the floodplain and upland vegetation along the river, patches of intact natural communities persist. As discussed below (Section 11.3), Southern Appalachian bogs and a series of high mountain elevations, known as the Amphibolites, provide two examples of the distinct natural features and biological diversity found in the New River basin.

11.2 Rare Aquatic and Wetland-Dwelling Animal Species

Table 20 lists the rare fish, mollusks, insects, amphibians and reptiles found throughout the New River basin. For information on any of the species listed in Table 20, visit the NC Natural Heritage Program (NHP) website at www.ncnhp.org.

11.3 Significant Natural Heritage Areas in the New River Basin

The NC Natural Heritage Program (NHP) compiles a list of Significant Natural Heritage Areas as required by the Nature Preserves Act. The list is based on the program's inventory of natural diversity in the state. Natural areas are evaluated based on the number and quality occurrences of rare plant and animal species, rare or high-quality natural communities, and special animal habitats. The global and statewide rarity of these elements and their quality at a site is compared with other occurrences to determine a site's significance. Sites included on this list are the best representatives of the natural diversity of the state, and therefore, have priority for protection. Inclusion on the list does not imply that any protection or public access to the site exists.

The Significant Natural Heritage Areas found in the New River basin are shown in Figure 14. Sites that directly contribute to the maintenance of water quality in the New River basin are highlighted on the map and in the following text. The NHP has identified more than 60 individual natural areas in the New River basin. Due to space limitations, only the aquatic habitats and two themes that almost dominate the natural heritage of the New River basin – the Amphibolite Mountains and the Southern Appalachian bogs – will be discussed here.

The **Amphibolite Mountains** are a series of mountains that stretch from northeastern Watauga County to central Ashe County. Elevations reach 4,600 feet or higher, and because of the underlying rock formation, soils are nutrient rich with a high pH. Many of the rare plants and distinct natural communities found in the New River basin are associated with the rich soils and high elevations of these mountains. This includes the only known example worldwide of the Southern Appalachian Fen wetland. Of the nearly 120 rare plants documented in this basin, over

Table 20 List of Rare Animals Associated with Aquatic and Wetland Habitats in the New River Basin

Scientific Name	Common Name	Major Group	State Status	Federal Status
<i>Etheostoma kannawhae</i>	Kanawha Darter	Fish	SR	
<i>Exoglossum laurae</i>	Tongue-Tied Minnow	Fish	SR	
<i>Percina caprodes</i>	Logperch	Fish	T	
<i>Percina oxyrhynchus</i>	Sharpnose Darter	Fish	SC	
<i>Phenacobius teretulus</i>	Kanawha Minnow	Fish	SC	FSC
<i>Cyclonaias tuberculata</i>	Purple Wartback	Mollusk	E	
<i>Elliptio dilatata</i>	Spike	Mollusk	SC	
<i>Lasmigona subviridis</i>	Green Floater	Mollusk	E	FSC
<i>Leptoxis dilatata</i>	Seep Mudalia	Mollusk	T	
<i>Tritogonia verrucosa</i>	Pistolgrip	Mollusk	EX	
<i>Vireo gilvus</i>	Warbling vireo	Bird	SR	
<i>Autochton cellus</i>	Golden-banded skipper	Insect	SR	
<i>Ephemera berneri</i>	A mayfly	Insect	SR	
<i>Attaneuria ruralis</i>	Stonefly	Insect	SR	
<i>Bolotoperla rossi</i>	A stonefly	Insect	SR	
<i>Ceraclea mentiea</i>	Caddisfly	Insect	SR	
<i>Ceraclea slossonae</i>	Caddisfly	Insect	SR	
<i>Ophiogomphus asperses</i>	Brook Snaketail (Dragonfly)	Insect	SR	
<i>Ophiogomphus howei</i>	Pygmy Snaketail (Dragonfly)	Insect	SR	FSC
<i>Ophiogomphus mainensis</i>	Twin-horned Snaketail (Dragonfly)	Insect	SR	
<i>Isoperla frisoni</i>	A stonefly	Insect	SR	
<i>Zapada chila</i>	A stonefly	Insect	SR	
<i>Stenelmis gammoni</i>	Gammon's Stenelmis Riffle Beetle	Insect	SR	FSC
<i>Stylurus scudderi</i>	Zebra Clubtail (Dragonfly)	Insect	SR	
<i>Ambystoma talpoideum</i>	Mole Salamander	Amphibian	SC	
<i>Cryptobranchus alleganiensis</i>	Hellbender	Amphibian	SC	FSC
<i>Eurycea longicauda</i>	Longtail Salamander	Amphibian	SC	
<i>Plethodon wehrlei</i>	Wehrle's Salamander	Amphibian	T	
<i>Crotalus horridus</i>	Timber Rattlesnake	Reptile	SC	
<i>Glyptemys muhlenbergii</i>	Bog Turtle	Reptile	T	T(S/A)
<i>Ascetocythere cosmata</i>	Grayson Crayfish Ostracod	Crustacean	SR	FSC

