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The Appalachian VOICE

June/July 2016

Born to be Wild

Stories about the natural wonders of our world

Mushrooms
& Mycology

Critters
at Risk

Wildlife
Rescuers

Plus: 21st Century Energy Co-ops | WV Mine Wars Museum | Hidden Treasures of Appalachia





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About the Cover

Wild foods ambassador Alan Muskat harvests a morel while leading a foraging excursion near Weaverville, N.C. Muskat introduces patrons to native edible plants through his enterprise No Taste Like Home. Foraging, he says, allows people to reconnect with nature and their ancestors — and “it’s never the same old shitake.” Photo by Jim Britt



Until Aug. 31, Appalachian Voices members will get \$10 off a tour or gift certificate with coupon code VOICES. Visit notastelikehome.org

GET INVOLVED environmental & cultural events [See more at appvoices.org/calendar](http://appvoices.org/calendar)

N.C. High Country Farm Tours

June 18, Caldwell Co.; July 16, Watauga Co.; Aug. 13, Ashe Co.: Learn where food comes from by touring local farms and gain a unique perspective on how sustainable farms operate. \$15-20 per carload. To pay for tickets or volunteer, visit farmtour.brwia.org or call 828-386-1537.

Rhododendron Festival

June 18-19, 10 a.m.-5 p.m.: Showcasing the blossoms of Rhododendron Gardens, this tradition includes musicians, crafters, food and more. Free. Roan Mountain State Park, Tenn. Visit instateparks.com or call 423-772-0190.

4th of July Parade Cumberland Mountain State Park

July 4, 10 a.m.: Celebrate Independence Day with a parade, homemade ice cream, watermelon seed spitting contest and 2016 Independence Pride contest. Free. Crossville, Tenn. Visit instateparks.com or call 931-484-6138.

The Whippoorwill Festival

July 7-10: Join Kentucky Heartwood at the 6th annual Whippoorwill festival. Learn earth-friendly living skills by participating in some of the many workshops that will be offered at

the festival. \$35-110. Beattyville, Ky. Visit whippoorwillfest.com or call 859-447-6534.

Best of Birthplace of Rivers

July 9-10: Join West Virginia Rivers staff to celebrate the rivers of West Virginia with food, music and outdoor activities. \$75 through July 1; tickets include food, entertainment and excursions. Slatyfork, W.Va. Visit tinyurl.com/WVRivers or call 304-637-7201.

MusicFest 'N Sugar Grove

July 15-16: Celebrate the heritage of the High Country with Appalachian music, food and more. \$20-\$25 single-day tickets benefit the Doc and Merle Watson Folk Art Museum. Sugar Grove, N.C. Visit musicfestnsugargrove.org or call 828-297-2200.

Small Farm Marketing Principles Workshop

July 21: Pine Settlement School's workshop will help small farmers learn to better connect farms to the public and market agricultural products. Pine Mountain, Ky. Free. Register for the workshop at tinyurl.com/PineMnt or call 606-558-5282.

A note from the executive director

Three years ago, Appalachian Voices launched our “Energy Savings for Appalachia” program with high hopes of making home energy efficiency improvements more affordable for more people. Saving energy saves families money, results in more comfortable and healthy homes, creates local jobs and reduces environmental impacts from burning fossil fuels to meet our energy needs.

We reached a major milestone this spring when Blue Ridge Electric Membership Corp., a rural electric cooperative in western North Carolina, announced a new financing option for its members. The co-op will pay the upfront costs of energy efficiency improvements for eligible members, who enjoy the benefits immediately while repaying the co-op over time through a new charge on their electric bill.

Appalachian Voices worked with the co-op, local businesses, residents and community organizations to establish the program, known as “on-bill financing.” As we help Blue Ridge Electric publicize and further improve the program, we are expanding our campaign to more co-ops in western North Carolina. And to broaden our impact, Appalachian Voices co-founded a statewide group to help more families receive the benefits of on-bill financing.

Meanwhile, in East Tennessee we have been working with the Department of Environment and Conservation, the Tennessee Electric Cooperative Association and Appalachian Electric Cooperative to design an on-bill financing program, on track to be finalized soon. Due largely to our community outreach, more than half of East Tennessee’s eight co-ops have shown strong interest in offering on-bill financing for their members. Read more about electric cooperatives and energy efficiency beginning on page 10.

By this time next year, we anticipate that at least several million dollars in new energy efficiency investments will have been made in Appalachia as a result of our efforts. But there’s more work ahead, and we are deeply committed to achieving the region’s full energy savings potential and realizing a more sustainable future for Appalachia.



For the mountains,

Tom

Tom Cormons, Executive Director

FloydFest

July 27-31: An incredible 5-day music and arts festival in the beautiful Appalachian Mountains near Floyd, Va., combines musical performances from stellar artists of all genres with a family-oriented outdoor camping adventure. Appalachian Voices is the featured nonprofit, so stop by our table and say hi! \$95-240. Learn more at appvoices.org/floydfest or call 888-VA-FESTS.

New River Cave Tour

July 28, 2-4 p.m.: Explore the caves of New River Trail State Park and learn about the geology of these underground spaces. Dress to get dirty. Max Meadows, Va. \$10, pre-registration required. Visit tinyurl.com/newrivertrail or call 276-699-6778.

Virginia Highlands Festival

July 29- Aug. 7: The annual festival celebrates Virginia’s cultural and natural beauty. Outdoor events include wildlife hikes, biking events, kayaking and wine tours. Costs vary. Abingdon, Va. Visit vahighlandsfestival.org or call 276-623-5266.

Southeastern Permaculture Gathering

Aug. 5-7: Join permaculture advocates for a collaborative discussion of sustainable de-

sign. Camp and network with individuals of all backgrounds. Payment options vary. Celo, N.C. Register at southeasternpermaculturegathering.org or call 303-931-7586.

RiverFest by RiverLink

Aug. 13: Enjoy local music, food, beer and the Anything That Floats Parade. Celebrate the French Broad River and the city of Asheville, N.C. Free. Visit riverlink.org/experience/riverfest or call 828-252-8474.

Natural Dye Symposium

Aug. 13: Learn how to grow and use natural dyes and practice using plant dyes to color different natural fibers. \$50 - \$60. Cost includes lunch and a plant sample. Knoxville, Tenn. Visit utgardens.wildapricot.org/UTGardensEvents or call 865-974-7324.

Hike Bluff Mountain Preserve

Ongoing: Take a guided tour of The Nature Conservancy’s Bluff Mountain Preserve and learn about the botanical variety of this fragile landscape. Hikes available most weekends during the summer and fall. Ashe Co., N.C. \$15. Visit tinyurl.com/BluffMountain or call 336-385-6312.

Across Appalachia

Region experienced wider, more intense forest fires this spring

By Savannah Clemmons

This spring, forest fires throughout southern and central Appalachia burned wider than fires of previous seasons. The increase in intensity came as peak wildfire season overlapped with a period of particularly dry weather throughout the Appalachian region.

Lisa Jennings, a public information officer at the U.S. Forest Service, says that because of the wet winter, the spring 2016 wildfire season began slowly. However, as central and southern Appalachia experienced a two-to-three week period with little rainfall at the beginning of

April, the brush dried out, resulting in near perfect conditions for wildfires.

According to Jennings, North Carolina’s most unique fire of the season was the Silver Mine fire that burned near Hot Springs, N.C., in late April. Due to its size and proximity to the town, the fire posed a bigger threat to ecosystems and the public than typical forest fires. The Silver Mine fire took two weeks to extinguish and resulted in a total of 5,964 acres burned.

Throughout April, wildfires continued to grow in intensity. The Starlight fire in Greene County, Tenn., burned 90 acres, the equivalent of nearly half the

total amount of acres burned in the area between 2003 and 2015.

In Virginia’s Shenandoah National Park, the Rocky Mountain fire burned over 10,000 acres in what is considered to be the park’s second-largest fire on record. The Rocky Mountain fire, along with the Silver Mine and Buck Knob fires in North Carolina, closed several sections of state parks and the Appalachian Trail.

When confronted with especially dry weather conditions during peak wildfire season, it is important for humans to recognize their own influence. “Ninety-nine percent of wildfires are human caused,” Jennings states.

Flames from debris fires account for a large amount of human-caused wildfires. In spring 2015, 43 percent of all forest fires in West Virginia were caused by escaped debris from campfires.

While low-intensity forest fires can replenish forests, high-intensity fires such as those that have burned this season can jeopardize ecosystems by damaging canopy habitats. In order to prevent high-intensity fires that threaten communities and natural areas, Jennings says that individuals must “use common sense,” follow cautions and restrictions released by the forest service, and recognize weather patterns that could increase fire danger.

Kentucky Tourism Experiences Strongest Growth in 10 Years

The Kentucky Department of Travel and Tourism announced in May that it contributed \$13.7 billion to the state’s economy in 2015, which is the most added in a single year since 2005. This growth created more than 6,000 jobs in the industry since 2014, for a total of 186,204 tourism jobs.

Tourism to the state’s eastern region added more than a billion dollars to the

state’s economy. This part of the state contains many natural attractions, including the Appalachian mountains and Daniel Boone National Forest, which have made Kentucky such a desirable destination. This area hosts a number of horse trails, mountain and lake state parks, more than 500 miles of hiking trails, and the Red River Gorge. — *Dylan Turner*

Virginia Doctor Wins Award for Work With Mobile Care Clinic

Dr. Joseph Smiddy was recognized as the Unsung Hero at the Heroes in Healthcare Awards Ceremony held on May 26. The Unsung Hero award is given to an individual who has helped to provide care for uninsured Virginia residents. Smiddy is one of the few doctors working with The Health Wagon, a nonprofit mobile clinic

that provides health care and screenings to medically underserved residents in City of Norton, and Dickenson, Buchanan, Russell, Scott and Wise counties of Virginia. In a press release, The Health Wagon’s Executive Director Dr. Teresa Gardner said, “No person could be more deserving of such an award.” — *Hannah Petersen*

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Agreement Stops Trash Trains in Boyd County, Ky.

By Hannah Petersen

Due to an agreement spearheaded by a citizens group in Boyd County, Ky., Big Run Landfill will stop accepting waste brought in by rail and will transition to a regional landfill accepting trash only from within 75 miles of the site. According to Boyd County Judge-Executive Steve Towler, the residents of Boyd County saw the last "trash train" delivery on April 19, after raising complaints of disruptive odors for nearly two years.

Ending the trash trains was the result of an agreement between the Citizens of Boyd County Environmental Coalition, Boyd County Fiscal Court, Big Run

Landfill and the state Department for Environmental Protection. The agreement not only eliminates all rail deliveries but also requires the closure of large areas of the landfill and installation of air monitoring systems around the property.

"It was something I knew had to be taken care of," says Towler. "This agreement brought everyone together to reach a beneficial and reasonable conclusion."

Big Run is Kentucky's largest landfill and holds nearly 43 million tons of waste within a mile of a high school and nearby homes. For years, Big Run had accepted waste brought on trains from as far away as New Jersey, according to The Herald Dispatch.

New App Allows Citizens to Report Sediment in Waterways

A new smartphone app called Muddy Water Watch empowers any user to report sediment pollution across the United States. Users can take a photo of water pollution, provide a description and use location technology to submit the report to the nearest environmental watchdog organization, such as a local Riverkeeper group. The app is the latest extension of Muddy Water Watch, a program sponsored by North Carolina Riverkeepers. Hartwell Carson, the French Broad Riverkeeper, paired up with Shiny Creek, an Asheville-based web and mobile application development company to create the app.

Muddy Water Watch intends to fight sediment pollution, the number one reason for poor water quality in North Carolina.

Carson said that they are adding riverkeepers into the system on the state level first, but any report across the nation can still be submitted to him.

"There had been a region and statewide effort to train citizens to monitor sediment, but the largest hold-up was recording tools," says Carson. "This is simple and greatly improves our ability to record."

The app is available on iTunes and Google Play. — Hannah Petersen

Tennessee Passes New Lead Notification Bill

In April, Tennessee's governor passed Senate Bill 2450 requiring quicker notification of dangerous lead levels in public water. Under this law, public water systems must notify the Tennessee Department of Environment and Conservation within 24 hours and affected residents within 72 hours of discov-

ering levels above the federal standard. The water utilities must also provide information regarding potential contamination sources, health effects and possible mitigation to the agency. The previous law allowed utilities to wait 60 days before notifying the public of lead contamination. — Hannah Petersen



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Computer Models Could Fight Toxins in the New River

By Savannah Clemmons

Scientists and researchers at Virginia Tech have begun to use computer-generated models that could help fight toxic PCB chemicals in the New River.

PCBs, or polychlorinated biphenyls, are industrial compounds that were banned in 1977 after scientists found them to be possible causes of several illnesses, including gastrointestinal disease and cancer. Humans come in contact with PCBs through the consumption of fish. Since 2001 the Virginia Department of Health has maintained several advisories against consuming certain fish caught

from the New River.

In order to more aggressively confront PCBs, researchers are using computer-generated models to pinpoint the sources of contaminants in the river and to gauge the extent of the pollution. This mapping technology will allow researchers to better understand how toxic chemicals move and interact with ecosystems over time.

According to the Virginia Department of Environmental Quality, mapping PCBs in the New River is an important step in understanding how to stop the spread of pollution and obtain higher water quality.

New Virginia Main Street Towns Aim to Thrive

Lexington and Wytheville, Va., are two of four new towns to be considered Virginia Main Street Communities. The Virginia Main Street Program, managed by the Virginia Department of Housing and Community Development, works to revitalize select downtown economies, while preserving their historic value. Towns with a Main Street designation become eligible for certain grants, such as Downtown Improvement Grants that can provide up to \$25,000 for

one-time projects. Economic consulting services will also become available.

Main Street Lexington Executive Director Stephanie Wilkinson hopes to make use of the upper floors of downtown buildings for condos or small businesses. Wytheville plans on opening several new businesses over the summer in addition to the six that were established last year, and potentially more by the end of 2016. — Dylan Turner

Study Shows Nutrients Returning to Damaged S.C. Soil

An ongoing study by Dr. Dan Richter, a professor of Soils and Forest Ecology at Duke University, shows Piedmont soils are making a slow recovery from erosion and carbon damages caused by cotton production. According to university news outlet DukeToday, the land in the Piedmont and in western South Carolina lost half a foot of topsoil to erosion due to cotton farming. This caused the soil's organic carbon level, an indicator of soil health, to drop by almost half by the middle of the 20th century. Richter explains that forests have returned to the area and falling leaves and branches have begun to return nutrients to the soil. — Hannah Petersen

Virginia Greenway Receives Environmental Award

The Hawksbill Greenway in Luray, Va., was honored with a gold medal as a part of the Governor's Environmental Excellence Awards. The greenway consists of a two-mile walking and biking trail along the Hawksbill Creek.

