# Safeguarding Waterways in the Southeast

## How to Protect 10 Pristine Rivers

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## How to Protect 10 Pristine Rivers

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# Executive Summary

The Southeast is home to breathtakingly beautiful rivers, lakes, and streams. Despite the pollution and degradation of many waterways in the region, the Southeast still holds some of the most pristine, biologically diverse, and beautiful waterways anywhere in the nation.

However, as sprawling residential and commercial development continues to spread into previously remote corners of the Southeast, many of the region's most special waterways face new threats. Runoff pollution from new development, excessive water withdrawals, and continuing exposure to agricultural and industrial pollution pose challenges to the delicate ecological balance in many of the Southeast's most pristine waterways.

This report identifies 10 special rivers in the Southeast of exceptional beauty, recreational value and ecological importance. Each of these waterways faces significant challenges. And all of them deserve the highest level of protection the Clean Water Act affords—designation as Outstanding National Resource Waters.

The waterways profiled in this report include:

1. **Apalachicola River, Florida:** The Apalachicola River is one of the most biologically diverse and ecologically important rivers in Florida.

2. **Conasauga and Jacks Rivers, Georgia:** These two mountain streams combine to form the Conasauga, which supports more than 90 different fish species and 25 species of freshwater mussels, making it one of the 10 most biologically diverse rivers in the nation.

3. **Chattahoochee River, Georgia:** The Chattahoochee is the best-known and most beloved waterway in Georgia, providing drinking water for much of the Atlanta metro area, recreational opportunities, and habitat for several rare fish species.

4. **Dragon Run, Virginia:** The river meanders through wetlands virtually untouched by human influence and is to home to bald eagles and 15 rare species.

5. **Eastatoe River, South Carolina:** The Eastatoe River descends from its headwaters through a dramatic gorge, providing excellent trout fishing and hiking opportunities, containing extraordinary biodiversity, and contributing to a major regional source of drinking water.

6. **Eno River, North Carolina:** Lined with popular state and local parks, the Eno River sustains a variety of rare and sensitive species including nationally significant mussels, snails, salamanders and fish.

7. **Hazel River, Virginia:** Surrounded by woods, the Hazel River is scenic, wild, and largely unpolluted. It has been nominated three times for protection as an "exceptional state water."

8. **Middle Saluda River, South Carolina:** The state's first river to receive a Wild and Scenic designation, the Middle Saluda's clear, cold water supports reproducing trout populations and is surrounded by 400 species of plants, including some that are endangered.

9. **Suwannee River, Florida:** The Suwannee River is the only undisturbed major river system in the southeastern United States, without any dams, and supports a wide variety of wildlife.

10. **Tar River, North Carolina:** The Tar River, home to many rare and endangered species, provides drinking water for the town of Tarboro, and is a favorite recreation spot.

States in the Southeast have the tools available to protect these and other exceptional waterways. The federal Clean Water Act allows states to designate waterways as "Outstanding National Resource Waters." Under that designation, no degradation of water quality is permitted—meaning that these special waterways will be maintained for generations of Southerners to enjoy.

For each of the waterways profiled in this report and for other exceptional waterways, the states should:

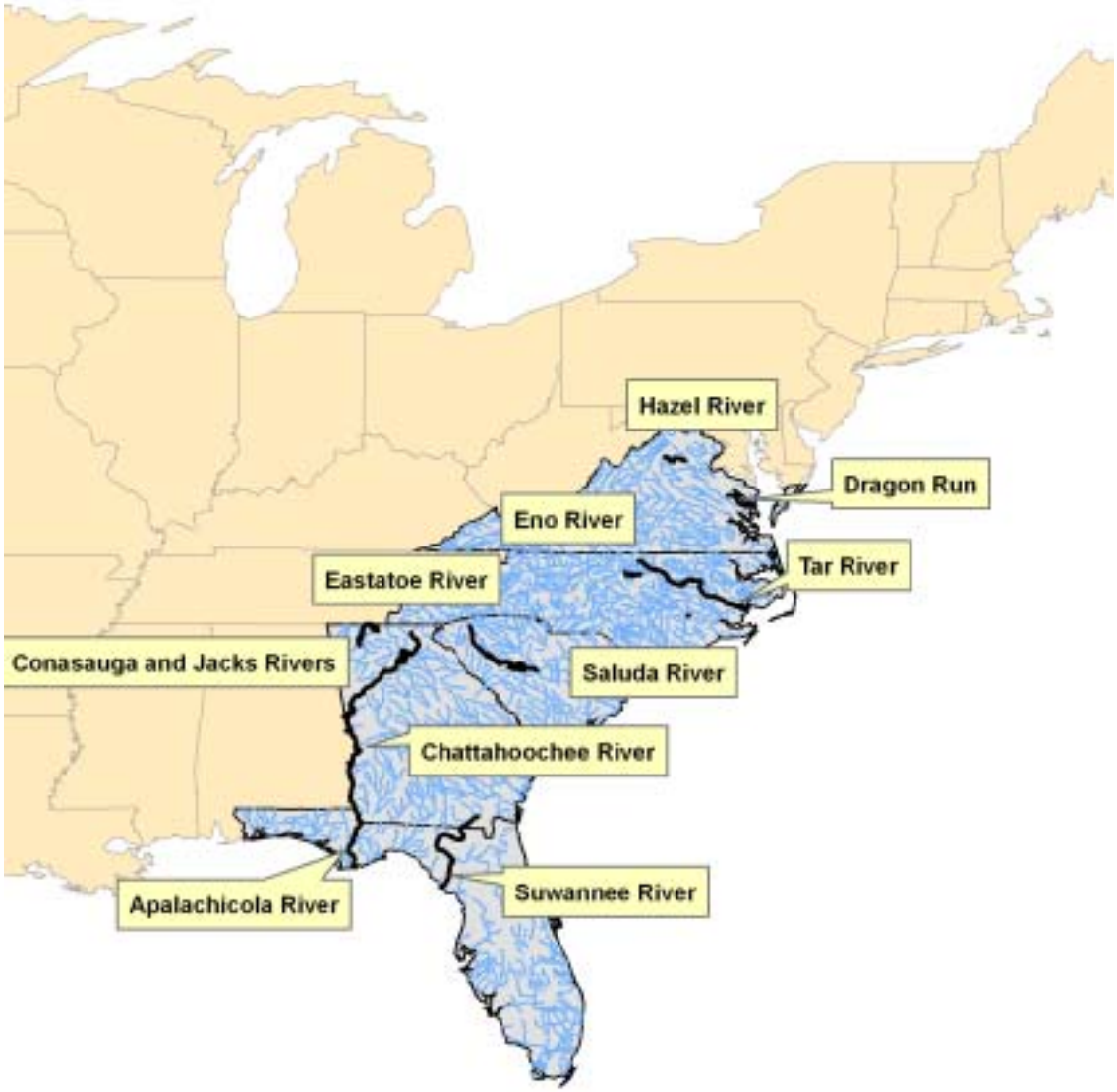
- Designate the waterways as Outstanding National Resource Waters and propose rules for the protection of these waters as quickly as possible.

- Put a hold on permits for discharges into these rivers and streams until the rulemaking process for individual waterways is complete.

- Create or revise rules to ensure that Outstanding National Resource Waters status provides pristine waterways with full protection from the growing threat of runoff pollution from development.

- Develop a timetable for the protection of the state's remaining unspoiled waterways.

There are many beautiful rivers and streams needing protection. This report highlights some of the most pristine waters in the southeastern United States, all needing public support to ensure their unspoiled nature is preserved.


Hazel River
Dragon Run
Eno River
Tar River
Eastatoe River
Conasauga and Jacks Rivers
Saluda River
Chattahoochee River
Apalachicola River
Suwannee River

# Introduction

Crystal clear mountain streams teeming with trout. Meandering rivers sliding their way through undisturbed wetlands on their way to the sea. Mysterious blackwater rivers. Rivers of song, story and legend.

