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Bad Actor Coal Company Seeks to Expand Surface Mine in Endangered Candy Darter Habitat

By Willie Dodson, Appalachian Voices

The highland ridges and swift mountain streams of northern Greenbrier County, West Virginia, comprise an exceptional landscape and unique ecosystems. Here along the edge of the Monongahela National Forest, peaks topping out above 4,000 feet in elevation host some of the nation's southernmost stands of red spruce forest. The headwaters of the Cherry River are home to native brook trout and the endangered candy darter. In a region



that is abundant—perhaps even saturated—with natural splendor, this area stands out as a destination for anglers, boaters, birders and hikers. It is no surprise that this corner of West Virginia is a focal point of numerous conservation efforts.

But despite a growing misperception that coal mining in Appalachia is a thing of the past, northern Greenbrier County has seen a proliferation of large, destructive

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Thoughts from our President

By Larry Thomas

We were very excited that the February 2023 issue of The Highlands Voice was printed in color for the very first time. In addition, Olivia, our communications director is in Tasmania, Australia, and was able to put the Voice together from approximately 9,887 miles around the world and has done the same with this issue—thanks to the marvel of technology.

Off-Road Vehicles Continue to Pose a Threat to West Virginia Public Lands

West Virginia Highlands Conservancy has a long history of opposing Off-Road Vehicle (ORV) use on our West Virginia federal and state public lands. As reported previously, the Conservancy Legislative Committee, along with the West Virginia Environmental Council, and other environmental organizations have kept an eye out during this legislative session for any legislation to permit the use of ORVs on West Virginia public lands. As predicted, bills were again introduced all linked and laying the foundation for a comprehensive program to allow the use of off-road on our West Virginia public lands.

The Public Lands Committee “ORV Recreation on West Virginia Public Lands” project is posted on the [Allegheny-Blue Ridge Alliance’s Conservation Hub site](#) and highlights the threats ORVs pose to the environmental integrity of our public lands. Sponsored by the Conservancy, the project includes information and an interactive online map to help educate the public and legislators regarding the impacts of ORV use on our public lands. The project’s web page points out that “there are severe effects and environmental impacts” if permitted to operate on public lands, citing a comprehensive study on the issue conducted by the United States Geological Survey. The study discusses the negative impacts that often result when ORVs are permitted to be used on public lands, including the effects on soils, vegetation, wildlife habitats, water quality and the socioeconomic implications of their use.

The photo above is an example of damage caused by illegal ORV use on National Forest lands.

Concerns over the environmental damage that can result from ORVs being operated on certain lands is not limited to West Virginia. The Virginia Mercury ran a major story on the environmental damage that ORVs are causing to a system of trails in Southwestern Virginia. The article reported on the three-year fight that a local citizens group, the Clinch Coalition, has had with the Virginia Department of Environmental Quality over erosion and sediment control problems caused by ORV to the trail system.



The West Virginia 2023 Legislature

Once again activities at the legislature have taken front row in the environmental community. Luanne McGovern, chair of the Conservancy’s Legislative Committee, along with the West Virginia Environmental Council and other environmental organizations, have been keeping an eye on good as well as bad legislation. 60 days seems like an eternity for those involved with watching the legislative session. See the article in this month’s Voice for an update of the happenings.

Other Conservancy Committee Activities

Committees are working on other projects and issues including rerouting of a section of Corridor H, preparing recommendations for what individuals can do as their part to combat climate change, preparing for the 2023 Dolly Sods Stewards program activities, monitoring water pollution, and mining issues, scheduling more outings throughout 2023 and planning another exciting Fall Review in October. Committees are always looking for members, so if you are interested, please contact us.

Thanks again to the Conservancy board of directors and committees for all of your hard work and dedication and a special thank you to our members and supporters for your continued support. Your continued vote of confidence in our work is greatly appreciated.

The Drinking Water Treatment Process

By Rick Watson

History

There are records of humans treating water for thousands of years. However, scientists only began understanding the sources and impacts of drinking water contamination in the late 1800s. During this time the focus remained on visible contamination because germs and their relationship to disease were not understood until the 1880s when Louis Pasteur discovered how microscopic organisms could transmit disease through water. Until this time, treatment focused on improving the aesthetic qualities of drinking water (e.g., appearance, odor, taste, etc.) mostly by reducing suspended solids. Early documented treatment methods included filtering through charcoal, exposing to sunlight, boiling, straining and settling.

During the early to mid-1800s, sand filtration was beginning to be regularly used to remove particulate matter from water. Following Pasteur's discoveries and a gradual increase in the understanding of disease-causing microorganisms in public water, drinking water quality began focusing on microbes in drinking water. During this time (early 1900s), scientists determined source water suspended matter also contained microbial contaminants causing typhoid, dysentery and cholera epidemics. The result was increased sand filtration use for United States drinking water.