Rare Species Listing Criteria

- E = Endangered (those species in danger of becoming extinct)
- T = Threatened (considered likely to become endangered within the foreseeable future)
- SR = Significantly Rare (those whose numbers are small and whose populations need monitoring)
- SC = Species of Special Concern
- FSC = Federal Species of Concern (those under consideration for listing under the Federal Endangered Species Act)
- T(S/A) = Threatened due to similarity of appearance
- EX = Extirpated

70 percent occur in the Amphibolite Mountains. In the Amphibolite Mountains, the core area of some of the larger mountains are essentially unfragmented and heavily forested. These areas include Three Top Mountain, Bluff Mountain, Phoenix Mountain, Paddy Mountain, Mount Jefferson and several high peaks that border Long Hope Valley.

The rare combination of gentle topography and high elevation in **Long Hope Valley** encouraged the development of numerous unique bogs. Nearly twenty-three bogs, the largest concentration in North Carolina, are found in Long Hope Valley. The nearest comparable concentration of bogs occurs hundreds of miles away to the north at Cranberry Glades in West Virginia. Other examples of this rare community occur at Sparta Bog, Skunk Cabbage Bog, Peak Creek Bog and Idlewild Bog. Many other bogs are scattered along the southeastern margin of the New River basin. Southern Appalachian bogs are naturally open and usually have a mixture of vegetation, including patches of open tree canopy, shrub thickets, and beds of herbs, fens, grasses, and sedges. The flora is comparable to bogs in the northern United States and Canada, often containing a combination of disjunct northern plant species and typically southern wetland species. Several of these northern disjunct species occur in North Carolina only in bogs of the New River basin.

Southern Appalachian bogs are restricted to the mountains of North Carolina, Tennessee, and Virginia. They are naturally rare since the flat, bottomland locations where they occur make up a very small portion of the mountain landscape. Because of their location, the southern Appalachian bog communities are also one of the most imperiled communities in western North Carolina; bogs are highly susceptible to human alterations, such as draining, filling, conversion to pasture or impoundment. Since bogs are usually small in size, alterations affect them quickly and drastically. The dynamics of these bogs are not well understood, and the intact examples of this natural community often contain clusters of rare plants and animals. Alleghany County Soil and Water Conservation District (SWCD) is currently working with the NC Wildlife Resources Commission (WRC) to identify and protect bog habitats. Refer to Section 3.5.3 for more information.

11.4 Significant Aquatic Habitats in New River Basin

The NHP also collaborates with other agencies and organizations to identify Significant Aquatic Habitats in North Carolina. These habitat areas often include stream segments or other bodies of water that contain significant natural resources, such as a large diversity of rare aquatic animal species. The impact from lands adjacent to and upstream of these stream reaches determines their water quality and the viability of their aquatic species. The identification of a natural area conveys no protection; these lands are the responsibility of the landowner. Significant Aquatic Habitats in the New River basin are described below and are shown on Figure 14.

The **South Fork New River Aquatic Habitat** is considered significant for its cluster of sixteen rare species, including three fish species endemic to the New River basin (Sharpnose darter, Kanawha minnow and Kanawha darter). The South Fork New River is also the state's only known location for the Gammon's riffle beetle. The South Fork of the New River also contains important populations of Virginia spiraea (*Spiraea virginiana*), a federally listed plant that grows along the riverbanks.

Another area identified as ecologically significant is the **North Fork New River Aquatic Habitat**. Here, there is a cluster of ten rare species including: Kanawha minnow; Kanawha darter; tongue-tied minnow; green floater; and four aquatic insect species.