The Southeast has long been shaped, in ways large and small, by its rivers and streams. Rivers provided means of transportation and commerce for early settlers and sources of water for growing Southern communities. Our coastal river estuaries,

*Photo: Sally Mello*

*Hazel River, Virginia*

then as now, have helped sustain the rich diversity of our marine environment, supplying the region and the nation with fish and shellfish, and luring anglers and wildlife enthusiasts from around the world.

The dramatic growth and development of the Southeast over the past several decades has brought new opportunities to the region, but it has also cost us natural treasures that can never be replaced. The region has lost vast areas of open space and forest land. And the quality of water in many of our rivers and streams has suffered.

In remote corners and cherished areas of the Southeast, however, a few exceptional waterways remain. These waterways are important to our economy—drawing visitors from afar and providing valuable sources of clean drinking water. They are important to the natural web of life that sustains all of us, providing habitat for countless species of plants and animals—some found nowhere else on Earth. And they remind us of our cultural heritage, our connection to nature, and the delicacy, intricacy and beauty of undisturbed ecosystems.

To lose what is special about these rivers and streams as a result of reckless development or a lack of appropriate effort would be a tragedy—not just for us, but for generations to come. Yet, across the region, development is threatening to encroach upon the Southeast's most pristine and special waterways.

Thankfully, residents of our region are taking action. They have started land preservation programs in environmentally sensitive watersheds, organized water monitoring programs, conducted scientific research, pressed for greater protection for these waterways, and helped spread the word about what makes these waterways special through environmental education efforts.

The federal Clean Water Act provides one more tool citizens can use to ensure permanent protection of these waterways: designation as Outstanding National Resource Waters. The Outstanding National Resource Waters designation affords the highest level of protection available under the Clean Water Act, ensuring that the current level of water quality in those rivers and streams is maintained and providing focus for efforts to restore ecologically and recreationally important waterways that face significant threats.

The 10 rivers highlighted in this report are emblematic of the types of southeastern waterways deserving of Outstanding National Resource Water protection. They represent a variety of ecosystems in a variety of states along the southeastern seaboard, stretching from Virginia to Florida. They are by no means the only waterways of significance to the region, nor the only ones deserving of such protection. But the stories of these waterways remind us why it is so important to maintain the special ecosystems that remain in the Southeast, even in the face of ongoing threats to their continued health.

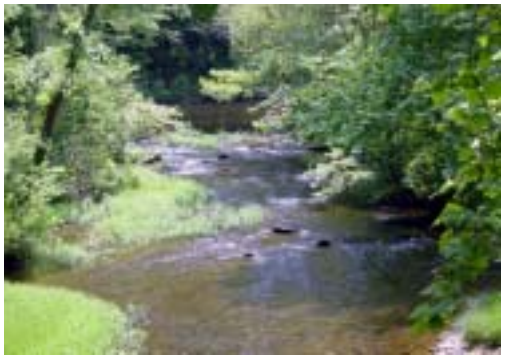
These waterways are invaluable. But once they are gone—or altered beyond recognition—they can never be recovered.

# Protecting Precious Waterways in the Southeast:
## Outstanding National Resource Waters Designation

Clean water is the lifeblood of the Southeast. The region's rivers, lakes and streams provide us with clean drinking water, recreational opportunities, and habitat for countless species of wildlife.

Too often, however, waterways in the Southeast have been left to fall into a state of pollution and degradation. Nutrient runoff from farms, industrial discharges, pollution from sewage treatment plants, and urban runoff have caused severe damage to many waterways across the region. As of 2000, the Environmental Protection Agency found that 38 percent of assessed rivers and streams nationally were impaired for fishing, swimming or other uses.[1]

Still, there remain a few precious gems of natural beauty and ecological vitality among the Southeast's rivers and streams. Even today, a hiker, paddler or angler can find rivers and streams that are close to their natural condition. These waterways support vigorous and diverse populations of wildlife, including some species found nowhere else in the world, and that provide human communities with clean drinking water and a reminder of nature's beauty.



Many of these waterways are located partly or wholly within state parks and other nominally protected areas. But as with all rivers and streams, they are not only affected by development and pollution along their immediate banks, but also by changes elsewhere within their watersheds. Ensuring that these rivers remain in their natural and pristine state requires special tools—tools provided by the federal Clean Water Act.

## Development: The Primary Threat to the Southeast's Exceptional Waterways

Throughout the Southeast, waterways are degraded by pollution from many sources. Historically, agricultural and industrial pollution have been among the most impor-

tant direct threats to the region's waterways. Some of the waterways profiled in this report face challenges from these sources of pollution to this day—challenges that must be addressed in order to ensure that these waterways remain in their high-quality state for future generations.

The one threat that has the potential to affect all the waterways profiled in this report is the threat posed by the sprawling residential and commercial development that has characterized the Southeast over the last few decades. From 1990 to 2005, the population of the five southern states included in this report increased by an average of 33 percent.[2] From 1992 to 2003, the amount of developed land in the region increased by 38 percent.[3]

Population growth is expected to slow slightly in the next 15 years, for a total regional increase of 25 percent.[4] At the high end, Florida's population will increase by 34 percent, while South Carolina will grow most slowly at 14 percent. No projections are available for how much land will be developed to accommodate this growing population, but if past patterns continue, thousands of acres will be developed.

Development poses a variety of threats to waterways. Development brings with it an increase in the amount of "impervious surface" in an area—the land covered by pavement, buildings and other structures that do not allow rainfall to penetrate into the ground. This increases the amount of runoff that finds its way, unfiltered, into rivers and streams. Runoff carries with it a host of pollutants—including fertilizer, pesticides, dirt, oil, grease, bacteria and sediment—that can cause degradation of water quality and the impairment of river ecosystems.

Runoff, along with improper development near river banks, can cause erosion of stream banks and contribute to greater risk of flooding. Construction activities that involve clearing land for development, including highways and shopping malls, expose thousands of acres of soil every year to erosion caused by wind and rain. Unless erosion control methods are employed, tons of soil can be lost from just one cleared acre of land during a heavy rainstorm.[5] The soil picked up during storms is carried to lakes and streams.

Though this material may be suspended in water for a time, it will eventually settle out into deposits. Some sedimentation is natural, as a river picks up silt and gravel from upstream during high flows and deposits them wherever the water slows down. Unnaturally high sedimentation, however, as caused by runoff from construction projects or developed land, can destroy sensitive aquatic environments.[6] Wetlands, for example, can quickly change shape and become more susceptible to invasive species, making it difficult for native species to thrive.[7]

In addition, residential development increases strain on sewage systems and sewage treatment facilities (or, in more rural areas, causes an expansion in the use of septic tanks). Sewage treatment facilities and sewage overflows are significant water polluters, adding nutrients and a host of other pollutants to waterways.

Excessive nutrients in a waterway, as from sewage or fertilizers, can cause eutrophication.[8] Microorganisms that feed on the nutrients dramatically increase in number, reducing water quality and sunlight penetration in the streams. Both sewage and fertilizer contamination can be reduced with better practices, but development makes the problems worse.

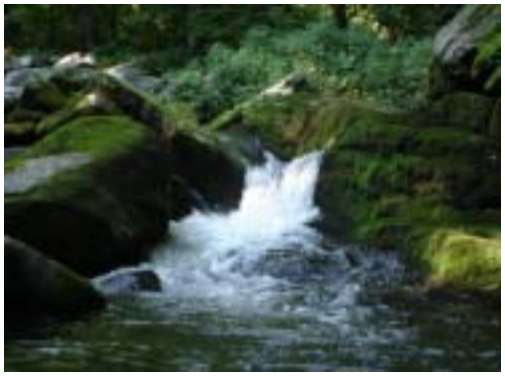
Development also brings new demands for water that can endanger rivers by reducing their flows. While withdrawing drinking water directly from the river is one obvious cause of reduced river levels, relying on groundwater through wells can be similarly problematic. Groundwater is part of a complex hydrological system that feeds and sustains high water quality in rivers and streams. For example, the Suwanee River in Florida is fed by 180 springs. Withdrawing groundwater reduces the amount of water available to feed the river and withdrawing water from the river lowers the

water table that feeds the springs.

