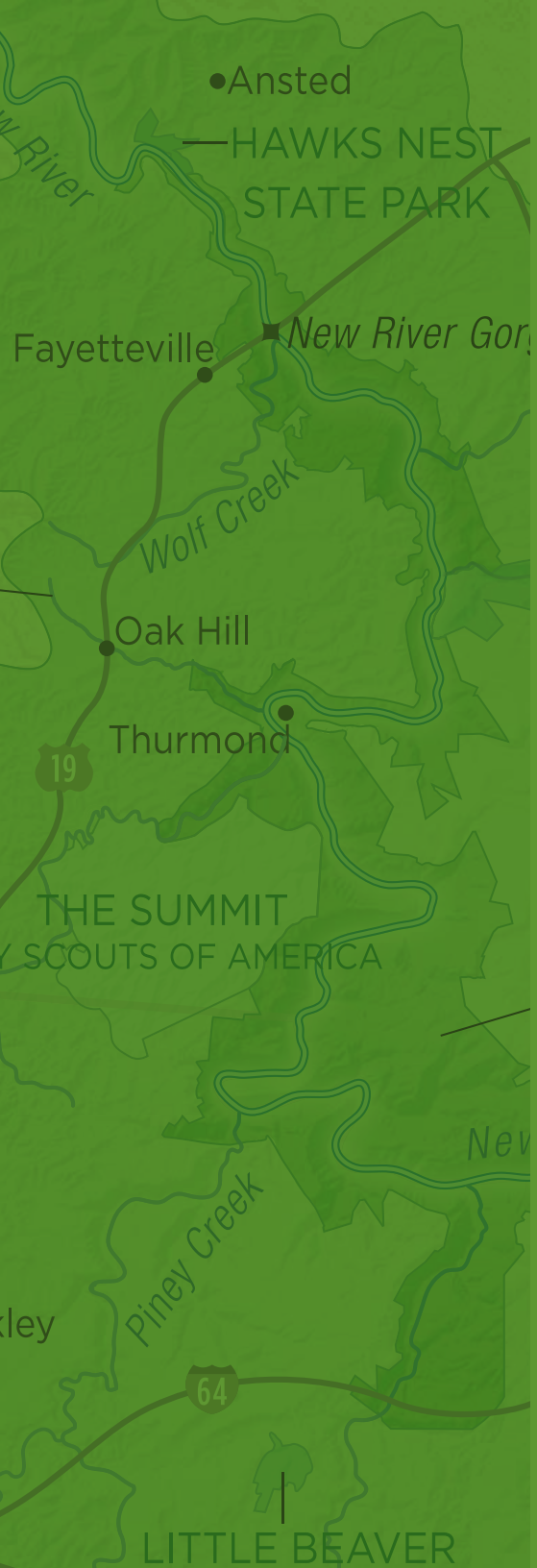
New River Clean Water Alliance

July
2011

LOWER NEW RIVER

STATE OF THE WATERSHED


Ansted
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LOWER NEW RIVER

STATE OF THE WATERSHED

A rock climber reaches the top of a classic climb in the New River Gorge.

LETTER FROM THE NEW RIVER CLEAN WATER ALLIANCE

The New River is a special place for residents of, and visitors to, the New River Gorge region in Southern West Virginia. In 2009, a group of local citizens and community leaders concerned about the health of the New River met to discuss the status of water quality and what could be done, strategically and effectively, to address challenges facing the river.

Out of those discussions, we formed the New River Clean Water Alliance and the idea for this report was born. This report provides an assessment of the river's current health and a basic roadmap to guide the people of the Lower New as we work to promote clean water. Our goal is to improve water quality in the Lower New River and its tributaries to sustain the river's environmental, cultural, recreational, and economic benefits. Our approach is to identify the issues, incorporate community input, focus priorities, and set the stage for improving water quality in the Lower New. Everyone who values clean water has a role, including those who fish, boat, swim, live, work, visit, or have family ties to the region. This report serves as an invitation to you to get involved to restore our river. Postive change is possible through the targeted solutions we outline in this report.

Thank you for your interest. We look forward to working together for a bright and healthy future for our communities and our children.

Sincerely,

The New River Clean Water Alliance

(For contact information for representatives of the following organizations, please see page 61 of report.)

National Parks Conservation Association®

www.npca.org

dep

west virginia department of environmental protection

PAN

Plateau Action Network

National Park Service

WVPRO

West Virginia Professional River Outfitters

Representing America's Best Whitewater

Mountain Resource Conservation & Development

Southern Conservation District

Piney Creek Watershed Association

National Committee for the New River

EXECUTIVE SUMMARY

The Lower New River is the beating heart of the region through which it flows. The river is at the core of the area's unique and threatened natural resources, its rich cultural heritage, and its economic future. We define the Lower New River watershed as the 690-square-mile land area that drains into the New River from Hinton to Gauley Bridge in Southern West Virginia. The Lower New River watershed includes 53 river-miles of the New River Gorge National River, which was designated a national park unit by Congress in 1978. The goal of this report is to highlight the Lower New River's significance to local communities and the nation, clearly define and communicate the clean water challenges facing the river, and recommend strategic actions to promote clean water in the river and its tributary creeks. This report is a call to action to engage those who care about the Lower New River, and the communities that depend on it for drinking water, recreational opportunities, tourist dollars, and spiritual renewal. We begin by sharing stories and images of the Lower New River that illustrate its importance to the region and the country.

Scattered amidst the lush, biologically diverse West Virginia forest and river are reminders of the once-thriving coal mining and railroad communities and memories of camping and fishing with family and friends. More than 100,000 commercial rafters and private boaters enjoy wild and wonderful world-class whitewater rafting on the New each year. More than one million visitors spend an estimated $130 million annually in the New River Gorge region. The Boy Scouts of America (BSA) recently selected the New River region for their fourth national high adventure camp, national jamboree site, and leadership academy. In 2013, the BSA will host its first national jamboree on the site, inviting an estimated 30,000 scouts to the region. Local residents and visitors from afar all appreciate the New River Gorge – this report is about recognizing and addressing the water-quality situation that affects each one of us.

We also document the state of the New River watershed today – what are the clean water challenges to the New River and the creeks that flow into it? Downstream Strategies, an environmental consulting company based in West Virginia, assisted the Alliance with conducting data analysis on water quality, gathering and analyzing stakeholder input, predicting project feasibility, and arriving at priority tributaries to focus recommendations.

We highlight the following key points related to water quality:

- Many tributaries that flow into the Lower New River routinely have pollutant levels that violate clean-water standards set to protect public health. In the New's tributaries, fecal coliform, an indicator of human disease-causing pathogens in fecal matter, is often 10 to 100 times beyond clean water standards.
- The New River itself is considered impaired by the State of West Virginia, which means it does not meet the clean-water standard for fecal coliform under some weather conditions.
- Pollution is most likely to be found at unsafe levels after periods of heavy rainfall when the New River is running high (at levels greater than 10,600 cubic feet per second).
- Most pollution originates in local tributaries that flow into the New River below Bluestone Dam.
- Heavy rainfall flushes the land surface and enters wastewater systems through leaking sewer pipes, causing fecal matter to enter New River tributaries.

The final section of the report outlines proposed priorities, strategies, and next steps for cleaning up the New River. Based on our analysis, the following tributaries were selected as top priorities: Piney Creek watershed including Beckley, Arbuckle Creek watershed including part of Oak Hill, and the Wolf Creek watershed including Fayetteville.

The following recommendations are expected to be the most cost-effective way to reach clean water goals for the New River:

1. Community Support: Strengthen the regional voice for clean water through increased staff and funding for local organizations to educate and engage community members.
   - Secure sustained funding for a fulltime executive director for the Piney Creek Watershed Association who will assist in community education and water quality monitoring program.
   - Support community outreach and education in Arbuckle Creek through water quality monitoring.
2. Infrastructure: Support funding proposals and affordable financing to repair sewer leaks on public and private property. Garner community support for existing wastewater efforts.
   - Seek grant funding for leak detection and major repair of sewers in the Arbuckle Creek watershed.
   - Support Beckley Sanitary Board's Downtown Sewer Replacement Project, which will address the largest source of inflow and infiltration into the Beckley system.
   - Fund current proposal for a database to store

and track septic system information in Fayette County, including their maintenance schedules.

- Propose and support common-sense regulation designed to support clean water recommendations.

3. Alternatives: Demonstrate green and decentralized infrastructure solutions.

- Support full funding for alternative wastewater infrastructure in the community of Winona as a model for other areas without sewer systems.

- Implement green infrastructure strategies that mimic natural hydrology to slow runoff and prevent stormwater from entering sewer lines (see page 42). These strategies should include protections for streambank areas and vegetated stormwater retention systems (see photo on page 43) in Piney Creek.

In sum, the New River is a special place for visitors and residents. Clean water in the New River requires clean water in the creeks flowing into it. By working with active citizen groups and community leaders to target polluted tributaries, we can reduce pollution in the New River. We invite you to be part of this exciting clean water initiative so that we can continue to drink, swim, fish, and float the New.

Dunloup Creek cascades alongside the 10,600 acre Summit Bechtel Reserve recently purchased by the Boy Scouts of America on its way to the New River. Reducing pollution in tributaries like Dunloup Creek is the best way to improve water quality in the New River.

THE STORY OF THE LOWER NEW RIVER: A LOCAL AND NATIONAL TREASURE

The sun sets over Sandstone Falls on the New River. The spectacular vistas, powerful water, and lush forest draw more than one million visitors each year to the New River Gorge National River.

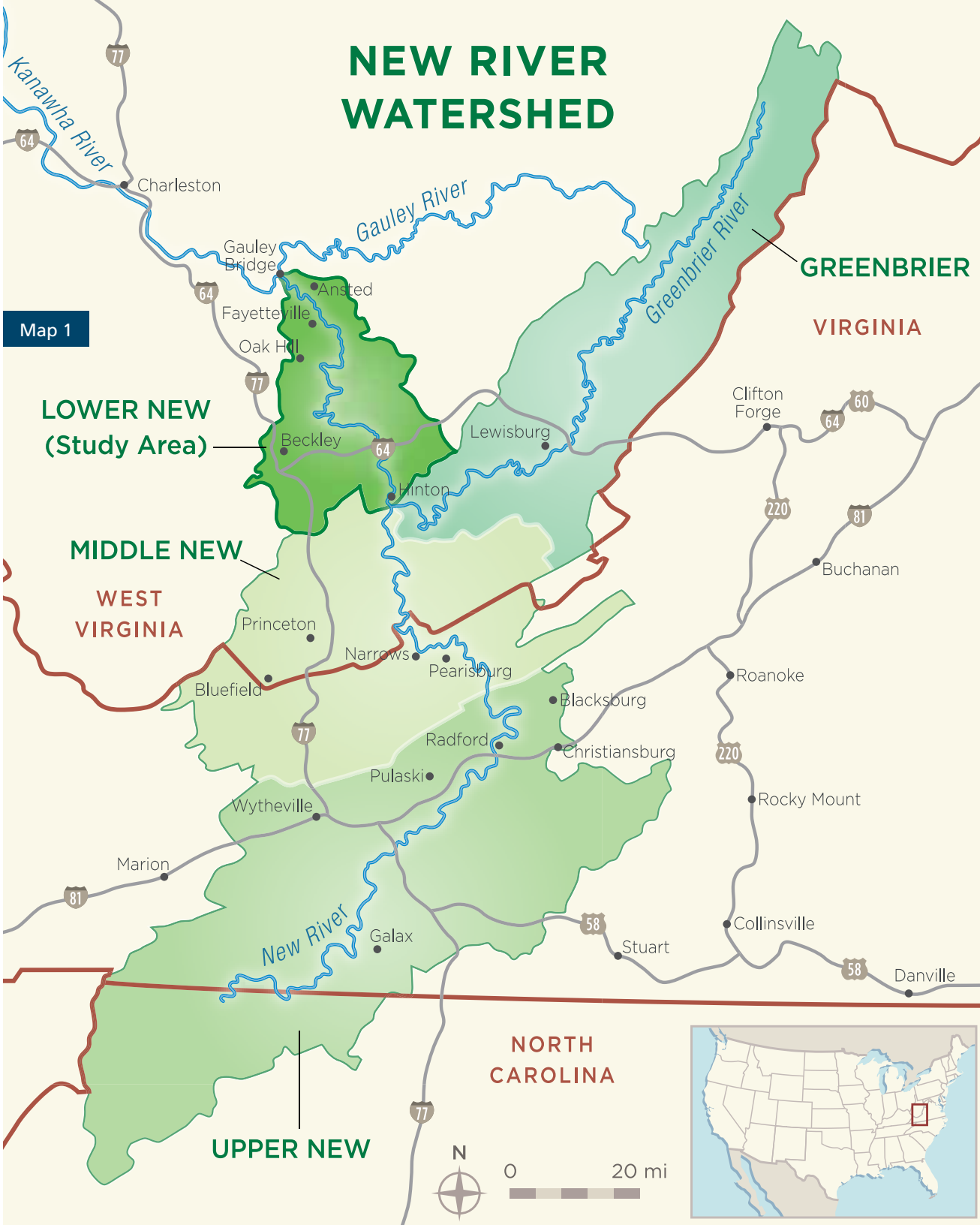
WELCOME TO THE LOWER NEW RIVER WATERSHED

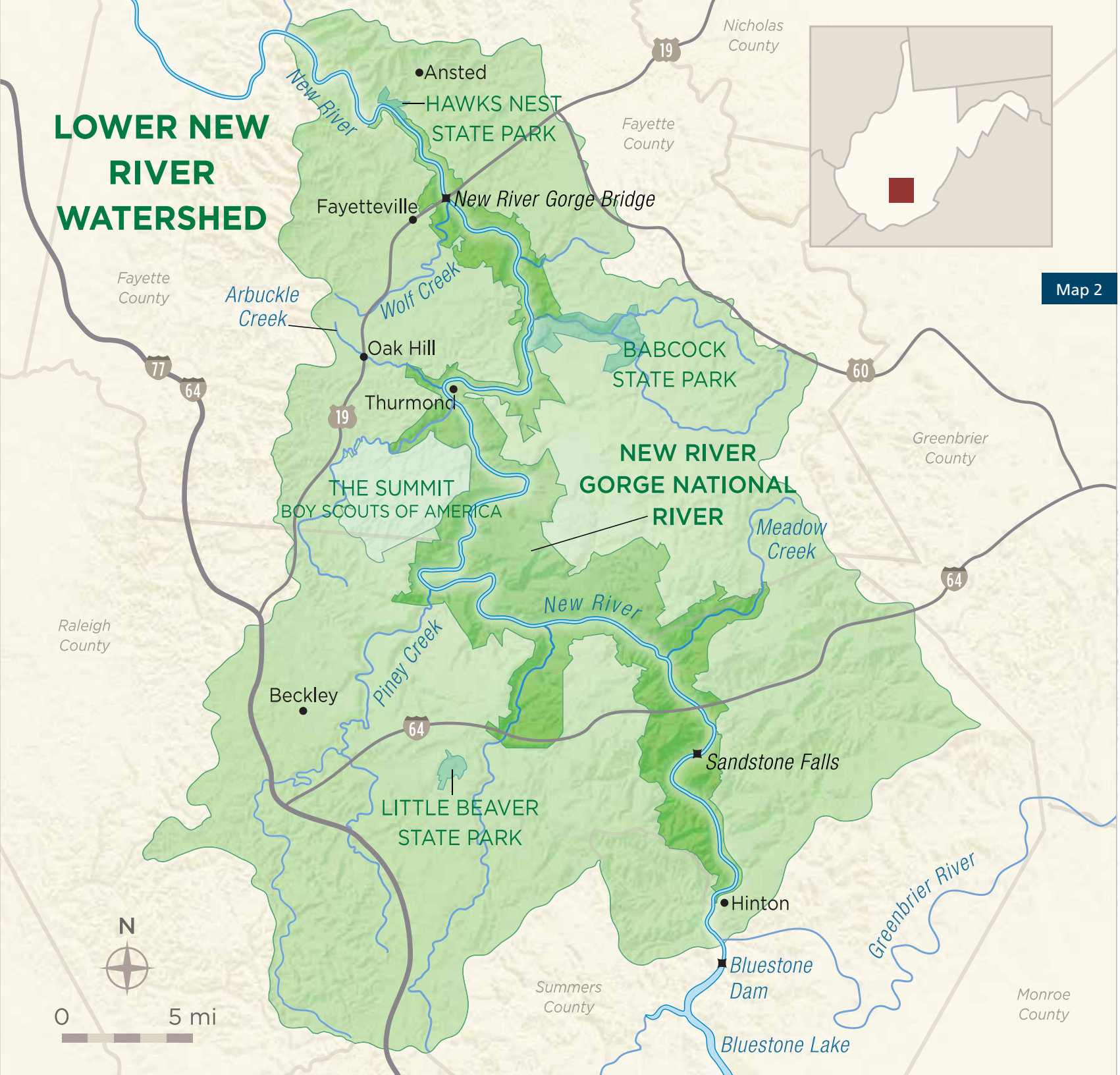
The Lower New River watershed, located in Southern West Virginia, is home to inspiring individuals, unique small towns, rich natural and cultural resources, and the spectacular New River Gorge National River.