Filtration was, and continues to be, an effective treatment for reducing turbidity. However, reducing transmission of waterborne disease through turbidity reduction is limited. During the early 1900s, we learned disinfectants, like chlorine, effectively reduce drinking water microbial contamination and waterborne disease outbreaks. Drinking water filtration and disinfection are considered one of the greatest, most effective actions improving public health and premature death of all time. These two drinking water treatment technologies remain the most commonly applied treatment processes.

The Modern Water Treatment Process

The Center for Disease Control cites the following statistics for U.S. drinking water systems:

- There are over 150,000 U.S. public water systems. Approximately 33.5 percent are community systems and 66.5 percent are noncommunity systems (e.g., private mobile home parks, subdivisions, parks, etc.).
- Over 286 million Americans get their tap water from a community water system.
- Eight percent of U.S. community water systems provide water to 82

percent of the U.S. population through large municipal water systems.

- Although the majority of community water systems (78 percent) are supplied by ground water, more people (68 percent) are supplied by community water systems using surface water.

There are important distinctions between ground water and surface water treatment systems. Typically, since ground water systems do not contain significant suspended solids, they rarely require coagulation, flocculation, sedimentation or filtration (unless metals removal—primarily iron and manganese—is necessary). Often ground water systems need only disinfection and distribution. However, surface water systems are far more susceptible to everyday environmental impacts requiring solids and turbidity removal.

While filtration and disinfection remain the cornerstone of the modern water treatment process, nearly all modern water treatment plants incorporate additional treatment steps into their treatment process. Coagulation, flocculation, and sedimentation are commonly used before filtration. This process creates larger, heavier particles. These particles are removed by settling in a clarifier prior to filtration. The removal of much of the particulate matter using flocculation and sedimentation reduces filter loading, improves treatment efficiency, and reduces the cost of drinking water treatment.

Several water treatment technologies are typically used in sequence to make raw surface or ground water safe for human consumption prior to discharge from the treatment system and distribution to the water system's customers. The following treatment steps are commonly used in drinking water treatment systems.

Screens: Surface water intakes commonly use screens to remove debris from raw water (weeds, twigs or sticks, fish or other aquatic life, etc.).

Coagulation, Flocculation and Sedimentation: During coagulation, positively charged chemicals are added to the raw water (aluminum sulphate and ferric sulphate are two of the most common) and react with alkalinity to form metal hydroxides of aluminum and iron. Small particles in the raw water attach to these coagulants. Flocculation gently mixes the water, forming larger, heavier particles. Sedimentation then separates solids from the water. Clarifiers collect settled solids for removal and disposal and decant clarified water for further treatment.

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The West Virginia Highlands Conservancy is a non-profit corporation which has been recognized as a tax exempt organization by the Internal Revenue Service. Its bylaws describe its purpose:

The purposes of the Conservancy shall be to promote, encourage, and work for the conservation—including both preservation and wise use—and appreciation of the natural resources of West Virginia and the nation, and especially of the Highlands Region of West Virginia, for the cultural, social, educational, physical, health, spiritual, and economic benefit of present and future generations of West Virginians and Americans.

Energy Efficiency: The Cheapest Choice

By John McFerrin

There is no free lunch. Getting energy that we can use always has an environmental cost, including some release of greenhouse gases. More solar energy strikes the earth every day than we humans could possibly use. While this solar energy may keep us from freezing to death and powers the plant life that makes all life on earth possible, it can't meet many of our needs until humans need to turn it into electricity. Converting it into electricity takes equipment, solar panels, etc. There is always some cost to manufacture and install this equipment. While the environmental cost of producing electricity this way is small compared to alternatives such as coal, it is not zero.

The closest thing we have to a free lunch is conservation. While even that has an energy and environmental cost (double pane windows do not just jump up out of the ground, ready to install), the easiest and lowest cost step to solving the problem of pollution from energy production is to use less energy.

One way to measure how efficiently we are producing and using energy is by measuring carbon dioxide emissions per person. Buildings are responsible for 35 percent of all carbon dioxide emissions in the United States. Since buildings are the biggest source of carbon dioxide emissions after transportation, measuring carbon dioxide per person associated with buildings in West Virginia is one measure of how we are doing.

By this measure, West Virginia is doing terribly. Buildings in West Virginia emit more carbon dioxide per person than buildings in all but two other states, Wyoming and North Dakota. How much carbon dioxide is emitted depends upon both the source of power that heats and cools buildings and things such as insulation and the efficiency of the equipment. An efficient furnace in a snug house ends up emitting less carbon dioxide than an inefficient furnace in a drafty house. If that furnace is powered by a low carbon source, the house ends up emitting less carbon dioxide.