The Southeast's pristine waterways are often able to sustain their aquatic communities only because they maintain a delicate ecological balance. The temperature of a trout stream, the salinity in a brackish water ecosystem, and the level of nutrients in a river or stream all have a dramatic impact on the health of wildlife and on the attractiveness of a waterway for recreational use. Even subtle changes—the addition of nutrients from a new farm, septic system or sewage treatment plant; the addition of sediment from a construction site; a shift in water temperature or increase in penetration of sunlight due to the removal of vegetation that once provided shade—can have significant and lasting impacts on the health of a waterway and the species that live within it. Sediment can destroy shad spawning grounds and bury freshwater mussels, threatening their survival.[9] Decreased shade can raise water temperature, causing dissolved oxygen levels to drop and reducing the quality of habitat for fish.[10]

As residential and commercial development spreads outward into previously remote areas of the Southeast, the pressures experienced by the region's most exceptional waterways can only be expected to increase. Thankfully, the federal Clean Water Act provides a powerful tool states can use to ensure that these waterways are preserved in their natural condition: the Outstanding National Resource Waters designation.

*Photo: Wes Cooler*



*Eastatoe River, South Carolina*

## The Clean Water Act's Antidegradation Policy: A Powerful Tool for Protecting Waterways

The Clean Water Act, passed in 1972, is the main federal law governing water pollution in the United States. The crafters of the Clean Water Act recognized that waterways in the United States face a variety of conditions, ranging from heavy pollution from industrial sources that needs to be cleaned up, to pristine conditions that should be thoroughly protected from future damage.

The Clean Water Act instructs that states should implement water protection standards, with oversight by the federal government. Through a federal-state partnership, states develop their own standards and programs as required by the Clean Water Act and they then submit those policies to the EPA, which must ensure that the states are in compliance with the Act. If the EPA concludes that a state has failed to develop adequate water quality standards, it will intervene and develop standards that provide the protection required by the Act. In addition, any time a state revises or adopts new standards, the EPA must again review them to ensure compliance with the Act.[11]

States must classify waterways into those that meet and those that fail to meet water quality standards, which are based on water quality that is adequate to allow "designated uses" such as fishing, swimming, and use for drinking water. Waters that are too polluted to allow their designated use are classified as "impaired" and states must develop plans for cleaning them up. Waterways that do meet water quality standards are subject to the Clean Water Act's "antidegradation" policy, which prevents backsliding on water quality.

The anti-degradation policy offers three levels, or "tiers," of protection. Tier 1 protection ensures that a waterway will be protected so that existing uses—whether industrial water use, fishing, or recreation—

can be maintained. Pollution levels in a waterway can be allowed to increase, provided the river remains clean enough for existing uses to continue. For example, a river that is currently used for an industrial water supply but not for drinking water could be allowed to become more polluted, provided that pollution levels do not make the river too dirty for industrial use.

Tier 2 protection applies to higher-quality waters, those that are clean enough at least to support fish and wildlife populations, and to allow safe recreational use of the water.[12] States may allow additional pollution of these waterways, but only under extraordinary circumstances. The additional pollution may not be so great that it threatens an existing use. Before additional pollution is allowed, the state must offer an opportunity for public participation, evaluate the alternatives to the proposed discharge, and determine that the lowering of water quality "is necessary to accommodate important economic or social development in the area in which the waters are located."[13] In other words, Tier 2 does not provide foolproof protection for a waterway, but it erects additional hurdles to proposals that would allow more pollution.

Tier 3 protection is intended for waterways that "constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance."[14] In these waterways, dubbed "Outstanding National Resource Waters," "water quality shall be maintained and protected," meaning that no further degradation of water quality shall be allowed. Water quality in a waterway need not be pristine in order for a Tier 3 designation to take place, if it is an important recreational or ecological resource.[15] Federal policy also allows members of the public to nominate waterways for Tier 3 protection.

States are permitted to adopt their own anti-degradation policies, but in no case may a state policy be weaker than the federal policy. For example, Virginia has adopted an anti-degradation policy to protect Tier 3 waters, which are known in Virginia as Exceptional State Waters. Virginia protects Exceptional State Waters by prohibiting permanent increased discharges into the waterway.[16] Increased pollution is allowed upstream from the Exceptional State Waters segment, so long as it does not reduce water quality in the Exceptional State Waters segment.[17]

Several states have used the flexibility of the federal anti-degradation requirement to define an intermediate level of protection between Tier 2 and Tier 3. These "Tier 2.5" designations generally provide additional protection to waterways beyond Tier 2 status, but often without the formal and complete prohibition on water quality degradation provided by Tier 3. The strength of Tier 2.5 protections varies widely from state to state.

Historically, the Clean Water Act's anti-degradation policy has been a much-overlooked tool for preserving water quality. In recent years, however, states have begun to use the policy—and particularly the ability to designate Outstanding National Resource Waters—to offer full protection to their most pristine and important waterways. Numerous waterways in the Southeast are prime candidates for that designation.

# Ten Exceptional Waterways of the Southeast

## Apalachicola River, Florida

Florida's biggest river is also one of its richest natural treasures. The Apalachicola River, which starts at Lake Seminole on the border with Georgia and crosses the panhandle to the Gulf of Mexico, is one of the top six biodiversity "hot spots" in the United States.[18] However, the Apalachicola faces significant threats to its future health and vitality.

The Apalachicola's 107-mile length and its surrounding watershed is home to thousands of species—1,300 species of plants, including 60 trees and two of the world's rarest evergreens, the Florida torreya and

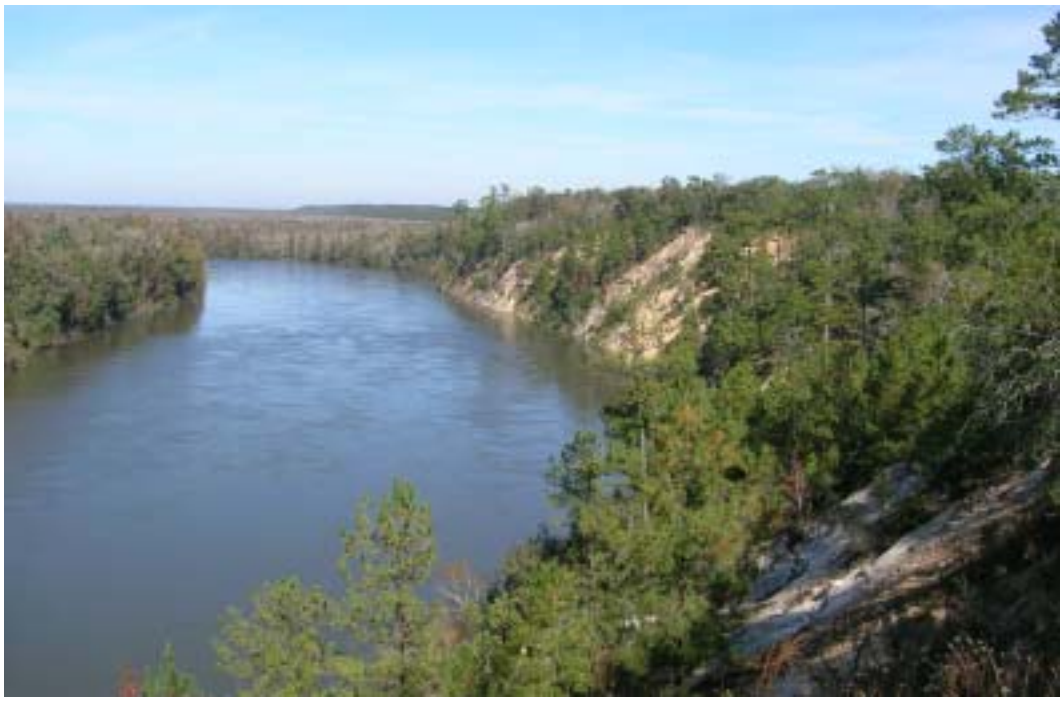


*Photo: Roy Ogles*

the Florida yew; 131 varieties of fish; 38 types of mussels; 308 bird species; and 57 mammal species.[19] The estuary fed by the river, Apalachicola Bay, is also a biological wonder, and is highly dependent on the river's fresh water. Sheltered by islands, the bay serves as a nursery for many Gulf of Mexico marine species, and is home to scores of threatened species and over a dozen federally endangered species of reptiles, birds, mammals and plants.[20]

The Apalachicola River is also important for recreation and commercial fishing. The Apalachicola River provides opportunities for fishing, canoeing, wildlife viewing and other pastimes, while Apalachicola Bay produces one tenth of America's annual oyster catch.[21] The Apalachicola basin is also known for its high quality tupelo honey.