We focus on the Lower New River watershed, or all of the land area that drains into the New River from below the Bluestone Dam, near Hinton, to the confluence with the Gauley River at Gauley Bridge (see Map 2: Lower New River watershed). We tell the story of why the New River is critically important to the people of this region and the nation, explore the current water-quality situation, and recommend strategic actions that communities, local governments, nonprofits, the National Park Service, and individuals can take to restore clean water in the New River and its tributaries.

The New River is among the oldest rivers in the world, stretching for more than 320 miles through North Carolina, Virginia, and West Virginia (see Map 1). Our focus area, the Lower New River, includes the 53 river miles of the New River Gorge National River, designated a national park unit by Congress in 1978.[1] The New River and surrounding national park protect the region's rich history, including the story of coal mining, industrialization, and the railroad. Today, drinking water is drawn from Hawks Nest Lake for nearly 25,000 area residents.[2]

Clean water in the New River requires clean water in the creeks flowing into it. The Lower New River watershed can be divided into smaller subwatersheds representing the land area that drains into 15 major tributary creeks of the New River (see Map 3: Lower New River Subwatersheds).[3] The Keeney's Creek subwatershed, for example, includes the communities of Winona and Lookout. Keeney's Creek drains this land



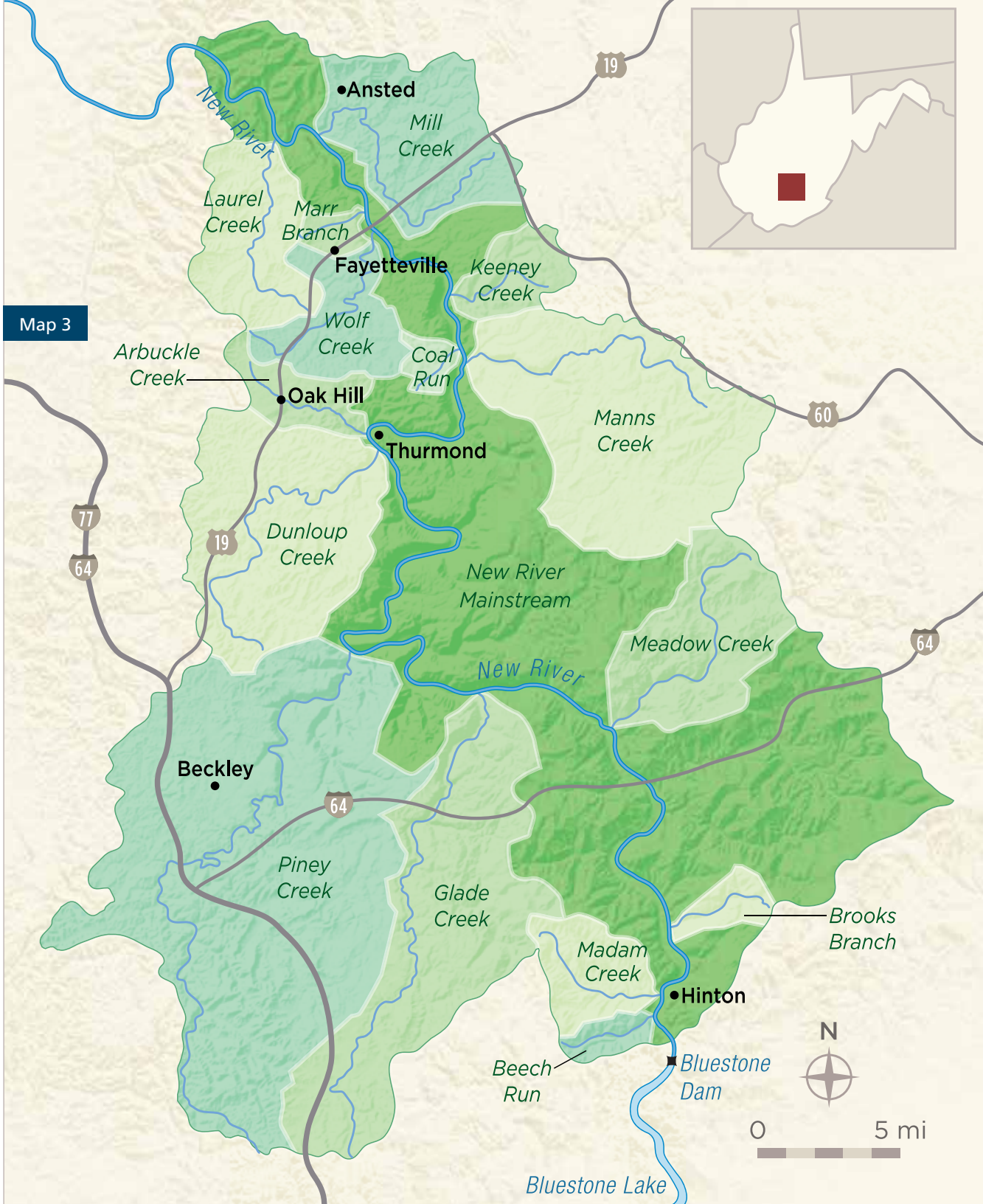

LOWER NEW RIVER WATERSHED
Map 2
Ansted
HAWKS NEST STATE PARK
New River
Fayetteville
New River Gorge Bridge
Nicholas County
Fayette County
Fayette County
Arbuckle Creek
Wolf Creek
Oak Hill
Thurmond
BABCOCK STATE PARK
Greenbrier County
NEW RIVER GORGE NATIONAL RIVER
THE SUMMIT
BOY SCOUTS OF AMERICA
Meadow Creek
New River
Raleigh County
Piney Creek
Beckley
Sandstone Falls
LITTLE BEAVER STATE PARK
Hinton
Greenbrier River
Bluestone Dam
Summers County
Monroe County
Bluestone Lake
N
0
5 mi
19
77
64
60

area and ultimately flows into the New River at rapids popular with whitewater rafters and kayakers.

Each subwatershed, from Piney Creek including the City of Beckley, to Madam Creek across the river from Hinton, is unique, and plays a role in shaping the characteristics of the New River. These subwatersheds have their own geography, land use patterns, population distribution, and pollution sources. We focus on priority creeks because of this connectivity and recommend focused cleanup efforts at the tributary level.

LOWER NEW RIVER WATERSHED BY THE NUMBERS

- **>90,000 = number of people who live in the Lower New River watershed**
- **690 = square mile area of the Lower New River watershed (see Maps 1 & 2)**
- **>1,600 = stream miles in the Lower New River watershed**
- **110 = square miles of the watershed included in the New River Gorge National River**
- **6 = percentage of the watershed that is developed. A majority of the watershed is forested.**



The sun rises over the New River Gorge at Grandview. All the water that courses over this vast region is part of the Lower New River watershed, and flows into the New River.

NEW RIVER ~ A DEFINING CHARACTERISTIC OF LOCAL CULTURE AND QUALITY OF LIFE

The New River has long been a defining characteristic of local culture and quality of life.[4] For many residents throughout the Allegheny Plateau – in places like Beauty Mountain, Edmond, and Fayetteville – the now abandoned coal camps and railroad towns of the New River Gorge remain alive as stories are passed down through generations. These stories tell of the strong community bonds and hardships of life in the more than 50 company-owned coal camps that provided coal to fuel the Industrial Revolution. Visitors to the New River Gorge might catch a glimpse of the cut limestone walls of the once bustling company store in the now abandoned coal mining town of Kaymoor while floating down the river; or even make a special trip to Nuttallburg to see the intact coal tipple, coke ovens, or foundation of the boarding house from a mine once owned by Henry Ford to supply coal to make steel for his company.

Prior to Western settlement, Native Americans traveled across the plateau through what is now Beckley to Paint Creek and down to the Kanawha River to bypass the New River Gorge's ruggedness. For Native Americans, the New River Gorge was reserved for visiting hunting parties, not for permanent settlement. Descendants from families in Virginia settled the upper stretches of the New River near Hinton as early as the 1770s, enjoying gentler, more fertile lands. The backbreaking labor of immigrants chiseled a route for the main line of the Chesapeake & Ohio railroad in 1873 giving growing cities access to the coal and timber found in the New River Gorge.

Paul Fox, whose fifth great-grandfather John moved to Lansing in 1803, recalls how eager his mother was to move from South Nuttall, a coal camp deep in the New River Gorge where the sun would slip behind the gorge walls at two in the afternoon, back to their home place on Beauty Mountain. As a child, Paul and friends enjoyed swimming in the "backwater" where Keeney's Creek flows into the New River. He has fond memories of walking down to Nuttallburg from Beauty Mountain, following a path similar to his father's route to and from the mine every day. "We'd come here to fish and camp [and sleep in the old Tipple], we called it camping out."

Gene Wilfong from Meadow Creek echoes this sentiment. "[Camping] close to the river sort of originated from the coal mining days, the old coal mining days. The coal miners didn't make much money. They didn't go to Myrtle Beach. (laughs) They went to their local riverbank and threw out the camp, and the family, and that's where they stayed for a couple of weeks."[5]

Some of Phyllis Farley's fondest memories are of "being out in the fresh air and being with family members by the New River." Phyllis recalls sleeping under a canvas tent set up on the back of a truck on fishing trips with her family down by the New River – "that's where the women and kids slept." She shares a few old pictures from a trip during which she unexpectedly caught several fish by using marshmallows as improvised bait.

The New River and its history continue to be celebrated across the region in local fairs and festivals. These events strengthen community and showcase the area to visitors. In August 2010, Hinton celebrated the 46th Annual West Virginia State Water Festival inviting visitors and former residents to "Come Home to Where Old Friends and Rivers Meet." Mary Lou Haley, the festival organizer, enjoys all aspects of the weeklong event that features historic water and frontier activities including a street fair, bateau boat-building contest, fishing tournament, sock hop, boat parade, and rubber ducky race.[6]

Many residents have chosen to make the New River Gorge region home and enjoy the adventurous lifestyle and rural landscape. "I practically grew up on the New. My parents founded and operated one of the first whitewater rafting companies here. That makes me a second-generation raft guide," says local resident and National Parks Conservation Association staffer Heather Lukacs. "Recently, I was drawn back to the area by the possibility of meaningful work and desire to live closer to the land. I still love to boat and camp along the river with my family."

The New River Gorge offers a range of pursuits for those who prefer dry land – including world-class rock climbing, mountain biking, hiking, and bird-watching. Rock climbers from around the world are drawn to the climbing in and around, the New River Gorge. Megan Curtis, a local resident originally from Braxton County, West Virginia, lives with her family in a former coal camp community adjoining the national park. "We love to rock climb," she says. "There is nothing more magical than topping out of a climb and seeing the Gorge from the peregrine's perspective. We also love the river. Playing in the New River in the summertime is something we look forward to for years to come, for ourselves and for our children."

Beaver resident Phyllis Farley shares stories of her family's connections to the New River, some dating back decades. As of February 2011, she is the first Executive Director of the Piney Creek Watershed Association.

The main street of the historic railroad town of Thurmond is a railroad line. In 1889, a railroad bridge constructed across the New at Thurmond made branch lines possible up Dunloup and Arbuckle creeks. These branch lines are now beautiful park trails athe restored train depot is a park visitor center.

Local resident, Bryan Kirk, spends the day play boating on the New River. Many residents chose to live in the area because of the world-class recreational opportunities in and near the New.

Mary Lou Haley stands by the New River near Hinton. Haley organizes the West Virginia State Water Festival that invites everyone to "Come Home to Where Old Friends and Rivers Meet."

NEW RIVER ~ A CORNERSTONE OF THE LOCAL ECONOMY

The New River is a cornerstone of the regional economy for both river-based tourism and the quality-of-life benefits that the river imparts to neighboring communities, drawing in residents and businesses.

"It's difficult to overstate the importance of river-based tourism to the local economy," says Mark Lewis, the executive director of the West Virginia Professional River Outfitters, a nonprofit organization that represents the commercial rafting industry. "The New River provides one of America's truly great whitewater experiences and rafting has become the foundation of a vibrant tourist economy that contributes tens of millions of dollars to the area each year." Mark was first drawn to the New River Gorge as a guest on a commercial raft trip and has now guided here for more than 25 years.

Since the first rafting company began operations in 1968, the New River has become one of the busiest whitewater rivers in the country. More than two and a half million guests have rafted the New River commercially in the last 42 years, with an average of more than 100,000 guests per year over the last 20 years. In 2010, rafting companies directly employed more than 1,000 people, according to the data gathered by the West Virginia Professional River Outfitters.

The New River is also a major draw for thousands of private boaters from across the country. The calmer sections of the river from Hinton to Thurmond that were once floated in wooden bateau boats, are now great for family trips in canoes, rafts, or inflatable kayaks. The lower sections of the river, known as the Gorge, feature big rollercoaster waves during the spring and early summer and are enjoyed by private boaters and commercial rafters alike. Some extreme paddlers also descend favorite New River tributaries including Mann's, Mill, Glade, Piney, Wolf, and Lick creeks.

Fishing brought an estimated $1.2 billion to the West Virginia's economy in 2006.[7] The New River is an important part of that windfall. Fishing is one of the most popular activities on the main stem of the New River. The New River, an excellent warm-water fishery, is home to a wide diversity of fish including bass (smallmouth, largemouth, striped, and rock), walleye, muskellunge, crappie, bluegill, carp, and channel catfish.[8] Local fisherman Bobby Bower has been guiding on the New River for more than 15 years: "I really enjoy seeing someone who doesn't get out into nature – maybe someone from the city – experience the beauty of the New River," Bobby explains. "[I'm glad] to share my favorite place with them – just to be out in the New River Gorge is amazing." Many anglers also fish the trout streams, including Piney Creek, which feed the New.

The New River Birding and Nature Festival, one of the top 10 birding events in the country, draws bird watchers from near and far each year. This weeklong event generates an estimated $100,000 in direct income each year, more than $10,000 of which supports local educational programs for high school students and programming at the Wolf Creek Park wetlands boardwalk.

The New River Gorge National River hosts more than one million visitors per year. While many of these visitors float the river, others prefer to bird watch, climb, bike, or hike, explore the gorge's historic towns, or go for a scenic drive. The National Park Service estimates that these visitors contribute about $130 million to the region's economy annually (see Table 1).[9]

Table 1 **Economic Impact of the New River Gorge**

CATEGORY	IMPACT
ANNUAL SPENDING	$130,017,490
JOBS	3,550
INCOME	$49,254,450
TAXES (STATE/LOCAL)	$9,394,467

A private squirt boater dances under the water of the New River. When the water is low, certain places on the New become ideal for squirt boaters who intentionally submerge their boats to enjoy the whims of underwater currents before resurfacing.

Guests enjoy an autumn trip down the river with a local commercial rafting company. More than 100,000 commercial guests raft the river each year.

QUALITY OF LIFE ~ ATTRACTING RESIDENTS AND BUSINESSES

Many people choose to live in the New River Gorge region because of the easy access to world-class recreational opportunities, the low crime rate, the low cost of living, and the scenic beauty. Some new residents bring their jobs with them or start new businesses in the region. This "creative class" of entrepreneurs – at the forefront of the new economy – is often able to locate wherever they can get high-speed internet access and many are choosing to live in beautiful places that have high quality of life.[10] Furthermore, businesses looking to set up shop in a community often strongly consider the lifestyle afforded by the place. Create West Virginia, a grassroots organization whose focus is on building creative communities for the new economy, includes quality of place as one of their six pillars for success.

One example of a recent project locating in the region because of the New River is the Boy Scouts of America's (BSA) new national high adventure camp and National Jamboree site located on 10,600 acres adjacent to the New River Gorge National River in Fayette County. One of the factors influencing the decision to locate the camp here was the opportunity to incorporate rafting and other river-related activities as a centerpiece of BSA adventure programs. The economic investment associated with

Trout Unlimited and the West Virginia Division of Natural Resources, in partnership with CSX, prepare to stock Piney Creek with fingerling trout. Fishing is a popular activity in the main stem of the New River as well as its tributaries. Fishing contributed an estimated $1.2 billion to West Virginia's economy in 2006.[7]

Mayor R. A. "Pete" Hobbs relocated to Ansted in 1995 as an AT&T employee and early subscriber to "telecommuting." Hobbs left Ansted in 1961 after graduating from high school. Like many West Virginians, he made frequent trips home to the mountains. With a reasonable cost of living, recreation trails connecting into the national park, and access to high speed Internet, Ansted is an ideal home for telecommuters like Hobbs.

building and developing the programs for the camp will exceed $200 million. When the camp is fully operational, BSA will have 500 to 600 scouts per day boating various sections of the New River, for an additional 25,000 rafting days per year. They are also planning to host the National Scout Jamboree at the site in 2013 and every four years after that. This event will bring more than 200,000 people to the area over a ten-day period. The publicity during the build-in phase of this project alone will increase national awareness of the New River Gorge as a premier outdoor recreation destination.