The states that beat out West Virginia for the title of most carbon dioxide per capita were states that are both cold and get their electricity

from coal. Other cold places (Minnesota, for example) rank well behind West Virginia in carbon dioxide emissions. They get less of their electricity from coal.

So why is West Virginia one of the worst states in the nation in terms of carbon dioxide emitted by its buildings?

The overriding cause is attitude: we're not even trying. Many states have goals of reducing greenhouse gas emissions. Pennsylvania has a goal of reducing greenhouse gas emissions 80 percent below 2005 levels by 2050; California has a goal of reducing greenhouse gas emissions by 40 percent below 1990 levels by 2030; North Carolina hopes to reduce its greenhouse gas emissions below 50 percent of 2005 levels by 2030. In all, 25 states and the District of Columbia have set goals for limiting greenhouse gas emission targets.

West Virginia has not articulated a goal. From the most recent legislative session, it is apparent that our goal is to increase emissions. There was a bill to lower taxes on coal burned to produce electricity and another bill requiring that utility companies get approval from the Public Energy Authority before closing a coal fired power plant. Under other bills, a state agency would be tasked with finding sites for new coal or gas burning power plants.

Meanwhile, the bill that would have decreased emissions by encouraging solar power by enabling community solar projects, was met with something between indifference and hostility.

As this is written the legislative session is not over yet. Nobody knows if the pro-carbon dioxide bills will pass. There is always the possibility that the legislature will have a Road to Damascus moment, embrace solar energy, and quit fighting to protect fossil fuels from the market forces that will eventually eliminate them. Don't count on it. West Virginia's obvious, if unarticulated goal will remain to increase carbon dioxide emissions.

A change in attitude is a years long project, maybe a generational thing. Maybe it could change in a few elections; we may have to settle for waiting for the current generation of politi-

cians to die off.

Short of waiting for politicians to die off, there are a couple of things we could do. First, we could update our building codes to require more energy efficiency. The American Council on an Energy Efficient Economy has collected data on which states have the most effective building codes in promoting energy efficiency. West Virginia ranked 36th of the 50 states and the District of Columbia.

While this is not bad when compared with most of our usual rankings, it is not great either. We could do better.

The fortunate thing is that there is now money available to help us do that. The United States Department of Energy has recently announced the availability of \$45 million in grants to help states come up with building codes that promote energy efficiency. This comes from the Bipartisan Infrastructure Law that was passed in 2021. The Inflation Reduction Act, passed in 2022, has \$1 billion to support states who want to adopt stronger energy codes.

The need is there; the money is there to help us do it. The only thing standing in the way is our commitment to a policy of increasing carbon dioxide emissions.

The second thing we could do is require that our utility companies do more to help their customers use less energy. Our utilities are doing some things in this regard. They could do a lot more.

As a general matter, our public utilities are supposed to provide us with electricity and gas at a fair price. Our Public Service Commission exists to see that they do that. Historically, utilities have done this by building enough power plants to meet the demand. If demand went up, they would have to build more plants, run their existing plants more often, or do something to meet that demand.

Building more power plants is not, however, the only way to skin that cat. Utilities could meet their obligation by helping their customers use energy more efficiently and, in doing so, reduce demand. Reducing demand reduces our emissions of carbon dioxide.

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2023 West Virginia Legislature Update

By Luanne McGovern



By the time you are reading this, the 86th West Virginia legislative session will be drawing to its close. Thank goodness—March 11 cannot come soon enough. So far, it is hard to declare many victories. But it seems the goal each year is to make sure the worst bills do not move forward, and any small accomplishments are celebrated.

There are many bills still in play, so, this update is likely to be out of date, but here goes!

Public Lands

The most contentious bill concerning public lands is SB468 (Continuing Cabwaylingo State Forest Trail System). This bill is intended to make the use of Off-Road Vehicles (ORVs) in Cabwaylingo State Park and Forest permanent, after the three-year pilot program.

Unfortunately, several amendments and changes have been attempted to be added to the bill, expanding ORV use in state lands. These include “connector trails” from the Hatfield McCoy trails to state parks and forests, and the potential widespread expansion of ORVs in state forests. The Committee Substitute for the bill limited the amendments to allow connector trails only and was passed from the Outdoor Recreation Committee to the Senate. We will be monitoring any further amendments to the bill, but passage is likely.

The support of all West Virginia Highlands Conservancy members that have voiced their opposition is greatly appreciated.

SB4 (Creating Adopt-A-Trail volunteer programs for public land under DNR jurisdiction) was signed by the Governor on Feb. 20. Groups that already maintain trail systems on state lands are encouraged to follow this program’s implementation and ensure that they are recognized for the work currently being done. There is a concern that outside groups could come into state parks and forests and try to “improve” trails.

SB143 (Adopt A Stream) was signed by the Governor on Feb. 7.

SB160 (Rail Trails Program) provides clarifications to existing programs. It passed the Senate and is now in the House, where it is likely to pass.