A report from the Virginia Department of Environmental Quality states that by providing citizens with fitness classes and protecting the creek from pollution using

natural barriers, the greenway "encourages wellness and connectivity" throughout the community. — Savannah Clemmons

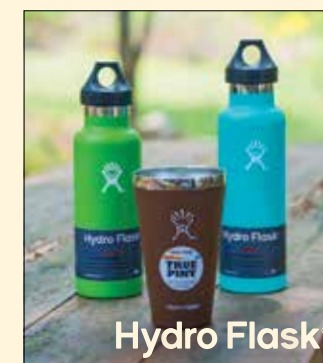
Environmental Education Center Opens in West Virginia

The National Park Service opened Camp Brookside Environmental Education Center in Brooks, W.Va., on May 21. Originally a children's summer camp, Camp Brookside was renovated to house research and environmental education services. The center has seven cabins, a mess hall, field study tools and other amenities that can be found at nps.gov/neri. — Hannah Petersen

Online Water Mapping a Useful Tool for Citizens

The U.S. Environmental Protection Agency released an online resource where users can learn more about water sources and water quality. The Drinking Water Mapping Application to Protect Source Waters allows users to enter an address and see both the source of drinking water for that area as well as potential or existing sources of contamination. The tool is located at epa.gov/sourcewaterprotection/dwmaps. — Dylan Turner

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Hidden Treasures



For the past 20 years, in addition to highlighting environmental problems in our region, *The Appalachian Voice* has also sought to showcase our magnificent, ancient mountains that people from all over the world come to visit. For this issue, we offer up just a taste of the natural adventures and cultural highlights from our story archives, and invite you to explore even more of these in our special online section (including the 2012 Waterfalls of Appalachia insert!) at AppVoices.org/HiddenTreasures.

By Savannah Clemmons and Jamie Goodman



North Carolina

Elk Knob State Park

In September 2011, volunteers from across the region completed the construction of a trail to the summit of the 5,520-foot Elk Knob, one of 10 peaks in the Amphibolite Mountains in the northwestern corner of North Carolina. Due to the mountain's soil, which is derived from the rich metamorphic rock called amphibolite, Elk Knob hosts a variety of rare plant and animal species, such as the Gray's Lily and trailing wolfsbane. The state park, opened in 2002, now includes four trails which vary in difficulty, as well as a backcountry camping area. The picnic area, located near the kid-friendly Beech Tree Trail, offers an opportunity to relax or enjoy lunch. While Beech Tree and Maple Run are easy hikes, the Summit Trail provides a challenge for more experienced hikers. *First covered in our Oct./Nov. 2011 issue.* — S.C.

John C. Campbell Folk School

This hub of Appalachian art and cultural learning located in Brasstown, N.C., offers over 860 weekly or weekend classes for adults in the areas of art, music, dance, cooking and storytelling. Learn how to make baskets from trees, clothing from natural fibers, and books bound from leather. Day visitors are welcome to tour the craft and history center, hike the nature trails and beautiful grounds, or attend a free concert series and semi-weekly Saturday night community dances. *Covered in our Dec/Jan 2012 issue.* — S.C.



Photo courtesy of John C. Campbell Folk School, folkschool.org

Paddling Appalachia

In the summer of 2009, Tim W. Jackson, former editor of *Canoe and Kayak* magazine, outlined for *The Appalachian Voice* eight choice paddling opportunities in central and southern Appalachia. From heart-pounding class IV-V rapids to tranquil lake excursions, the list he created was by no means complete, but well-represents the diversity of the region's aquatic adventures. — J.G.

Gauley River (WV) — Class III-V rapids, one of the preeminent expert whitewater rivers in the country.

New River (NC, VA, WV) — From picturesque calm in N.C. and Va., to exciting class IV+ in the New River Gorge.

Nolichucky River (NC, TN) — Flows through a deep mountain gorge, ranging from class I-III to the class IV rapid, Quarter Mile.

Ocoee River (TN) — Action-packed class III and IV runs gained the Ocoee worldwide attention during



Photo by Carl Galie

the 1996 Olympic Games whitewater events.

Youghiogheny River (WV, PA, MD) — Various sections offer class I-II, the Lower "Yough" offers expert class III-IVs.

Chattahoochee River (GA) — Typically a class I or II, dam releases or heavy rains can offer a few more thrills and spills.

Lake Guntersville (AL) — 69,000-acre reservoir that provides excellent canoe or kayak fishing.

Allegheny Reservoir (PA, NY) — Surrounded by national forest and park lands, perfect for canoe-camping.



Corn Maze in Patrick County, photo by Sammy Shelor

Virginia

Crooked Road

Hop in your car and follow the 333-mile long Crooked Road in Southwest Virginia to experience a living history of Appalachian mountain music and culture. The year-round tour covers 19 counties and over 50 towns and communities, and is comprised of museums, exhibits and more than 60 venues where travelers can watch live performances of bluegrass and old-time, see instruments being made and more. Wayside exhibits along the route include

special 5-minute audio recordings accessible on your car radio. The Birthplace of Country Music, the Carter Family Fold, and the Clinch Mountain Bluegrass Fest are just a few of the rich offerings along the route. *First covered in our Summer 2007 issue.* — J.G.

Carvin's Cove Nature Preserve

Seven miles north of Roanoke, Va., lies the largest city-managed park east of the Mississippi River. Carvin's Cove protects over 12,000 acres of beautiful, thick forests surrounding a large reservoir. The cove is home to over 50 miles of scenic hiking and biking trails. The preserve has become a valued hotspot for mountain bikers, with routes ranging in difficulty from easy, like Riley's Loop, to strenuous, such as the Hemlock Tunnel Trail. *Covered in our Early Winter 1997 issue.* — S.C.



Photo courtesy of the City of Roanoke



Photo by Brian Greer

Tennessee

Dudley Falls

In southwest Tennessee, Paint Creek pools to form Dudley Falls. The waterfall, and the swimming hole beneath, is a cool-water gathering place perfect during a hot summer day. The swimming hole ranges in depth, great for families with children of all ages. Set against the picturesque waterfall, the Dudley Falls swimming hole provides a relaxing place to swim or catch some sunrays while laying out on the rocks. We covered Dudley Falls and other Ap-

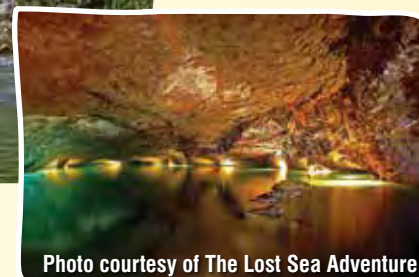


Photo courtesy of The Lost Sea Adventure

Craighead Caverns and the Lost Sea

Craighead Caverns in Sweetwater, Tenn., is home to America's largest underground lake, known as the Lost Sea. The cavern

features unique geologic formations called anthodites, or "cave flowers," which are crystal-like minerals found in only a handful of caves worldwide. Lost Sea Adventures provides guided journeys into the cave, including a 3/4-mile hike and a glass bottom boat ride on the lake, as well as an overnight "wild cave" tour for groups. *Covered in our Early Winter 1997 issue.* — S.C.



Photo by Kent Mason

West Virginia

Bear Rocks Preserve

Located near Dolly Sods Wilderness, this 477-acre Nature Conservancy tract offers views stretching as far east as Shenandoah National Park. Due to extensive deforestation, the preserve is a wind-swept plateau dotted with stunted red spruce and barren shrub species characteristic of subalpine zones, providing habitat to plants and animals normally found much further north. The conservancy has worked to encourage native plant life such as huckleberry, wild azalea and the once-abundant red spruce. The plateau is also home to high-elevation cranberry bogs and giant boulders from which you can spot migrating raptors and songbirds. The land was used

as an artillery training ground in World War II, so visitors are cautioned to stay on marked trails. *Covered in our June/July 2012 Hidden Treasures issue.* — J.G.

Droop Mountain Battlefield State Park

Located on Route 219 just north of Lewisburg, Droop Mountain is home to West Virginia's last civil war battle scene. A Civilian Conservation Corps-built museum and lookout tower still stand by the battlefield, and a system of easy to strenuous short hiking trails lead to a natural spring, mountain bog, pump house and a series of caves. The park also offers reenactments of the battle during the month of October. *Covered in our June/July 2012 Hidden Treasures issue.* — J.G.

Pennsylvania Black Moshannon State Park



Photo by Ruhrfish

In addition to more than 20 miles of trails and a network of adjacent unpaved state forest roads, the 3,394-acre Black Moshannon park contains 1,592 acres of rare protected bog that is home to three species of carnivorous plants, 17 varieties of orchids, and other unique species that make this a naturalist's dream. Part of the state's Important Bird Area, birdwatchers have spotted more than 175 different species, including the Greater and Lesser Yellowlegs, the Alder Flycatcher and the Common Yellowthroat. *Covered in our June/July 2012 Hidden Treasures issue.* — J.G.

palachian swimming holes including Georgia's Sutton Hole and North Carolina's Toe Hole in our Summer 1998 issue. — S.C.



Kentucky

Photo by Dana Kuhlmeier

Bad Branch State Nature Preserve

On the southern face of Kentucky's Pine Mountain lies a 2,639-acre piece of land that contains some of the most diverse ecosystems and stunning sandstone geology in the state. Located near Whitesburg, Ky., the preserve consists of a network of trails that leads hikers through a gorge filled with hemlock and rhododendron and past the 60-foot Bad Branch falls. Hikers can sunbathe on the trail's boulders, cool off under the falls, or take the High Rock Loop or Pine Mountain Scenic Trail to witness incredible views. Nature sightings include black bears, wildflowers or even Kentucky's only known nesting pair of common ravens. *Covered in our Early Winter 2013 issue.* — S.C.

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Stepping into the Mine Wars

Museum tells the story of the dramatic struggle to unionize coal mines in West Virginia

By Molly Moore

On a Saturday in May, a crowd gathered in Matewan, W.Va., to witness a local, all-volunteer cast reenact a bloody clash that affected the struggle to unionize Appalachian coal mines.

The outdoor drama recounts the 1920 shootout alternately known as the Matewan Massacre or Battle of Matewan. During the confrontation, union miners and their supporters faced off against private detectives hired by the coal companies to quash the rising labor movement.

Nearly 100 years later, the events leading up to that fateful day and the struggles that followed are featured at the West Virginia Mine Wars Museum in downtown Matewan. The museum opened in May 2015 in a building that still bears bullet holes from the confrontation. Inside, exhibits transport visitors to the turn of the 20th century, a time when coal companies exerted a degree of control over the lives of workers and their families that is nearly unfathomable today.

In the early 1900s in West Virginia, many towns were wholly owned by the coal operators. Miners rented company-owned houses and were paid in scrip, which could only be exchanged at the company store. Coal bosses also employed private, armed mine guards to enforce rules and suppress union activity.

That environment, compounded with dangers in the mines themselves,

led miners of diverse racial and ethnic backgrounds to unify under the banner of the United Mine Workers of America and demand improved working and living conditions.

At the museum, Kimberly McCoy serves as program fellow, welcoming visitors and imparting her passion for the subject. Her great-great-great uncle was Sid Hatfield, the Matewan chief of police who was at the center of the 1920 shootout, and her grandfather Earklis Perkins, a proud union miner, was buried in his UMWA hat.

"It was a terrible, trying time," she says of the struggle to unionize the early 20th-century coal camps. McCoy grew up listening to her family's stories about the hardships they endured and their passionate fight to establish the union. "It was a sacrifice, it was a sacrifice all around. And that's what we're trying to preserve."

Walking through History

Visitors are greeted by an exhibit on coal camp life at the turn of the 20th century, which features black-and-white photographs of miners and their families. Artifacts on display include miners' helmets and lanterns, household items and a collection of scrip coins emblazoned with company insignia.

"Between 1890 and 1912, the mines of West Virginia had the highest death rate among the nation's coal-producing states; its mine-accident death rate was five times higher than that of any European country," reads a quote from historian David Alan Corbin.

During that time, the UMWA grew in other states, but the union's progress was slower in the company-controlled towns of southern West Virginia. In 1912 and 1913, more than 12,000 union and non-union workers went on strike at mines in Kanawha County. De-



The West Virginia Mine Wars Museum transports visitors to the early 20th century, when local miners fought against powerful coal companies to secure union rights. Inside, the collection presents oral histories, digitized film reels, artifacts, maps and historic photos. Photo by Molly Moore

mands included union recognition and equal wages. The companies hired hundreds of mine guards through the Baldwin-Felts detective agency to break the strike.

Violence troubled the area for months; mine guards evicted many miners from their homes, and guards set up machine gun embankments. The governor declared martial law, confiscating weapons from both sides and detaining suspected union sympathizers through military courts. By July 1913, after more than 50 directly related deaths, the remaining striking miners accepted a proposal that partially reflected workers' demands.

At the museum, a replica of one of the canvas tents that evicted miner families lived in features an audio recording in the persona of national union activist Mother Jones, who had a prominent role in the Mine Wars.

Images of local and national union leaders share wall space with photographs of the Baldwin-Felts detectives. "One of the things that we aim to do is to tell this history from multiple points of view and to include multiple voices, and part of that has been the side of management," says Dr. Lou Martin, a museum board member and a historian and department chair at Chatham University.

Tensions Unleashed

After World War I, efforts to unionize southern West Virginia were picking up steam, as was the friction between

management and workers. On May 19, 1920, Baldwin-Felts detectives arrived in Matewan to evict striking miners at a nearby coal camp.

When the detectives returned to town, they were met in front of the hardware store by Matewan Chief of Police Sid Hatfield and Mayor Cabell Testerman. Armed miners watched as the pro-union Hatfield attempted to arrest the detectives. Albert Felts, one of the Baldwin-Felts detectives, then attempted to arrest Hatfield. It's unclear who fired first, but a gun battle ensued that left seven detectives and four town residents dead, including Albert and his brother Lee Felts and Mayor Testerman.

Hatfield and 22 others were put on trial for their role in the Battle of Matewan, but were ultimately acquitted of murder charges.

Local strikes continued, as did violence between strikers and company agents. The following summer, Hatfield and his deputy, Ed Chambers, were charged with shooting at a coal facility. As the two men and their wives ascended the courthouse steps for the trial on Aug. 1, 1921, Hatfield and Chambers were fatally shot by Baldwin-Felts agents.

Miners across the southern coalfields were outraged. Text on the museum wall explains that a week after the shooting, 5,000 miners assembled in the state capital of Charleston. "You have no recourse except to fight," local union

continued on next page

Mine Wars

Continued from previous page

leader Frank Keeney told the crowd. "The only way you can get your rights is with a high-powered rifle."

Later that month, miners began assembling in Kanawha County, aiming to march 50 miles, overthrow the mine guard system, and free workers in Logan County who had been imprisoned under martial law. Logan County Sheriff Don Chafin was firmly on the side of the coal companies. "No armed mob will cross Logan County," he declared, and assembled a force of deputies, mine guards and local volunteers at Blair Mountain along the county line.

After initial skirmishes and a shooting of union sympathizers, tensions boiled over into the Battle of Blair Mountain on Aug. 29. During the fighting, privately hired planes dropped homemade bombs on the miners. Days later, federal troops arrived to suppress the uprising. Federal air power arrived as well, and though the planes never attacked, the museum notes that this was the only time the U.S. government planned to bomb its own citizens. The commanding general declared a ceasefire on Sept. 3, and both state forces and miners began to disband.

At the museum, displays of weapons and spent ammunition underscore the violence of this history. Between 10,000 to 20,000 miners are estimated to have been part of what became known as the Red Neck Army — so named for the red bandanas worn by union miners during the Mine Wars.

After the fighting, 528 people were charged with crimes including treason and murder against the State of West Virginia. Many were acquitted, but some were found guilty. The legal costs and negative publicity took a toll, and state UMWA membership declined dramatically during the remainder of the 1920s. As the museum notes, however, miners ultimately received the rights they sought: "In the 1930s, with Franklin D. Roosevelt's administration,

workers were given the right to bargain collectively and the mine guard system was abolished in West Virginia."

Building on the Past

Pride in Matewan's union history isn't new — the town was placed on the National Historic Register in 1997, and visitors can press a button on the exterior wall near the bullet holes from the infamous shootout and hear an audio recording that features excerpts from oral histories collected from local residents. The Matewan Massacre outdoor drama has performed for more than a decade — often multiple times a year. And a visitor's center, housed within a replica of the town's historic train depot, also discusses the area's past. But the brick-and-mortar museum devoted to the Mine Wars represents a new effort to preserve that history.