With a large watershed that extends into Alabama and Georgia, the Apalachicola River is inevitably affected by upstream land use. Both the Chattahoochee and Flint rivers, the primary tributaries to the Apalachicola, draw water from the developed area around Atlanta, and face threats to water quality and quantity by the time they join to become the Apalachicola.

Low water flow in the Apalachicola causes "the quantity and quality of floodplain habitats for fish, mussels, and other aquatic organisms" to decline, and wetland forests of the floodplain to react to the drier conditions.[22] As development continues in the Apalachicola watershed, there will be an increased demand on water from the river, and the river's ecosystems could suffer the consequences.

The threat from the various types of pollution that affect the health of the Apalachicola ecosystem is amplified by the reduced water quantity, since pollutants become more concentrated with lower water levels. The Apalachicola is also recovering from the impacts of a half-century of dredging by the Army Corps of Engineers, which sought to keep the river navigable for commercial barges. Dredging finally ended in 2004, but could be resumed in the future.[23]

Designation of the Apalachicola as an Outstanding National Resource Water under the Clean Water Act would ensure that the river is not harmed by future destructive activities like dredging, and that the threats of reduced flow and higher pollution levels are addressed.

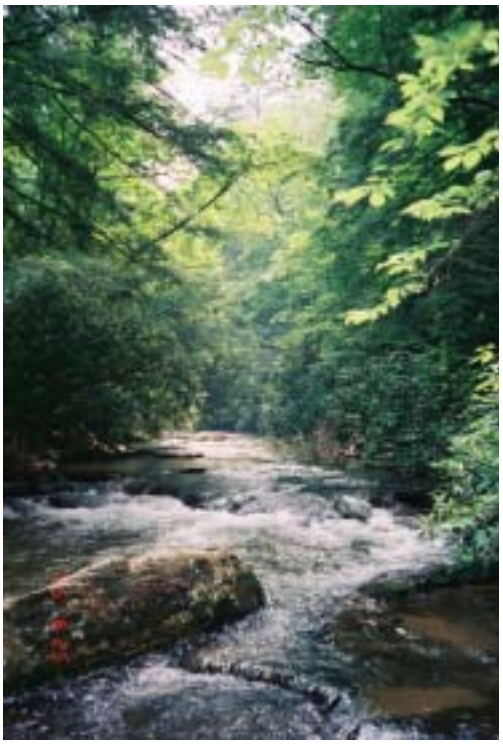


*Photo: Darcie Holcomb*

## Chattahoochee River, Georgia

The Chattahoochee River is the best-known and most beloved waterway in Georgia. It also is one of the most heavily used. Maintaining the quality of the headwaters of the Chattahoochee is important to ensuring the health of the entire river.

The Chattahoochee River provides the drinking water for much of the Atlanta metro area. It forms Lake Lanier, heavily used by Atlanta and metro area residents

for boating, fishing and swimming. Just north of Atlanta, upstream approximately 48 miles to Buford Dam, the river forms the heart of the Chattahoochee National Recreation Area, where people jog, walk and picnic along the river.[24] Both above and below Buford Dam, the river is also known as one of the best trout streams in the Southeast.

Though the metro area's growth and development have degraded the river below Buford Dam, the Chattahoochee's headwaters above Lake Lanier remain relatively pristine. The river begins in the Chattahoochee National Forest, where the river and its tributaries are cold and clean enough to support trout.[25] Several rare fish live in the Chattahoochee's headwater streams, including the Coosa shiner and the Tennessee shiner. For years, these two species were thought to have been extinct in the watershed, but in 2002 and 2003, the fish were rediscovered there. A third rare species—the Halloween darter—also lives in the Chattahoochee Basin, but only in the most pristine streams.[26] There have been few surveys of fish and other creatures in the upper Chattahoochee, so obtaining a full list of the species that live there is impossible.

Development and road construction threaten the Chattahoochee. North Georgia is growing quickly, attracting people who want a vacation home or who want to escape urban sprawl. A new residential development in Helen, located on the edge of the Chattahoochee National Forest, would more than double the size of the town, increasing development impacts on the river.[27] A federal proposal to construct a new interstate from Knoxville, Tennessee to Savannah, Georgia—known as I-3—would involve heavy road construction near the Chattahoochee's headwaters.[28]

The Trust for Public Land has undertaken a campaign to acquire land or easements that would create a 500-foot buffer zone and protect the river.[29] Maintaining natural vegetation near the river reduces the amount of sediment, sewage and poisons that run into the water. However, only 70 miles of river have been protected with an easement thus far, and such easements will not necessarily fully protect streams that feed into the Chattahoochee.

Designating the headwaters of the Chattahoochee as an Outstanding National Resource Water would help protect the health of the river, both in it headwaters and downstream.

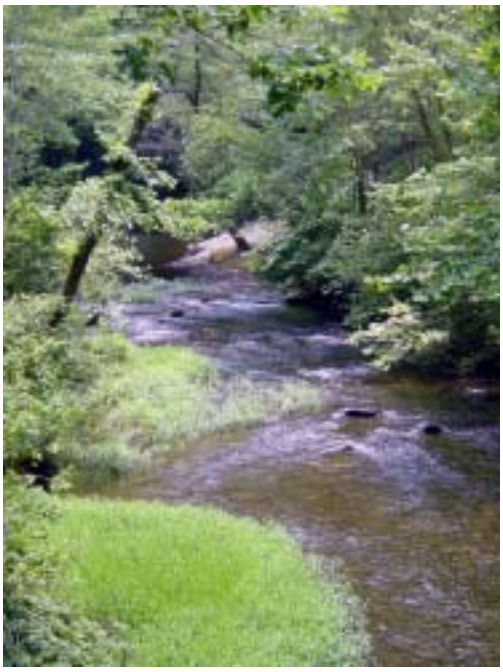


*Photo: Jeannette Gayer*

## Conasauga and Jacks Rivers, Georgia

The Conasauga and Jacks rivers begin in northern Georgia, providing habitat to fish and other species and offering popular spots for fishing, canoeing and other recreational activities. Yet, accelerating development in northern Georgia threatens to upset the delicate balance that makes the Conasauga and the Jacks natural treasures.

The Conasauga and Jacks rivers begin their run in the Cohutta Wilderness. The Conasauga begins at a spring and flows cold and clear through a hardwood forest. The

trees and rhododendrons growing along the river's banks provide ample shade, limiting the growth of algae. Several species of trout live in the portion of the river that flows through the Cohutta Wilderness. The river quickly descends from its origin at 4,000 feet, passing through the wilderness area into the Chattahoochee National Forest and briefly crossing into Tennessee at 1,100 feet.[30]

East of the Conasauga River but still within the Cohutta Wilderness, the Jacks River flows north until it joins the Conasauga River near the Tennessee border. The Jacks River is a popular destination for hikers and backpackers. The river is well known for its 60-foot waterfall.

Below the confluence of the two rivers, the Conasauga River supports a broad diversity of aquatic animals. More than 90 different fish species live in the river, along with 25 species of freshwater mussels, many of them unusual. Twelve of these fish and mussel species are protected by federal endangered or threatened species status.[31] One species of fish lives nowhere else in the world except for a 15-mile stretch of the Conasauga River.[32] Overall, the river is one of the 10 most biologically diverse rivers in the nation.[33] This diversity attracts both scientists and people who want to witness the river's unusual ecosystem.