HB2062 (Establish rules and regulations for e-bikes in West Virginia that more closely comport to federal law) would bring West Virginia regulations into compliance with the federal rules and allow “throttle only” bikes wherever regular bikes are allowed. This bill has passed the House and the Senate and is likely to become law.

SB162 (Authorizing director of DNR to lease state-owned pore spaces in certain areas for carbon sequestration) was signed by the Governor on Jan. 25. It is intended to allow CO2 sequestration from the production of “blue hydrogen” from natural gas at the state’s proposed hydrogen hub.

SB202 (Increasing terms of Natural Resources Commission members from four to seven years) passed in the Senate but appears to be stalled in the House.

SB595 (Relating to real property, tax, and registration requirements associated with carbon offset agreements) caused a lot of stir when it was introduced. It is intended to limit forest landowners from entering into carbon offset agreements for more than 20 years, and to impose large taxes on the proceeds from the agreements. Hopefully this bill is dead in committee.

At the last minute, SB739 (Relating to moratorium on carbon capture agreements) was introduced to prohibit landowners from entering into carbon capture agreements for 60 days from enactment. This would “allow the legislature to deliberate and pass laws as may be determined to be necessary to prevent or mitigate substantial economic harm to West Virginia citizens.”

Community Solar

HB2159 (Establishing a Community Solar Program) was introduced by Delegate Evan Hansen. SB627 (Establishing solar program for subscribers to gain credits against their utility bills) is a bipartisan version of the bill introduced in the Senate. Both bills would create a community solar program where subscribers could purchase an interest in a solar facility and use credits against their electric utility costs. There was hope that the Senate bill would progress, but both appear to be stalled, victims of the coal lobby.

Orphaned Well Prevention/Funding for Oil and Gas Inspections

SB109 (Orphan Oil and Gas Well Prevention Act) and HB2852 (Create the Orphan Well Prevention Act of 2023) were both introduced to deal with orphaned oil and gas wells. Both bills are currently stalled. HB3110 (Relating to funding the Office of Oil and Gas in the Department of Environmental Protection) would increase funding for the Department of Environmental Protection to inspect wells. It has passed the House and is in Senate committee.

PFAS Protection Act

HB3189 (PFAS Protection Act) was introduced in the House by a bipartisan group of senators (this replaces SB485). It has passed the House and is under consideration in the Senate. This bill would be a great step forward towards understanding the sources of PFAS in drinking water and developing action plans to address contamination. United States Environmental Protection Agency water quality criteria for certain PFAS chemicals are expected to be finalized in the coming months.

To follow the West Virginia legislature in more detail; wvriwers.org, wvecouncil.org

It's Time to Stop Clear-Cutting: The Battle for the Mon

By Joseph Dumire



A grove of older-growth trees near Leadmine, West Virginia, set to be clear-cut in the Upper Cheat River project. (John Coleman)

Forgetting history, the United States Forest Service (USFS) is on the brink of making the same mistake they did 50 years ago: clear-cutting the Mon. What they have forgotten is in 1973, citizen protests stopped them and that brutal forestry practice in West Virginia, as we are trying to do now.

The USFS currently has set its sights and plans on clear-cutting close to 3,463 acres—nearly five and a half square miles—of the Upper Cheat River portion of our spectacular Monongahela National Forest, including mature and old-growth trees that President Biden specifically called out to protect for their critical value in slowing climate change, in his Executive Order issued last Earth Day, April 2022.

Another aspect of our history the USFS seems to have forgotten is the consequences of earlier clear-cuts: the floods of 1907 and again in 1936 and 1985, when heavy rains hit steep slopes denuded of trees and sent flood waters cascading into the mighty Cheat River, downstream into Pittsburgh, turning downtown streets into canals wreaking damage of \$5 million and \$250 million, respectively.

We face the same dangers today. Clear-cutting is an ugly forest management practice that decimates not only every standing tree but, in its wake, the forests' former networks of tree roots dies and no longer holds

the soil. The forests proposed for this upcoming operation are on slopes above farms and towns, some so steep that the USFS plans to bring helicopters in from Colorado to reach the trees. This means the cost to carry out the operation will exceed any gains from the timber taken, by an estimated \$1.4 million dollars.

However, that may be a low estimate of the potential loss. For the most recent harvest, there were no buyers. The century-old trees ended up having to be chipped and sold off as sawdust to a local charcoal factory.

The land proposed for clear-cutting is home to 225 bird species and 60 fish species, including 12 game fish. In the trees above the Upper Cheat River live federally protected West Virginia northern flying squirrels. In their shade dwell federally listed Cheat Mountain salamanders and rare green salamander. Endangered northern long-eared bats and other threatened bat species slalom through the tree trunks. Brook trout thrive in the shaded waters because they are cool. If the forest is slashed away the streams will warm and choke with sediment.