BOY SCOUTS OF AMERICA
SUMMIT BECHTEL RESERVE PROPOSED WATER-SUSTAINABILITY PRACTICES

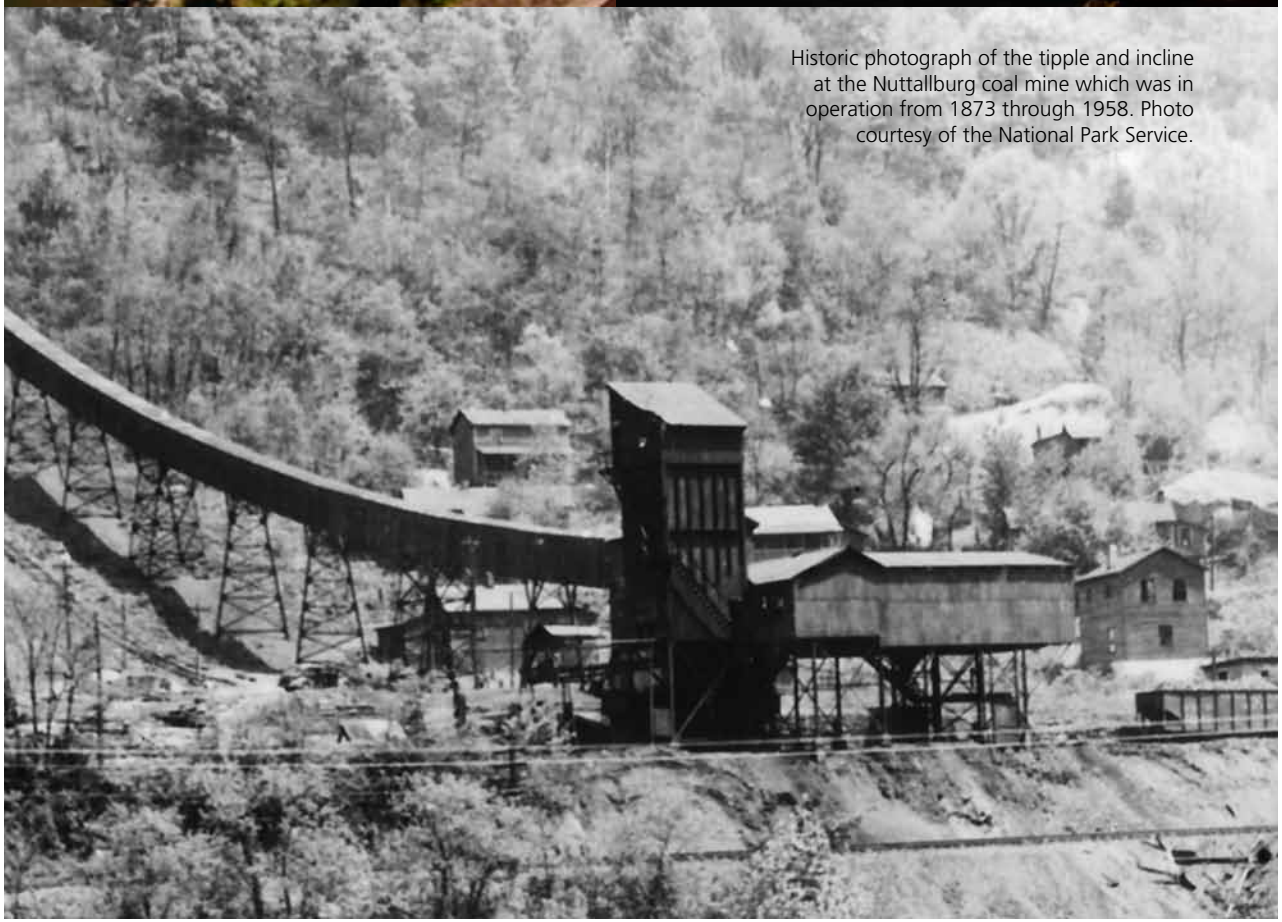
- **Gray water systems to recycle shower and lavatory water for use in flushing toilets, which will cut water consumption by nearly half.**
- **Rainwater collection systems to further reduce the amount of additional water needed on site.**
- **Cold-water showers with pull chains to encourage water and energy conservation.**
- **Solar power for water supply and wastewater treatment systems to reduce electricity needs.**

NEW RIVER ~ A NATIONAL TREASURE

The New River and its surrounding gorge has been protected as part of the National Park System since 1978, joining the ranks of our most treasured sites, such as the Civil War Battlefield at Gettysburg and the natural wonders of Yellowstone.

The extraordinary New River is the heart of the New River Gorge National River and at the core of the park's national and global significance.[11] Part of the ancient Teays River system, the New River is among the oldest rivers in the world. It has been flowing north, carving the gorge, for millions of years. The river also hosts a diverse array of plants, endangered mammals, and rare birds and amphibians in its unique aquatic and riverbank habitats.

"The New River Gorge is at the heart of one of the largest, least-fragmented blocks of forestland in this part of the Appalachians. Along with similar forests in China, the Central and Southern Appalachians support the most diverse temperate deciduous forests on Earth," says Rodney Bartgis, State Director of The Nature Conservancy in West Virginia. "These forests are home to both species found throughout the eastern forests, and many species found only in these mountains and nowhere else." The New River Gorge forest provides stopover habitat that is critical for the survival of migrating birds such as the Golden-winged, Blue-winged, and Swainson's Warbler, as well as the Scarlet Tanager.[12] The Nature Conservancy has identified the New River Gorge as one of the few places still intact enough to allow these forest ecosystems to survive large-scale ecological changes now happening. The New River Gorge National River is connected to the larger landscape and additional protected lands including the Bluestone National Scenic River, Gauley River National Recreation Area, Summersville Lake Wildlife



Historic photograph of the tipple and incline at the Nuttallburg coal mine which was in operation from 1873 through 1958. Photo courtesy of the National Park Service.

Superintendent of the New River Gorge National River, Don Striker, rappels from below the New River Gorge Bridge. The New River Gorge National River was added to the National Park System in 1978 to protect the nationally and globally significant natural and historic resources found here.

Levi Rose, Wolf Creek Watershed Coordinator, tops out on one of the New River Gorge's classic climbs. Rose moved to the area because of the climbing opportunities, and quickly got involved in clean water issues facing the New.

Management Area, Bluestone Wildlife Management Area, Babcock State Park, Hawk's Nest State Park, and Little Beaver State Park.

The unique visitor experiences that the New River and the gorge provide to more than one million people per year also make it a national treasure. The nationally significant stories of industry and coal mining are part of the interpretation provided to visitors. Visitors can learn about this rich history at National Park Service Visitor's Centers and by exploring restored buildings in Thurmond, Kaymoor, and Nuttallburg. Others might count over 100 species of birds on a typical spring day or watch a peregrine falcon soar along the cliffs – appreciating the biological diversity of the New River Gorge.

Residents and visitors are met with breathtaking scenic vistas, thrilling rapids, and memorable adventures. Those who choose to go down the river alone, or with only a few friends, also experience the solitude and natural quiet of the park. These places where families and friends can come together and individuals can challenge their skills are increasingly rare, making the New River and the experiences it provides ever more important.

NATIONAL PARK SERVICE WORKS FOR CLEAN WATER

The National Park Service (NPS) has been monitoring water quality in the Lower New River watershed since 1980, focusing on fecal coliform bacteria. The NPS shares monitoring data with regulators and decision makers, and support local water quality improvement planning efforts and projects. These efforts create a better-informed and more concerned public, and increased funding for cleaner streams in the New River Gorge region. One example is Hinton's extension of a sewer line to serve one of the most polluted local streams, the lower Madam Creek area. A $6 million project to replace a crumbled sewer line in Beckley was supported by NPS testimony. There have been sewer extensions and plant upgrades along Dunloup Creek, and a $14 million voluntary buyout of flood plain properties was announced at NPS headquarters. Flooding is a water-quality problem because floodwaters often overwhelm septic and sewage systems, increasing fecal pollution. The buyout will relieve this problem, while freeing homeowners from worrying about floods every time it rains. The NPS also supported efforts to abate an acid mine drainage problem on Wolf Creek that resulted from a coal mining waste pile, backed innovative solutions for providing sewer-equivalency to Winona along Keeney's Creek, and helped Fayette County prepare a county-wide wastewater master plan.

A Peregrine Falcon hovers high above the New River. Peregrines are one of over 200 species of birds that call the New River Gorge home or stop here on their migrations. ©Gary Hartley

WHERE WE ARE NOW: THE CURRENT CONDITION OF THE LOWER NEW RIVER

A visitor holds a crayfish near Sandstone Falls on the New River. One measure of the health of a river or creek is its ability to support biological life.

The Lower New River is a national and local treasure integral to the region's culture, quality of life, and economy. This important resource faces significant water-quality challenges, primarily as a result of pollution flowing into the New River from local creeks. The following pages lay the groundwork for future strategic action by analyzing available data to better define water quality challenges.

From those who get their drinking water from the New River to those who paddle its world-class whitewater, everyone has the same question: How clean is the water? The answer depends on how you define "clean water." For some, water is considered high quality if it supports a thriving system of aquatic life. For others, water that is crystal clear may be perceived as clean even if it cannot support insect species. Others are most interested in the effect on their health if they swim in the water.

The federal Clean Water Act determines different standards for water quality based on the designated use of the body of water. The New River is designated for drinking-water supply, water-contact recreation (such as swimming or boating), and as a warm-water fishery. That means standards for the New River are set to protect human health and aquatic life. Clean water standards also protect trout in tributary creeks including Arbuckle, Glade, Keeney's, Meadow, Mill, Piney, and Wolf. When a body of water fails to meet the standards set for its designated use, it is considered ***IMPAIRED.***

In 2006, the State of West Virginia found the New River impaired by fecal coliform along its entire length below Bluestone Dam.[13] The New River is considered impaired because the clean water standard set to protect human health is not met during some weather conditions. Fecal coliform bacteria itself is not a risk to human health, but its presence indicates the presence of fecal pollution, from inadequately treated human sewage or animal waste. Untreated waste contains pathogens that could spread waterborne diseases such as Giardia to those in direct contact with the water.

IMPAIRMENT IS DETERMINED BY THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) UNDER THE FEDERAL CLEAN WATER ACT (CWA). THE CWA ESTABLISHED A LIST OF BENEFICIAL USES FOR WATER, AND WATER-QUALITY STANDARDS TO BE MET FOR EACH BENEFICIAL USE. WHEN WATER QUALITY DOES NOT MEET THE STANDARDS, THAT WATER IS CONSIDERED IMPAIRED. THE LIST OF IMPAIRED WATERS (CALLED THE 303D LIST AFTER THE RELEVANT SECTION OF THE CWA) IS ASSEMBLED AFTER SAMPLING BY DEP, AND COLLECTING DATA PROVIDED BY OTHER MONITORS LIKE THE NATIONAL PARK SERVICE (NPS). THE LIST IS UPDATED EVERY 2 YEARS, AND MUST BE APPROVED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA).

A park visitor enjoys a break and a swim during a whitewater rafting trip down the New River

FOLLOWING THE FLOW & FINDING THE SOURCE

More than 270 miles of streams in the Lower New River watershed are impaired by fecal coliform, making it the most widespread concern. The upper stretches of the New River, above Bluestone Lake, are not impaired by fecal coliform. Therefore, most pollution flows into the Lower New from local tributaries, and can be addressed through local actions. (See Map 4: Impaired Streams in the Lower New River Watershed). It is imperative that ***LOWER NEW RIVER STAKEHOLDERS*** participate in a collaborative effort to address this problem.

Because each creek has a unique combination of issues, achieving clean water in the Lower New River requires understanding the underlying causes to arrive at solutions in each tributary. A range of pollutants – including fecal coliform bacteria, aluminum, and iron – impair many New River tributaries (see Table 2, page 32).

A "biological impairment" indicates that creek conditions are not conducive to healthy fish or insect communities (see Table 2). Biologists sample insect communities at the bottom of a stream, and compare the results to healthy streams in the region. Insects are an easily sampled and well-studied aspect of stream ecosystems, and support other stream life like fish, amphibians, and water birds. In the Lower New River watershed, biological impairments are likely caused by sediment flowing into the water, organic enrichment from fertilizers and untreated sewage, elevated temperatures due to the removal of trees adjacent to creeks, and toxicity from metals and acidic conditions.

Historic and current coal mining operations have also left their mark on the watershed. Of the 93 stream miles impaired by poor biological conditions, nearly 70 percent are also impaired by acid mine drainage¬-related parameters, which is usually reflected in low pH and high concentrations of metals (mostly iron, aluminum, and manganese). Abandoned mine lands (AMLs)[14] comprise over 2,500 acres in the Lower New River watershed and are considered a significant source of metals and pH impairments throughout the watershed.[15] Conditions toxic to biological life are prevalent in the Lower New River watershed with 133 miles of iron-impaired streams, 18 miles impaired because of pH levels, and 14 miles impaired by high levels of aluminum. In addition to mining-related sources, metals can also come from forestry practices, oil and gas operations, erosion, and the presence of roads and urban development.

LOWER NEW RIVER STAKEHOLDER: EVERYONE WHO VALUES CLEAN WATER IN THE NEW RIVER REGION INCLUDING THOSE WHO FISH, BOAT, SWIM, LIVE, DRINK WATER, VISIT, OR HAVE FAMILY TIES IN THE AREA.

Dunloup Creek flows through Glen Jean as it cascades its way to the New River near Thurmond, WV. Most of the pollution that flows into the Lower New River is from tributary creeks.

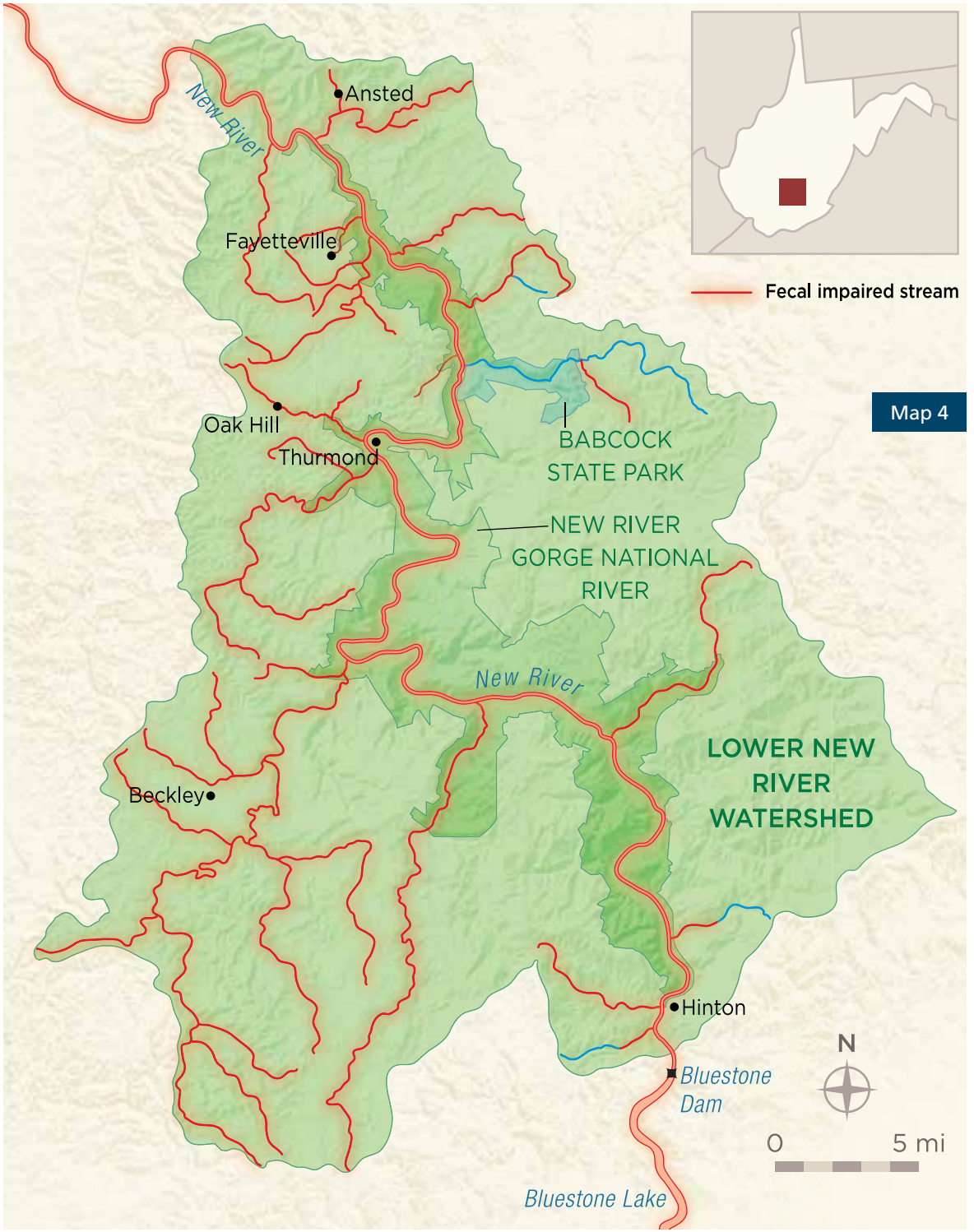

Ansted
New River
Fayetteville
Oak Hill
Thurmond
BABCOCK
STATE PARK
NEW RIVER
GORGE NATIONAL
RIVER
New River
LOWER NEW
RIVER
WATERSHED
Beckley
Hinton
Bluestone
Dam
Bluestone Lake
N
0
5 mi
Fecal impaired stream
Map 4

Table 2 **Impairments to the main stem of creeks that flow into the Lower New River (2008)[i]**

	PERCENTAGE OF TOTAL LOWER RIVER DRAINAGE AREA	POPULATION ESTIMATE	FECAL COLIFORM	BIOLOGICAL IMPAIRMENT	IRON	ALUMINUM	PH
LOWER NEW RIVER	**100%**	**94,150[ii]**	√				
BEECH RUN	0.5%	150	√				
MADAM CREEK	1.8%	610	√				
BROOKS BRANCH	0.7%	130	√				
MEADOW CREEK	4.2%	1,550	√				
GLADE CREEK	9.3%	3,310	√	√			
PINEY CREEK	19.7%	54,030	√		√		
DUNLOUP CREEK	7.0%	7,020	√	√	√		
ARBUCKLE CREEK	1.3%	7,360	√	√	√		
COAL RUN	0.5%	90	√				
MANNS CREEK	8.6%	1,600					
KEENEY'S CREEK	1.3%	370	√				
WOLF CREEK	3.3%	5,030	√	√	√	√	√
MARR BRANCH	0.4%	1,220	√	√	√		
MILL CREEK	4.2%	2,870	√				
LAUREL CREEK	3.1%	1,240	√				

[i]In addition to impairments of the main stem of creeks, there also may be additional impairments to smaller tributaries flowing into these streams. For example, Floyd Creek that flows into Manns Creek has biological and metal impairments.