In addition to supporting a broad array of species, the Conasauga River is used for recreation, as a drinking water source, and for industrial purposes. The portions of the Jacks and Conasauga rivers that run through national forest and wilderness are used for fishing and canoeing, and camping alongside the river is so popular that some areas suffer from overuse. Approximately 125,000 people live in the Conasauga River watershed, and many rely upon it for drinking water. Georgia's carpet industry—which produces two-thirds of the carpets manufactured in the U.S.—uses vast quantities of water from the river in the water-intensive carpet-dyeing process.[34]

Residential development threatens the Conasauga and Jacks rivers, particularly in the pristine headwater areas. The headwaters of the Conasauga are located just 90 minutes from Atlanta, making the region attractive to urban residents seeking a vacation home. According to Georgia Forestwatch, privately owned land within the Chattahoochee National Forest is becoming available for development. Large landowners and timber companies such as Weyerhaeuser and Inland Container have sold their property, which is being marketed for residential development.[35] A local realty company boasts that "the North Georgia mountain region is the smart, affordable solution for second home buyers looking to quickly get away from it all."[36]

The threats to the rivers have attracted attention. The Conasauga River Alliance, a coalition of more than 30 organizations, universities and public agencies, has undertaken a variety of watershed protection and restoration efforts in the past decade. The coalition has repaired or closed roads and trails that added sediment to the rivers, helped improve the disposal of waste from large poultry farms, replanted trees, and created buffer zones along the riverbanks.

In addition, the federal Land and Water and Conservation Fund allocated approximately $6 million to purchase 1,350 acres of privately owned land from 2002 to 2005. Georgia Forestwatch estimates that another 10,000 acres in the Chattahoochee National Forest should be purchased to limit development and protect rivers in the area.[37] In 2006, this would have cost an estimated $21 million. That cost will rise over time.

The Conasauga and Jacks rivers are two of the four "Scenic Rivers" recognized by the state of Georgia. This designation provides protection from dams and other changes in the natural flow of the river but not from new sources of pollution. Further protection could be added to the rivers by giving both the Conasauga and Jacks rivers Outstanding Natural Resource Water designation.

*Photo: Tom Gregory*

## Dragon Run, Virginia

*The Dragon's swamps, streams and marshes embrace a wilderness unparalleled on the Chesapeake. Gossamer bells dangle from the pink stems of fetterbush, and the buttonbush bloom like tiny supernovas, translucent spears of light shooting from their bright white centers. Bald cypress trees loom from the water, their massive trunks as wide as eight feet. Mistletoe clumps in the treetops, and turks cap lilies flame like a thousand orange suns against the rich green of the wetland forest. Otters slide through the dark water, beavers build, ospreys and eagles soar and keen above.*

—Wendy Mitman Clarke,
*Window on the Chesapeake*[38]

Dragon Run, a 40-mile river in Virginia's Middle Peninsula, meanders through wetlands that have been characterized as "some of the most extensive and unspoiled swamp forest and woodland communities" in the state.[39] Left virtually untouched by human influence, the Dragon Run watershed is home to 15 rare species and five rare natural communities despite encompassing only 140 square miles of forests, wetlands, and scattered farms.[40] Now, however, Dragon Run faces threats from increasing development near the waterway.

The Dragon Run watershed is the northernmost example of a Baldcypress-Tupelo Swamp ecological community in the United States—a type of ecosystem characterized by an often-flooded forest dominated by cypress and tupelo trees. As a result, the area is home to a variety of rare species, as well as to bald eagles. The Virginia Coastal Program reports that "the stream, along with the surrounding Dragon Run Swamp, forms an ecologically unique system. A system of excellent water quality and numerous and diverse species of flora and fauna."[41] The Dragon Run area is popular for hunting, fishing and canoeing.

But what makes Dragon Run and its surrounding ecosystem truly unique is its undisturbed character. Only about 1 percent of the land in the Dragon Run watershed consists of "impervious cover"—land covered by pavement, buildings and other structures that impede rainfall absorption.[42] High levels of impervious cover in an area can cause excessive runoff, leading to water quality problems. The lack of human disturbance along Dragon Run has helped keep the water quality high, and led one researcher to describe the waterway as a "100 year old time capsule."[43]

The pristine character of Dragon Run is due in large part to the efforts of local land-owners and conservationists. Currently, there are only about 500 residences in the Dragon Run watershed, and it is characterized largely by low-impact land uses.[44]

Dragon Run's future as a pristine and unique ecosystem, however, is not guaranteed. Population growth in three of the four counties that share the watershed is at least 14.4% a year, enough to quadruple in size within a decade.[45] And the Dragon Run watershed itself is zoned for 40,000 housing units.[46] Intense residential or other development within the watershed would permanently change the area's pristine and undisturbed character, while also increasing the potential for water quality problems in Dragon Run itself.

Residential and commercial development elsewhere in the Chesapeake Bay area have wreaked havoc on water quality and the integrity of ecosystems. The Anacostia

River in the District of Columbia, for example, is now the target of a restoration campaign to undo the damage done by development without an eye toward its effects on the river. It doesn't have to be that way in the Dragon Run watershed. With Outstanding National Resource Waters designation, Virginia can ensure that any development that does occur in the Dragon Run watershed does not result in the degradation of the waterway. All new development in the watershed would be required to ensure that it will not negatively impact Dragon Run, preserving it as a uniquely wild and ecologically significant part of Virginia's natural heritage.

*Photo: Wes Cooler*

## Eastatoe River, South Carolina

The Eastatoe River is a waterway of contrasts. Beginning near the North Carolina-South Carolina border in the Jocassee Gorges area, the Eastatoe starts as a rugged mountain stream, plunging through a rocky gorge that provides some of South Carolina's best trout fishing as well as extraordinary scenic beauty. Below the gorge, the river valley opens up and the Eastatoe flows through beautiful and historic agricultural lands before entering a second gorge section and finally emptying into Lake Keowee. The Eastatoe River's fragile ecological balance, however, is jeopardized by development in both North Carolina and South Carolina.

The Eastatoe has exceptional recreational and ecological value. It was selected by *South Carolina Game and Fish* magazine as one of the top five trout waters in the state.[47] The river is home to a mostly self-sustaining population of wild trout—mostly rainbow trout but also, according to anecdotal evidence, wild brook trout.[48] Healthy trout populations depend on clean water, healthy aquatic communities, and appropriate water temperatures. Most of the 750 miles of trout streams in South Carolina's northwestern corner are impaired due to sediment loading and temperature, so the Eastatoe's healthy trout fishery is particularly special.

The Eastatoe also traverses a landscape of extraordinary biological diversity. A mountain on one side of the river hosts nearly 1,000 species of plants, nearly 20 of which are not found elsewhere in South Carolina and two which were until recently unknown to science.[49] Indeed, it is known as the most botanically diverse place in South Carolina. The rare Turnbridge fern exists within the river's narrows, the only place in the continental western hemisphere where it is found.[50] At high water levels, the Eastatoe is also an occasional destination for whitewater kayakers, providing miles of class II to class IV rapids.

Below the gorge, the Eastatoe River passes through an agricultural valley, providing an excellent example of a healthy, intact ecosystem within a farm setting, and eventually into Lake Keowee, which serves as a drinking water source for the Greenville metropolitan area.

While much of the land in the upper and lower Eastatoe basin is protected, and much

of the middle Eastatoe traverses traditional agricultural land, the river is not immune to threats from development and other activities. Accelerating development in the North Carolina portion of the watershed, combined with homebuilding and other forms of development in the South Carolina portion, threaten the delicate ecological balance that makes the Eastatoe River special.[51] Local landowner Wes Cooler states that, because of the low population density of the region, the Eastatoe has managed to retain its high water quality. But, "as density increases, damage will have a real effect."

As Wes Cooler notes, "What makes this river special is that it is still at a stage where it can not only be saved from further degradation, but it can potentially be restored to a significant degree to a high quality trout stream along its entire length." Extending Outstanding National Resource Water protection to the Eastatoe River can help make that vision a reality.