The Forest Service's principal rationale for the Upper Cheat River project is to create varied-age landscapes, early successional habitat. But right next door is all kinds of private property, already clear-cut, patchworked around the proposed National Forest project.

What's rare in the east is old growth. Monongahela's old trees now store over a century's worth of carbon, keeping it from wreaking exponentially more havoc in causing extreme heat, cold, droughts and floods.

Just last month the Forest Service withdrew a plan to log 2,000 acres of older forests in Oregon's Willamette National Forest, headwaters of the McKenzie River. Residents there successfully protested the Flat Country Project based on concerns about issues like ours.

We're asking the Forest Service to follow that lead and change course on the Upper Cheat River Project, to reconsider its role as purveyors of publicly owned resources to private industry. The ultimate long-term value of our National Forests is to the public, in clean air, clean water, recreation and the carbon-eating power of big old trees. We hope the USFS will rise to a higher purpose and protect them.

Raised in Thomas Joseph W. Dumire graduated from West Virginia University and attended the University of Virginia National AICPA Banking School. In his banking career he became head internal auditor, retiring from the housing industry and returning to live in Thomas. Dumire is known as a local historian and advocate for the environment.

Dolly Sods Wilderness Stewards Program Expands with New Trail Maintenance Teams

By Dave Johnston

As reported in last month's Voice, the Dolly Sods Wilderness Stewards is taking big steps to expand the activity and reach of the program. We will continue with our tried-and-true Trailhead Stewards and hope to be able to provide more training for new Stewards through the year. We will do at least one solitude monitoring survey this year on the way to establishing a rotation of doing a different season every year. We expect to complete any remaining campsite surveys needed and may work with the Forest Service to close and restore some problematic campsites to a natural condition.

But the big news is the addition of two new teams that will allow us to assist the Forest Service in supporting the natural environment in Dolly Sods. The Trail Maintenance Team will make trails more compatible with the surrounding area and minimize their impact. The Crosscut Sawyer Team will use traditional tools to clear trees and brush that create safety issues, or which cause hikers to go off trail.

Dates for the trainings for two of the new teams have been set, as has the date for the first training of the year for new Trailhead Stewards.

Trail Maintenance Team

Dolly Sods is a uniquely wet and rocky area, interspersed with wetlands and areas of shallow soil over impermeable bedrock. This makes trails vulnerable to poor drainage, erosion and uneven tread. While the trails in Dolly Sods will always be primitive, the Wilderness Stewards work with the Forest Service to address the worst problem areas, particularly where hikers are tempted to bypass the trail to avoid difficult sections. While this trail work may also make the trails more pleasant for hikers, its primary purpose is to maintain the natural environment and minimize user impact or safety issues.

Under the direction of Monongahela National Forest trail specialists, volunteers assist with trail maintenance, rehabilitation or re-routing. Tools and training are provided by the Forest Service. The ability to hike to the location and engage in physical labor will be important

for most jobs, but lighter roles may be available to support and supply the crew. This part of the project is planned for implementation during 2023. Training and work project schedules as well as job options will be provided when it is ready to be implemented.

The first Trail Maintenance training is scheduled for April 29-30, 2023. See below to sign up.

Crosscut Sawyer Team

Trees fall across trails in Dolly Sods all the time, and other wood and brush clearing is often needed. Because mechanized equipment cannot be used in wilderness, this must be done with hand operated tools such as crosscut saws, loppers and axes. The Wilderness Stewards is forming a Crosscut Sawyer Team to work with Forest Service experts to maintain safe trail passage in Dolly Sods.

Volunteers will be trained and certified at the A Sawyer level, for bucking in non-complex situations under the supervision of a higher-level Sawyer. Training in wilderness first aid and CPR is also required for certification. This is a great opportunity to gain new skills and certification that can be used in Dolly Sods and other locations.

The first Crosscut Sawyer training is scheduled for April 1-2, 2023. See below to sign up.

Wilderness Trailhead Stewards

Volunteers are stationed at popular trailheads during times of peak visitation, mainly on weekends, and engage in brief conversation with visitors about what makes Dolly Sods unique, the values of wilderness and Leave No Trace practices.

A "script" outlining the key messages provides a basis for the conversation, but volunteers will typically use their own words and adjust to the needs of the visitor. The script is keyed for an engagement of 30 to 60 seconds, but visitors frequently ask questions about trail conditions, route and camping suggestions, and

weather, which provides an opportunity to work in other messages. The Conservancy has prepared a trail map of Dolly Sods with wilderness and Leave No Trace messages on the back, which we frequently hand out to hikers.

No special skills or background are required for volunteers, though familiarity with Dolly Sods and hiking experience will be helpful. Before starting at trailheads, volunteers are encouraged to complete two free, self-guided online courses, and we will provide an in-person training on effective messaging, key concepts and safety considerations. The training is completed by joining an experienced Trailhead Steward at a trailhead for a live practice session.