[ii]7,580 people live in an area that flows directly into the Lower New River watershed and thus only appears in this total stream number.

WHAT ARE THE MAJOR INFLUENCES ON WATER QUALITY IN THE LOWER NEW RIVER?

Most of the pollution in the New River flows in from tributaries, so sources of pollution in individual creeks can be analyzed to identify cleanup strategies. Bodies of water listed as impaired are subject to a total maximum daily load (TMDL) report that outlines a "diet" to reduce pollution to levels safe for designated uses. The Lower New River TMDL, completed in 2008, estimates the amount and location of pollution sources. The TMDL framework has been used to create watershed-based plans in Wolf Creek and Piney Creek, that include detailed actions and timelines for cleanup.

Raised levels of fecal coliform bacteria, the only impairment to the main stem of the Lower New River, come from many sources. The most common sources are wastewater treatment systems, failing septic systems, and household sewage straight-piped into streams without being treated. Other sources include runoff from wildlands, pasture, cropland, and residential areas.

Point sources of pollution that flow directly from pipes into waterways require regulatory permits. Normally, sewage is treated by a wastewater plant and then flows through a permitted point source discharge before entering a waterway. But damaged or cracked pipes in existing wastewater systems across the Lower New River watershed cause pollution in two ways: sewage leaks out during dry weather (infiltration) and stormwater leaks into sewer pipes when it rains (inflow). Leaking sewage out is an obvious pollution problem, while stormwater leaking into sewer lines is a more subtle issue. In many cases, systems meant to move and treat wastewater are unable to treat the larger water volumes associated with excess stormwater and sewage overflows into local streams (see Figures 1 & 2).

Some collection systems, called combined sewers, are designed to capture both rainwater and to deliver sewage from households to the plant for treatment (see Figure 1).[16] During dry weather, combined sewer systems convey

NONPOINT SOURCE DISCHARGES DESCRIBE POLLUTION THAT DOES NOT COME FROM A SINGLE POINT INCLUDING AGRICULTURAL LANDS, ANIMAL WASTE, AND FAILING SEPTIC SYSTEMS. NONPOINT SOURCE POLLUTION IS DIFFICULT TO MEASURE AND REGULATE, AND OFTEN INCREASES WHEN HEAVY RAINS FLUSH POLLUTION FROM THE LAND INTO STREAMS. STREAMSIDE VEGETATION CAN SLOW AND FILTER RUNOFF FROM AREAS CONTAINING NONPOINT SOURCE POLLUTION. ACCORDING TO THE TOTAL MAXIMUM DAILY LOAD ESTABLISHED FOR THE NEW RIVER, THE CONTRIBUTION OF FECAL COLIFORM FROM FARMING IS SMALL COMPARED TO RESIDENTIAL SOURCES.

Stormwater makes its way into Cranberry Creek from the Beckley streets and parking lots. As the most densely populated area in the New River watershed, the City of Beckley is proactively addressing stormwater runoff concerns.

wastewater directly to treatment plants before discharging into streams. After heavy rains, stormwater overwhelms the systems designed to move and treat wastewater, resulting in ***COMBINED SEWER OVERFLOWS (CSO).***

Sanitary sewers, on the other hand, are designed to transport sewage only, while separate storm drains and ditches carry the stormwater (see Figure 2). Yet, even when designed to be separate, stormwater can seep into sewer pipes from saturated soil through leaks or connected roof downspouts. In the Lower New River watershed, both sanitary and combined sewers suffer from eroded and damaged clay pipes and overflows of sewage into creeks. Sanitary sewer overflows (SSOs) often do not undergo any treatment before being discharged into waterways.

NONPOINT SOURCE (see definition on page 33) discharges describe pollution that does not come from a single point including agricultural lands, animal waste, and failing septic systems. Nonpoint source pollution is difficult to measure and regulate, and often increases when heavy rains flush pollution from the land into streams. Streamside vegetation can slow and filter runoff from areas containing nonpoint source pollution. According to the total maximum daily load established for the New River, the contribution of fecal coliform from farming is small compared to residential sources.

COMBINED SEWER OVERFLOW (CSO) IS A MUNICIPAL SYSTEM THAT COMBINES STORM WATER WITH SANITARY SEWAGE AND RESULTS IN THE DISCHARGE OF MINIMALLY TREATED SEWAGE AFTER HEAVY RAINS.

Figure 1

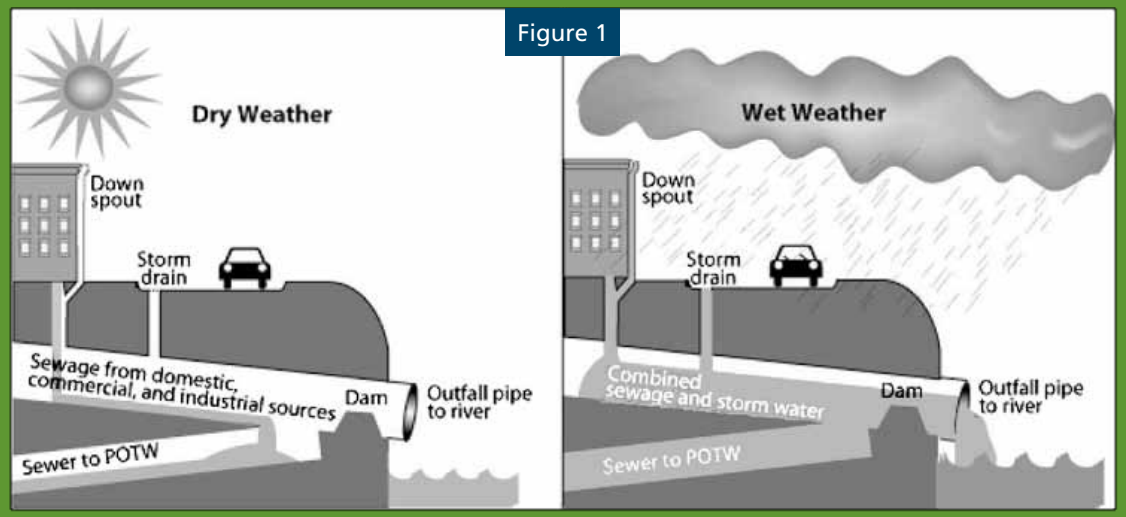


Figure 2

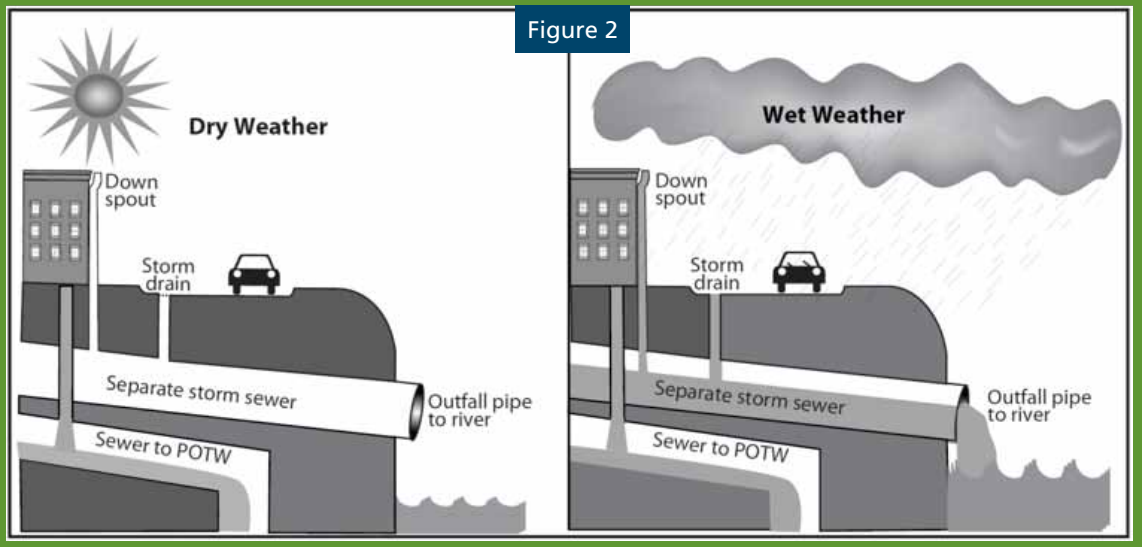


Figure 1: Combined Sewer Systems are designed for stormwater and sewage to share the same pipes. When it rains, publicly owned treatment works (POTW) / wastewater plants are unable to treat all excess water and some sewage flows into creeks. Source: US EPA (2004)[16]

Figure 2: Sanitary sewer systems are designed to keep stormwater separate from sewer pipes. When it rains, stormwater flows into the river while sewage flows to the publicly owned treatment works (POTW) / wastewater plant. Source: US EPA (2004)[16]

THINKING BIGGER: MORE FACTORS THAT INFLUENCE WATER QUALITY

Heavy rains falling on impervious surfaces do serious damage to the water quality in tributaries, and consequently the New River. Slowing runoff from rainfall and keeping it out of sewer lines is likely the most important way to improve water quality in the Lower New River.

Compare how rainwater moves through a forest in contrast to a parking lot: In the forest, rainwater is slowly filtered by the soil, taken up by trees and other plants, and released to the atmosphere as water vapor with relatively small amounts of rainwater flowing directly on the ground into streams. In parking lots, however, almost all rainwater quickly moves along the lot's impervious surface. The volume and speed of the water allow it to pick up and carry residual motor oil, anti-freeze, dirt, and garbage to storm drains, sewers, or ditches and ultimately into a receiving stream. If emptying into a ditch, stormwater erodes the ditch and adds soil to the mix. If stormwater enters sewer lines, wastewater systems are not able to treat all the excess water (see Figures 1 & 2).

POPULATION DENSITY AND DEVELOPMENT

Map 5: Water Quality Influences shows the concentration of developed areas in the Lower New River watershed. Tributary watersheds with high populations tend to be those that contribute the most fecal coliform bacteria to the main stem of the New River.

Removal of forest vegetation, including conversion of forest to agricultural uses (cropland, fields, and pastures), lawns, parking lots, streets, and buildings, reduces the amount of rainfall absorbed by the ground. This leads to increased runoff that carries fecal material from livestock, wildlife, and pets into streams. Population centers in the watershed including

Kathy Oney with the National Park Service counts the fecal coliform bacteria found in a water sample taken from a New River tributary. Water data that was analyzed in this report was collected by the NPS, WVDEP, and WVPRO.

Report data and methods

For this report, Downstream Strategies created a water-quality database of all available data from more than 350 unique sample locations in the Lower New River. From this database, more than 1,500 water samples – taken from 157 unique locations over a six-year period from 2004-2009 – were extracted and their fecal coliform results analyzed. Data were provided by three sources: the WV Department of Environmental Protection's (WVDEP) Watershed Assessment Program database (WAP; 1,078 samples over 136 locations), the West Virginia Professional River Outfitters Association (WVPRO; 48 samples at one location), and the National Park Service database (NPS; 639 samples over 28 locations).

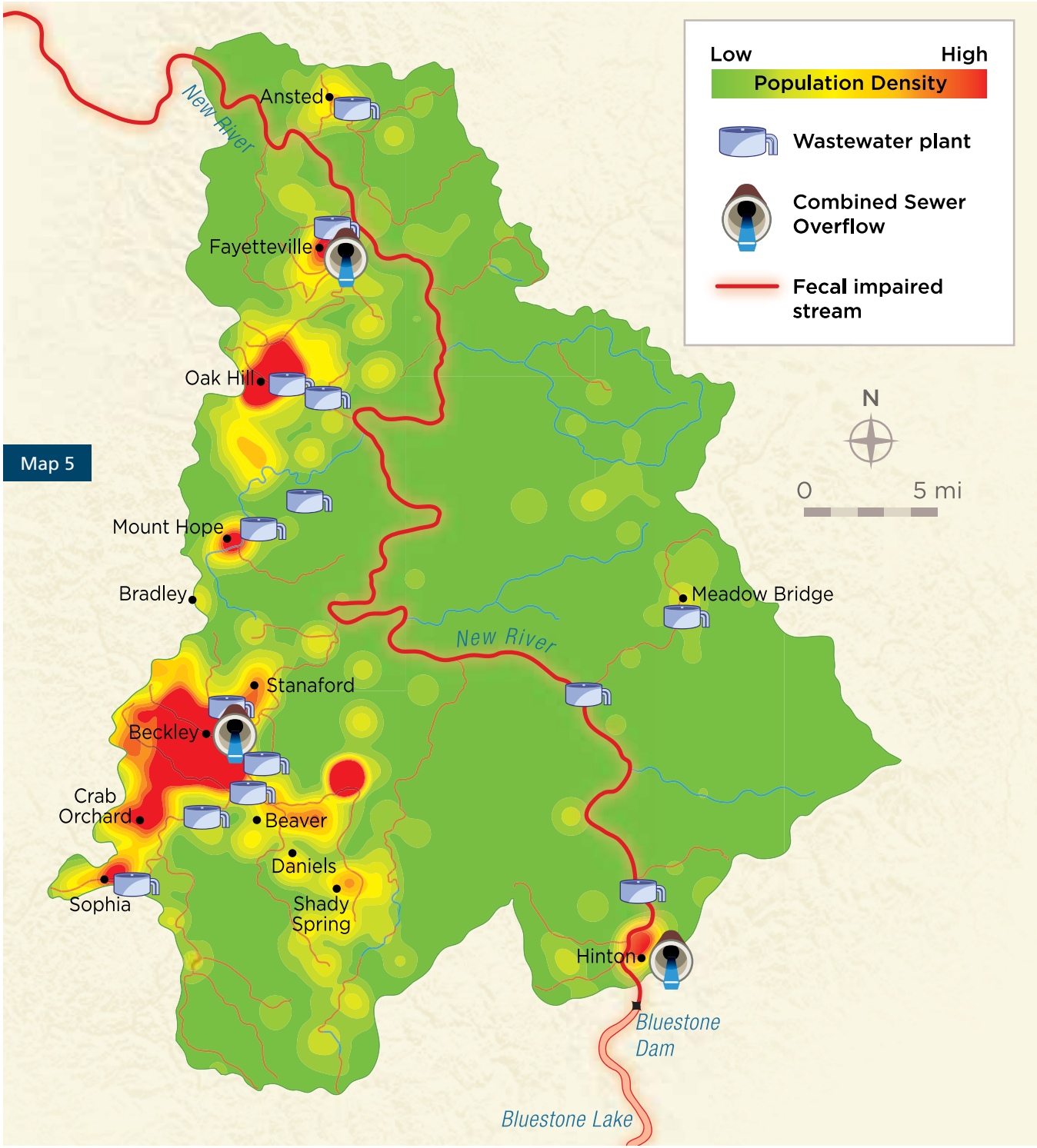
Fayetteville and Beckley also have combined sewer systems (see Figure 1 on page 34).