A third aquatic Significant Natural Heritage Area, the **New River (Ashe/Alleghany) Aquatic Habitat**, extends from the confluence of the two aquatic systems mentioned above and along the New River itself. Rare species of this stretch include: Purple wartyback; spike; pistolgrip; green floater; Kanawha darter; logperch, sharpnose darter; Kanawha minnow; *Ceraclea mentiea* (a caddisfly); Hellbender; and pygmy snaketail. While the sites are adjacent, the boundaries help differentiate population distributions of a good assemblage of rare mussel and fish species, as well as the extent of certain macrohabitats. The amphibian hellbender (*Cryptobranchus alleganiensis*) requires large and clear fast-flowing streams with big rocks. It has been found in this section of the New River. Biologists note that the habitat is good and land protection efforts have been somewhat successful, but there is some concern about the unexplained decline of this species in recent years.

A number of other rare and uncommon aquatic species are also found in North Carolina only in the New River drainage. Uncommon fish include the bigmouth chub (*Nocomis platyrhynchus*), the New River shiner (*Notropis scabriceps*) and the Appalachia darter (*Percina gymnocephala*). The uncommon New River crayfish (*Cambarus chasmodactylus*), and the significantly rare freshwater mussels – purple wartyback (*Cyclonaias tuberculata*) and pistolgrip (*Tritogonia verrucosa*) – are also found in North Carolina only in the New River drainage; however, the pistolgrip may be extirpated from North Carolina. An uncommon fish found primarily in the New and Tennessee River drainages is the spotfin shiner (*Cyprinella spiloptera*).

There are a number of Upland, Riparian and Wetland Significant Natural Heritage Areas not listed here that contribute to New River Water Quality. Contact the NC NHP to obtain more information about these natural areas, or visit the NHP website at www.ncnhp.org.

11.5 Public Lands

Public conservation lands in the New River basin are also shown in Figure 14. The basin contains significant public lands, both in terms of area and ecological value. The National Park Service Blue Ridge Parkway is the largest federal ownership, and includes many ecologically significant areas. The New River State Park encompasses over 1,300 acres and includes those areas of the South Fork New River and the New River that are designated as a State Scenic River. Here, the soils are fertile and support a variety of plant species including hardwoods, pines, shrubs and wildflowers. Of these, at least fourteen are considered rare, threatened or endangered. Many animal, bird and aquatic species can also be found in the New River valley.