The first Trailhead Stewards training of the year is scheduled for May 20, 2023, to be followed by an all-Stewards picnic. See below to sign up.

How to get involved

As these projects evolve, we will send out more information and specific arrangements to all who have signed up to be a Dolly Sods Wilderness Steward. To ensure that you get information on the team or training you are interested in, first become a Wilderness Steward and indicate your projects of interest on the sign-up form.

Simply go to the Conservancy's [Dolly Sods Wilderness Stewards webpage](#). From there you can go to the online sign-up form. If you have any other questions, write to dolly-sodsstewards@gmail.com. We will be in touch if more information is needed and with information about training, scheduling, etc.

The Value of State Parks

By Robert Beanblossom

In recent years, many short-sighted individuals have developed a perception that West Virginia's state park and forest system is a financial liability to the state—a 'luxury' that the state cannot afford—that they 'lose' money and that the system is 'mismanaged' and should be made to produce a profit. There is a strong belief by many legislative leaders and the governor that private investment and operation is the way to go.

Nothing could be further from the truth. Our state parks and forests are among the state's greatest assets and have served the people of West Virginia well since their initial creation in the late 1920s. West Virginia established our parks and forests for other objectives than profitability and the success or failure of the system should always be ultimately judged, as with any state agency, on how well those objectives, as specified in state law, are met.

The natural resources section of the State Code specifically mandates that the state park system is to "promote conservation by preserving and protecting natural areas of unique or exceptional scenic, scientific, cultural, archaeological, or historical significance and to provide outdoor recreational opportunities for the citizens of this state and its visitors." In other words, its purpose is to provide stewardship of the land while serving people. By any measure, our park and forest system has met both objectives exceedingly well during its 94-year history.

Environmental stewardship responsibilities are often overlooked in the debate about the 'profitability' of the state park system. Our state parks and forests provide numerous tangible and intangible environmental benefits. In addition to outdoor recreation, the roughly 200,000 acres of forestland in the system provide watershed protection, which helps in the process of maintaining clean drinking water for all of us. Forest cover protects and nurtures the soils that are the key to water retention, filtering and quality.

Our state park system also protects valuable wildlife habitat, especially for late successional, interior, forest dwelling species, and they also help to protect our air quality. One mature tree absorbs approximately 13 pounds of carbon

dioxide a year. For every ton of wood a forest grows, it removes 1.47 tons of carbon dioxide and replaces it with 1.07 tons of oxygen. The forests that are protected and managed in the system produce enough oxygen for over 3,600,000 people to breathe each year to say nothing of the carbon they sequester.

Preservation of green space is probably one of the greatest environmental benefits of our park and forest system. In many respects, West Virginia is fortunate that we have not had to deal with the urban sprawl, which is consuming our farm and forestlands at an alarming rate throughout the United States. Although blessed with an abundance of privately owned forestlands, the state is, however, beginning to feel the effects of development. The forest inventory conducted in the mid-1990s revealed that West Virginia had, for the first time since 1940, lost forestland. About 200,000 acres or more have been consumed by strip-mining, road construction, and urban growth in the eastern panhandle and the Morgantown area. This decrease in forest land may indicate that the area of forest land in West Virginia may have peaked.

Obviously, there are costs associated in maintaining land whether it is in public or private ownership and the recreation user alone should not and cannot be expected to pay all of them. General revenue and lottery dollars help cover those costs. For example, park superintendents and assistant superintendents have full police power on their areas and are especially instrumental in enforcing hunting and fishing violations. Our superintendents also help protect our lands from the ravages of wildfires and provide insect and disease control efforts to help maintain healthy forests. Water and sewer and other infrastructure systems must also be maintained.

When weighed against the benefits to society, these yearly expenditures of our modest tax dollars are a wise investment by the state. After all, land is a precious commodity and the most finite resource we have. One of the more important functions of government is to hold that resource in a public trust not only for our use but for generations yet unborn. Many states are belatedly learning that lesson. In 36 states where urbanization is rapidly occurring, over \$8.5 bil-

lion has been spent just since 2001 to preserve what remnants of green space remain. Investment in additional public lands in West Virginia now would be one of the wisest moves the state could make.

What about the second mandate which is provide affordable outdoor recreation for West Virginians and its visitors? West Virginia deserves high marks in this regard, too. The West Virginia State Parks system is one of the most diverse systems in the nation in terms of the types of areas operated and the complexity of recreational facilities. The system operates 35 state parks, nine state forests, and two long-distance trails. On those areas are found seven golf courses, 11 lodges with about 922 rooms, 333 cabins, 1,729 campsites, 1,036 miles of hiking trails, 3,863 picnic tables and numerous swimming pools, trams, tennis courts, picnic shelters and even a railroad.