## Eno River, North Carolina

The Eno River is known to many North Carolinians as the centerpiece of Eno River State Park—a natural playground of canoeing, fishing, hiking and other recreational opportunities. But the Eno River is also an important source of drinking water and sustains a number of rare and sensitive species including nationally significant mussels, snails, salamanders and fish. The Eno, however, is located in one of the fastest growing areas of North Carolina, and is threatened by development, water withdrawals from various municipalities, and forestry and agricultural uses.

The Eno is one of three waterways that combine to form the Neuse River. It is a main source stream for the Falls Lake reservoir, which provides drinking water to communities including Raleigh, Durham and Hillsborough.

The Eno River State Park covers 4,131 acres along the Eno River and offers five

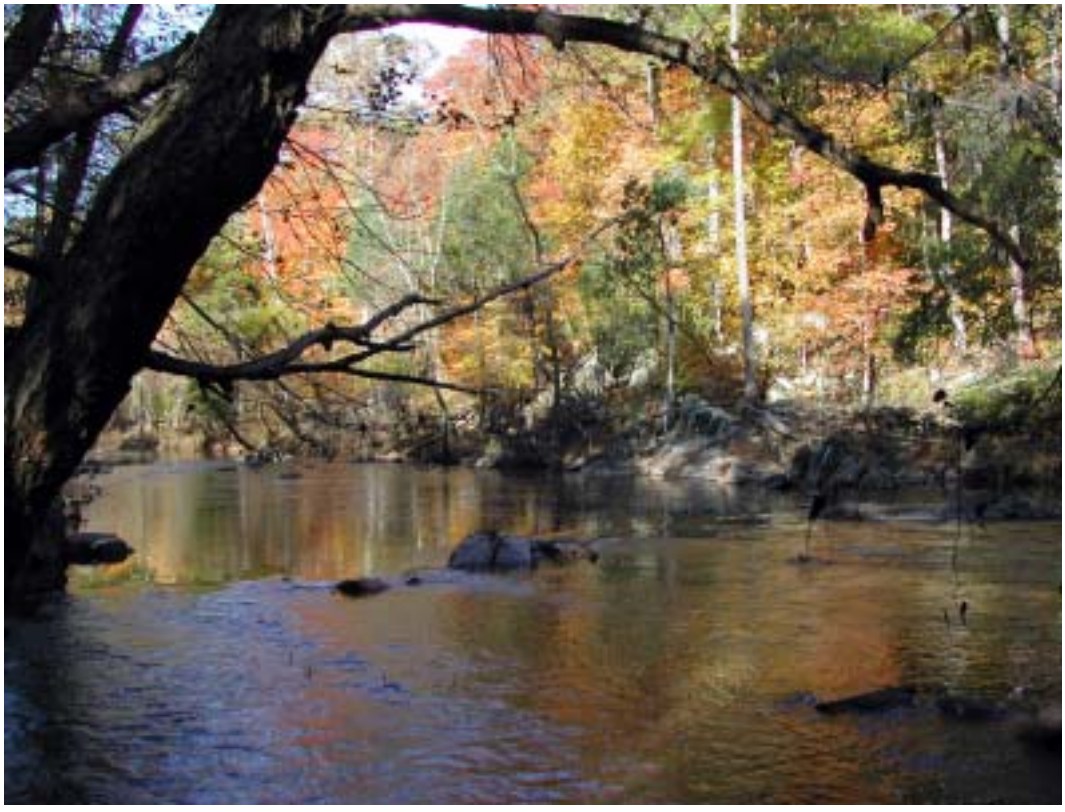


*Photo: Elizabeth Ouzts*

access areas into the largely unspoiled river. Visitors to the park enjoy camping, canoeing, fishing, hiking, picnicking, and special events like the Festival for the Eno.

The park's beautiful natural landscape includes slopes and bluffs covered with mountain laurel, Catawba rhododendron and ferns. Wildflowers and greenbrier, grape and trumpet flower vines are also found in the park. The park is home to many animals as well; even beavers, once nearly extinct because of excessive trapping, can be seen regularly along the river.[52]

The Eno River basin contains some of the most scenic and biologically important natural areas within the entire Eastern Piedmont. According to the Division of Water Quality, these portions of the Eno River are significant to biodiversity conservation because they are home to many rare and sensitive species. According to the Eno River Association, the river supports "at least 61 species of fish, an exceptionally high biodiversity for a river of this length. In addition, there are 12 species of freshwater mussels, many of which are on federal and state endangered species lists; seven species of turtles; 14 species of snakes; 15 species of amphibians; and a healthy variety of mammals including the beaver, river otter, muskrat, woodchuck, weasel, mink, and white-tailed deer. Over 100 species of trees grace the parklands with a delicate forest floor covering of herbaceous flowers."[53]

Water quality in the Eno River is generally excellent.[54] Much of the land along the banks of the Eno is already protected as part of a network of state and local parks, natural areas, and areas preserved through private land purchases. But significant gaps in protection remain, and given the rampant growth in development in the Triangle area of North Carolina in recent years, development pressure could have a negative impact on water quality in the future. For example, it has been estimated that by the year 2020, the Triangle will see a 64% increase in developed areas, adding over 356,000 developed acres.[55]

The ecological importance of the Eno River, combined with its exceptional recreational value demonstrates why it should be granted Outstanding National Resource Water status. By doing so, North Carolina can ensure that the treasures of the Eno will continue to be available to future generations of North Carolinians.

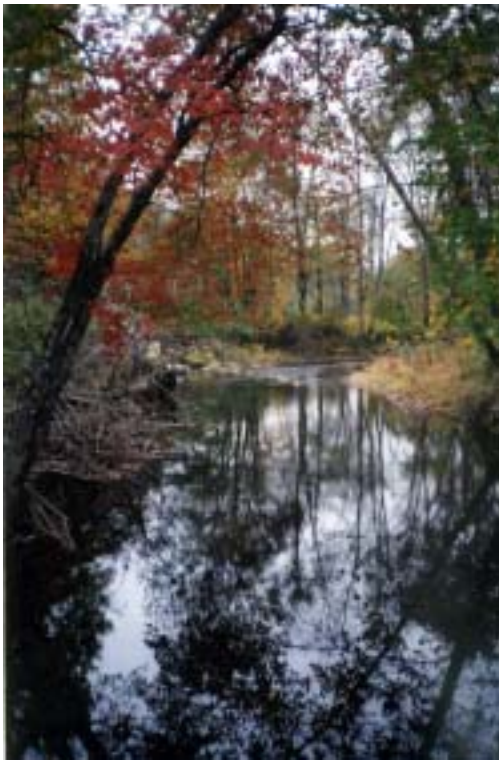


*Photo: Sally Mello*

## Hazel River, Virginia

The Hazel River begins in the Blue Ridge Mountains in Shenandoah National Park and flows 48 miles before joining the Rappahannock River in Culpeper County.[56] Residential development in the area, however, threatens the river. As allowed by federal law, a coalition of citizens and organizations has nominated the Hazel River for designation as an "Exceptional State Water" (Virginia's version of the Outstanding National Resource Water designation).[57]

Largely surrounded by woods, the Ha-

zel River is scenic and wild. At its origins in Shenandoah National Park, the river is essentially a brook. As it gains size, it flows through agricultural Rappahannock and Culpeper counties. Wooded riverbanks minimize the impact of agriculture. Of the 20 miles of river in Culpeper County surveyed by staff of Virginia's State Water Control Board, 80 percent of the river flows through woods or through a sizeable forested buffer that limits runoff and impacts from agricultural activities.[58] Most farmhouses are set back from the river, adding to its wild feel. Motorized access to the river is limited.

The woods are a mix of oaks, maple, tulip poplar, hickory, dogwood and redbuds.[59] Kayakers and canoers on the river can see whitetail deer, woodchucks, beaver and numerous birds.[60]

Because the surrounding counties are primarily agricultural and the river has a wooded buffer, the river is largely unpolluted. Only one small-sized industrial facility discharges into the Hazel River. Residential development, however, presents an increasing threat to the river.[61]

The Hazel River has been nominated three times for protection as an "exceptional state water." One early proposal, in 1993, was not acted upon because of larger questions about Virginia's program to protect pristine waters.[62] No decision has yet been made for the third nomination, submitted in 2005.