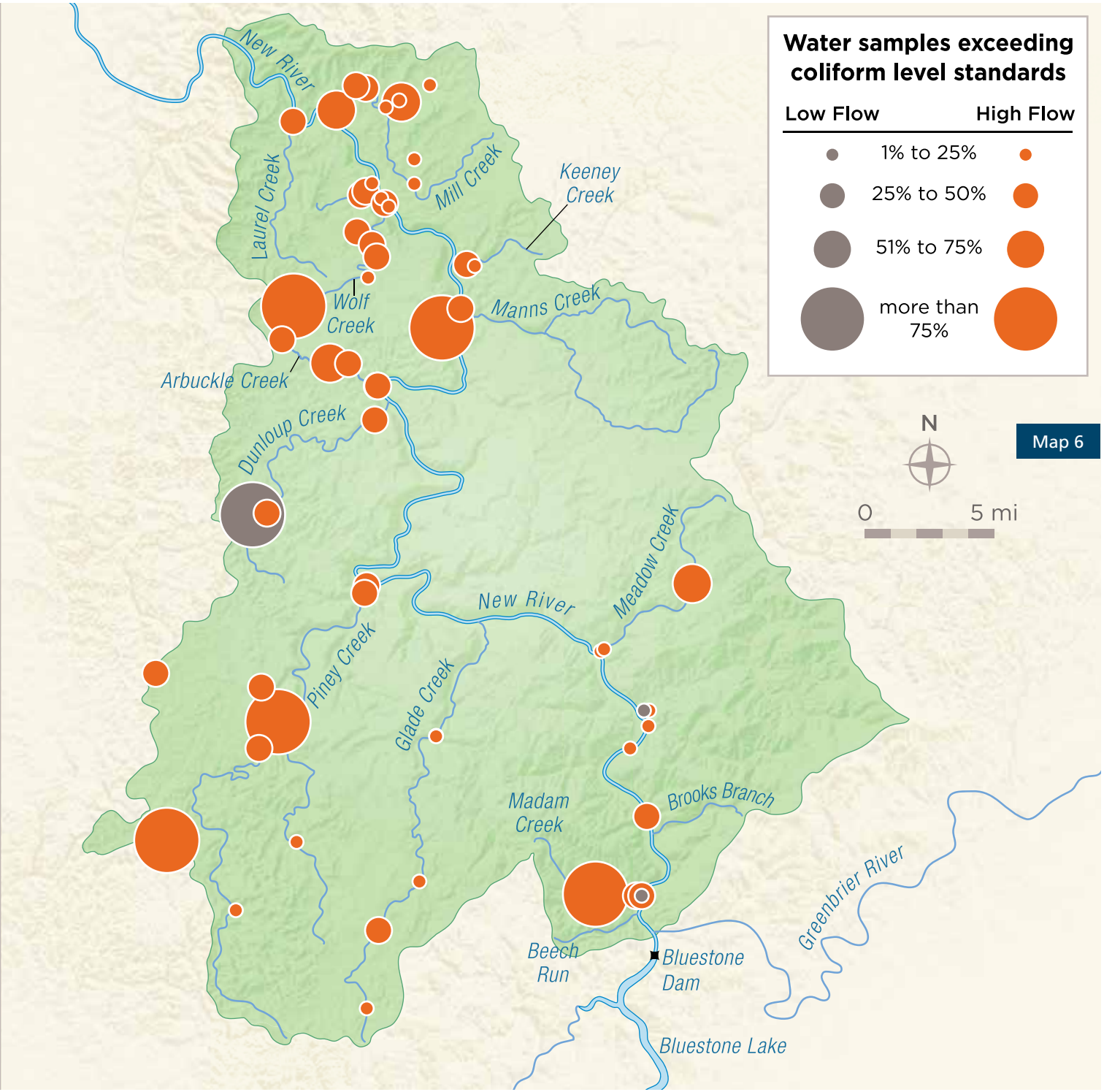
Steep, rocky land and stream channels, common in the Lower New River watershed accelerate the delivery of fecal pollution from septic systems and broken pipes to the river. This rapid delivery prevents pollution from remaining on land surfaces or being deposited on stream bottoms where it could slowly be assimilated into forest or aquatic food webs.

IMPACT OF FLOW ON WATER QUALITY

Map 6: Water Quality at Varying Flows shows that high fecal coliform levels in the New River mainly occur during high flows (greater than 10,600 cfs), as very few of the samples exceeded water-quality standards at low flow (less than 2,800 cfs).[17] Data indicate high fecal coliform levels occur at all flows in the creeks flowing into the New. Tributaries are closer to the sources of fecal contamination and have less water to dilute it, so this is not surprising. During high flows, intense precipitation flushes land saturated with pollution from residential streets, failing septic fields, and around broken sewer pipes. Waste is then carried to streams by the increased surface runoff. Rainfall also contributes to the overflows from wastewater treatment systems.

In the Lower New River watershed, the highest flows tend to occur in the winter and early spring, while low flows generally occur in summer and early fall. As most water-contact recreation (paddling, swimming) occurs during low-flow periods, the risk to those participants is not as high as it might otherwise be. Yet some river and stream users prefer high water paddling or are unaware of the risk, and high flows do occur periodically throughout the year.




Water samples exceeding coliform level standards
Low Flow
High Flow
1% to 25%
25% to 50%
51% to 75%
more than 75%
N
0
5 mi
Map 6
New River
Laurel Creek
Mill Creek
Keeney Creek
Wolf Creek
Manns Creek
Arbuckle Creek
Dunloup Creek
New River
Meadow Creek
Piney Creek
Glade Creek
Madam Creek
Brooks Branch
Greenbrier River
Beech Run
Bluestone Dam
Bluestone Lake

LOOKING TO THE FUTURE: STRATEGIES FOR CLEAN WATER

FINDING SOLUTIONS

The New River is a national and local treasure, and it is facing significant clean water challenges. Strategic solutions to correct this problem must be implemented without delay. Although we support current and future efforts to address the mining-related metal and pH contamination occurring in several New River tributaries, our recommendations focus on reducing fecal coliform pollution, the most widespread challenge and greatest risk to human health in the Lower New River watershed. Some of our recommendations, such as implementing green infrastructure projects, will reduce unhealthy metals along with fecal matter (e.g., streamside buffers, wetlands, and vegetated retention systems).

To address fecal coliform pollution, we recommend a holistic strategy that builds a cohesive regional voice for clean water, supports funding for repair of leaky sewer pipes, and demonstrates alternatives for clean water such as green infrastructure and decentralized wastewater (see page 42 for green infrastructure sidebar). Implementing these solutions will require a concerted, focused effort from members of the entire Lower New River community.

We first describe recommendations applicable across the entire Lower New River watershed, and the Alliance's approach to project selection. We then detail specific actions to address pollution in Piney, Wolf, and Arbuckle creeks. Recommendations draw on current on-the-ground knowledge of partners, community members, and wastewater professionals. Additionally, we consulted the Fayette County Comprehensive Wastewater Management Plan and TMDL model predictions.

A fisherman enjoys an afternoon casting into the New River near Sandstone Falls. Water must be of high quality so people can continue to fish, swim, and boat safely on the river.

LOWER NEW RIVER WATERSHED RECOMMENDATIONS

1) COMMUNITY SUPPORT:
Strengthen the regional voice for clean water.

- Increase capacity in local watershed groups

Watershed groups provide an opportunity for community residents and visitors to become involved in cleaning up and monitoring local creeks. Watershed groups in Wolf Creek and Piney Creek are currently implementing clean-water projects. The Dunloup Creek Watershed Association is facilitating buyouts in flood plains.

Clean water cannot be achieved without the support of communities and the efforts of local organizers. Because of the huge time and resource commitment required, we support paid staff to further the work of existing watershed groups. Paid staff can facilitate partnerships with local wastewater and health departments, assess water quality, and educate and engage others. All other recommendations related to wastewater projects and water-quality monitoring require dedicated time and effort to advance implementation, track progress, and involve the community. We also support National Park Service efforts to continue to dedicate technical expertise, facilities, and funds within the watershed, even beyond park boundaries.

- Create a community-based program to monitor the water quality in the Lower New River

Engaging citizens through science where they live, work, or recreate involves potential supporters in a meaningful way by promoting inquiry, understanding, and participation in local watershed groups and cleanup efforts. Representative data collected in all weather conditions across the watershed is essential to focus sanitary sewer improvements and measure the impact of watershed restoration efforts. We recommend Alliance members continue to foster relationships with stakeholders in local communities to design and implement a regionally consistent water quality monitoring program, starting in the featured tributary creeks.[18]

2) INFRASTRUCTURE:
Identify and support funding to repair sewer leaks.

- Eliminate leaking pipes in wastewater systems on public and private property

Repair of leaky sewers should be the top priority for wastewater managers. Although service extensions to new customers increase much-needed wastewater system revenues and may reduce pollution from failing septic tanks, adding connections to a wastewater treatment plant can exacerbate existing problems and potentially lead to more sewer overflows (see Figures 1 and 2 on page 34).

Many sewer lines on private property also allow rainfall into sewer systems through roof and/or driveway drainage tied into public sewer systems or through leaky pipes. This impacts water quality by overtaxing sewer systems and contributing to overflow events. We support the development of educational resources and funding incentives to encourage private homeowners to correct these problems themselves. Sewer rules issued by the Public Service Commission allow wastewater systems to bill customers for the amount of stormwater going into sewer through roof downspouts.[19] Unique funding programs elsewhere provide public subsidies or low-interest financing for repairing private connections to sewer lines or rain barrels and cisterns. Because these types of programs generally have significant water-quality return for public investment compared to major wastewater infrastructure improvements, we support government funding for pilot programs with local wastewater entities.

- Support federal and state grant funding to address identified infrastructure needs

Wastewater managers throughout the Lower New River watershed work hard to treat wastewater adequately, in a challenging and fiscally restrained climate. We support their efforts to advance clean water. As innovative and effective projects are identified, the New River Clean Water Alliance will work with the larger community to advocate for state and federal funding for these critically important projects.

Both targeted repair and system-wide replacement of aged leaky infrastructure will not be cheap. Current local efforts to fix infrastructure are limited by a wastewater system's ability to secure debt and the local customers' ability to pay. A timely solution to the aged infrastructure problem requires increased outside investment and rethinking public policy regarding infrastructure funding in these waters of national significance. Visitors to a national park should expect, and encounter, some of the cleanest water in the country. Funding projects that ensure clean water in the Lower New River should be a state and federal priority.

3) ALTERNATIVES:
Demonstrate green and decentralized infrastructure solutions.

- Incorporate green infrastructure as a clean water solution

A central tenet of green infrastructure is to mimic the natural water cycle by slowing polluted storm runoff and filtering it through natural systems such as wetlands or rain gardens. Green infrastructure not only reduces surface runoff, but also reduces stormwater entering sewer systems causing overflows into streams. Green infrastructure is often more cost-effective, and it generates secondary community benefits, like open spaces and green landscapes. Green infrastructure is an ideal approach to protect the waters of the New River while allowing our communities to grow responsibly.

Comprehensive strategies for planning and implementing green infrastructure are needed in the following areas:

(continued on page 44)

Students from Shady Spring Middle School explore a protected wetland and outdoor classroom in the Piney Creek watershed. Wetlands slow runoff reducing the pollution that flows into the creek.

GREEN INFRASTUCTURE

"Green infrastructure is an approach to water management that protects, restores, or mimics the natural water cycle. Green infrastructure is effective, economical, and enhances community safety and quality of life. It means planting trees and restoring wetlands, rather than building a costly new water treatment plant. It means choosing water efficiency instead of building a new water supply dam. It means restoring flood plains instead of building taller levees. Green infrastructure incorporates both natural and engineered systems to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people and wildlife. Green infrastructure solutions can be applied at different scales, from the house or building level, to the broader landscape scale level. On the local level, green infrastructure practices include rain gardens, permeable pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting systems. At the largest scale, the preservation and restoration of natural landscapes (such as forests, flood plains, and wetlands) are critical components of green infrastructure)." – *American Rivers, 2010*

"Achieving a vision of thriving communities and healthy rivers will require moving green infrastructure from an 'innovative' practice to a mainstream practice" says Katherine Baer, senior director, Clean Water Program for American Rivers. "Green infrastructure is simply the cost-effective and reliable way for communities to secure clean water, flood protection, and other vital benefits now and into the future."

These benefits require regulation and guidance that supports planning, management and implementation of green infrastructure solutions to water management, and dedicated funding to support these wise investments.

An example of green infrastructure, a rain garden in Beckley slows the flow of water into creeks and, eventually, the New River. The plants in the rain garden help filter pollutants from the water before it reaches the river.

National Park Service Ranger Bill Parker adds another tire to the stack of tires removed from the New River. The National Park Service and partners removed over 2,000 tires from the river in 2010 alone. Photo courtesy of Carl Galie and National Committee for the New River.

Doug King, Beckley Sanitary Board, stands on a vegetated stormwater retention system under construction in Beckley. Once complete, plants will cover the top of the facility and stormwater not taken up by the plants will filter through soil and slowly be absorbed into the ground. This system will protect houses and businesses downstream that suffer from repeated flooding.

Water-quality samples are processed in the National Park Service Lab. In order to understand and address water quality, we recommend the development of a community-based monitoring program for the Lower New River watershed.

(Recommendations continued from page 40)

- *Proactively protect lands important to watershed health.*

Wetlands, streambanks, and many other areas in the watershed are especially important for watershed health. These natural areas provide significant filtering capability, reducing pollution that reaches area creeks. We support the consideration of "Smart Growth" strategies such as clustering development in fewer areas, conserving and restoring stream corridors, and minimizing the creation of new impervious surfaces by setting more stringent standards for the construction of streets and parking lots.

- *Support flood-plain easements and buyouts to promote clean water.*

We support the coordination of state and federal flood mitigation programs with clean water programs to solve multiple objectives.[20] Simply reducing the number of occupied dwellings that suffer from repeated flooding should reduce sewer and septic problems. This can be accomplished through land use planning such as voluntary buyouts of flood plain properties on Dunloup Creek.[21] An estimated 3,600 structures sit on the flood plain in the Lower New River watershed, of which an estimated 2,000 are residences.[22] While natural flood plains provide the benefit of buffering runoff from streams, houses in the flood plain rarely have enough space for functioning septic systems. If flood plain houses are connected to the sewer, leaks in the sewer can flow directly into the nearby stream.

- *Enhance New River regional educational campaign and partnership with wastewater facilities to pilot green infrastructure solutions.*

Public infrastructure managers and private developers have expressed interest in green infrastructure solutions for urban runoff and combined sewer overflows. Vegetated stormwater retention systems have been designed and constructed in Beckley and near Oak Hill (see photo on page 43). Rain gardens and wetland demonstration projects have also been built. Challenges remain, such as establishing a local supply chain for materials and finding local installers. Additional pilot projects with wastewater facilities should incorporate green infrastructure to address polluted runoff.

- Support alternative and innovative wastewater demonstration projects and incentives

Providing wastewater services to all households in the Lower New River watershed does not require connecting distant houses to a centralized system. Geographic and topographic realities of the region, including low population density, mountainous terrain, and shallow depth to bedrock and groundwater make it challenging and expensive to install conventional wastewater pipes. Rocky ground and hard rains also contribute to poor performance of septic systems and faulty original construction of sewer pipes is common. As a first step, we support alternative system demonstration projects based on local interest and funding opportunities. The results from demonstration projects will help project implementers understand cost and local demand for alternatives.

- *Support full funding for Winona cluster system as a model for other areas without sewer systems*

We support the consideration of cluster systems – owned, operated and managed by existing wastewater professionals – in all locations not yet served by sewer systems. Our top priority decentralized system is the Winona cluster system on Keeney's Creek (see sidebar on page 45).[23]

- *Encourage private homeowners, businesses, and government agencies as early adopters of innovative alternatives*

We also support pilot projects of improved septic systems designd for more efficient pathogen removal, composting toilets, and gray water treatment systems. We back requirements for the routine maintenance, pumping, retrofitting, and replacement of septic systems to better

SHADY SPRING LIBRARY WETLAND

In the fall of 2009, Piney Creek Watershed Association (PCWA) built a wetland at the Shady Spring Library that will not only clean polluted runoff coming from the library's parking lot and adjacent street but also act as an education tool for the local Middle School and Elementary School. This marks the first wetland designed specifically to clean polluted runoff in this area of Southern West Virginia. The project was a partnership between PCWA, the New River Gorge National River, West Virginia Department of Environmental Protection, Shady Spring Garden Club, the Shady Spring Library, and the Friends of the Shady Spring Library. The wetland will capture and clean more than 18,000 gallons of water for every inch of rainwater that falls, while simultaneously providing wildlife habitat for deer, bats, frogs, salamanders, and songbirds.

NEW SEWER FOR KEENEY'S CREEK COMMUNITY OF WINONA CHALLENGE: REDUCE DIRECT DISCHARGE OF HUMAN WASTE

Project Info: This alternative sewer system demonstrates a community can come together to support responsible treatment of their waste in a setting with many factors that make treatment of waste difficult, including rocky topography and far distance to existing sewers. This project will serve approximately 100 households and clean up a unique creek that flows into the New River at some of the most beautiful and challenging rapids of the Lower New.