The museum's board brings together a diverse group of people, including a local UMWA leader, a Matewan town councilwoman, a retired local teacher, a facilitator, a journalist, historians and the great-grandson of union leader Frank Keeney.

Many of the objects and photographs on display come from local collectors, in particular the museum's Board President Kenny King, who lives near the historic Blair Mountain site. Efforts to preserve the battlefield and prevent surface mining on Blair Mountain have also pitted citizens groups like the Friends of Blair Mountain against the coal industry, and,

at times, the state of West Virginia (see upper right).

"It's a subject that for a variety of reasons has been convenient to forget," says Martin. "And that goes back to the initial participants — many of them would not talk about the events of the mine wars because they still faced potential criminal charges. But it also has been something that at times the state of West Virginia has not wanted to publicize, when they were trying to shed the image of a state that had labor strife in trying to attract new investments."

The museum is also involved with events such as this spring's May Day Matinee at the local union hall, which brought more than 50 attendees to listen to old-time music and watch a recent PBS documentary about the Mine Wars.

"Very much as the [coal] industry is in decline, so are communities," says Elijah Hooker, a Logan County native and museum board member who served as the program fellow in 2015. "I think one of the things that this museum's got going for it, particularly with the events that we hold, is attempting to reestablish that sense of community."

Roughly 2,000 visitors arrived during the museum's first season, and



The museum displays a ribbon memorializing Sid Hatfield and Ed Chambers and a photograph of their widows. Weapons and spent ammunition emphasize the violence of the time period. At left, visitors study a map during the museum's grand opening. Photos courtesy of West Virginia Mine Wars Museum

The Battle to Save Blair Mountain

Decades after the 1921 Battle of Blair Mountain, the effort to conserve the battlefield and the mountain has put the area at the center of another sort of conflict: Alpha Natural Resources and Arch Coal both have permits for surface mining on Blair Mountain.

After years of campaigning by historical and environmental preservation organizations, in 2009 the Blair Mountain Battlefield — a 1600-acre portion of the mountain — was added to the National Register of Historic Places.

Though inclusion on the national register doesn't prohibit mining, it would establish an additional federal hurdle for any mining permits near the battlefield.

The advocates' 2009 victory was short-lived. Just a few months later, the site was delisted "at the urging of coal companies owning land on Blair Mountain," according to a recent court document.

But in April 2016, a federal judge declared that the battlefield had been improperly removed from the register, so the decision is now back in the hands of the Keeper of the National Register of Historic Places.

2016 is off to a strong start. Some, like a British couple that visited on a recent Sunday, make the journey after watching the PBS documentary or the 1987 film "Matewan." Others are tourists drawn to the Tug River Valley by the notorious Hatfield-McCoy feud — there are 12 feud sites nearby, along with an extensive all-terrain vehicle trail network named after the famous families.

School groups come from near and far — one class this spring came all the way from Wisconsin's Carroll University, and board members have presented the story of the Mine Wars to youth across southern West Virginia, in partnership with public schools and the National Parks Service.

According to Martin, volunteer groups performing service in nearby areas often tour the museum and gain a deeper understanding of the region's past and resilience. Many visitors also come from the surrounding area or have family ties to the mine wars.

"It's imperative to teach the generations to come about where they came from locally and how strong that their people are," says McCoy. ♦

Plan Your Visit

When: Museum is open Saturdays and Sundays until October, 12 p.m. to 7 p.m.
Where: 336 Mate St., Matewan, WV
Website: wvminewars.com, see website for details, special events, places to stay and area attractions

Upcoming events include the Aug. 6 unveiling of a miners' memorial exhibit featuring guest speakers, and a Sept. 10 event where area speakers will share stories from their families' experiences with the Mine Wars.



The term "redneck" can be traced back to union miners who showed their allegiance by wearing red bandanas. Photo courtesy of WV Mine Wars Museum

The Changing Nature of Rural Electric Cooperatives in the 21st Century

By Rory McIlmoil, *Appalachian Voices Energy Policy Director*

When people think of their electric utility, they don't usually think about how it operates, or whether it invests in clean energy or could help reduce their energy costs. But this is changing as people struggle to pay their electric bill and as residents grow more concerned about their health, the environment and their local economies.

After more than a century of primarily generating and selling electricity, many utilities are exploring new business models that better respond to customer needs and the changing electricity market. Rural electric cooperatives, which account for 10 percent of all electricity sales in the United States, are leading the pack in changing how they do business.

"Co-ops are looking at the best way to serve their consumers and provide them with a variety of services," said Nelle Hotchkiss of the North Carolina Electric Membership Corp. "It's not just about providing electrons anymore."

That mindset is the driving force behind new energy efficiency and renewable energy programs being developed by electric co-ops across the country. Many of the most prominent examples have been developed in Appalachia and the Southeast. However, co-ops will have to work closely with the communities they serve if these programs are to reach the scale required to have a significant impact on local economies and the environment. Fortunately, that

spirit of cooperation lies at the core of the co-op mission.

Electric Co-ops and America's Energy Future

Rural electric co-ops are not-for-profit electric utilities owned by their customers, who are considered co-op members. Each member owns an equal vote in electing the Board of Directors — the primary decision-making body of the co-op — and therefore have a strong voice in how their utility is operated.

The nation's first rural electric co-op was established in Tacoma, Washington in 1914. Over the next two decades, only eight more electric co-ops were developed, and by the mid-1930s only 10 percent of rural homes had electricity, according to the National Rural Electric Cooperative Association.

Recognizing the need to extend power into rural areas, the federal government encouraged the growth of electric co-ops through a series of initiatives launched in the 1930s. These programs expanded access to the financial resources needed to electrify rural communities, and residents came together and formed their own rural electric co-ops, building the electrical lines and constructing the power plants themselves in some cases.

Today, there are more than 900 electric co-ops serving 42 million people in 47 states. Most co-ops still obtain most of their electricity from large coal, gas and nuclear power plants, which accounts for a lot of the country's carbon emissions and other energy-related



Larry and Deborah Freeman (left) are Roanoke Electric members who benefited from the Upgrade to Save program. Photo courtesy of Roanoke Electric Cooperative. John Kidda, owner of reNew Home Inc (above), performs an energy audit as part of Appalachian Voices' home energy makeover contest in 2015.

pollution. Rural co-op areas also have a higher concentration of older, drafty homes, meaning that more energy is wasted per customer than is for customers of other electric utilities.

Reducing that waste through increasing energy efficiency and developing more renewable energy would have substantial environmental benefits, eliminating millions of tons of carbon emissions each year and cutting down on other air and water pollution. But it would also have a profound impact on families and local economies.

The average poverty rate in co-op service areas, particularly in Appalachia and the Southeast, is often higher than the national average. With costs for electricity higher in rural areas, co-op members ultimately spend a disproportionate amount of their income on their energy bills. This poses a significant burden on low-to-moderate income residents, exacerbating poverty and diverting money away from local economies.

All this means that there is an opportunity for co-ops to rethink how they provide power to rural areas and manage energy demand. Yet not many co-ops have addressed these issues — until recently.

The Changing Electricity Market

"Would you believe that the people in this room, the people in the electrical industry, are a stubborn group of people?" asked Harold DePriest, CEO of the Electric Power Board of Chattanooga and former Chair of the Tennessee Valley Public Power Authority.

"We don't like to change." DePriest was speaking at a meeting with representatives from approximately 155 municipal utilities and rural electric cooperatives in 2013, arguing that the utilities should be doing more for their members and communities. His point was that by offering programs that improve the lives of their customers, the utilities would discover a new way of doing business.

The U.S. electricity market is evolving from the traditional system of large, centralized power plants to a more efficient, distributed, customer-owned model at a pace much quicker than utilities are comfortable with. Following decades of rising electricity demand, sales are now shrinking due to energy efficiency, conservation and consumer-owned renewable energy. But this means that electric utility revenues are also declining.

In response, many rural electric co-ops are exploring new business models that meet the needs of their members while still generating the revenues they need to operate. "Co-ops by their very nature, because they are locally governed and responsive to their members, have the flexibility to be responsive [to new challenges]," Hotchkiss explains. "There is an evolution going on and we're not immune to that, nor should we be. Embracing new opportunities is important."

Many rural electric co-ops in Appalachia and across the Southeast are

continued on next page

Electric Co-ops

Continued from previous page

pursuing renewable energy and energy efficiency programs for their members. A handful of these co-ops are even going beyond energy and playing a more comprehensive role in economic development for their communities.

A Holistic Approach

Marshall Cherry, a native of Bertie County, N.C., has worked with Roanoke Electric Cooperative for 23 years and currently serves as the chief operating officer. "If I'm out in the community and people know me, and know that I work for the co-op, somewhere along the line the conversation does come up about electric bills," he says.

According to Cherry, nearly 7 percent of the average household income in Roanoke Electric's service area is spent on energy costs. This is roughly three times the national average, in an area where many members fall below the poverty line. "So when a member has an electric bill of \$1,000 [for a single month], that is close to or above 40 percent of their income in many situations," Cherry says. To address this problem, the co-op launched Upgrade to \$ave, an on-bill energy efficiency finance program, in June 2015.

With on-bill financing, the electric utility pays for a contractor to make improvements, such as weatherization or more efficient heating and cooling systems, to a customer's home. The resident then repays the utility through a new charge on their bill which is more than offset by the amount they save on their energy bill from the improvements. With Upgrade to \$ave, the customer keeps at least 25 percent of the savings. The remainder goes to Roanoke Electric to repay the cost of the improvements.

Federal Financing

In early 2014 the U.S. Department of Agriculture launched the Energy Efficiency and Conservation Loan Program. So far, the program has announced more than \$60 million in new loan guarantees to electric cooperatives and other utilities to implement on-bill energy efficiency finance and community solar programs to benefit rural areas.

Another new federal program will allow USDA to provide zero-interest loans to rural electric utilities for the utilities to offer on-bill financing to their customers. The Rural Energy Savings Program is expected to be available summer 2016.

In other words, despite an added charge on their bill, nearly all customers start to see an immediate reduction in their electricity costs as a result of the efficiency improvements. Once the utility has been reimbursed, 100 percent of the savings are kept by the customer.

Under this model, eligibility for financing is determined by a customer's bill payment history, not a credit check, and the repayment is attached to the property and not the individual. This allows all residents with good utility bill payment history, including residents of low-income and rental properties to access financing they couldn't obtain elsewhere.

The results expected by Roanoke Electric are impressive. The first group of retrofitted homes are projected to save nearly \$600 a year on their electric bills, even after factoring in the new charge for the upgrades. To fund the program, the co-op received a \$6 million federal loan guarantee to help finance energy improvements on as many as 1,000 homes over four years.

The co-op also saves money by not having to purchase as much power during peak hours when electricity is most expensive. "There is a business case for us because we're more than able to recapture the costs and losses through the financial benefits we receive," says Cherry.

Roanoke Electric is becoming more service-oriented for their members, offering new opportunities like a community solar program, high-speed internet and a workforce training program for energy efficiency contractors, among other programs.

"We're now able to offer a package of services that holistically improves the quality of life for our members," concludes Cherry.

A New Model in Tennessee

Thousands of U.S. residents struggle to pay their electric bills each year, especially in the winter months when heating costs skyrocket. Many residents have to apply for federal funds through the Low-Income Home Energy Assistance Program to keep the electricity on. LIHEAP funding is limited, however, so residents are often competing for assistance.

One resident from Tazewell, Tenn.,

Sean Dunlap — Story of Success

Blue Ridge Electric member Sean Dunlap lives with his wife and two children in a 1938 farm house built by his wife's great-grandfather. Two years ago, the family was struggling with high heating bills and staying warm in the winter. "It was frustrating and expensive," said Dunlap. "Having an infant in a house that gets really, really cold in the wintertime is stressful."

In late 2014, the Dunlap family applied for Appalachian Voices' Home Energy Makeover Contest and

won \$800 worth of insulation and air sealing. According to an analysis by the consulting firm ResiSpeak, those improvements saved the Dunlap's nearly 10 percent on their energy bills in 2015. "We are so thankful for all of the work that was done on our house. We immediately began noticing an improvement in the comfort of our home and saved quite a bit on our heating costs last winter," said Dunlap.

A High Country Energy Solutions employee weatherizes Sean Dunlap's home.



a member of Powell Valley Electric Cooperative, shared her experience with applying for LIHEAP funding. "For years, to get assistance with our electric bills we sat out [by the weatherization assistance agency's building] all night," she recalled. "You had to get there the night before because they only had enough [funding] for so many applications. I would sit there and I would doze off and when I woke I had snow on my blanket."

"The line would go all the way out around the food stamp office and back down the highway," she said.

And while the LIHEAP program

helps families pay their energy bills, it doesn't address the underlying problems of poverty and energy waste in homes. The only other source of funding available, the federal Weatherization Assistance Program, provides just enough funding to weatherize about 800 homes a year in Tennessee — a drop in the bucket compared to what the U.S. Census Bureau identifies as more than 700,000 homes in poverty and 1.2 million homes that are over 35 years old in the state. Even though most Tennessee co-ops and municipal utilities offer energy efficiency loan programs, many

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BUILDING BETTER SPONSORED BY



The Clean Energy Future Starts At Home

To minimize the disruption from climate change, our society needs to transition from a reliance on fossil fuels to clean energy — and quickly. On both a macro scale and at home, the task is straightforward: Reduce energy consumption by increasing efficiency and our production of clean, renewable energy.

You can make this transition at home by following a three-step process for building or retrofitting an energy-efficient house. As we've described in past Sunny Day Homes columns, step one is to create a tight barrier that eliminates or reduces air leakage and heat loss. Step two is to install high-efficiency equipment for heating and cooling, and to replace inefficient appliances with Energy Star-rated appliances. Step three is to produce some or all of your energy with renewable systems such as photovoltaic solar panels, solar thermal, micro-hydro and wind.

At the residential level, solar panels are often the simplest, most cost-effective approach to producing clean, renewable energy. It is fairly easy to find a company

that can do a site assessment and design and install a system for you. Financing is not as straightforward — tax credits and leasing and purchasing rules vary by state, but often nonprofit organizations can help homeowners navigate these options.

Renewable energy is now as cheap as dirty energy for consumers in many states that have "power purchase agreements." These agreements allow a solar company to install panels on a consumer's roof, and the consumer buys electricity directly from the installer. Unfortunately in North Carolina, where Duke Energy has a state-sanctioned monopoly, consumers cannot enter into one of these agreements.

At their most recent shareholder meeting, Duke Energy's CEO Lynn Good defended the company's plan to go 4 percent solar over the next 15 years. Clearly, we have a long way to go to develop momentum towards a clean energy transition. Everyone who owns a home can start now by reducing how much dirty energy they use and increasing the amount of clean energy their home generates.

ABOUT SUNNY DAY HOMES: Sunny Day homes is a small, family-owned general contracting firm that has been incorporated since 1997. They built the first certified green home in North Carolina's High Country in 2008 and have been advocating for non-toxic, environmentally responsible and energy-efficient building ever since. Call/text (828) 964-3419 or visit sunnydayhomesinc.com



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millerjm1@appstate.edu, 828-262-8913



Electric Co-ops

Continued from previous page

residents aren't eligible because they don't own their home or fail to meet the credit requirements.

But thanks to the leadership of a handful of co-ops, a new opportunity is launching this year that will be available for residents of all income levels, as well as renters.

"We see members every month who do not qualify for current energy efficiency programs due to their credit score, yet they are good electric bill payers," says Greg Williams, general manager of Appalachian Electric Cooperative. "We also see every winter members who simply struggle to pay high bills. Helping our members to improve their quality of life is foundational to who we are and that includes helping them lower their electric bill."