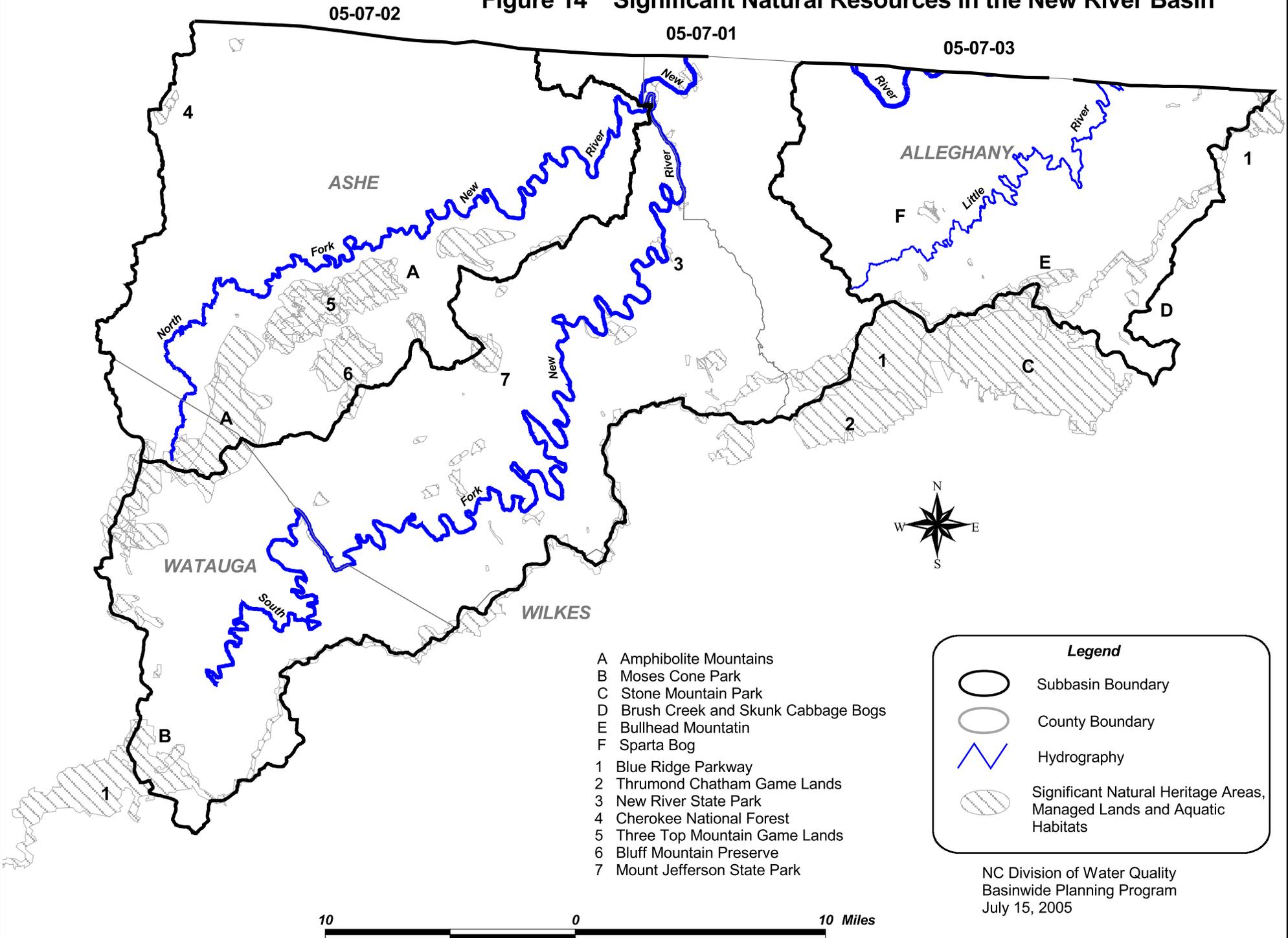
Conservation lands in the Amphibolite Mountain region also include Mount Jefferson State Natural Area and Three Top Mountain Game Preserve. Mount Jefferson is known for its magnificent oak-hickory forests, and its peak of 4,700 feet, which provides a magnificent view of a large portion of the New River basin. The Three Top Mountain Game Preserve covers over one-third of the mountain and still another preserve located on Bluff Mountain is a private preserve, which protects nearly all of the mountain itself. The Department of Agriculture's

Plant Conservation Program manages land at Paddy Mountain and owns land at Potato Hill that Appalachian State University (ASU) helps to manage.

The Sparta Bog includes over 300 acres of wetland mitigation land. Purchased by the NC Department of Transportation (NCDOT), the park contains walking trails, a bog turtle observation deck, and native plant and wildflower plots. The bog showcases this unique area of Alleghany County and is part of the New River Watershed Work Plan from the New River Community Partners (NRCP).

Todd Island Park is a 10-acre island in the South Fork New River near the Community of Todd, Ashe County. Trails, benches and camping sites are located on the island with much of the construction being done by citizen volunteers. To stabilize severely eroding streambanks and to deflect the water's energy, the National Committee for the New River (NCNR) constructed a whole tree revetment as a demonstration project. The whole tree revetment project involved the use of rootwads and a cabled hemlock tree. The rootwads consist of the base of large trees and much of their root system, which are inserted directly into the streambank. The hemlock was secured sideways into the streambank with cables. These natural structures not only reduce the amount of erosion, but also provide a habitat area for both aquatic and terrestrial species. Several native trees and shrubs were also planted along the streambanks, and stairs were built for easy canoe access. The Todd Island Park demonstration project was funded by the NC Clean Water Management Trust Fund (CWMTF) and the National Fish and Wildlife Foundation. For more information about NCNR, visit www.ncnr.org.

Figure 14 Significant Natural Resources in the New River Basin



- A Amphibolite Mountains
- B Moses Cone Park
- C Stone Mountain Park
- D Brush Creek and Skunk Cabbage Bogs
- E Bullhead Mountain
- F Sparta Bog
- 1 Blue Ridge Parkway
- 2 Thrumond Chatham Game Lands
- 3 New River State Park
- 4 Cherokee National Forest
- 5 Three Top Mountain Game Lands
- 6 Bluff Mountain Preserve
- 7 Mount Jefferson State Park

Legend

-  Subbasin Boundary
-  County Boundary
-  Hydrography
-  Significant Natural Heritage Areas, Managed Lands and Aquatic Habitats

NC Division of Water Quality
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