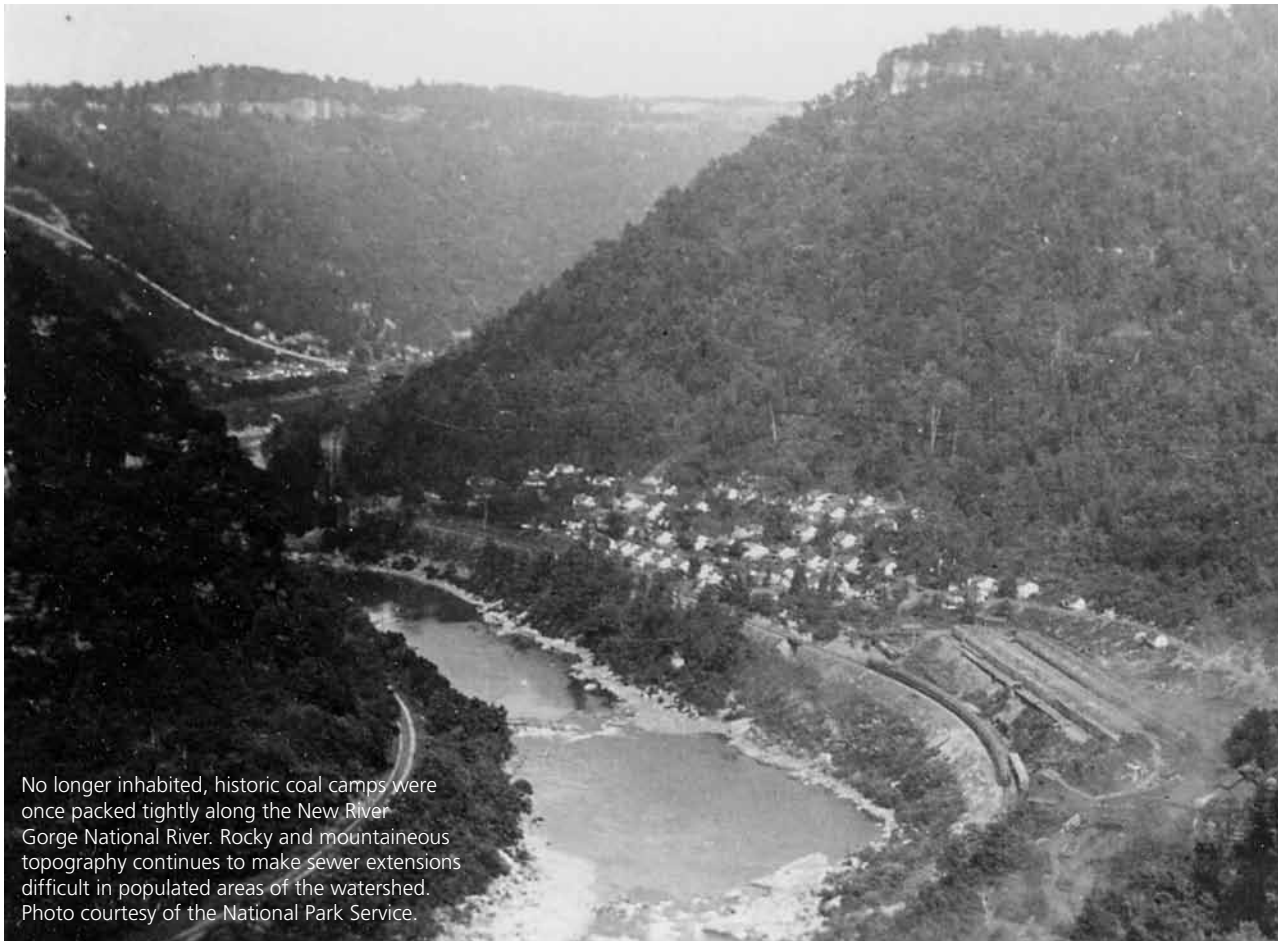
Team/Partners: PAN, Fayette County Water Quality Coalition, Transition Team, County Commission, Lombardo Associates-Stafford Consulting, National Small Flows Clearinghouse, Canaan Valley Institute, New Haven PSD, WV DEP, National Park Service, Winona Residents.

Funding: WV DEP Green Infrastructure Grant, U.S. Army Corps of Engineers

suit the local terrain as described in the Fayette County Comprehensive Wastewater Management Plan. These include two-compartment septic tanks, mound systems, effluent filters, and systems that help evenly distribute water as it flows into drain fields.[24] Composting toilets and gray-water recycling or treatment are also appropriate alternatives for high-use facilities within the New River Gorge National River and seasonal residences on the banks of the New River.

MEASURING THE STATE OF THE WATERSHED: MEASURING SUCCESS

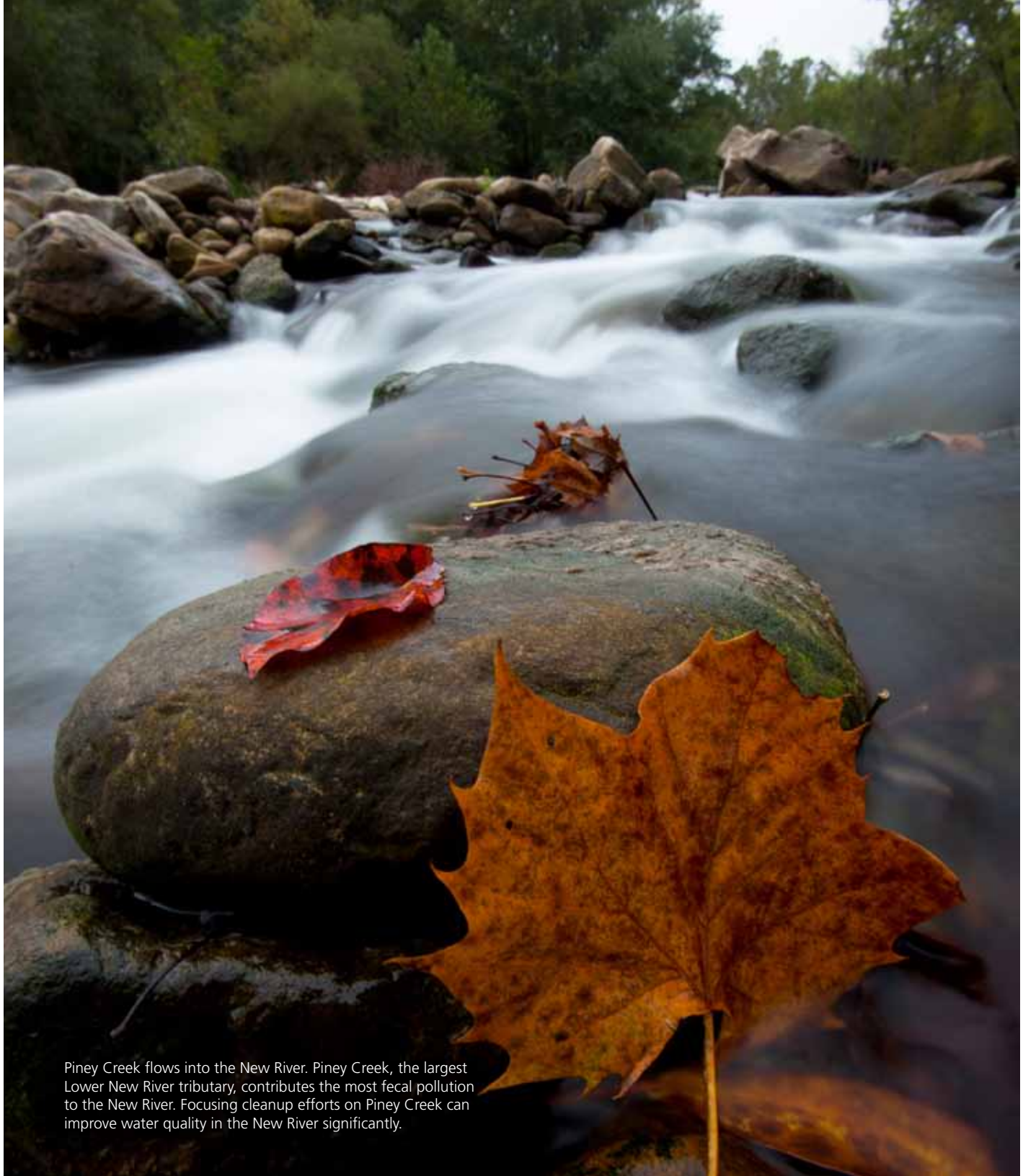
The following table shows metrics the New River Clean Water Alliance developed to measure the impact of collective efforts to implement the above recommendations. When the State of the Watershed Report is updated, an analysis of these metrics will be included to track progress and focus future action.



No longer inhabited, historic coal camps were once packed tightly along the New River Gorge National River. Rocky and mountaineous topography continues to make sewer extensions difficult in populated areas of the watershed. Photo courtesy of the National Park Service.

Table 3 Measuring the New River State of the Watershed

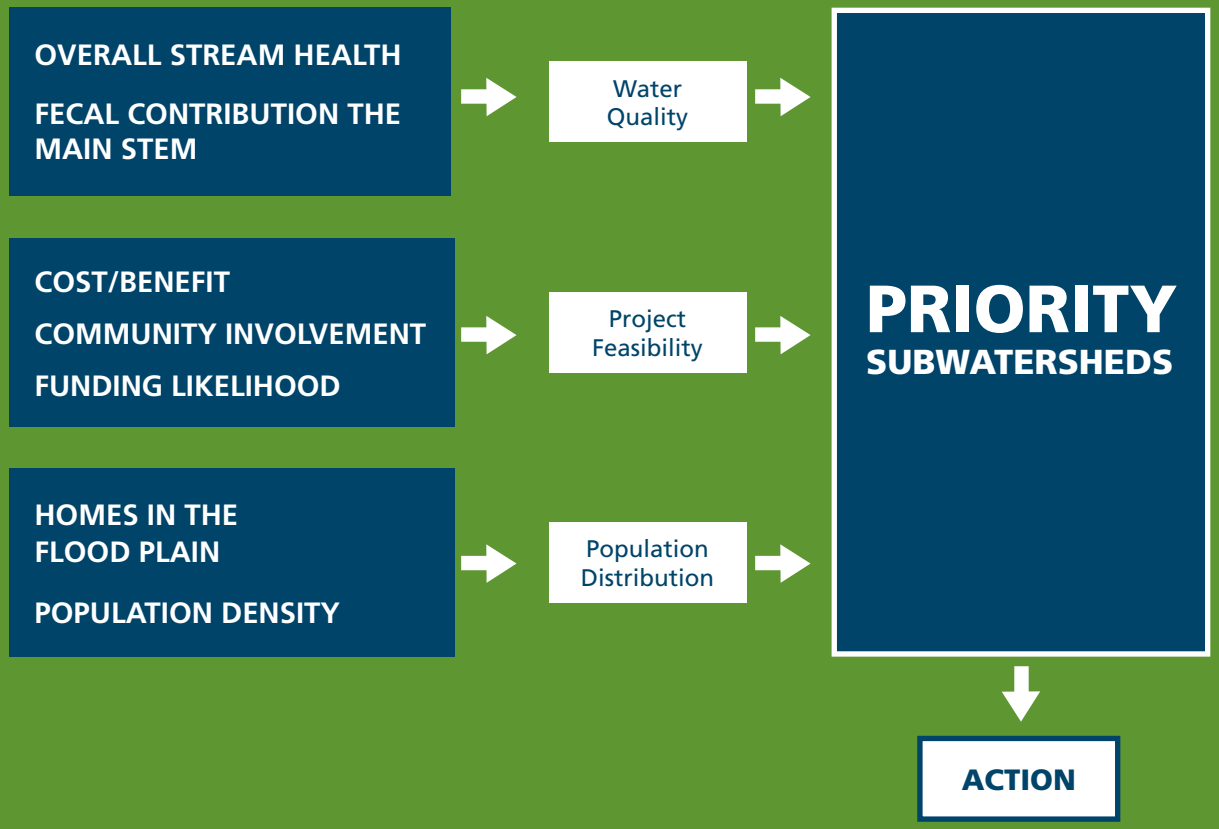
OVERALL MEASURE OF SUCCESS
• Extent of fecal coliform impairments (number of stream miles, location, and severity)
• Fecal coliform total load reductions (term from TMDL), specifically in tributaries with new projects.
RECOMMENDATION 1: COMMUNITY SUPPORT – STRENGTHENING THE REGIONAL VOICE FOR CLEAN WATER
Increasing capacity in local watershed groups
• Number of active watershed groups, number and salary of staff hired.
• Number of project grants received. Number of stream miles and land area impacted by projects.
• Number of active dues-paying members of watershed groups.
Creating a community-based plan to monitor water quality in the Lower New River
• Number of local groups participating.
• Number of streams/sites in subwatersheds monitored, Frequency of locations monitored.
• Number of citizens attending trainings and becoming certified, annual increase in volunteer participation, number of years active.
• Amount of grant money received to operate/supply monitors.
RECOMMENDATION 2: INFRASTRUCTURE – IDENTIFYING AND SUPPORTING FUNDING TO REPAIR SEWER LEAKS
Eliminating leaking pipes in wastewater systems - on public and private property
• Number and location of sanitary sewer overflows (SSOs) documented, Number of SSOs monitoring volume of discharge.
• Number and volume of SSO and combined sewer overflow (CSO) events per year. Number of CSO and SSO events with less than 1" rainfall.
• Number of long term control plans for CSOs written.
• Feet of pipe replaced/repaired, dry-weather versus wet-weather flow-in system.
• Number of major wastewater plants visited each year for inspection.
Supporting funding to address identified infrastructure needs
• Funding received (grants, low interest loans, State Revolving Fund green infrastructure).
• Number of New River wastewater projects prioritized in appropriation process.
RECOMMENDATION 3: ALTERNATIVES – DEMONSTRATING GREEN AND DECENTRALIZED INFRASTRUCTURE SOLUTIONS
Incorporating green infrastructure as a clean water solution
• Acres of protected lands, easements, and forested lands in watershed.
• Number of inhabited structures in flood plain.
• New proposed, designed, or built green infrastructure projects in watershed.
• Amount of impervious cover and runoff reduced or prevented using green infrastructure (in CSO watersheds).
• Number of city and county stormwater ordinances created, and strength of these
Support alternative and innovative wastewater demonstration projects and incentives
• Number and type of alternative systems installed, Initial and monthly cost per household of new systems installed.



Piney Creek flows into the New River. Piney Creek, the largest Lower New River tributary, contributes the most fecal pollution to the New River. Focusing cleanup efforts on Piney Creek can improve water quality in the New River significantly.

Figure 3

Prioritizing creeks flowing into the Lower New River

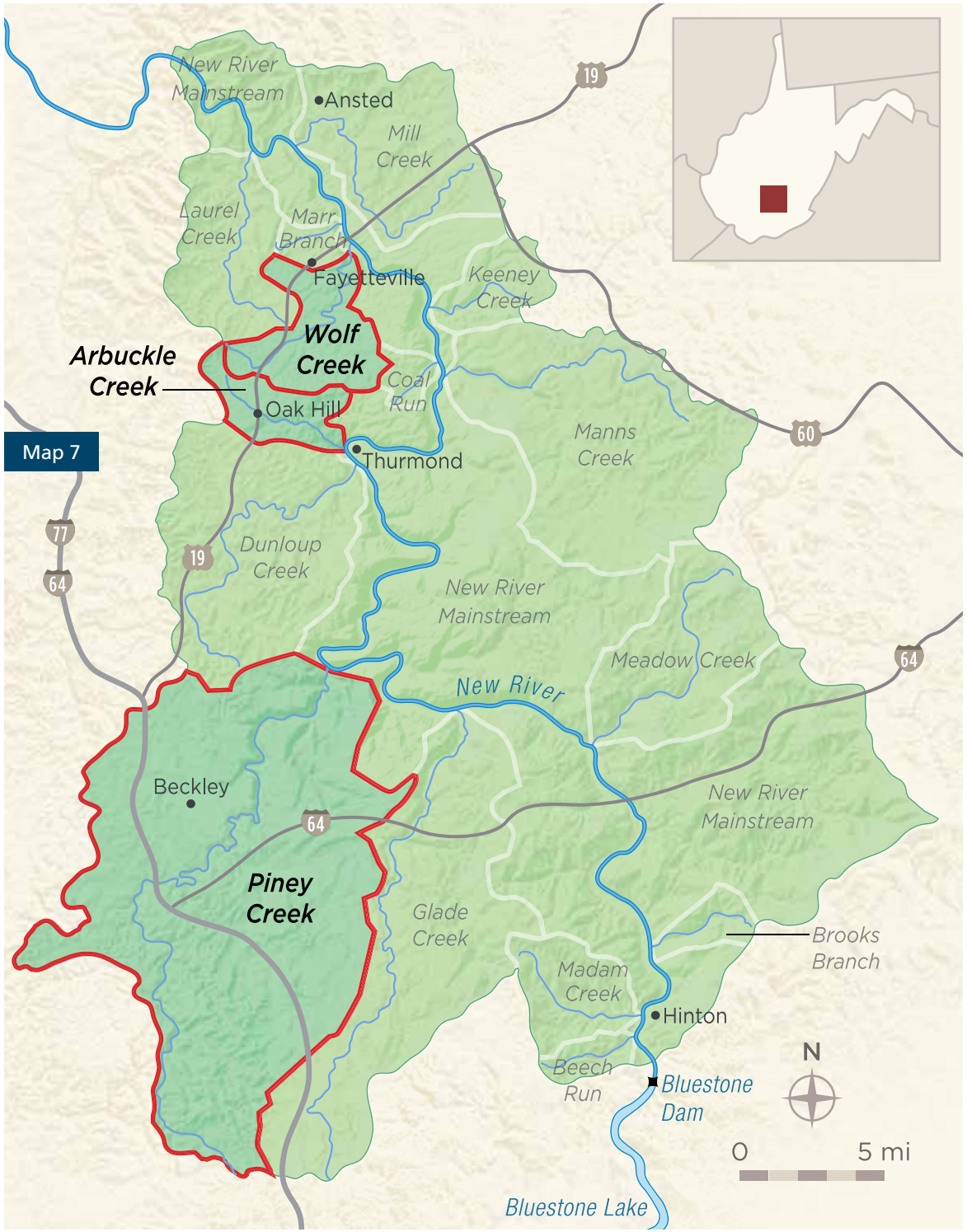


A PLACE TO START – PRIORITY CREEKS & PROJECTS

Given that many creeks flowing into the New River are polluted with fecal coliform, where is the best place to focus cleanup to most effectively address the issue? There are many different methods for determining priorities. One could start with the dirtiest creeks, those farthest upstream, the easiest or hardest, the most cost effective, the highest profile, those that most impact recreational users, or a number of other criteria.

The Alliance, with stakeholder input, selected three creeks to feature in this report based on poor water quality, promising project feasibility, and current population distributions (see Figure 3). Downstream Strategies, a West Virginia–based environmental consulting company, assisted the Alliance by conducting data analysis on water quality, gathering and analyzing stakeholder input, and arriving at these priority creeks. More detailed explanation of this process is available upon request.