A new statewide on-bill finance program — expected to be launched this fall — is a direct result of the efforts of Appalachian Voices, which is the publisher of this newspaper, and of Appalachian Electric Cooperative's commitment to finding new energy solutions for its members. The conversation began three years ago, and generated additional interest from the Tennessee Electric Cooperative Association as well as support from the state Department of Environment and Conservation, the program is expected to launch this fall.

While only Appalachian Electric has committed to the program thus far, as many as 10 of the state's co-ops are expected to participate. Williams hopes to see the program expand even further. "If we could get every co-op in the state to adopt this program, that would be amazing and would create an enormous impact across the state for energy efficiency," he says.

Responding to growing member interest in solar energy, Appalachian Electric is also developing a community solar program that allows members to lease solar panels and earn a credit on their electric bill for the power generated by the panels. In total, the project will cover the energy needs of more than 100 homes. While this is a significant achievement, it represents less than a half percent of the co-op's total membership.

A number of factors are working together to limit the amount of solar that co-ops can develop. As demand for solar from co-op members grows and the price continues to fall, co-ops that want to meet that demand and keep up with the changing market will need to develop new solutions.

"The Utility of Today"

In 2013, Blue Ridge Electric Membership Corp. was one of the first co-ops Appalachian Voices reached out to when advocating for on-bill financing. Blue Ridge Electric is one of the largest electric co-ops serving Appalachia. Following a number of meetings with co-op executives, it became clear that there was only one way they would consider creating such a program.

"They kept telling us they needed to hear from the members," Ashe County, N.C., resident Mary Ruble said in an interview with the national non-profit WeOwnIt. "So we got over 1,000 signatures from co-op members on a petition," she said. "We got publicity. We went to the annual meeting. We made sure they heard from members."

Partnering with Appalachian Voices, Ruble and other community stakeholders expressed their support for an on-bill finance program, and in April of this year Blue Ridge Electric launched the Energy SAVER Loan Program. While renters are not eligible to apply, the program offers affordable loans for member homeowners to pay for energy efficiency improvements such as insulation and new heating systems.

The current pilot program will finance \$100,000 in energy retrofits during the first phase. If the program is successful, the co-op plans to expand it after the first year.

"We're making life better for our members by offering a way for them to be able to afford a more comfortable and efficient home," says Blue Ridge Electric's Energy Efficiency Marketing Manager Jon Jacob. "Even those who don't participate benefit because energy efficiency is integral to helping us keep our rates from going up."

The program isn't the first of its kind to be developed in western North Carolina. French Broad Electric Mem-



Amy Kelly of Appalachian Voices, speaks with a volunteer at a hunger ministry about the burden of high energy costs in Tazewell, Tenn. (left). Mary Ruble (at right), a Blue Ridge Electric member, discusses efficiency with stakeholders at a community meeting.

bership Corp. launched an on-bill financing program in 2013 and has financed nearly \$1 million in new energy efficient heat pumps for its members.

French Broad's Director of Member Services Sam Hutchins got the idea for the program from his own experience with high energy bills. "Several years ago, I received a \$500 December power bill for my double wide [manufactured home] that had an old electric furnace," he says. "I knew I could not afford to continue heating that way. Through internet research I found [high efficiency] heat pumps. If that was the answer for me, I knew it could help others."

These two programs are having an immediate economic impact, not only through saving co-op members money, but by hiring local contractors to make the improvements and install the heating systems.

"On-bill financing for energy efficiency improvements represents our best chance to provide good local jobs and reduce our energy consumption," says Sam Zimmerman, president of Sunny Day Homes and one of Blue Ridge Electric's program contractors as well as an Appalachian Voices supporter. "Brought to scale this program would demonstrate that what helps the environment sometimes helps the economy even more."

Due to rising demand from their members, Blue Ridge Electric is also in the process of developing a community solar project that will generate enough electricity at the start to power about 50 homes. The co-op is also exploring services like integrating battery storage into their grid, providing a rooftop solar option and selling home energy management technologies.

"As part of our changing business model, we have to find ways to fund clean energy projects through other revenue sources," says Jacob. When asked whether Blue Ridge Electric was becoming a "utility of the future," he responded, "It's no longer 'of the future,' but rather 'utility of today.' It's happening now."

Cooperation is the key

Despite the progress made by Appalachian co-ops, the programs are still relatively new and have yet to make a significant dent in reducing energy waste and driving local economic development. Less than one-third of the co-ops serving central Appalachian communities have developed or committed to on-bill finance programs. Even where the programs exist, achieving the level of investment and participation that is possible in the region is proving to be a challenge.

Chris Woolery of the Mountain Association for Community Economic Development coordinates the How\$mart Kentucky on-bill finance program, which launched in 2010 and currently has six participating co-ops. Yet in six years fewer than 500 homes have benefitted. But Woolery has an idea of what's needed to expand that impact. "We want to see energy efficiency as an economic driver in the region," he says. "That requires bringing the community together and creating advocates for this kind of program one household at a time." ♦

Appalachian Voices' Energy Savings for Appalachia campaign is promoting on-bill energy efficiency financing through rural electric cooperatives serving western North Carolina and eastern Tennessee. To learn more visit: AppalachianVoices.org/EnergySavings

Hiking the Highlands

Pink Beds Loop *Wandering through Pisgah Forest*

By Elizabeth E. Payne

On Friday the 13th, I set out to Transylvania County, N.C., to spend the day exploring Pisgah National Forest with my brother. The Pink Beds Loop was rumored to have mountain bogs and plentiful wildflowers, and the hike did not disappoint.

The Pink Beds Valley was named by early settlers for the overwhelming number of rhododendron and mountain laurel blossoms that blanketed the area. According to the U.S. Forest Service website, "the name is more historic than descriptive," since reforestation has changed the balance of the forest and these blooms — while present — no longer dominate the valley.

This area of Pisgah is part of the Cradle of Forestry, where the nation's first school of forestry was founded in the late 1800s. The Forest Discovery Center is just down the road from Pink Beds, and its interactive exhibits bring this history to life.

The Pink Beds Loop is a nearly flat, oval-shaped trail measuring at least five miles. The wide path and orange blaze are easy to follow, although roots and ruts require some attention for footing.

What makes this hike spectacular is that with each twist of the path, the landscape changes dramatically. With



As you begin the loop clockwise, the path passes through tunnels of mountain laurel and rhododendron. Photo by Andrew G. Payne

one turn, the thick understory of tangled mountain laurel and rhododendron gives way to a forest awash in a sea of fern. Around another turn, dogwoods, doghobble, trillium or squawroot will be the treasure that catches your eye. I even spotted a lone gathering of Pink Lady's Slippers.

The marked trailhead is at the far side of the Pink Beds parking lot. Follow the short path across the first small stream to reach the loop.

The trail crosses the South Mills River and its tributaries numerous times, and footbridges and rock-hop crossings make navigating the waterways easy.

Upon reaching the loop, either direction will result in an enjoyable hike. We chose to go left and walked the loop clockwise.

The oval is bisected by another trail, Barnett Branch, which you will first cross after about 1.5 miles. Turning onto Barnett Branch will cut across the center of the oval and make for a shorter hike. But to stay on Pink Beds Loop, follow the orange blaze straight.

At the midpoint of the loop, a side trail leads to the South Mills River gauging station, where there is a parking lot and an alternate trailhead for Pink Beds Loop.

As the path turns back for the return journey, the ground becomes wetter and the river crossings are wider. The path undulates through a carpet of fern, before rising out of the valley to catch glimpses of the mountains in the distance. And everywhere, bird songs provide the soundtrack of the forest.

After another mile, you'll again cross the Barnett Branch path. Follow the orange blaze to remain on Pink Beds. (If taking the loop counterclockwise, the sign marking the Pink Beds Loop may be difficult to spot.)

From here, Barnett Branch and Pink Beds briefly follow the same path, before Barnett Branch turns off across



Pink Beds Loop

Difficulty: Easy to moderate

Details: 5-plus mile loop; muddy in wet weather.

Directions: From Brevard, N.C., take US 64 East. Turn left onto US 276 North for 11 miles. Past the Forest Discovery Center, the Pink Beds Picnic Area is on the right. Enter trail at far right of parking area.

More info: Contact Pisgah Ranger District at 828-877-3265 or visit tinyurl.com/PinkBeds



Newly constructed elevated boardwalks winds through the bog area, which beaver dams have expanded in size. The flame azalea is just one of the many beautiful native plants you'll encounter on this hike. Photos by Andrew G. Payne

an elevated boardwalk through a grove of cinnamon ferns, which were just emerging as fiddleheads on the day we visited. This path is well worth a detour.

As the Pink Beds Loop enters its final mile, we encountered one of the rarest of all Appalachian ecosystems—the swampy oasis known as the Southern Appalachian mountain bog.

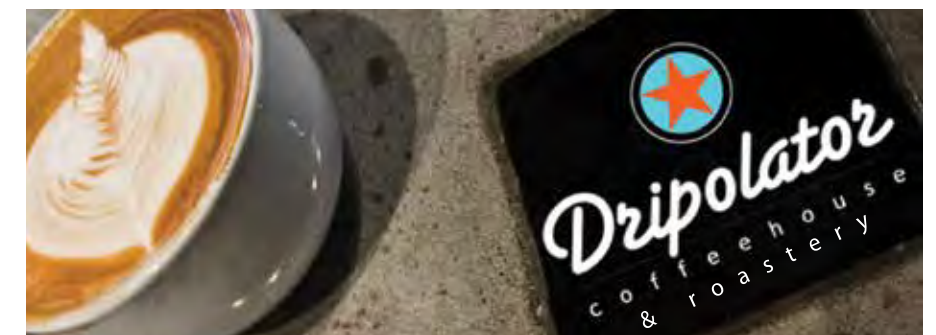
The day we visited was fairly dry, but the area was still teeming with life. Sphagnum moss and tall, grass-like sedge plants abound, nestled beneath pine and maple trees. While I didn't see any, the bog is also home to the threat-

ened swamp pink flower and the carnivorous purple mountain pitcher plant.

Beaver dams have greatly expanded the area submerged by water in the bog, requiring one section of the trail to be shifted to higher ground and another to be crossed by nearly a quarter mile of elevated boardwalk.

A few more stream crossings will bring you to the end of the Pink Beds Loop. Turn left and go past the picnic area to return to the parking lot.

The quiet solitude and diverse wildlife make the Pink Beds Loop a nature lover's dream. ♦



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Virginia big-eared bats are found in isolated colonies in limestone caves across central and southern Appalachia. This bat is endangered largely because of loss of habitat and human disturbance. Photo by Larisa Bishop-Boros

CRITTERS AT RISK

►► Endangered Species and Habitats of Appalachia

By Elizabeth E. Payne

Central and southern Appalachia are renowned for their rich biological diversity. The temperate forests are home to thousands of species of plants and animals, many of which are found nowhere else on earth.

But according to Tierra Curry, a senior scientist for the Center for Biological Diversity, Appalachia is a “unique place where one of the highest biodiversity levels in the world overlaps geographically with some of the most destructive land use practices in the world.”

Part of what makes the Appalachian region so special are its varied

ecosystems, such as the southern Appalachian mountain bog and the high elevation red spruce forest.

“There are species adapted exclusively to our cooler, higher summits, while others spend their entire lives on isolated rock faces deep within river gorges,” Walter Smith, assistant professor of biology at the University of Virginia’s College at Wise, wrote in an email.

According to Smith, the spruce-fir forest is a particularly fragile environment, susceptible to effects of climate change. As temperatures rise, these cold-loving forests retreat farther up the mountain sides and eventually will reach the tops of the mountains and run out of habitat.

These forests are home to the endangered spruce-fir moss spider. According to the U.S. Fish and Wildlife Service, this tiny arachnid measures only 0.1 inches across and its habitat is “restricted to small areas of suitable moss mats on a few scattered rock outcrops and boulders beneath fir trees in the spruce-fir forests.”

Such vulnerable creatures are protected by the Endangered Species Act, which the U.S. Congress passed into law in 1973. Its main purpose was to provide protection for species at risk of becoming extinct and to protect the ecosystems in which they live. The U.S. Fish and Wildlife Service is charged with implementing the act for land-based and freshwater species.

The act expanded previous protections provided to endangered species and allowed plants and invertebrates to be classified as “endangered” or

“threatened.” The law also required federal agencies to conserve endangered species while prohibiting the agencies from damaging the habitats on which those species depend.

States also have an active role in conserving the wildlife within their borders, and the act outlines a framework for this collaboration and established sources of federal funding that continue to help offset the costs of state initiatives.

To list or not to list

The Endangered Species Act can be used to protect — or not protect — very specific classifications of plants and animals, such as subspecies of flying squirrels.

The Carolina northern flying squirrel is federally recognized as endangered and is a rare subspecies of flying squirrel found only at high elevations in western North Carolina, Southwest Virginia and East Tennessee. This nocturnal mammal reaches up to 12 inches in length and glides, rather than flies, on flaps of skin that extend from its outstretched arms. It is primarily threatened by loss of habitat, introduction of foreign pests and expansion of residential and recreational spaces.

But another subspecies — the West Virginia northern flying squirrel — lost its protected status in 2008

continued on page 16



The tiny bog turtle lives in marshes and bogs across the eastern United States. Both the northern and southern populations are threatened with extinction. Photo courtesy of the U.S. Fish and Wildlife Service

BORN to be WILD

►► Wildlife rehabilitation in Appalachia

By Lorelei Goff

A snapping turtle lays in the road, unborn eggs shielded inside her shattered body. A possum gives birth inside a suburban attic. A starving snowy owl wanders far outside its natural range and develops a crippling illness. A mother mallard hatches her ducklings outside a grocery store and tries to lead them across a busy highway.

Though each of these stories ended happily, thanks to wildlife rehabilitators across the region, hu-

manity’s rapid encroachment on wild places is taking a heavy toll.

“Ninety percent of the animals come in because of human involvement,” says Jessie Cole, a wildlife rehabilitator at Rockfish Wildlife Sanctuary in Nelson County, Va. “Humans are leaving an imprint on the earth and, unfortunately, animals sometimes have to pay the consequences for that.”

Animals that become accustomed to feeding on human food or trash are often injured or sickened and they can never be re-wilded.

Dana Dodd, president of the Appalachian Bear Rescue in Townsend, Tenn., says, “Last summer, [Tennessee Wildlife Resources Agency] had to put down a mother bear and four cubs because they had made their living eating trash in Gatlinburg. It’s not the wildlife officers who kill those animals. It’s the people who cause the situation.”

Walking on the Wild Side

Rehabilitators face daunting challenges, including the cost. They operate without state or federal funding, relying on donations to cover expensive veterinary care, antibiotics, fluid therapy, milk replacer and other supplies.

“Each species has to have its own species-specific milk replacer that’s been manufactured in the lab to closely resemble the

mother’s milk,” says Jennifer Crabill, director of the Kentucky Wildlife Center in Lexington. “One 20-pound tub of raccoon milk replacer runs roughly \$200. We go through that in about a week.”

Finding volunteers is another obstacle. “It’s very different from volunteering at a humane society where you’re walking dogs and playing with cats and it’s very fun,” Crabill warns. “Volunteering with a rehabilitation center is very hard work. You get dirty. They’re wild animals so they’re unpredictable and there’s a chance that you’re going to get scratched or bit.”

According to Crabill, relying on volunteers can create its own issues. “Sometimes they decide that they have something else that they would rather do and we end up being short staffed,” she says.