In fiscal year 2020, the system generated a total of \$29,390,544 in revenue and operated at 59.34 percent self-sufficiency, while the national average for state park systems was a little over 35 percent and those state park systems that ranked higher had mandatory entrance fees.

State parks and forests touch the very fabric of life in every corner of the state and touch individual lives in ways we would never imagine.

In addition, many of our state parks with the least revenue are some of the ones with the most significant historical importance. Carnifex Ferry and Droop Mountain battlefields are a part of West Virginia's Civil War heritage, and Cathedral, with its virgin hemlock stand, has been declared a national, natural historic landmark. This virgin forest has incalculable benefits for research as foresters continue to explore the dynamics of old growth ecosystems. Valley Falls, Prickett's Fort, and Watters Smith also have significant historical value, yet all of these have limited income while serving a vital need for recreation and preservation of some unique historic sites. Visitors, especially children, can literally see history come alive visiting one of

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The Value of State Parks *continued*

these areas, and these experiences reinforce and supplement what they have learned from textbooks in the classroom. To suggest that these parks be eliminated or closed would be the equivalent of advocating that we no longer provide free textbooks to school children.

Further, our parks and forests are an important source of employment in many of the more rural areas to the state. Young men and women carry skills learned during the time they serve as lifeguards, campground attendants, maintenance workers, front desk clerks, and other positions throughout their lives. Society ultimately benefits because they were able to avail themselves of these rewarding and enriching experiences.

Another important aspect of state parks that is often overlooked is their contribution to democratic principles and beliefs. They are the embodiment of democracy at best. This precept was laid down at the very beginning of the establishment of parks in America. Frederic Law Olmsted who was born in 1822 in Hartford, Connecticut, was hired to develop Central Park in New York City.

Olmsted believed natural scenery should be available to all the people. He did not agree with the apologists of aristocracy that working men and women were incapable of appreciating natural scenery and being improved by its influences. Therefore, in the U.S., it was the right and duty of government to protect some natural areas and to make them readily available to all the citizens.

This very basic tenant is at the very core of state park operation and management today. This, in part, explains why entrance fees have never been implemented for West Virginia State Parks and Forests system. The argument against entrance fees rests on the belief that wildland recreation provides benefits to participants in society that are sufficiently important to justify providing opportunities at public expense so that all citizens may participate. Arguments along this line are called "merit goods" arguments. Common to all these merit goods arguments is the notion that recreation user fees are discriminatory because they deprive those on the lower rungs of the socioeconomic ladder a

fair chance to realize these benefits. A certain level of outdoor recreational opportunity should be available to all without charge. Further, implicit in this concept is the belief that recreation resources should be subsidized with public funds because recreation is as good for society as for the individual participant.

West Virginia benefits economically because of the park system. If one only looks narrowly, each state-run facility "loses" money; but if you take a broader look that includes the sales tax generated, the turnpike fees paid, and the monies spent in the local communities shows the system more than pays for itself. The 'profit' from the system is found in the many businesses located in the rural communities surrounding our parks and forests. According to an economic impact study conducted in 2016, the total economic impact of the system is between \$160.5 million to \$189.5 million annually.

More importantly it would be impossible in the future for West Virginia to have any chance for economic growth without amenities like our state parks and forests. The highly educated, mobile, high-tech, service sector employees of the 21st century will accept no less. Quality of life is the number one reason they cite for relocating to a given area, with the recreational amenities available at the top of the list.

Intangible recreational benefits are just as important. In 2001, the Surgeon General declared a national "call to action" to reverse a national trend toward obesity with West Virginia being one of the worst offenders in this regard. Health professionals agree that outdoor activities are good for both the body and mind. Most state park and forest visits involve at least some walking and many entail more strenuous forms of exercise such as skiing, hunting, mountain biking, or hiking. This type of recreation contributes to a healthy lifestyle while lowering health care costs for all West Virginians.

There are social and spiritual benefits as well. Recreational activities often are occasions for bonding with family and friends. They help us learn about teamwork, about the outdoors and about our own abilities. They give us a sense of accomplishment in meeting a challenge, such as catching a fish, climbing a mountain or com-

pleting a rigorous hike.

They are occasions for aesthetic enjoyment in spectacular surroundings, and they can offer us quiet and solitude in communion with nature and reconnecting with the land that give us life. I have often thought that if West Virginia ever was forced to implement entrance fees, then likely our greatest decline in visitations would be on Sundays. Our parks literally overflow with thousands of visitors attending church picnics and meetings all summer. These rural, often strapped for cash churches, could no longer afford these outings.