Piney Creek, Wolf Creek, and Arbuckle Creek were consistently shown to be the highest priorities based on our analysis (see Map 7: Priority Subwatersheds). This selection does not suggest the other 12 creeks are insignificant or do not need cleanup measures installed; rather, this is place to begin making a difference.


New River Mainstream
Ansted
Mill Creek
Laurel Creek
Marr Branch
Fayetteville
Keeney Creek
Wolf Creek
Arbuckle Creek
Coal Run
Oak Hill
Thurmond
Manns Creek
Map 7
77
64
19
Dunloup Creek
New River Mainstream
Meadow Creek
New River
Beckley
Piney Creek
Glade Creek
Madam Creek
Brooks Branch
Hinton
Beech Run
Bluestone Dam
Bluestone Lake
N
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5 mi

Tara Shleser, David Thompson, and Laurel Ackison explore the Piney Creek gorge during one of the Piney Creek Watershed Association's creek walks held to raise awareness of the beauty and challenges to the creek.

PINEY CREEK

BACKGROUND

Piney Creek is the largest tributary, draining approximately 20 percent or about 136 square miles of the Lower New River watershed. Beckley and the surrounding areas, with a population of about 17,000, contain more than half of the total residential and urban land (or more than 20 square miles) of the Lower New River watershed.[25] In contrast, the Piney Creek gorge is strikingly scenic, remote, and used only by adventurous residents for fishing and whitewater kayaking. There is, however, potential to link the Piney Creek gorge and the city of Beckley, with the New River Gorge National River with a trail system.

The prosperity the coal and timber industry brought to many of the communities of the Piney Creek watershed in Raleigh County was lost as the rich resources were depleted. Companies that were the backbone of local economies took jobs, people, and money elsewhere. Leaving in their wake empty mines, homes, and other structures, and the poverty that results from a declining economy. Today, Piney Creek has approximately 54,000 residents of which 9,500 or 18 percent live in poverty.

NEEDS

Much of the Piney Creek watershed suffers from insufficient sewage and wastewater infrastructure and the impacts of abandoned mines, all of which cause serious harm to the environment and threaten promising new industries like tourism. Experiencing a high frequency and a high magnitude of fecal coliform above pollution limits, the watershed scored much worse in the Water Quality category than the next lowest ranking watershed. This is largely attributable to its large drainage area and high population density. Three out of ten stream miles in the Piney Creek watershed are impaired by at least one pollutant.

As a large watershed, Piney Creek contains many sources of fecal coliform with the vast majority entering from Cranberry Creek, Little Whitestick Creek, and Whitestick Creek. Twenty-one permitted sewage treatment facilities discharge into Piney Creek. During heavy rainfall, the watershed has one combined sewer overflow (CSO), numerous sanitary sewer overflows (SSO), significant residential runoff, and failing onsite septic systems (see Figures 1 and 2 on page 34). Thirty-five percent of the samples collected from the Piney Creek watershed contain, on average, over 10 times the safe level of fecal coliform for recreational contact.

SUPPORT FOR CLEAN WATER

Piney Creek benefits from the dedication of the Piney Creek Watershed Association (PCWA), a volunteer membership organization founded in 2004 that educates the community about water quality issues and performs service projects. PCWA and steering committee partners completed a watershed-based planning process in June 2011. The Beckley Sanitary Board has been a leader in stormwater and wastewater management and is poised to be a model utility for the region. They maintain the only designated municipal separate storm sewer system (MS4) in the watershed to control pollution from stormwater runoff.[26]

RECOMMENDATIONS

1) Hire the first fulltime, paid executive director for the Piney Creek Watershed Association.

We support a director to manage projects and programs essential to watershed health, including implementation of, and full funding for, a water quality monitoring program. One of the greatest challenges for a grassroots watershed group is to engage in major projects without a staff person whose responsibility it is to locate, apply for, draft, and shepherd large project grants for clean water. It is also difficult to sustain volunteer interest without paid leadership. PCWA has recently taken the critical step of hiring a part-time executive director. The New River Clean Water Alliance supports funding necessary to make this a sustainable full-time paid position.

2) Establish a rigorous monitoring program to better define problems and solutions.

Piney Creek is a large watershed with a lot of activities that contribute pollution. Existing monitoring programs are insufficient to identify all the pollution hotspots. Once the executive director is in place, we recommend the Piney Creek Watershed Association work in partnership with Alliance members and interested stakeholders to document the number of incidences and amount of sewage released by SSOs. This more thorough water quality monitoring may show that SSOs are a greater concern than the one CSO (see Fgures 1 and 2 on page 34 for definition and example). Municipal authorities are working to address the CSO in the Piney Creek watershed by providing primary treatment/disinfection and have an approved long-term control plan for remediation. These types of measures need to be taken for SSOs as well, once they are better understood.

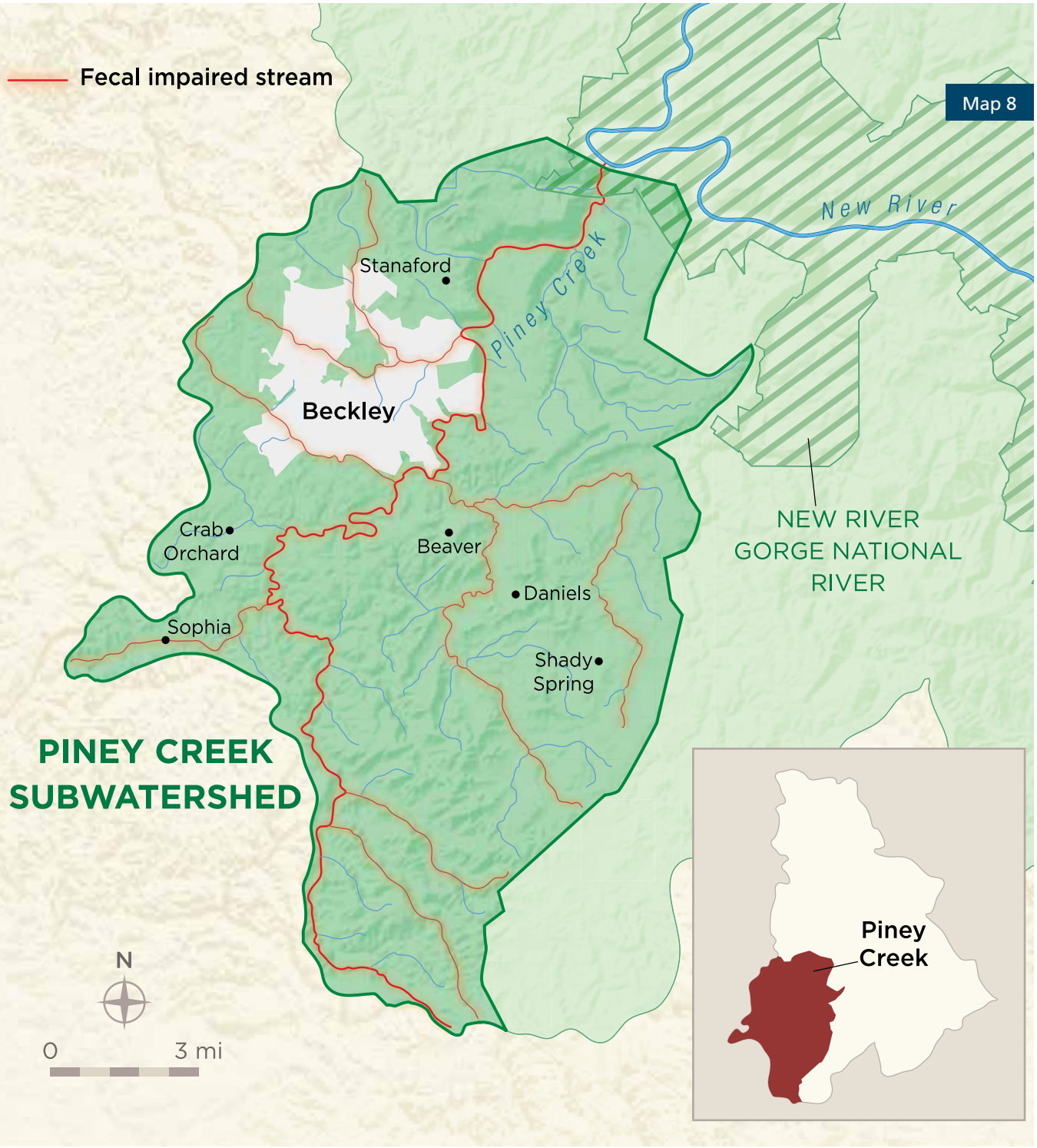
3) Support wastewater systems to fix leaky, aged infrastructure.

Numerous wastewater systems in the Piney watershed have problems with aged, leaky infrastructure that takes in stormwater runoff, which contributes to overflow events. We support efforts to repair or replace this infrastructure. One example is Beckley Sanitary Board's Downtown Sewer Replacement project, which will address the largest source of inflow and infiltration into the Beckley system. We support the funding of additional measures associated with this project to clean up urban runoff and reduce overflow incidences. As monitoring data is generated and the Piney Creek watershed based plan is implemented, we

Stormwater runoff flows into Cranberry Creek which then flows into Piney Creek. During rainstorms, Cranberry Creek is a major source of pollution into Piney Creek and the New River.

PROTECTING WATER BY PROTECTING LAND

As water flows into the New River, it flows through our communities, parks, farm fields, and forest lands. To improve water quality it's important to protect lands that are vital to the river's health, such as flood plains and wetlands. Recently, the National Committee for the New River secured an important 1,324-acre conservation easement in the Piney Creek watershed. This allows the property owner to continue to use the land in many ways, such as for hunting and fishing, but ensures that the property will not be developed in anyway.



will support and advocate for additonal projects in this watershed to improve water quality.

(4) Incorporate green infrastructure as a clean water solution.

Fixing aging infrastructure can be a daunting task. Nationally, a movement is occurring to reduce some of these costs and provide additional community benefits by utilizing green infrastructure to solve water quality problems (see sidebar on page 42). The Piney Creek watershed is poised to be a leader in the region in green infrastructure education and implementation because:

- Piney Creek Watershed Association has been a leader in education and outreach efforts around slowing storm runoff through projects like the Shady Spring wetland and outdoor classroom (see sidebar on page 44).
- Beckley Sanitary Board already builds and maintains rain gardens and vegetated stormwater retention systems.
- Piney Creek has more impervious surface than other subwatersheds.
- Slowing storm runoff may be the most important way to improve water quality in Piney Creek and the New River.

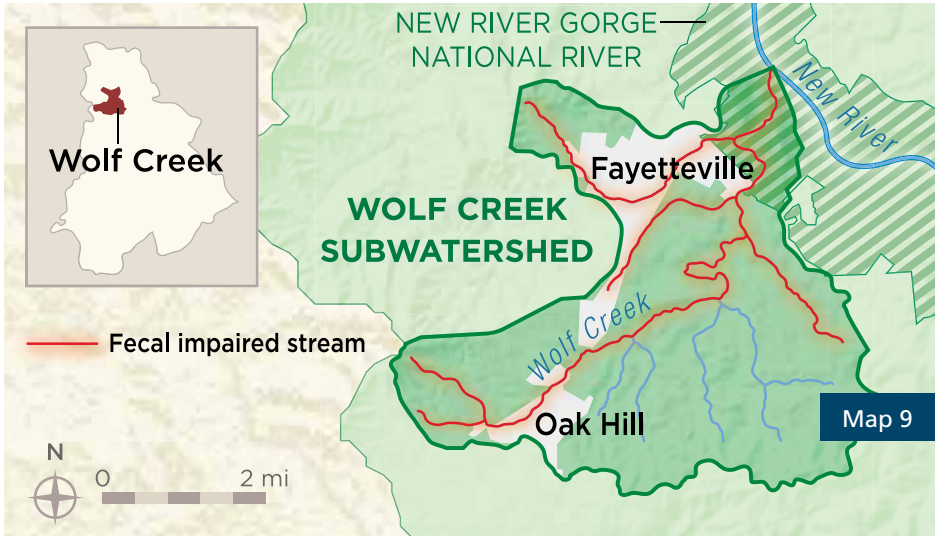
The Alliance supports the targeted application of green infrastructure in priority subwatersheds in the Beckley area as a means to show a measurable improvement to water quality through reductions in urban runoff, CSOs, and SSOs. The community will benefit from increased green spaces, environmental education opportunities, and property values, which are often understated.

Kayakers play in Fayette Station Rapids where Wolf Creek flows into the New River. Wolf Creek faces significant water quality challenges that must be addressed in order to see improvements in popular swimming and boating places like Fayette Station.

WOLF CREEK

BACKGROUND

Wolf Creek drains approximately 11,000 acres in the lower reaches of the New (see map 9: Wolf Creek Subwatershed). It flows about 10.5 miles from Oak Hill through Fayetteville and into the New River at Fayette Station rapid, a popular area to swim and boat. Historically, the Fayette Station train depot was a frequent arrival and departure point for people visiting the Town of Fayetteville, which is the county seat. Fayetteville resident Tom Heemstra recalls stories of horse-drawn carriages winding up what is now Fayette Avenue, and travelers stopping for a picnic or summer swim along the way.



Today, many park trails cross the cascades and pools of Wolf Creek, allowing park visitors and residents easy access to this tributary. A few extreme kayakers have descended waterfalls in the final mile, as Wolf Creek drops almost 900 feet before flowing into the New River. With water-quality improvements, Wolf Creek will be an even greater asset for local residents and park visitors.

NEEDS

In the late 1990s, Randy Boyd, a lifelong resident of Fayette County, shared stories about fishing in Wolf Creek that had a deep impact on friends and members of the recently formed Plateau Action Network (PAN). Gene Kistler, a resident and business owner, recalls, "When he was a kid, [Randy] would go to that park down by the water plant every Sunday. He remembered when all that changed and there were no fish in the creek."

The Town of Fayetteville deemed Wolf Creek unsuitable as their primary public water source in 2004 when the state identified water quality impairments. The entire main stem of Wolf Creek remains impaired with iron and aluminum from acid mine drainage and streambank erosion. About one-third of the stream miles in the Wolf Creek watershed are impaired by at least one pollutant. Over 90 percent of impaired streams are impaired by fecal coliform.

Fayetteville's combined sewer system has two overflow locations; one discharges into a tributary of Wolf Creek (House Branch), while the other discharges into a tributary of Marr Branch. The primary concerns in Wolf Creek are the CSO into House Branch in Fayetteville, nonpoint pollution from farmlands across the watershed, and failing onsite septic systems.[27]

SUPPORT FOR CLEAN WATER

The Plateau Action Network (PAN) and partners envision a restored Wolf Creek that is safe for swimming and supports a healthy trout population. In 2001, PAN and the WVDEP developed a memorandum of understanding and partnered with 16 national, state, and local agencies and organizations, who signed to show their commitment to the long-term restoration of Wolf Creek. PAN and WVDEP worked to establish the Wolf Creek Environmental Trust, one of two private / public trusts in West Virginia. In 2009, PAN completed a watershed-based plan and hired their first fulltime staff member to coordinate the monitoring and cleanup of Wolf Creek. Wolf Creek was selected as a priority because of the serious water quality issues it faces and the capacity of PAN to manage future projects, continue water quality monitoring, support nearby community efforts, and practice environmental stewardship at a regional scale.

WV American Water acquired both the water and the wastewater system in the Town of Fayetteville in 2008. They have made significant investments to improve the wastewater system including identification and repair of sewer leaks.

RECOMMENDATIONS

1) Support WV American Water's efforts to repair and replace old leaking clay pipe in wastewater system. Assist WV American Water in developing an innovative program that provides an incentive for private homeowners to replace their pipes.

The House Branch CSO discharges into Wolf Creek when stormwater enters the sewer lines. WV American Water has a five-year control plan to bring the CSO into compliance. As a private company, it requires

Matt McLane with West Virginia American Water stands above an aeration tank at their Fayetteville wastewater facility. WV American Water has made significant investments to improve their recently acquired system.

public partners to apply for existing grants and low-interest loans. Alternative sources of funding are needed to accomplish the goal of eliminating leaks that allow stormwater to overload the system and release sewage into Wolf Creek.

2) Better define the scope of the failing septic system problem as a basis for action.

We support the current proposal for an onsite septic system database for Fayette County developed and managed by the Fayette County Health Department. This investment will help prioritize communities for decentralized alternative wastewater treatment.

3) Partner with local farmers to implement best management practices

Landowners can reduce polluted runoff from the agricultural sector by implementing best management practices such as planting streamside buffers and fencing animals out of streams. We encourage the Natural Resource Conservation Service and other agricultural programs to prioritize grant opportunities and outreach in watersheds with known fecal coliform impairments. The Fayette County Farmland Conservation Board is a potential partner in the Wolf Creek watershed.

Levi Rose, Wolf Creek Watershed Coordinator, takes a water sample from Wolf Creek near the vehicle bridge that allows access to the New River above and below Fayette Station rapid. This is a popular place to swim and a takeout for commercial rafting outfitters.

Hikers enjoy a walk in the Arbuckle Creek gorge on the park's Rend Trail.