Carlton Burke, a home-based wildlife rehabilitator and freelance naturalist, says tough decisions and a heavy workload also take a toll. “Sometimes you have an animal so severely injured that the animal has to be euthanized,” he says. “Possibly 50 percent or more might not be able

continued on page 17



After their nest was destroyed, Carlton Burke built these baby barn owls a makeshift home out of a plastic garbage can. The parent birds soon returned to care for their owlets. Photo by Carlton S. Burke, Carolina Mountain Naturalists

BE A GOOD NEIGHBOR

Humans can minimize the negative impact we have on our wild neighbors. Make food sources — like pet food, birdseed and trash — inaccessible and keep barbecue grills clean.

Think twice before throwing food scraps along roadsides where animals and birds can be injured or killed by traffic. Don’t place sticky traps where hungry birds can get caught in them, and hang something in large picture windows so birds know they’re there. Open containers of liquid are also dangerous and can drown chipmunks, bats and other small animals.

SALAMANDERS OF APPALACHIA

According to the Smithsonian Conservation Biology Institute in Washington, D.C., more species of salamanders live in the varied altitudes and freshwater ecosystems of Appalachia than anywhere else on earth.

However, populations of amphibians — including many salamanders — are declining rapidly, though the specific causes of this decline are unknown. Factors such as climate change may play a role in the loss of lungless salamanders that breathe through

their skin and are particularly sensitive to water quality, changes in temperature and moisture levels.

In February, the U.S. Forest Service rejected a 10-mile segment of the proposed Atlantic Coast Pipeline — which would carry natural gas from West Virginia to Virginia and North Carolina — in order to protect critical habitats along its route. The habitats of the rare, spotted Cow Knob salamander and the brassy-flecked, threatened Cheat Mountain salamander would have been destroyed.



Along with amphibian species worldwide, Appalachia’s diverse salamander populations are declining. At-risk species include the Cow Knob Salamander (left, photo by Steven David Johnson, stevedavidjohnson.com) and the Cheat Mountain Salamander (right, photo courtesy U.S. Fish and Wildlife Service)



Baby animals must be hand-fed multiple times each day. Here, Barbara Slusar cares for a very young squirrel. Photo courtesy of Rockfish Wildlife Sanctuary



In periods of heavy rains, young waterfowl — such as this Canada Goose gosling — can be separated from their family. Photo courtesy of Rockfish Wildlife Sanctuary



These red fox kits will remain at the rehabilitation center until they are five to six months old and can be released into the wild. Photo courtesy of Rockfish Wildlife Sanctuary

Critters at Risk

Continued from page 14

after the U.S. Fish and Wildlife Service determined that there was no longer a risk of extinction. This decision was challenged in court by Friends of Blackwater, a nonprofit conservation organization, and a U.S. District Court overturned the initial ruling. This flying squirrel was then returned to the endangered species list in 2011. The USFWS appealed this decision and an appellate court ruled in its favor, and in 2013 this subspecies was again removed from the endangered species list.

Central to this case were competing methodologies for estimating the size and health of the flying squirrel population. But each species considered for protected status will bring its own specific circumstances that will need to be debated.

Water is the source of life

The streams of Appalachia are particularly stressed, both Curry and Smith note. "These habitats are really being hit from all angles in terms of threats to biodiversity," Smith wrote in an email. "This includes impairments in water quality from sedimentation, chemical pollution and septic waste, as well as impacts from the historical damming of many rivers across the Appalachian region."

These streams are home to thousands of species whose habitats are now fragmented, shrinking and polluted.

"Water is the source of all life," says Curry. "All of the animals either live in the water, near the water or they drink the water. And the water quality also affects the human community. So,

water is the common thread that ties everything together."

One creature that depends on these streams is the diamond darter. This translucent silver fish buries itself in sandy river bottoms to avoid predators and is recognized by the U.S. Fish and Wildlife Service as one of the most endangered species of fish in the Southeast. This member of the perch family reaches no more than five inches in length and is most active at dawn and dusk.

Poor water quality and sedimentation, as well as the fragmentation of its habitat due to the construction of dams, has severely reduced this darter's numbers. Once found in Kentucky, Ohio, Tennessee and West Virginia, the only surviving diamond darter population is now restricted to the Elk River of West Virginia. And the watershed of the Elk River is affected by such harmful practices as mountaintop removal coal mining, natural gas drilling and timbering, all of which impact water quality and thus further threaten the diamond darter.

Mountain streams are also home to numerous species of endangered freshwater mussels, such as the Appalachian Monkeyface. Now found only in sections of the Powell and Clinch rivers of Virginia and Tennessee, this filter-feeding mollusk is losing its habitat from the construction of dams and is being poisoned by sediments and toxins in the water.

Preserving Appalachian Habitats and Humans

Groups such as the Center for Biological Diversity, a nonprofit organization based in Tucson, Ariz., are work-

CRAWDADS GET RESPECT

The U.S. Fish and Wildlife Service extended protection for two Appalachian crayfish in April. The Big Sandy crayfish is now recognized as threatened and the Guyandotte River crayfish as endangered.

According to a statement from the Center for Biological Diversity, one of the biggest threats to both species is mountaintop removal coal mining because of the pollution and sediment that fill affected streams and rivers. The Big Sandy crayfish lives in eastern Kentucky, Southwest Virginia and southern West Virginia. The Guyandotte River crayfish's habitat has shrunk to a single river basin in southern West Virginia.

Citizen groups hope to redirect the route of the proposed Mountain Valley Pipeline to protect three other species of rare crayfish. The USFWS is considering one species, the Elk River crayfish, for endangered status. Scientists have just recently discovered the other two species.



The Big Sandy crayfish is one of two Appalachian crayfish now protected under the Endangered Species Act. Photo by Guenter Schuster

ing hard to expand federal protection to as many endangered and threatened species as possible. While the group continues to petition the U.S. Fish and Wildlife Service to have new species considered for protection, a 2011 settlement with the agency is also ensuring that decisions are being made about the status of species that have been on the agency's candidate list, sometimes for many years.

According to Curry, a scientist with the organization, there's a correlation between helping endangered species and helping the human populations around them.

"The things that threaten the endangered species also threaten the health and wellbeing of the hu-

man communities," says Curry. "It's really frustrating to me, as a native Appalachian, that we can't petition directly to protect the people who are threatened by the same factors. ... Protection for the species' habitat is also going to directly benefit the people who live there."

Efforts to preserve the wild creatures and places of Appalachia help preserve what makes the region so special.

"These organisms and habitats rank right up there with our region's culture, music, and human heritage," wrote Walter Smith. "It's equally crucial that we preserve our natural heritage alongside our way of life." ♦

Born to be Wild

Continued from page 15

to ever go back out to the wild. That's just the reality of wildlife rehabilitation.

"A lot of wildlife rehabilitators get burned out," Burke continues. "It's very frustrating because of all the calls you get and you just can't take care of them all. We need more rehabilitators and facilities to spread the work around a little better."

When Love Hurts

Another frustration for rehabilitators is that many calls they receive are for orphaned birds and animals that are mistakenly kidnapped by well-intentioned humans.

"This is very common with rabbits and deer," says Crabill. "In the wild, mother rabbits and mother deer have a very strong scent that attracts predators. The babies have no scent whatsoever. The mother only comes back to feed the babies and stays away the rest of the time so as not to attract a predator."

According to Crabill, trying to raise an orphaned bird or animal, which is illegal in most states without the proper permits for rehabilitation or education, is a bad idea. Each species must maintain a specific body temperature and requires special milk and foods. If fed improperly or with the wrong kind of nipple, the babies can develop pneumonia or even drown. Sometimes rescued animals need intravenous fluids and antibiotics.

Even if an orphan survives, making a pet out of wildlife and later abandoning it when it becomes too difficult to handle is essentially giving that animal a death sentence.

"It would be like taking an 8- or 10-year-old child out of their home, driving them to the middle of New



York City, [and] dropping them off," says Cabrill.

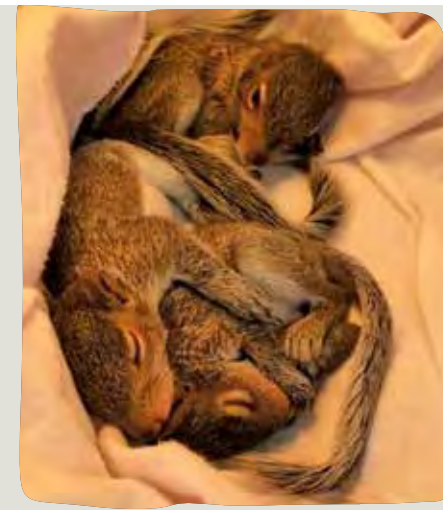
An animal is considered unreleasable once it bonds with humans and depends on them for food. Jesse Cole of Rockfish Wildlife Sanctuary tells a story of a raccoon named Bob that was kept as a pet for 10 years. Often, such an unreleasable animal would be euthanized, but Bob was lucky. The sanctuary had a space for an educational animal available.

"When Bob arrived, he was about three times the size of a normal raccoon. He was fed a diet of chicken McNuggets and marshmallows, just candy and junk food," says Cole. "So he came to us extremely obese. His hair was falling out because of his improper diet. He was depressed."

Bob is slowly beginning to make progress after two months at the sanctuary, but Cole doesn't know if Bob will ever be able to bond with another raccoon, even in captivity.

If You Love Somebody, Set Them Free

Rehabilitators do what they do so animals can remain free and fill their place in the web of life. While every



This young raccoon (left) has a condition called leucism that affects its coloring. Animal rehabilitators care for a diverse range of animals, including these three infant squirrels (right). Photos courtesy of Kentucky Wildlife Center, Inc.

by the incredibly loud hissing of the terrified babies, and was saddened to realize that a couple more of them would have to be euthanized because of their injuries.

"I was determined to try to save the remaining two and get them back to the parents if at all possible," says Burke.

Instead of taking them into captivity, hand-raising them and then trying to teach them to hunt and release them back into the wild, Burke devised a makeshift nest out of a large plastic trash can, put it back in the same tree and placed the fuzzy, hissing owlets inside. The parents came back and took care of them even though it wasn't the original nest.

Burke observed the baby owls' progress with trail cameras. Several weeks later the two fledged and flew off to take their places in the wild.

"It's pretty gratifying to know that you stepped in and did something, and what you thought would work, actually did work," he says. ♦

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Shift Leader Tessa Lube leads an educational program in which she introduces a group of children to a young opossum. Photo courtesy of Kentucky Wildlife Center

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A Magical Mycology Tapestry

Mushrooms Weave a Network of Ecology, Medicine, Food and Farming

By Eliza Laubach

Encountering a mushroom in the forest provides a glimpse to a web that is largely unseen, underground. The mushroom is a fruiting body that emerges from a network of branching mycelium, a cellular structure interwoven in soil. This mass thrives by connecting to other organisms, especially the roots of trees and plants.

The Appalachian mountains boast a wide diversity of fungi, the collective term for mushroom and mycelium. Fungi reach their highest diversity in the southern part of the mountain range, according to the Highlander Biological Center, and scientists estimate that only 2,300 of as many as 20,000 species have been identified there.

Often, a mushroom patch represents a single organism. The subterranean net of mycelium can be large and long-lived, and “the mushrooms are just ephemeral, passing creatures,” says Dr. John Walker, a mycology professor at Appalachian State University. Walker studies fungi and their ecological relationship to roots.

Nearly 90 percent of plants form a special relationship to fungi in natural areas. One type of fungi, called mycorrhizae, attach to plant roots, providing food and water to the plants and receiving sugars in return. This symbiosis connects an ecosystem’s extensive root and mycelium networks, and it can actually affect plant ecology in a habitat, such as a rhododendron thicket.

A study Walker conducted found that native rhododendrons interact with

a specific species of mycorrhizae, and this can suppress tree seedlings, thereby giving the rhododendron an advantage to flourish. The shrubs decrease light and develop a pervasive root mat, strong factors that, combined with human-caused ecological changes, have led to rhododendron thickets increasing in amount throughout southern Appalachia.

These mountains encompass microclimates ranging from the second-highest amount of rainfall in the country to the least amount of rainfall east of the Mississippi. Given the steep elevation changes, various ecosystems are found in mountain hollers that host multitudes of fungi and soil types from creek to ridge, explains Chris Parker, owner of Asheville Fungi, a company that cultivates, sells and educates about all things mycology.

Mushroom medicine

After years of paying attention, Parker now recognizes how patterns of certain plants in an area to easily find and identify mushrooms in the wild. He was trained to see these patterns early on by Cherokee elders on his father’s side. When Parker learned that his great-grandmother died from a hip injury she sustained while mushroom hunting, he



Alan Muskat admires a cluster of *Laetiporus sulphureus*, mango-colored mushrooms also known as chicken of the woods. Muskat has turned his love of foraging into a small business in Asheville, N.C. Photo courtesy of No Taste Like Home

started asking questions.

He learned that the Cherokee used mushrooms not just for food, but also medicine. But within what Parker calls a “present fragmented healthcare system,” he fears many healing ways are being lost.

Scientific research backs what snippets he has uncovered, however, and reinforces folklore around the peculiar, white-fringed lion’s mane mushroom.

Something as simple as a name can hold great knowledge. For instance, the Eastern Cherokee word for lion’s mane mushroom is wahuhi, a general reference to the owl — a cross-cultural totem for wisdom. Lion’s mane mushrooms have been extensively studied for their positive effects on brain health, according to an article published in 2013 in the *Journal of Traditional and Complementary Medicine*.

Since high school, Parker has devoted his life to mushrooms. He propagates medicinal and edible mushroom mycelium to spread healing through his community in Western North

Carolina. He built a cultivation lab from scratch and earns his living teaching workshops about at-home cultivation and selling various products to help people grow their own mushrooms. He also sells foraged and cultivated mushrooms at local farmers markets.

One of his most sought-after offerings is *Ganoderma tsugae*, a reishi mushroom native to Appalachia that specifically grows on the Eastern hemlock tree as it is dying. Throughout Appalachia, an invasive pest, the woolly adelgid, is attacking the great hemlocks, and *Ganoderma tsugae* is abundant. An Asian species of reishi has been revered for centuries in China, and both species are excellent at reducing inflammation and balance the immune system, says Parker. In his experience, the hemlock reishi works better for women.

“What a gift that all these hemlocks are dying, and they provide a gift of female energy to the bioregion,” says Parker. He is inspired by fungi’s basic nature: decomposition, relaying healing power of transformation and rebirth, and embodying change by thriving on ecological edges, such as a riverbank, a log or the border of a forest.

Embodying change within and without

The potential that mushrooms have to bring change to Appalachia is a huge opportunity, says Brad Cochran, agent at the West Virginia State University Extension office. Cochran has spent the past five years educating interested farmers and landowners about mushroom farming. He also conducts research on how to successfully weave the practice into the local food movement. He experiments with innovative ways to grow mushrooms on logs, such as in high tunnel greenhouses and even underground — one project is located inside an abandoned underground coal mine.

“We’re not afraid to think outside the box and find some potential for local foods and West Virginia’s economy,” says Cochran. He has taught at least 200 people about small-scale mushroom farming, with special interest from former tobacco

continued on next page

Magical Mycology

Continued from previous page

farmers and those who are looking to cultivate a non-timber forest product.

“It’s a very hands-off form of growing that is very profit heavy,” says Cochran. “People are really jumping into it.” While the economic benefits are slow to arrive, as it takes a few seasons for the fungi to establish a strong mycelium for full fruiting production, many mushroom farmers he has taught are approaching that mark.

Cities provide a substantial market for edible mushrooms at restaurants and farmers markets, but in rural Appalachia, the economy is often not strong enough to support demand for higher-priced fungal delicacies. Some farmers try to increase their impact on an individual scale, says Cochran, like West Virginia mushroom farmer Susan Maslowski, who has a recipe section in her local paper.