Citizens and landowners largely support protecting the river. According to Sally Mello, who has led the effort to protect the Hazel River, property owners enjoy the river and want their grandchildren to be able to safely swim in it.[63] A number of farmers are participating in the federal Conservation Reserve Enhancement Program, in which they receive subsidies to plant more trees that will reduce erosion, add habitat and protect the river.[64]

The Board of Supervisors in Culpeper County—which initially opposed the proposal—has since endorsed it, recognizing the designation as a way to protect the river from development.[65] However, in Rappahannock County the Board of Supervisors opposes the "exceptional state water" designation for the Hazel River. Staff of the State Water Control Board have recommended that the Hazel River receive the "exceptional state waters" designation for the three miles of river within the Shenandoah National Forest and the 32 miles of the river in Culpeper County, but not for the portion of the river in Rappahannock County.[66] The decision now rests with the State Water Control Board.

Should the river be designated as an "exceptional state water," Sally Mello hopes to expand access to the river for bird-watchers, canoers, kayakers and others to enjoy the river's beauty, while limiting access enough to protect its wildness.

## Middle Saluda River, South Carolina

The Middle Saluda was the first wild and scenic river designated by the state of South Carolina in 1978. Located primarily within Jones Gap State Park in Greenville County, the Middle Saluda consists of clear and cold water that supports reproducing trout populations. Trout streams are already scarce in South Carolina (the southern edge of trout populations in the U.S.) and growing scarcer under the combined threat of development and siltation pollution. Development in the area, combined with unplanned growth and poor land-use practices has the potential to threaten the continued health of the Middle Saluda.

The Middle Saluda River, a tributary of the Saluda River itself, is home to a diverse community of macro invertebrates. The region is particularly rich with salamanders and is a global hotspot of diversity for the species, which is dependent on clean, undisturbed water. More than 400 species of plants can be found in the Jones Gap area.[67] Because the Middle Saluda area is

*Photo: Erin Knight*

connected to a broader network of conservation lands, black bear, white tailed deer, wild turkey, bobcat, local and migratory raptors and trout all use the river in some capacity. Species of concern that have been identified near the Middle Saluda include Rafinesque's Big-Eared Bat, and the woodsrush.[68]

The Middle Saluda also provides breathtaking scenery and recreational opportunities. Over a four-mile stretch, the river drops almost 1,000 feet. During flooding, it is an important destination for paddling.

Over the past century, the river valley served as a place for rest and retreat for visitors traveling first by ox-drawn wagon and later by motorized vehicles along Jones Gap Road. The historic "Swamp Rabbit" Railroad's northern terminus was in the River Falls community, located along the Middle Saluda. The region is also littered with historic artifacts such as arrowheads, hide scrapers, pottery, and pipes used by the Cherokee Indians.

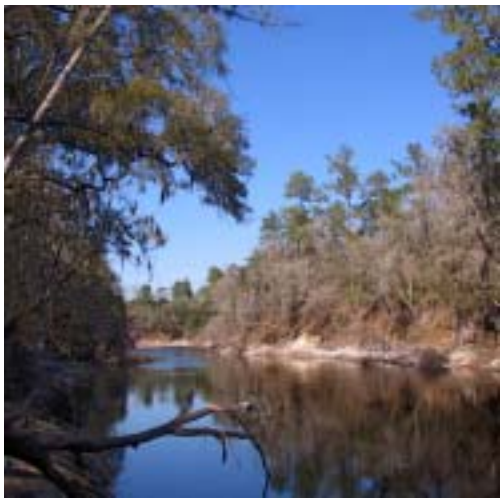
Unfortunately, even though the Middle Saluda is a wild and scenic river (along with the lower portion of the Saluda River mainstem), the "scenic river designation in and of itself does little to protect a river."[69] According to Malcolm Leaphart of the Lower Saluda River Advisory Council, "The scenic designation does not carry land or water use regulations to force appropriate management of a river. Instead, scenic status provides a forum where all the players can meet, discuss issues, and plan for the future."[70]

The chief threat to the Middle Saluda nowadays is non-point source pollution including waste, sediment and nutrients carried by stormwater. Rapid development, combined with unplanned growth and poor land-use practices, has the potential to undo progress made since the Clean Water Act was passed. Properties are for sale along the river's headwaters and, if developed, there would be a significant impact on one of the cleanest and coldest trout streams in the state. There are significant inholdings around the headwaters area—some of which have already been developed, others

of which are under development now, and still others of which are on the market. The threat is that if those parcels are developed, it will likely turn one of the cleanest rivers red with soil and sediment runoff, threatening the ecological integrity of the river.[71]

Providing Outstanding National Resource Water protection to the Middle Saluda River would encourage management of development in the area in such a way as to ensure that the quality of this special waterway is preserved.

*Photo: Cindy Johnson*



## Suwannee River, Florida

The Suwannee River is the only undisturbed major river system in the southeastern United States, without any dams. The local population, however, is expected to increase by 65 percent between 2000 and 2020, straining the river's water levels.[72] It is also threatened by pollution runoff from poultry farms, row crop and dairy farms.

The river has already been designated as an Outstanding Florida Waterway (OFW).[73] OFWs are intended to preserve and protect surface water quality and are not intended to restore degraded waters.[74] Indeed, they include similar but ultimately less stringent regulations than the Outstanding National Resource Waters (ONRW) designation affords.[75] According to the Florida Department of Environmental Protection, "For ONRWs, there are some specific prohibitions that could be allowed in OFWs."[76]

*National Geographic* has called the Suwannee River "Florida's Wildest River," and for good reason.[77] Much of the river bank on the Santa Fe, Ichetucknee and Suwannee Rivers is held in public trust by either the Florida Department of Environmental Protection or the Suwannee River Water Management District, giving the river a truly "wild" feel. The Suwannee basin is also home to the Lower Suwannee River National Wildlife Refuge, which covers 53,000 acres of pristine estuary.[78]

The Suwannee is home to a dazzling array of wildlife. The U.S. Fish and Wildlife Service calls the Lower Suwannee River estuary "one of the most productive ecosystems in the world."[79] The Lower Suwannee refuge hosts more than 250 species of birds, as well as alligators, bald eagles, wood storks and manatees. Gulf sturgeon make their way about 200 miles up the Suwannee River to spawn and manatees are often found in the middle portion of the river during the winter months.[80]

Despite its undisturbed appearance, however, the Suwannee River is in trouble—in part due to its hydrology. The Suwannee is fed by more than 180 springs, which provide more than 50 percent of its typical flow.[81] As a result, the quality of water in the Suwannee is directly affected by groundwater quality in the area. Intensive agriculture in the region—particularly the growth of factory farms—and fast-paced residential development have caused a steady increase in concentrations of nutrients, particularly nitrates, in groundwater. Direct discharge of pollutants to the Suwannee is another area of concern.

Increasing groundwater withdrawals also pose a threat to water levels in the Suwannee.

The flow of water into the river is being starved one residential well at a time. Everyone in the Suwannee River Basin uses groundwater, even cities and towns. And

because the Suwannee River basin is considered "water rich" by Florida standards, there have been periodic proposals for massive transfers of water from the region to other parts of Florida. Groundwater is vitally important to the continued health of the Suwannee, since it feeds the springs that in turn feed the river and its major tributaries. Careful management of groundwater withdrawals is essential to ensuring the proper flow of the Suwannee.

These challenges can have ripple effects far downstream, particularly at times when the ecosystem faces natural stresses. During the summer of 2006, for example, a combination of low river flows and high nutrients started an algae bloom in the river that caused a fish kill. When river flows are at normal levels, the nitrates in the dark, swift-moving water don't have time to contribute to algae blooms. When the flow decreases during a drought, almost all of the river flow comes from springs that are high in nutrients. This means that in addition to the nutrients, the water is very clear and transparent to sunshine. This slow-moving, clear water is a perfect breeding ground for filamentous algae. These algae smother the normal, healthy, submerged aquatic vegetation that all wildlife—from bugs to manatees—depends on. The thick, foul-smelling algal mats can also make recreational activities such as boating very unpleasant.