ARBUCKLE CREEK

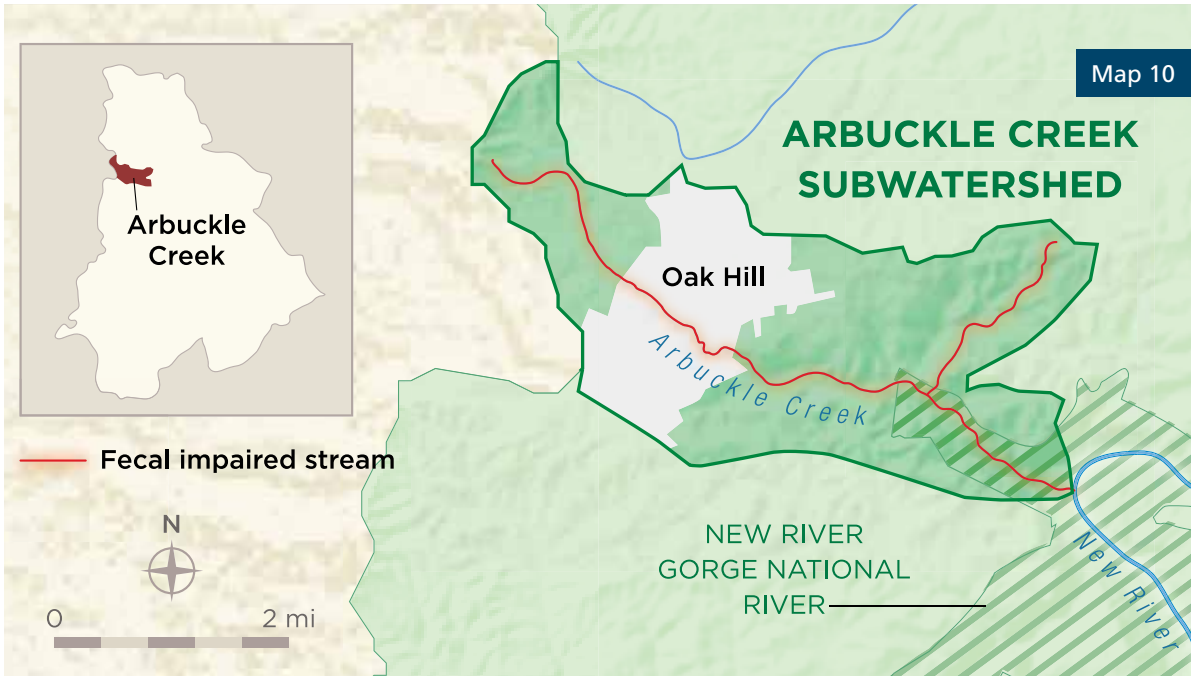
BACKGROUND

Arbuckle Creek flows almost 18 miles through the City of Oak Hill and the unincorporated community of Minden to the New River. Arbuckle Creek created a deep and scenic gorge that can be accessed by the National Park Service Rend Trail, previously named the Thurmond-Minden Trail.[28] The trail follows an abandoned rail line that was constructed in 1906 to haul coal mined in the town of Minden to the main railroad line in Thurmond. Just upstream of the Arbuckle Creek and New River confluence is the National Park Service Dun Glen Picnic Area and Boat Ramp, and downstream is a private commercial raft access point. The Arbuckle Creek watershed is approximately 53 percent forested, 14 percent agricultural, and 30 percent urban and populated areas, including Minden and half of Oak Hill. The watershed is nine square miles or about 1.3 percent of the total land area of the Lower New River watershed.

NEEDS

Nearly half of Arbuckle Creek is impaired by fecal coliform and the creek is also listed as impaired for iron and poor biological conditions. During our subwatershed prioritization, Arbuckle Creek's length and percent of impaired streams, urban density, and stakeholder interest resulted in this watershed being ranked third, despite its relatively small drainage.

Two wastewater treatment plants discharge to Arbuckle Creek: the Minden Road Wastewater Treatment Plant and the Arbuckle Public Service District (PSD). Arbuckle PSD services the unincorporated community of Minden and part of Oak Hill to the east of Gatewood Road. The Minden Road Wastewater Treatment Plant services half of the City of Oak Hill. Leaky sewer pipes and overflow from sanitary sewer systems (described in figure 2 on page 34) are likely the primary sources of fecal coliform in Arbuckle Creek.



Arbuckle PSD has average wet-weather flows eight times higher than dry-weather flows into the wastewater plant indicating large amounts of stormwater in the sewer lines.[29]

Iron impairments likely result from disturbed ground and old mine spoils. When soils are disturbed and streambanks erode, sediment muddies the water and can cause streams to become shallower and wider, damaging habitat for fish and other aquatic life. Biological impairment may be from sedimentation, high concentration of fecal coliform, and metal pollutants.

RECOMMENDATIONS

1) Community education and empowerment for clean water.

We support the expansion of clean water education, including water quality monitoring to engage local students, in the Arbuckle Creek watershed. In addition, the Alliance proposes to host a community gathering to bring concerned stakeholders together, provide an update on the status of their wastewater system, and share National Park Service data on the water quality of Arbuckle Creek.[30] The Arbuckle Creek Watershed Association is one group that has the potential to address water quality concerns, but the group needs more people and support.

2) Financial support for responsible wastewater treatment plant management, sewer mapping, and leak repair

With wastewater management dedicated to system improvements, the amount of fecal coliform discharging to Arbuckle Creek is likely to decrease. We advise the systematic detection and repair of major and minor leaks in the sewer collection system currently serviced by the Arbuckle PSD. We support the Fayette County Commission's management and supervision of funds dedicated to this important project.

FOOTNOTES

[1]The National Park Service owns 53,578 acres of land within the park boundary. Babcock State Park adds 4,608 acres of protected land adjoining the park. For more information on the park: http://www.nps.gov/neri/index.htm

[2]According to EPA's Safe Drinking Water Information System (SDWIS), accessed on December 3, 2010, the West Virginia American – New River Regional Water Treatment Plant serves a population of 24,854 with water drawn from Hawk's Nest Lake. http://www.epa.gov/enviro/html/sdwis/sdwis_query.html

[3]The TMDL models developed by the State of West Virginia to track pollution in the Lower New River watershed delineate 15 major tributaries. However, the State and their models consider additional streams such as Fern Creek, Lick Creek, and Laurel Creek (above Glade Creek) as part of the New River itself.

[4]In their 1997 book Balancing Nature and Commerce in Gateway Communities, Howe, McMahon, & Propst provide this definition: "Quality of life is a catchall term used to describe the noneconomic amenities a community has to offer, including clean air and water, safe streets, open space, cultural events, recreational opportunities, uncongested roads, good schools, and scenic views."

[5]This quote comes from an Ethnographic Overview and Assessment by Mary Hufford, PhD and colleagues through the National Park Service Ethnography Program. Boston, MA. September 2007. All other quotes in the report were recorded by the New River Clean Water Alliance directly.

[6]The West Virginia State Water Festival in Hinton is scheduled for August 1 to 7, 2011. Call 304.466.5332 or visit http://www.hintonwva.com/waterfest.html

[7]U.S. Fish and Wildlife Service's 2006 National Survey of Fishing, Hunting and Wildlife: http://www.associatedcontent.com/article/1569486/economic_impact_of_fishing_and_hunting.html?cat=3

[8]National Park Service http://www.nps.gov/neri/planyourvisit/fishing.htm

[9]A Study of the Economic Impact of the New River Gorge National River on Fayette, Nicholas, Raleigh, and Summers Counties, West Virginia (January 2006) was prepared for the National Park Service by David E. Versel. Copies of this report are available upon request from the National Park Service in Glen Jean.

[10]Dr. Richard Florida details the Rise of the Creative Class in his best-selling book. Florida describes how the over one third of the US work force that "create" for a living will shape the future of our communities. http://www.creativeclass.com/richard_florida/books/the_rise_of_the_creative_class/

[11]Information in this section draws on the "park significance statements" that the National Park Service uses to "describe why the park's resources and values are important enough to warrant national park designation." The park significance statements for New River Gorge National River can be found in the Draft Foundation Plan and the Draft General Management Plan and Environmental Impact Statement. http://parkplanning.nps.gov/document.cfm?parkID=259&projectID=11040&documentID=31487

[12]The Cornell Lab of Ornithology <http://www.allaboutbirds.org/>

[13]Specifically, the fecal coliform bacteria standard set to protect human health reads, "Maximum allowable level of fecal coliform content for Primary Contact Recreation shall not exceed 200/100 ml as a monthly geometric mean based on not less than 5 samples per month; nor to exceed 400/100 mL in more than 10 percent of all samples taken during the month." Thus, an impairment designation indicates that the standard is not met by at least 10 percent of the samples.

[14]Definition Note: AMLs are those lands, waters, and surrounding watersheds contaminated or scarred by the extraction, beneficiation or processing of coal, ores and minerals. Abandoned mine lands include areas where mining or processing activity is determined to have ceased. The West Virginia Office of AMLs & Reclamation was created in 1981 to manage the reclamation of lands and waters affected by mining prior to 1977. http://www.dep.wv.gov/aml/

[15]Source: Appendix A: Lower New Watershed, pg A1-8, Total Maximum Daily Loads in the New River Watershed, November 2008. The Lower New River TMDL and appendices are made available online by WVDEP: http://www.dep.wv.gov/WWE/watershed/TMDL/grpd/Pages/default.aspx - lower new

[16]U.S. Environmental Protection Agency, Washington, D.C. 2004. "Report to Congress: Impacts and Control of CSOs and SSOs." Document No. EPA 833-R-04-001. The whole report can be accessed and downloaded here: http://cfpub.epa.gov/npdes/cso/cpolicy_report2004.cfm.

[17]To better understand the effects of increased flow on fecal coliform levels, we analyzed 29 years of Unites States Geological Survey flow data from the New River and Piney Creek. We defined high flow as occurring in the top quarter of readings or greater than 10,600 cubic feet per second (cfs) for the New and greater than 79 cfs for Piney. Low flow occurs in the bottom quarter (less than 2,820 cfs for the New, less than 12 cfs for Piney) with medium flows in between. To present our findings as clearly as possible, Map 6 only includes sample locations that have at least one violation of clean water standards at high or low flow and where at least 5 samples were taken.

[18]In addition to the National Park Service monitoring program, WVDEP's Save our Streams and the National Committee for the New River's Water Watchers each monitor water quality primarily through the work of volunteers. We propose to move forward with a monitoring protocol that includes bacteria, flow, and other parameters. More information on these existing water quality monitoring programs can be found here: http://www.ncnr.org/monitoring.php; dep.wv.gov/sos; http://www.nps.gov/neri/naturescience/rivers.htm.

[19]The Public Service Commission (PSC) issued this rule for public and private wastewater service providers in the State of West Virginia. If roof downspouts are suspected to connect into the sewer, the wastewater provider can use smoke tests and cameras to investigate. A written notice requesting disconnection and information about the stormwater surcharge is then provided. If the customer does not disconnect, the wastewater provider uses monthly rainfall data and the area under roof to estimate the stormwater load into the sewer. The stormwater surcharge is added to the customer bill.

[20]We recognize that flood plain buyout programs are not the solution in every instance, and that flood plain property is critically important to stream and river health. It is the collaboration toward this win-win that we support.

[21]Devastating floods – in 2001, 2004, 2005, and most recently in March 2010 – have repeatedly damaged over 290 affected properties in the Dunloup watershed (a tributary to the New River). The USDA NRCS granted $14 million to flood plain buyouts as the most cost effective and feasible option in Dunloup Creek (April 2009, USDA NRCS). According to a former Senator Robert C. Byrd request to the Subcommittee on Agriculture, Rural Development and related agencies: "Accompanying this project are incalculable benefits to reducing risk to life and property, improving the quality of life to a distressed community, and restoring environmental integrity to the natural flood plain of Dunloup Creek." Accessed April 20, 2010. <http://byrd.senate.gov//projprog/index.cfm?ID=205>

[22]Flood plain estimate is based on FEMA Q3 Flood plain data for Fayette, Raleigh, and Summers Counties.

[23]Following the recommendations from the Fayette County Comprehensive Wastewater Treatment Plan, we endorse the designation of a public or private management entity to own and operate all decentralized systems in a particular area. This approach is similar to centralized conventional wastewater arrangements whereby users pay a monthly fee to the management entity that is responsible for operation and maintenance, regular inspections, and all repairs. In order for this type of management to be implemented, users need to sign easements allowing access to interceptor tanks on their property (similar to septic tank maintenance and pumping). The Fayette County Comprehensive Wastewater Plan (2004) details can be found online: http://www.lombardoassociates.com/fayette_county_west_virginia.php

[24]An anaerobic upflow filter, for example, can be added prior to drain fields as advanced primary treatment after septic tanks. The process is passive, costs ~$1,000-$1,500 per septic tank and has been shown to be effective. http://www.lombardoassociates.com/fayette_county_west_virginia.php

[25]Land-use data is from the TMDL report (November 2008). Appendix A: Lower New River Watershed and Appendix B: Piney

Creek Watershed. In the Piney Creek watershed, 15% or 20.7 sq. mi. is residential/urban land use; in the Lower New River watershed, 3.5% or 19.5 sq. mi. is residential/urban land use.

[26]Permits to discharge into the storm sewer are required for new construction in MS4 designated areas. Some MS4 areas charge fees for stormwater discharges or allow property owners to manage and treat their own stormwater in lieu of paying the fees. The only MS4 area in the Lower New River is in Beckley: http://www.beckleysanitaryboard.org/page.aspx?id=16&menu=3

[27]The Wolf Creek watershed-based plan models a 100 percent failure rate across the entire watershed. Model estimates are based in part on the records kept by the Fayette County Health Department and estimates of pollution loads from land use data. As Levi Rose, Wolf Creek Watershed Coordinator, says, "The poor site conditions [rocky, steep, shallow soil] combined with the age of the [septic] systems indicates it is likely that a significant portion of the systems will require repair or replacement in the next five to ten years." http://www.plateauactionnetwork.org/resources/wolf-creek-watershed-based-plan.html.

[28]"The 3.2 mile downhill trail follows the contours of the gorge, winding back and forth as it descends to the New River. Built in 1902, the Rend Branch Line was a difficult spur line to build due to the extreme topography and was active until it closed in 1972. You will cross over five-decked railroad trestles experiencing spectacular scenery, waterfalls and fantastic overlooks. Your guide will point out McKinley Rock, talk about Mary Ingles' epic journey through this area in 1755, and many other colorful historic facts. At the end of the trail we will jump onto remote Rt. 25 (paved) for a short ride to Historic Thurmond."

Source of information: http://www.aceraft.com/mountain-biking-scenic-new-river-trails.html.

[29]According to the Fayette County Comprehensive Wastewater Management Plan, approximately 200,000 gallons per day (gpd) of water flowed through the pipes of the Arbuckle Public Service District during dry weather. During wet weather, the flow on average per day was eight times the dry weather flow or 1,600,000 gpd. The small wastewater plant is permitted to treat 400,000 gpd so an estimated 1,200,000 gpd is untreated during wet weather (Lombardo and Associates, 2005).

[30]Recent NPS water quality reports are available on the parks website while early reports are available in hard copy by contacting the park, while more recent reports are posted on the park's website: http://www.nps.gov/neri/naturescience/rivers.htm.

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http://www.npca.org/newrivercleanwater

Beckley Sanitary Board, Jeremiah Johnson and Beth Schrayshuen
(304) 256-1760
http://www.beckleysanitaryboard.org/

Mountain Resource Conservation & Development, Mike Gasper
http://www.wv.nrcs.usda.gov/contact/

National Committee for the New River, Courtney Wait and George Santucci
336-846-6267
http://www.ncnr.org/

National Park Service, Jesse Purvis, Scott Stonum, David Thompson
(304) 465-0508
www.nps.gov/neri

Piney Creek Watershed Association, Phyllis Farley and Tara Shleser
304.228.1680
http://www.pineycreekwatershed.org

Plateau Action Network, Levi Rose and Laurel Ackison
304-574-4726
http://plateauactionnetwork.org/

Southern Conservation District, Sid Howard
(304) 253-0261
http://www.wvca.us/districts/?page=scd

West Virginia Department of Environmental Protection, Jennifer Dupree
(304) 465-1938
http://www.dep.wv.gov/

West Virginia Professional River Outfitters Association, Mark Lewis
(304) 574-2343
http://www.americasbestwhitewater.com/

PARTING THOUGHTS

"I suspect that in the future we will increasingly realize that we have too long taken clean water for granted and assumed it will always be an easily available and abundant resource. As a national river, long-term sustainable water quality throughout the watershed is our number one priority, and making smart decisions now to improve and protect the water quality of the New River watershed is an investment that will ensure that this important component of the region continues to protect our recreational and resource values well into the future."

– Don Striker, Superintendent of the New River Gorge National River

"The U.S. Congress has spoken for the people and made the New River a national treasure. Paramount to protecting water resources of this national river is our ability to address the problems created by failing, aged wastewater infrastructure. Local leadership is essential. Yet, the costs are too great and the stakes are too high for this problem to be solved strictly by local investment. New funding approaches and significant investments from state and federal sources will be necessary to accomplish these improvements."

– Jeremiah Johnson, Operations Manager of the Beckley Sanitary Board and Piney Creek Watershed Association board member


Nicholas
County
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NEST
PARK
Fayette
County
River Gorge Bridge
BABCOCK
STATE PARK
NEW RIVER
GORGE NATIONAL
RIVER
Meado
Creek
New River
Sandstone Fa

New River Clean Water Alliance

www.npca.org/newrivercleanwater