Others, like Billy Webb of Sheltoewe Farm in eastern Kentucky, rely on the consistent market at high-end restaurants in cities. Webb started mushroom farming in 2001, and by 2006 had the largest natural shiitake log operation in the United States. Drastic droughts in



Honey mushrooms form as parasites on hardwood trees. Their underground mycelia can be long-lived and immense. Photo courtesy of No Taste Like Home

2007 and 2008 forced Webb to move his production indoors, which also allows him to cultivate year-round, but he still struggles with his farm’s resilience.

The barriers Webb has faced have given him a cynical yet practical outlook on the economic potential mushroom farming holds. “If you’re in a poverty level area, people eat on a budget,” says Webb. A lack of demand at local markets has led him to sell direct to restaurants in Lexington, Ky., Louisville, Ky., and Cincinnati, Ohio.

Webb sees the future of mushroom forest farming in Appalachia as being reliant on regional distribution hubs, with transportation and storage infra-



Foraging for mushrooms can be dangerous since many varieties are poisonous. So, be sure to learn from an expert before collecting mushrooms yourself. Photos by James M. Davidson

structure being necessary for highly perishable mushrooms. “We want a project that will bring money back into this impoverished area,” he says.

The West Virginia State University Extension office is conducting such a project, now in its second year. Four eight-foot box trailers modified into massive refrigerators will be placed regionally and then travel to local farms to pick up fresh produce, and then back to a regional hub for distribution.

Also, diversification of both crops and enterprise will bring success to those who farm mushrooms, says Webb. “There are many aspects in the culture that will have to change: people willing to produce it, a market for it, distribution hubs,” says Webb. “It’s not going to happen overnight.”

Alan Muskat, a wild forager and

mycology devotee, sees mushrooms as being a gateway into deeper ecological awareness, helping the unlearned explorer see the forest as more than just a “green wall” of plants. He leads groups foraging in the forests in and around Asheville, N.C., and then brings the adventure to local restaurants, where experienced chefs craft his finds into delightful wild cuisine. The contentment Muskat feels when he is foraging for wild food has inspired his entrepreneurial business, No Taste Like Home.

“Getting into mushrooms was all about free food — the treasure hunt,” says Muskat. “The mythical garden of Eden is very real for me.”

Muskat works with the state to set standards for selling wild foraged mushrooms to restaurants, as the legality of the practice is currently murky at best. Along with mushrooms’ strong economic hook, he is also passionate about working with mycelium as part of fostering climate resilience skills, namely food security and conservation. He teaches youth about wild foraging and is excited about more people looking toward farming mushrooms to make income from large tracts of land without deforesting it.

“We think we’re separate, but we’re not. We’re just like mushrooms, all connected to Earth,” says Muskat. ♦

Fungus Among Us

IMPORTANT NOTE: Many edible mushrooms have poisonous look-alikes, and consuming misidentified mushrooms can lead to illness or death.



Photo by Gzirk via Wikimedia Commons

Morel: a fine edible mushroom with a coral-like cap. Found in early spring in recently burned areas, on/around dying trees.



Photo by Pethan via Dutch Wikipedia

Maitake: an edible mushroom with medicinal properties. Found on roots of dying/dead oaks in late summer to late fall.



Photo by Daniel Neal via Wikimedia Commons

Oyster: an edible mushroom that tastes like its maritime namesake, found nearly year-round on hardwood trees.



Photo by Strobilomyces via Wikimedia Commons

Chanterelle: bright orange, small, fan-like edible mushroom with apricot smell, found in late summer on dying trees.

Filtering Water with Fungi

In the town of Mars Hill, N.C., hydrologist Tim Ormond helped design a pilot project that used fungi to break down toxins in stormwater and agricultural runoff. Known as mycoremediation, the project is a type of bioremediation, a practice that uses microorganisms or plants to help filter pollutants from municipal and agricultural

runoff. This project attempted to use the mycelium network to break down and sequester toxins. The results were inconsistent, and Ormond suggests that future mycoremediation project designers could redesign the system to more holistically mimic the way the natural environment would use mycelium to filter water.

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The Miracle of Harvest

Meadowview Restaurant and Farm

Focuses on Local Foods and Community

By Eric J. Wallace

After co-authoring 2007's wildly successful New York Times best-seller, *Animal, Vegetable, Miracle* with his wife, Barbara Kingsolver, Steven Hopp got an idea: What if he used his portion of the profits to open a farm-to-table restaurant?

However, for many, Hopp's 2008 decision to found Harvest Table Restaurant in the tiny southwest Virginia town of Meadowview seemed ludicrous. The area's population totaled 967 and had a per-capita income of around \$15,700.

'Why would anyone open a gourmet seasonal restaurant here?' scoffed Hopp's critics. 'It will have no clientele. The idea is naive. Foolhardy. And doomed.'

But Hopp thought differently. By considering the venture in terms of traditional, profit-motivated business models, detractors all but missed the point. Indeed, Hopp believed the true riddle was how to maximize a business's positive impact on its community.

Turning a 'Miracle' into Reality

For Hopp, a professor of environmental science at Emory and Henry University, the notion seemed a logical outgrowth of *Miracle*. After all, the book had, at its heart, been about the Hopp-Kingsolver family's year-long journey to eat and drink as locally sourced and seasonally specific as possible. As co-authors, while Kingsolver dramatized

their day-to-day adventures, Hopp placed them in a larger context. Using the family's individual struggles as a point of departure, Hopp wrote about America's problematic eating habits.

Among the socio-environmental issues he took on were the problems of processed foods, genetically modified ingredients, shipping procedures that carry products thousands of miles via fossil fuels, the overuse of artificial fertilizers and pesticides, inhumane factory farming methods, and the disappearance of the family farmer, just to name a few.

"The story about our experiment to eat in-season, locally grown foods became more than just our story," explains Hopp. "Thousands of folks responded, telling us of their efforts to reclaim a healthier food culture — they found their local farmers' market, raised chickens and planted gardens. [Miracle] helped inspire individuals, families and communities to be involved in local food movements."

Considered from such a vantage, opening a restaurant based on principles outlined in *Miracle* made perfect sense. It was simply the next phase of the project.

"The experiment started when we realized we could do something for [our little] town of Meadowview," says Hopp. "Clearly we needed jobs. However, we needed jobs that created



"We're having a lot of fun, and we're healing the earth in the process," says Steven Hopp, founder of Harvest Table Restaurant. Photo courtesy of 621studios.com

a deeper sense of community."

Hopp hypothesized that if you create a business that maximizes local and regional participation, this will in turn bolster the community's overall well-being.

Present the notion to many accountants and they will laugh in your face, decrying your thinking as, economically speaking, a loser's bet. And likely they would be right. But in Hopp's case, with financial backing provided by *Miracle*, while he wanted the business to be financially viable, he was ultimately chasing a different kind of profit.

"A sustainable and socially responsible business has three cornerstones: Financial, environmental and social," explains Hopp. "For us, the latter was the most important... We believed if we made the restaurant a model for sustainable principles, it would effect a kind of paradigm shift for the community at large."

Determined to test the hypothesis, Hopp bought and renovated a big building in the center of Meadowview's dilapidated, .1-mile strip of a downtown that had once been a booming railway and textile hub. He convinced his long-time friend, protégé and farm-to-table mastermind Phillip Newton to man the kitchen, and promptly set to work.

Within a few short months of opening, Hopp and Newton had discovered nearly 50 local farms from which to purchase sustainably raised ingredients. They devised an impressive menu of Virginia-made wines, ciders and beer. Eventually, beyond free-trade coffee, South Carolina-produced rice, North

Carolina seafood, organically grown Florida lemons and some spirits, Harvest Table was sourcing 90 percent of its items within a 100-mile radius.

"We quickly got to know our area producers," says Hopp. "While we couldn't buy every last heirloom tomato grown in the county, if someone was producing celery in October, we'd buy every last bit of it. It was a learning experience for [everyone]."

It didn't take long for relationships to form. Growers began phoning Newton before planting the season's vegetables. Expert foragers would stop in and peddle what they'd found. Farms were upgrading their infrastructure and purchasing additional heritage breed livestock to meet the restaurant's demand for organic, sustainably raised meats.

In short, the project was working. However, Hopp and Newton weren't done.

With sky-high culinary ambitions — "We wanted our food to taste as good as anywhere in the U.S.," says Hopp. "That was one of our major goals." — there remained specialty ingredients that weren't getting produced. For farmers with the know-how to pull it off, the labor demands of raising small batches of specialty vegetables, herbs and spices didn't make economic sense.

So in early 2010, Hopp purchased a 4.5 acre tract of property adjacent to his and Kingsolver's homestead and hired Appalachian State University agro-ecology and sustainable development gradu-

continued on next page

Miracle of Harvest

Continued from previous page

ate Samantha Eubanks, charging her with the task of transforming the property into a world-class vegetable farm.

"Bringing on Sam allowed me to focus on the kitchen," says Newton.

Beyond managing the farm and, as Newton and Hopp call it, 'growing to the gaps,' Eubanks took on sourcing duties and became Harvest Table's insider within the local and regional farming community. In this manner, she was able to avoid growing what other farmers were already producing.

"A lot of my job is working with our suppliers to keep us all on the same page," says Eubanks. "I coordinate with Phillip to make sure that everyone's growing their share of what's needed now and anticipating what'll be needed in the future."

Overall, the strategy has worked. Within seven years of opening, the number of partnering farms and artisans has blossomed to nearly 100. Taste-wise, by 2011 the buzz was so audible it attracted a New York Times food writer, who subsequently described the restaurant as a place that would be "an instant hit in a progressive, urban enclave like Brooklyn or Berkeley, California."

Growing Beyond the Table

Devoted to spreading the gospel of sustainability through participatory education, Hopp began expanding his operations. He and Eubanks tapped into the World Wide Opportunities for Organic Farms network and partnered with Appalachian State to offer farming internships. They reached out to area public school systems, coordinating guided field-trips to the farm, and partnered with the Old Glade Antique Tractor Association, the city of Abingdon and White's Mill to grow and mill heirloom corn varieties.

Harvest Table Farm gathered wood chips for mulch from state road crews, and collected nitrogen-leaching manure from local cattle and poultry operations to add to the wood chips for compost. And they spearheaded an effort to open a collective canning kitchen accessible to area growers.

As a board member of the Abingdon-based regional nonprofit Appalachian Sustainable Development, Hopp also

offered keen insight into the organization's 2012 initiative to create an online listing through which farmers could sell produce to regional restaurants.

Most recently, he and Eubanks partnered with the local 4-H club. "Basically we taught the kids how to grow broccoli using sustainable methods," says Hopp. "We provided them with a template and instruction and then committed to helping them sell their crop."

The idea was to show kids that money can be made growing more than hay and cattle.

"They got to sell produce to stores and restaurants, [which] got them excited," says Hopp. "They could see this was a viable career path."

The Farmers Guild General Store, a two-story cooperative retail outlet adjacent to Harvest Table, features the work of over 200 local artists and artisans, including hand-carved chess boards, home-spun wools, paintings, photographs, books, hand-blown glass ornaments, soaps, jams, furniture, jewelry, earthenware and myriad other items. All are exquisite, locally produced and definitely for sale.

By combining the storefront with the restaurant, Hopp is able to provide talented local artisans with a sales platform.

With an estimated 40 percent of Harvest Table's customers streaming in from nearby arts presentations in Abingdon, Trip Advisor recommendations, or articles like this one, the benefits to the community are substantial. And the fact that the restaurant has been named by both Virginia Living and Blue Ridge Outdoors Magazine as the state and region's "greenest" restaurant has certainly helped.

"When someone visits we want them to have a good time and be amazed by the food," says Hopp. "We want them to access the community experience. Which, I think, is why we have so much repeat business. That's what keeps them coming back."

In the end, while Hopp is quick to point out the project is not making anyone rich fast, he says the farm, restaurant and Guild are putting money in



Harvest Table's menu features well-crafted standards like stone-oven pizzas, pasture-raised meats, and vegetarian and vegan offerings. Nothing is fresher than a bite picked from the Tasting Garden, which is located along the patio in back of the restaurant and is available to patrons. Photos courtesy of 621studios.com

the pockets of over 300 individuals and families. The overall result, he asserts, is a net positive for the community.

"When you shop at a big-box store, 90 cents on the dollar leaves the community," says Hopp. "Here, 85 cents of every dollar is going back into the town. A substantial share of that money comes from non-local sources ... In just eight years we've put upwards of \$1 million back into the local economy."

Meanwhile, according to Hopp, everyone involved is learning a little some-

thing about sustainable agriculture.

"We're touching tons of people," he says. "Hundreds and hundreds of farmers have altered their perceptions. Children and diners are learning about environmentally responsible agriculture. We're having a lot of fun, and we're healing the earth in the process."

And all of this has been made possible simply by believing in local foods. Isn't it amazing what a meal can do?

To find more information, visit harvesttablerestaurant.com ♦

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The Path of Most Resistance

Renewable energy is here to stay. But utility pushback and state policy battles could determine who has access to cleaner power.

By Brian Sewell

Last December, Congress supercharged America's already-booming solar industry when it extended federal tax credits for commercial and residential projects. The boost is expected to nearly double the total amount of solar installed — and the number of solar jobs — in the United States by 2021.

With federal incentives locked-in for the next five years, battles for the future of clean energy are heating up in dozens of states. Across the country, electric utilities are fighting to maintain monopoly control in the face of increasing power generation from distributed resources like rooftop solar or small wind projects that produce electricity near the point of consumption.

In many states, though, clean energy has built a constituency. Where the solar industry is well-established, it supports thousands of jobs and has the backing of a committed customer base that is calling for access to renewable power — for all.

Distributed Disputes

Pick any state on the map and there's likely a battle related to residential solar already underway. Take West Virginia, where lawmakers approved changes last year to net metering, a policy that allows utility customers with their own solar installations to offset the cost of power they draw from the grid with power they produce.

In March 2015, Gov. Earl Ray Tomblin vetoed a bill directing the state Public Service Commission to investigate utilities' most common argument against net metering: that, as more homeowners go solar and save money, eventually customers without solar will be forced to pay more.

But groups including The Alliance for Solar Choice and WV SUN claimed the bill's vague language could lead to fees and even punitive charges on West Virginians that already have solar. Two weeks after vetoing the original bill, Gov. Tomblin signed a revised version into law that also instructs the commission to consider the potential upsides of net metering.

Several state commissions are way ahead of West Virginia's and have already concluded that the benefits of net metering are both vast and shared. In 2014, the Mississippi Public Services Commission found that net metering promotes energy security and takes pressure off the state's power plants during periods of high energy demand.

A similar study conducted for the Maine Public Utilities Commission in 2015 valued electricity generated by distributed solar at 33 cents per kilowatt



Citizens are calling on their power companies to increase access to renewable energy in creative ways. Appalachian Power Company customers attend a grassroots meeting to oppose extra charges and size limits on solar in Virginia. Photo by Hannah Wiegard. A solar project designed to test North Carolina's ban on third-party electricity sales catches some rays on the roof of a Greensboro church. Photo courtesy of NC WARN.



hour, compared to 13 cents per kilowatt hour, the average retail price of electricity in the state. The higher value accounts for benefits to customers with or without solar such as reductions in air and climate pollution.

Overall, a recent analysis by North Carolina State University's Clean Energy Technology Center found that changes to net metering policies or the valuation of distributed solar were considered or enacted in 46 states last year alone. Many of those stemmed from utility-led efforts to thwart solar that are unlikely to let up.