Problems caused by low flow and high nutrients also affect the Suwannee River estuary. Low river flows cause saltwater to intrude farther up the river, affecting local ecosystems. Low flow and water quality problems can impact clam and oyster populations as well as sport fish nurseries.

Acknowledging the Suwannee River's unique ecological and recreational value through Outstanding National Resource Water designation would provide additional tools for achieving the challenging task of preserving "Florida's wildest river."

## Tar River, North Carolina

The Tar River and Pamlico River traverse 180 miles from the Piedmont Region to Pamlico Sound. The freshwater Tar River (which becomes the brackish Pamlico) is home to many rare and endangered species

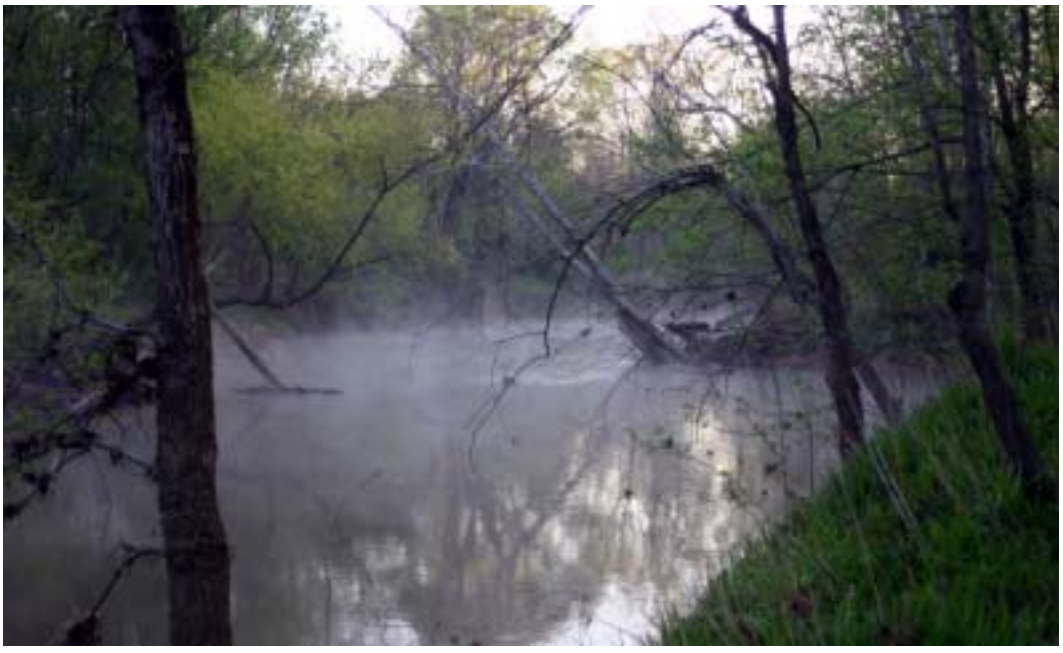


*Photo: Heather Jacobs*

and is an important source of drinking water and recreational opportunities for area residents.

Yet, the Tar River basin, like much of North Carolina, has seen explosive growth and development over the past several decades—development that poses a threat to the river's future health.

Among the many species that call the Tar River home is the Tar River Spinymussel, which is found only in five short sections of the Tar River and its tributaries and nowhere else in the world. The Tar River Spinymussel has unique spines on its outer shell—only two other freshwater mussels have spines.[82] But the spinymussel is now an endangered species, occupying about 1% of its probable historical range.[83] Spinymussels depend upon clean water for their survival; the best spinymussel populations are associated with areas composed mainly of woodlands, stable stream banks with extensive root systems, and limited pollution.[84]

The spinymussel is just one of 12 rare freshwater mussels that can be found in the Tar River ecosystem. The Lower Tar Aquatic Habitat also provides habitat for a host of other unique species, including the yellow lance, Atlantic pigtoe, yellow lampmussel, green floater, triangle floater, Roanoke Bass, Carolina madtom, dwarf wedgemussel (also an endangered species), and Neuse River waterdog, all of which are federally listed as "cause for concern."[85]

The Tar River isn't just a home for unusual wildlife, but it is also an important resource for people, providing drinking water for the Greenville, Tarboro, Louisburg, Rocky Mount and other municipalities, and numerous recreational opportunities such as canoeing and kayaking, which provide a boost to local economies.

But the Tar River, like many North Carolina waterways, faces significant threats from development. Between 1982 and 2002, the basin lost 80,700 acres of forestland and 190,600 acres of cropland, while gaining 117,900 acres of developed land.[86] The upper Tar River basin is rapidly being transformed into bedroom communities for the fast-growing Raleigh-Durham metropolitan area, making non-point source runoff—particularly nutrient and sediment loads—the top threat facing the river. Nutrient and sediment loads from forestry operations and agriculture also add to the stress on natural waterways in the region. In addition, leaks from outmoded wastewater infrastructure potentially pose a threat to water quality.[87]

Fortunately, preservation efforts are underway. The Pamlico-Tar River Foundation has filed a request to reclassify portions of the Tar River as Outstanding Resource Waters (a state designation). A portion of the river's Swift Creek tributary has already been designated as an Outstanding Resource Water and the state of North Carolina is studying whether to provide similar protections to portions of the Tar.

Designation of the Tar River as an Outstanding National Resource Water would ensure that the unique range of aquatic creatures that call the river home will be preserved, as well as protect water quality downstream in the Pamlico River and Pamlico Sound and ensure healthy drinking water and the continued availability of recreational opportunities for residents of the region.

# Policy Recommendations

Preserving the Southeast's most pristine waterways requires a variety of efforts, including strong enforcement of existing laws, protection of open spaces, and better safeguards to ensure that development does not have a negative impact on water quality.

Classifying rivers and streams as "Outstanding National Resource Waters" provides a powerful tool for states to use to protect pristine waterways. The 10 waterways profiled in this report meet the standards for Outstanding National Resource Waters protection. They are waterways of exceptional ecological and recreational value, deliver important services to communities, such as clean drinking water, and in many cases have a deep cultural significance as well.

The southeastern states should move forward with Outstanding National Resource Waters protection for the waterways described it this report. The states should also take several steps to ensure that such protection provides maximum benefit to the affected waterways. States should:

- Adopt Outstanding National Resource Waters designations for the rivers listed in this report, under EPA guidelines and state water quality regulations so that the waterways are protected from further degradation. Currently, reclassifying a water body is a lengthy procedure, often taking years, during which time the quality of the river may suffer. It is important that any requests for reclassification proceed through the rulemaking process as quickly as possible; the longer the delay in reclassifying a river, the greater the risk it faces.

- Put a hold on permits for discharges into these rivers and streams until the rulemaking process for individual waterways is complete. Because the reclassification process does take such a long time, it is important for the state government to take all steps necessary to protect rivers being examined. If the rivers are not protected from new sources of pollution, they may fail to retain their water quality and the reclassification process will be less effective.

- Create or revise rules to ensure that Outstanding National Resource Waters status provides pristine

waterways with full protection from the growing threat of runoff pollution from development. At a minimum, states should bar new or expanded discharges into Outstanding National Resource Waters, and establish buffer zones sufficient to capture runoff pollutants before they enter the waterway. To ensure that waterways are adequately protected, states should routinely monitor runoff pollution and water quality and employ strong enforcement mechanisms. Prevention-based approaches are crucial, such as: regional and watershed planning, growth management, conservation minded zoning ordinances, stormwater-sensitive site design, erosion prevention, and sediment control.

- Develop a timetable for the protection of the state's remaining unspoiled waterways. The rivers profiled in this report are not the only ones in the Southeast deserving of protection. The states should maintain a process to evaluate and nominate waterways for Outstanding National Resource Waters protection on an ongoing basis.

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