The American Legislative Exchange Council, an organization of industry groups and state lawmakers that drafts model legislation, has resolved to change state net metering policies. In its 2016 corporate goals, the Edison Electric Institute, an association of investor-owned electric utilities that funds ALEC and helped draft the resolution, calls on power companies to continue pushing back against distributed generation.

Some utilities that have lobbied to impede distributed solar are also pushing to keep uneconomical power plants online. In March, FirstEnergy and American Electric Power, which have pushed for changes to net metering in West Virginia and other states, won approval from Ohio regulators to raise rates to keep seven aging coal plants and one nuclear plant operating until 2024,

despite being uncompetitive in interstate electricity markets. Research by the Institute for Energy Economics and Financial Analysis indicates the plan could cost ratepayers more than \$4 billion.

Tug-of-War Tests Laws

More than any other state in the Southeast, North Carolina has emerged as a national solar leader, especially when it comes to utility-scale solar farms. Between 2007 and 2015, nearly \$6 billion was invested in clean energy development in the state. Last year, North Carolina added 1,134 megawatts of solar capacity, second only to California.

State tax credits for solar projects and a standard requiring utilities to meet a portion of electricity demand with renewables have made the state a model of solar success. But some North Carolina policymakers want to take a different path. Lawmakers let the state's solar tax credit expire at the end of 2015.

After an attempt in the state legislature last year to weaken the state's Renewable Energy Portfolio Standard, solar advocates are doubling down to communicate the benefits clean energy provides to residents.

"We learned that there is a lot of misinformation surrounding the solar industry and the clean energy industry as a whole," says Maggie Clark, Interim Director of Government Affairs of the

continued on next page

Most Resistance

Continued from previous page

N.C. Sustainable Energy Association. "It is falsely assumed that the [renewable energy standard] is a cost to ratepayers."

According to the North Carolina-based research institute RTI International, energy costs are lower today than they would have been if the state continued to rely entirely on conventional power sources. Researchers estimate investments in renewables and energy efficiency to comply with the renewable standard will generate \$651 million in savings for ratepayers between 2008 and 2029.

Even Jim Rogers, who was CEO of Duke Energy in 2007 when the company helped craft the standard, called out the policymakers pushing to weaken it.

"They are not focused on the future," Rogers said last year during a speech at the Charlotte Business Journal's Energy Inc. Summit. "They are focused on the past."

Companies including New Belgium Brewing and Mars, Inc., sent a letter to lawmakers opposing the effort because the renewable standard gave "companies like ours the business case to build and operate in North Carolina." Apple, Google and Facebook, which have data centers in the state, warned legislators in another letter that freezing the standard would "risk undermining the state's almost decade-long commitment to renewable power and energy efficiency."

The renewable standard survived due to a groundswell of public attention and support from a broad range of stakeholders. But now a different fight

is pitting companies and communities that want easier access to affordable solar against Duke Energy.

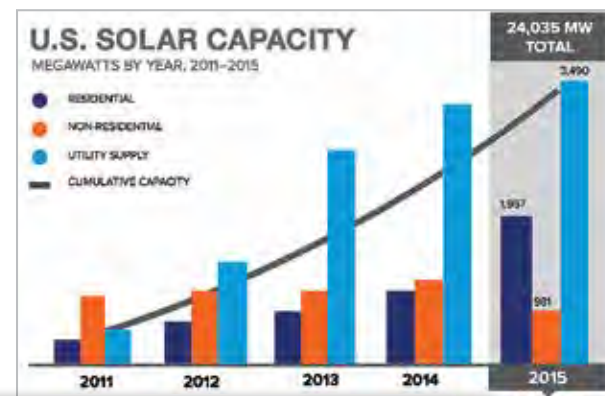
In April, the North Carolina Utilities Commission shot down an experimental solar project set up on a Greensboro church to test the legality of third-party electricity sales. North Carolina is one of only four states in the country with a ban on third-party sales, which allow energy producers other than utilities to compete in the clean energy marketplace. Duke Energy operates in three of those states.

NC WARN, the Durham-based advocacy group behind the test project, appealed the commission's ruling in May and disputed the idea that North Carolina is a leader on solar when it lacks policies to promote commercial and residential installations.

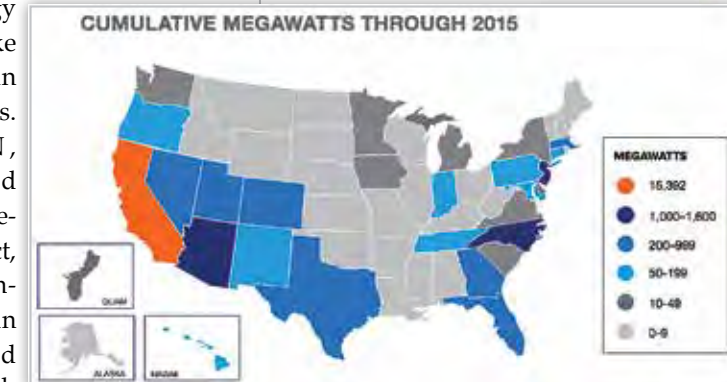
Standby for Solar

Unlike North Carolina, the solar market in Virginia has sat idle for years. The commonwealth has about the same potential for solar as its southern neighbor, but lacks a mandatory renewable portfolio standard and never enacted state tax credits to bolster clean energy investments.

An April report by the Center for Biological Diversity gave Virginia — among other southeastern states including Alabama, Georgia and Tennessee — an "F" on policies to help residents access solar.



Solar power is one of the fastest growing energy sources in the United States. But due to a patchwork of regulations, the total amount of solar capacity installed varies widely by state and sector. Illustration courtesy of the Smart Electric Power Alliance.



Since currently only a handful of the utilities' customers have systems that size, Main argues the extra fees are intended to discourage the residential solar market rather than protect ratepayers. And, like utility arguments against net metering, the charges ignore the benefits of distributed resources.

"[Distributed generation] is being done with private investment, but it is a tremendous public service," Main says.

As Duke Energy and Dominion restrict access to solar, they're making the case to utility regulators — and ratepayers — that building the \$5 billion Atlantic Coast Pipeline to transport natural gas is a must to maintain reliability and meet growing electricity demand. The two utilities will own a majority stake in the project, but if anticipated demand for natural gas does not materialize, their customers will still be on the hook to pay for the pipeline.

"We're seeing a clash of visions," says Main. "It's going to take a lot of public pressure to expand access to clean energy and make sure we're not locked into fossil fuels for the next 30 years." ♦

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114 TH CONGRESS: Below are recent congressional bills and amendments on environmental issues and how central and southern Appalachian representatives voted. To see other recent votes, or for congressional representatives outside of the five-state area, visit congress.gov. ● = pro-environment vote ✗ = anti-environment vote ○ = no vote	Kentucky		Tennessee		North Carolina		Virginia		West Virginia							
HOUSE	T. Massie (R) KY-04	H. Rogers (R) KY-05	A. Barr (R) KY-06	P. Roe (R) TN-01	J. Duncan (R) TN-02	Fleischman (R) TN-03	S. Desjardais (R) TN-04	V. Foxx (R) NC-05	P. McHenry (R) NC-10	M. Meadows (R) NC-11	R. Hurt (R) VA-05	B. Goodlatte (R) VA-06	M. Griffith (R) VA-09	D. McKinley (R) WV-01	A. Mooney (R) WV-02	E. Jenkins (R) WV-03
H.R. 897 , the Zika Vector Control Act, would allow direct pesticide applications to navigable waters without a Clean Water Act permit. Agencies responsible for preventing vector-borne diseases already have the ability to apply pesticides without a permit in emergency situations. 258 AYES 156 NOES 19 NV PASSED	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Amendment 1090 to H.R. 5055 , the Energy and Water Development and Related Agencies Appropriations Act, would cut \$50 million from the federal government's Energy Efficiency and Renewable Energy Program and boost the Fossil Energy Research and Development Program by \$45 million. 182 AYES 236 NOES 15 NV FAILED	✗	✗	✗	✗	✗	●	✗	●	✗	✗	✗	✗	✗	✗	✗	✗
SENATE	M. McConnell (R)	R. Paul (R)	L. Alexander (R)	B. Corker (R)	R. Burr (R)	T. Tillis (R)	T. Kaine (D)	M. Warner (D)	J. Manchin (D)	S. M. Capito (R)						
Amendment 3202 to S.2012 , the Energy Policy Modernization Act, would ensure that mortgages reflect a home's expected energy costs to reduce consumption and create energy-efficiency retrofit and construction jobs. 66 YEA 31 NAY 3 NV PASSED	✗	✗	●	✗	●	●	●	●	●	●	●	●	●	●	●	●
Amendment 3312 to S.2012 , the Energy Policy Modernization Act, would require the Secretary of the Treasury to propose a plan for Clean Energy Victory Bonds to fund increased federal energy efficiency and renewable energy while providing a financial return for investors. 43 YEA 52 NAY 5 NV FAILED	✗	✗	✗	✗	✗	✗	●	●	●	●	●	●	●	✗	✗	✗

N.C. Coal Ash Cleanup Plans Proposed, Controversy Continues

By Hannah Petersen

Following a series of 15 public hearings throughout the month of March, on May 18 the N.C. Department of Environmental Quality released rankings for Duke Energy's coal ash impoundments across the state. Eight sites are classified high priority, meaning the impoundments must be closed and the ash excavated and moved to another location by 2019. The remaining 25 were ranked intermediate, to be closed and excavated by 2024.

But these rankings could change. DEQ requested a change to the state law governing coal ash disposal and asked the General Assembly for an 18-month extension during which Duke Energy can take action to remediate issues that

led to the intermediate classifications. According to DEQ, providing water to communities around the impoundments will alleviate water quality concerns, potentially allowing the agency to reclassify the intermediate rankings as low. A low-priority ranking would allow Duke to leave the ash.

"Residents are angered that DEQ is already asking the legislature to consider changing the coal ash law in 18 months, likely creating further delays and loopholes," stated a press release from Alliance of Carolinians Together (ACT) Against Coal Ash—a coalition of community members directly impacted by the state's coal ash.

The Coal Ash Commission, the regulatory body established by the state

coal ash law to finalize the rankings, was ruled unconstitutional in March. As of press time in early June, the Senate and the House passed Senate Bill 71, which could reestablish the commission and provide future regulation for clean-up procedures. The Governor has threatened to veto it.

"This is a way for Duke to wiggle out of fixing the problem," says Doris Smith, a Walnut Cove resident who lives roughly two miles from Duke's Belews Creek Power Station, which was ranked intermediate. "Providing water does nothing for the pollution. The only solution is to get the ash out of here."

In 2015, more than 300 residents living near Duke Energy coal ash ponds were sent "Do Not Drink" letters from

the N.C. Department of Health and Human Services informing them of unsafe levels of heavy metals in their well water, including the carcinogen hexavalent chromium. This March, the state agencies rescinded those letters, claiming that further studies revealed the recommendations were overly cautious.

However, no physical well testing for contaminants occurred in North Carolina. During a deposition, DHHS State Epidemiologist Megan Davies revealed that the "extensive study" meant "reviewing literature," and that the quantity of pollutants allowed, like hexavalent chromium, was changed to match more lenient federal guidelines.

When asked if she thought the letters should have been rescinded, the deposition transcript shows Davies' response was "No."

Virginia Utility Submits Plan for the Future

In May, Dominion Virginia Power submitted its multi-year forecast for meeting energy and financial demands while complying with the federal Clean Power Plan.

The proposal presents alternate approaches for meeting its goals and compares the estimated cost of each. In announcing its plan, Dominion claims that it is "lessening dependence on coal and significantly increasing use of renewable resources such as solar power."

Environmental groups are unconvinced and are challenging the proposal, particularly Dominion's suggestion of building a third nuclear reactor at its North Anna facility in Louisa County.

This multi-billion dollar investment would come at the expense of more renewable alternatives. According to nonprofit advocacy group Natural Resources Defense Council, it "is all about dramatically boosting company profits by asking its hundreds of thousands of Virginia electricity customers to pay for unnecessary and overpriced construction."

"That loud sucking sound is Dominion vacuuming money from its customers' pockets for a \$19 billion dollar boondoggle," Glen Besa, director of the Virginia chapter of the Sierra Club, told the Associated Press. — *Elizabeth E. Payne*

Fracking Wastewaters Linked to Contamination

The U.S. Geological Survey released a study in May that for the first time linked surface water contamination to natural gas fracking wastewater injection sites.

Dr. Denise Akob and her colleagues at USGS studied the effects of a wastewater storage facility located on Wolf Creek, near Lochgelly, W.Va. They took water and sediment samples from locations at the facility, upstream, downstream and from nearby waterways.

The researchers wrote that "multiple lines of evidence demonstrate that activities at the disposal facility are impacting the stream that runs through the area."

InsideClimate News reports that

metals such as strontium, barium and lithium were found in higher concentrations in the downstream samples, as were radioactive compounds. Wolf Creek is a tributary of the New River.

In another study of this site, researchers from Duke University found that the downstream samples also contained endocrine-disrupting compounds that are known to affect the reproductive organs of certain fish.

The companies operating the facility in Fayette Co., W.Va., are fighting the implementation of a county-wide ban on fracking wastewater disposal and storage that passed unanimously in January. — *Elizabeth E. Payne*

Newsbites

Energy Burden Affects Low-Income and Minority Communities

Low-income, African-American, Latino and renter households spend a higher percentage of their household income on energy bills than the average household in the same cities, according to a study by the American Council for an Energy Efficient Economy and the Energy Efficiency for All coalition. This high energy burden can be tied to less efficient housing and is most prominent in the Southeast and Midwest regions of the United States. The study suggests energy efficiency tactics that could help to remediate this discrepancy such as

improving low-income utility programs and opting into the early credit options provided by the Clean Power Plan's Clean Energy Incentive Program. — *Hannah Petersen*

Feds Seek Public Comment on Coal Leases

The U.S. Department of Interior is reviewing the federal coal leasing program to re-assess the health, environmental and financial impacts of mining and burning coal found on federally owned land.

Six public hearings will be held across the country through June. On May 26, the southeastern hearing was held in Knoxville, Tenn. Concerned citizens, as well as en-

vironmental groups such as Appalachian Voices, attended this meeting.

"It's time for a planned transition that will keep federal coal in the ground," Bonnie Swinford from the Tennessee Chapter of the Sierra Club said in a press release.

Written comments can be submitted to DOI until July 28. For more information, visit tinyurl.com/CoalComment. — *Elizabeth E. Payne*

Ky. Utilities Seek Rate Increase for Coal Ash Cleanup

Kentucky Utilities Company and Louisville Gas and Electric are seeking permission from the Kentucky Public Services Commis-

sion to make customers supplement the cost for coal ash cleanup with increased rates. According to an article by the Public News Service, average monthly rates for KU consumers could increase \$2.16 and \$2.26 for LG&E consumers. The revenue would go toward closing and capping the companies' existing coal ash ponds, building new process water systems and controlling air emissions for the plants. However conservationists believe the costs of coal pollution that have been ignored for several decades should be factored into the costs of production, not consumption. Information about rate increases can be found at psc.ky.gov. — *Hannah Petersen*

Recent Studies Question the Economic Benefits of Pipelines

By Elizabeth E. Payne

New studies raise challenges about the financial harm of two natural gas pipeline projects proposed for West Virginia, Virginia and North Carolina—the Mountain Valley and Atlantic Coast Pipelines.

A study released in May by Key-Log Economics LLC estimated that the Mountain Valley Pipeline would cost local communities more than \$8 billion. The study was commissioned by the POWHR Coalition (Protect Our Water, Heritage, Rights), an alliance of citizen groups from eight Virginia and West Virginia counties along the pipeline's proposed route.

The study's authors calculated one-time and annual costs to the eight-county region from lost property values and taxes, and decreased natural beauty and quality-of-life that would result in fewer people moving to or visiting the area.

According to the U.S. Energy Information Administration, the capacity to generate power from natural gas is expanding rapidly, particularly around major shale plays. In the mid-Atlantic, Virginia is projected to have the greatest increase in capacity over the next two years.

Clean Power Plan Court Case Delayed Until September

The U.S. Court of Appeals for the D.C. Circuit has postponed hearing challenges to the federal Clean Power Plan until Sept. 27. The U.S. Environmental Protection Agency regulation is designed to reduce carbon emissions from electricity generation by at least 32 percent by 2030.

The postponed date will allow the full 17-judge panel to review the case instead of a 3-judge panel originally scheduled to hear arguments on June 2.

The case will determine whether it's legal for the EPA to regulate carbon dioxide emissions from existing power plants under

In another study, the Institute for Energy Economics and Financial Analysis concluded that pipelines from the Marcellus and Utica shale beneath Ohio, New York, Pennsylvania and West Virginia—the source for both proposed pipelines—are being overbuilt.

The study also concludes that the Federal Energy Regulatory Commission "facilitates [this] overbuilding" and that much of the cost of construction would likely be passed on to ratepayers.

"None of the economic interests within the natural gas industry have any incentive to seriously consider whether alternatives to natural gas—energy efficiency, renewable energy or other forms of power generation—may be cheaper," write the authors of the report.

Environmental advocates and homeowners along the routes continue to voice concerns about the harm the pipelines are likely to cause if constructed. Most recently, the Blue Ridge Parkway Foundation announced its opposition to the construction of both pipelines, each of which are projected to cross the parkway. And the Board of Supervisors of Augusta County, Va., also asked FERC to reject the current route of the Atlantic Coast Pipeline.

a specific section of the Clean Air Act. If the EPA wins, emission reductions must be met by any stationary source that emits carbon dioxide, and the EPA will have the power to require the best technology and systems to meet the reductions.

Until the review occurs, the EPA cannot implement or enforce the Clean Power Plan.

Although the carbon regulations have generated significant attention among policymakers, a recent national survey shows that 7 in 10 voters have heard "just a little or nothing at all" about the Clean Power Plan. — *Hannah Petersen*

2016 Predicted to Show a Drop in U.S. Coal Use

This year is predicted to see the largest decline in coal production since 1949, with the amount of coal produced in the Appalachian region forecasted to decline by 15 percent in 2016, according to the U.S. Energy Information Administration.

The EIA reports that consumption is

also declining and, on average, stockpiles measured in February 2016 were 26 percent higher than those measured in 2015.

The agency states this decline in consumption and production is due to a mild winter and competition from the natural gas market. — *Hannah Petersen*

Concerns Linger as Coal Companies Emerge from Bankruptcy

By Brian Sewell

Following months of tumultuous court proceedings, major coal companies are seeking approval for plans to exit bankruptcy—despite the objections of key stakeholders including regulators, lenders and union miners.

On May 5, Arch Coal revealed a plan to emerge from bankruptcy that sheds little light on how the company will pay to clean up its mines or meet its obligations to employees or the group of lenders that hold most of its debt. The company's plan does, however, ensure senior lenders will be paid. If approved, the plan would leave junior lenders and current shareholders with scraps.

But regulators and environmental groups say Arch's plan is most problematic for how it fails to address hundreds of millions in cleanup costs at the company's mines in Central Appalachia and western states.

Several states have allowed Arch and other companies to self-bond, a practice that allows the company to insure the cost of restoring the land after mining based on their financial history, rather than requiring collateral or a more secure form of bonding. Environmental groups including the Powder River Basin Resource Council argue the option to self-bond should be off the table for companies that

Obama Administration Nears Standards on Methane

On May 12, the U.S. Environmental Protection Agency took a step toward cutting methane emissions by 40 percent over the next ten years. Methane is a greenhouse gas that traps at least 25 percent more heat than carbon dioxide.

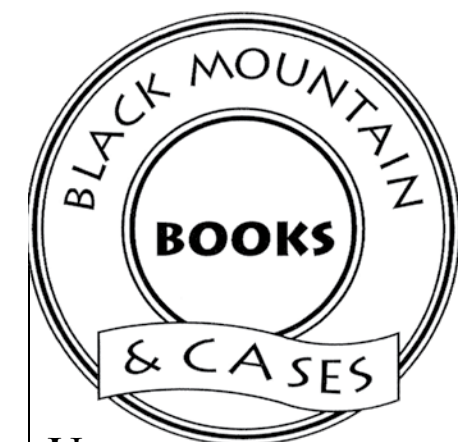
A significant source of methane is natural gas. The new action requires the oil and natural gas industry to provide information needed before the EPA issues the final rules. The standards are expected to limit methane leaks from existing infrastructure and prevent leaks in new constructions, such as wells and pipelines.

With an eye on limiting climate change, the Obama administration is seeking to address a potent source of greenhouse gas with these measures. — *Elizabeth E. Payne*

have gone through bankruptcy.

Although Arch pledged to honor its commitment to pay employee benefits, the company reserved the right to change pension and healthcare contracts. Another struggling coal giant, Alpha Natural Resources, was recently allowed to break its contract with United Mine Workers of America, a move that could affect more than 3,000 employees and retirees. According to the Associated Press, the company also plans to eliminate benefits to non-union miners.

Both Arch and Alpha are pressing ahead; Arch's creditors will vote on its restructuring plan in June, and a vote on Alpha's plan will come in July.

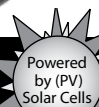


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Connecting the Economic Dots in Southwest Virginia

At a recent economic summit in Wise, Va., Dickenson County resident Tammy Owens paused at the Appalachian Voices information booth to talk about reclaiming existing abandoned coal mines in ways that benefit the local economy. Owens runs an organic commercial farm on former strip mine land. She also wants to start an outfitter company running river trips along the Russell Fork River and is working with the county and the U.S. Forest Service to develop a boat take-out site on another abandoned strip mine.

Owens was one of more than 300 people who attended the 2016 Economic Forum on May 12 hosted by the University of Virginia's College at Wise. The forum brought together public, private and nonprofit entities — including Appalachian Voices — working on economic

development initiatives to help move Southwest Virginia forward.

Although the region is struggling, there are opportunities, too. Under the Obama administration's POWER Initiative to boost areas around the country hit hard by coal's decline, the 2016 federal budget includes a total of \$65 million for matching grants. And if passed, the bipartisan RECLAIM Act would release an additional \$1 billion over five years for remediation of abandoned mine lands that have a post-cleanup economic benefit.

During afternoon breakout sessions, attendees discussed topics such as education, workforce development, health, supporting existing businesses, attracting new businesses, developing the region's agricultural and natural assets, and tapping into emerging in-



Adam Wells, our economic diversification campaign coordinator, left, helped organize the May summit. During breakout sessions, attendees discussed solar energy, agriculture, health and more.

dustries like solar energy.

Developing solar energy in Southwest Virginia was one of the featured topics at the Appalachian Voices booth. For the past several months, we have been partnering with the nonprofit organization Appalachian Institute for Renewable Energy to research opportunities for community-scale solar energy in the region. Our focus is on building the local economy by generating local jobs and relying on local services.

Our booth also focused on the opportunity to reclaim abandoned mine lands (generally strip mines closed prior to 1977) in a way that also develops economic opportunities such as solar energy. Appalachian Voices is currently work-

ing with environmental consulting firm Downstream Strategies and engineering firm Coal Mining Engineering Systems, LLC, to identify optimal sites for potential funding under the RECLAIM Act.

Hundreds of ideas came out of the breakout sessions at the economic forum and are posted on the UVA-Wise website. Six action teams will continue to develop those ideas in advance of a 90-day progress meeting scheduled for Aug. 24.

For more information on the forum, visit tinyurl.com/swva-economic-forum. To learn more about our work, visit appvoices.org/new-economy.



Appalachian Voices staff is gearing up for another fabulous FloydFest, and it's not too late for you to get your tickets and join us! We're honored to once again be the featured nonprofit organization at the Southeast's premiere music and arts festival in gorgeous Floyd, Va.,

July 27-31. We'll be stationed on Participation Row, where we will spread the word about mountaintop removal coal mining and natural gas pipelines and encourage stewardship of the mountains we all love. Stop by our table for your iLoveMountains temporary tattoo or AV t-shirt! Festival-goers also have an opportunity to donate to AV when purchasing tickets, and FloydFest will match that donation. Special thanks to Sam Calhoun, Kris Hodges, Erika Johnson, Kellee Mac and all the folks at Across-the-Way Productions. Learn more about the partnership and a special deal for supporters of Appalachian Voices (wink, wink) at appvoices.org/floydfest.

2016 Webinar Series

If you like reading about environmental and energy issues in The Appalachian Voice, delve deeper into specific topics through Appalachian Voices' ongoing webinar series. During these live webinars, attendees can ask AV staff and other experts questions. But

don't worry — if you miss the live session, you can watch the video recording online at your convenience! Videos from the first webinars of 2016 cover home energy efficiency, on-bill financing, and natural gas pipelines. Watch recordings and stay tuned for upcoming events at appvoices.org/webinars

Impacted Residents in NC and VA Protest Duke, Dominion Shareholder Meetings

This spring, Appalachian Voices and our partners attended the Duke Energy and Dominion Resources shareholder meetings to remind them to protect ratepayers and our planet. It's no secret that these big utilities don't have a strong track record on clean energy. Duke is working with the state of North Carolina to circumvent citizen demands that it quickly and thoroughly clean up coal ash contamination, and the utility is blocking third-party solar (see page 22). And both Dominion and Duke would rather invest in risky natural gas pipelines that accelerate fracking in central and northern Appalachia than invest those resources in affordable clean energy options like solar and energy efficiency.

During their May 5 annual meeting, Duke Energy shareholders, CEO Lynn Good and the company's board of directors were confronted by residents affected by the coal ash in their neighborhoods. Joined by a slew of climate and solar advocates, they asked tough questions during the meeting's Q&A section. Sarah Kellogg, our departing North



Photo courtesy of Chesapeake Climate Action Network

Carolina Field Coordinator, pointed out numerous inaccuracies in what Good said throughout the meeting. Good's response: "I can see we have a lot of work to do to rebuild trust."

Citizens from across the Southeast converged outside Dominion Resources' annual shareholder meeting in Columbia, S.C., on May 11, urging the company to abandon its agenda for decades of more dirty energy investments and instead lead the region's transition to renewable energy. Hannah Wiegand, our Virginia Campaign Coordinator, and concerned Dominion Virginia customers were among those protesting the meeting.



Accelerating Appalachia's Energy Savings

Momentum is growing around our Energy Savings for Appalachia program, which launched in 2013 to increase the energy efficiency options available for members of rural electric cooperatives in western North Carolina and East Tennessee.

This spring, Blue Ridge Electric Membership Corp. — an electric cooperative in the N.C. High Country — announced a new financing option to help eligible members pay for energy efficiency improvements to their homes. Alongside residents, energy services contractors and local agencies,

we worked with Blue Ridge Electric to launch the program, and we're continuing to help improve the program and educate members about the new opportunity.

Our team is also expanding our community outreach around energy efficiency to residents and local organizations in the French Broad Electric Membership Corp. and Surry-Yadkin Electric Membership Corp. territories. In Tennessee, we're collaborating with state organizations and electric cooperatives to develop a statewide energy efficiency financing program



Energy Policy Director Rory McIlmoil discusses energy efficiency in Boone, N.C.

— and so far, six Appalachian co-ops have expressed interest in taking part!

Read more about these initiatives, and the reasons why rural electric cooperatives have the ability and obligation to lead the way in energy efficiency on page 10. And check out Energy Savings news and resources about how to make your home more energy efficient at appvoices.org/energysavings.

Hellos and Goodbyes Changing Faces on the Appalachian Voices Team



Jonathan Harvey

This spring was a time of transition at Appalachian Voices as we welcomed fresh faces to the team and several key staff members moved on to new adventures.

Susan Kruse, who has advocated for environmental protection and justice for 20 years, steps in as our new Development Director. After launching the Allegheny Defense Project in Pennsylvania and leading the National Forest Protection Alliance, Susan joined the Legal Aid Justice Center in Charlottesville, Va., as their Director of Development in 2006.

"I am thrilled to join the incredible staff and supporters of Appalachian Voices, who are leading the charge for a new economy and a healthy environment in our region," Susan says.

This spring we said goodbye to former Director of Development Jonathan Harvey and former Director of Leadership Gifts Kayti Wingfield. Jonathan served as our Director of Development for nearly three years after working with The Nature Conservancy in his native West Virginia. Under his leadership the team was able to raise the bar, connect with new supporters and greatly expand our impact.

Before joining the Appalachian Voices team in 2011, Kayti worked with us and allies across Virginia to fight new coal-fired power plants as the Wise Energy For Virginia coalition coordinator. At Appalachian Voices, Kayti's passion for the region helped her communicate our work to members and supporters, and she

is now bringing those skills to the University of Virginia. Jonathan and Kayti's enthusiasm and talent will be greatly missed, and we wish them luck in their pursuits!

Nick Wood, a resident of Durham, N.C., joins our staff as N.C. Field Coordinator, replacing Sarah Kellogg. Nick is a licensed attorney and worked as a labor union organizer before getting involved with environmental justice as Organizing Director at NC WARN. In this role, he collaborated with Sarah to help form ACT Against Coal Ash, a statewide coalition of N.C. citizens affected by coal ash.

Sarah originally joined Appalachian Voices in 2013 as an AmeriCorps Project Conserve member helping to grow our energy efficiency program and serve N.C. communities impacted by coal ash. Later, as our N.C. Outreach Coordinator, she worked with residents and organizations across the state to push for coal ash cleanup. While we'll miss her positive energy and dedication, we wish her well as she pursues farming and builds a tiny house.

We also welcome Tennessee Outreach Associate Lou Murrey, our first OSMRE/VISTA AmeriCorps member. Lou, a native of Boone, N.C., is a documentary photographer and a steering committee member with the STAY Project. She is serving with our Energy Savings team in Knoxville, Tenn., learning from and engaging with East Tennessee communities regarding energy efficiency.



Susan Kruse



Nick Wood



Lou Murrey



Appalachian Voices is committed to protecting the land, air and water of the central and southern Appalachian region. Our mission is to empower people to defend our region's rich natural and cultural heritage by providing them with tools and strategies for successful grassroots campaigns.

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 Controller Maya Viknius
 Operations Manager Shay Boyd
 Operations and Outreach Associate Lauren Essick
 Development Coordinator Leigh Kirchner

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 Energy Policy Director Rory McIlmoil
 Legislative Associate Thom Kay
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 Virginia Campaign Coordinator Hannah Wiegand
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 Economic Diversification Coordinator Adam Wells
 Tennessee Energy Savings Coordinator Amy Kelly
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Although the sharp-shinned hawk is the smallest hawk in North America, its feats of aerial acrobatics are often deadly for songbirds. This particular bird collided with a car and required rehabilitation. Fortunately, there were no broken bones, and the hawk healed quickly. The raptor was released on Nov. 25, 2012. Turn to the centerspread to read more about regional efforts to save wild critters. Photo by Marty Silver, Tennessee State Parks

Renew your commitment to protecting Appalachia for future generations

This summer, consider how you can help protect the land, air, water and communities of this unique and beautiful region of the world.

Appalachian Voices is a nonprofit, grassroots organization working to save the central and southern Appalachian mountains from serious environmental threats and to advance a vision for a cleaner energy future. Join us today.

AppVoices.org/join

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