All the above seems to matter little to the current administration, just look at the recent attacks by Governor Justice and the legislature. Legislation was introduced to open state park lands to indiscriminate logging a couple of years ago and every year attempts are being made to open them to ATVs. Last year a bill was passed that permits wholesale privatization, and this year a bill (SB161) was quickly passed and signed into law that permits the director of the Division of Natural Resources to sell off almost anything including lands. This last move has the potential to be the most egregious of all and it behooves all of us to be ever vigilant to see this does not happen. Keep a close eye on this one!

West Virginia is indeed fortunate to have a diverse system with an abundance of recreational activities as it does. Visitor surveys show that it is ranked as one of the top systems in the United States. Let us keep it that way!

Robert Beanblossom, a member of the Society of American Foresters, grew up in Mingo County and retired after a 42-year career with the West Virginia Division of Natural Resources. He now resides in western North Carolina as the volunteer caretaker at the Cradle of Forestry in America and can be reached at r.beanblossom1862@outlook.com

Coal Company Seeks to Expand Surface Mine in Endangered Candy Darter Habitat *continued from page 1*

By Willie Dodson, Appalachian Voices

surface mines over the past decade. The chief culprit is South Fork Coal Company, which has received permits to operate huge strip mines and construct associated infrastructure on nearly 3,300 acres here since 2012, adding to the roughly 550 acres of surface coal mining permits the company has held in Greenbrier County since the 1990s.

Surface mining of this scale is bad news for the environment even if it is conducted within the confines of the law, but South Fork Coal Company's history of regulatory infractions is almost as egregious as Greenbrier County is beautiful. Since 2020, the company was cited 64 times by the West Virginia Department of Environmental Protection. Many of these citations were issued for failing to implement basic measures to reduce sedimentation of the South Fork of Cherry River and its tributaries—the primary threat to the endangered candy darter in this area.

A new program of the Allegheny-Blue Ridge Alliance aims to provide easy access to geospatial data about conservation imperatives and environmental threats in the Central Appalachian region of Virginia and West Virginia. The group calls the program the Conservation Hub. The environmental risks posed by coal operations in candy darter habitat is the focus of a newly posted Conservation Hub site and web map (<https://bit.ly/coalandcandydarter>).

The project features a web map that overlays mine permit boundaries and mine runoff discharge points, with designated candy darter habitat, verified native brook trout streams and rare upland red spruce stands, among other map layers. Users can toggle these layers on or off, and open corresponding data tables for more information about what each layer represents. ABRA is now compiling information on South Fork Coal Company's many environmental violations, which the organization intends to tie into the already impressive web map resource.

Rick Webb, ABRA's executive director, describes the Conservation Hub as a commu-

nity empowerment initiative.

"We work with our partners in the conservation community to provide public access to information needed for effective environmental review and oversight," he said. "In the case of coal mining in critical habitat for the endangered candy darter, we are building a web map that documents the aquatic baseline and allows examination of past and current mining impacts in the watershed. This information is needed prior to consideration of further mining in the watershed."

The sheer number of violations is not the only thing that is shocking about South Fork Coal Company's history. It is also troubling how long many of these violations have gone uncorrected. The federal Surface Mining Control and Reclamation Act establishes a period of 30 days, which may be extended up to 90 days, during which most coal mining regulatory violations must be addressed. At the time of publication, at least four violations on South Fork Coal Company's mines have been extended for over 14 months. In correspondence with the DEP, the company repeatedly pointed to bad weather as the justification for continually failing to correct these violations—an excuse DEP has accepted to this day.

It is worth noting that weather conditions did not stop the South Fork Coal Company from extracting 88,000 tons of coal from the 1,000-plus-acre Rocky Run Surface Mine over that same period of time. This gives the appearance that delays in correcting sediment control failures and other infractions has less to do with the weather and more to do with the company prioritizing quick revenue over environmental compliance.

None of this bodes well for the candy darter.

According to the U.S. Fish and Wildlife Service, almost half of all known candy darter populations (35 distinct groups in total) have been eradicated since the species was first identified 91 years ago. This led the agency to

identify the species as endangered in 2018 and designate certain sections of its remaining range as critical habitat, including the South Fork of Cherry River.

Under the Endangered Species Act, projects that are federally funded or that require a federal permit must demonstrate that they will not harm any endangered species before they are allowed to break ground in a designated critical habitat area. In West Virginia, coal mines are permitted by the state Department of Environmental Protection, but this authority is delegated and overseen by federal agencies within the Department of the Interior. This means that South Fork Coal Company must follow not only those regulations that apply to all coal mines, but that it also must comply with the requirements of the Endangered Species Act at its operations in the South Fork of Cherry River watershed.

While ABRA maintains a focus on access to critical information, other organizations, including Appalachian Voices, take on a more direct advocacy approach. South Fork Coal Company is currently seeking approval by the state of West Virginia to discharge mine runoff from an additional 37 acres of mining and coal hauling disturbance into tributaries of the South Fork of Cherry River. As the impacts of the company's present operations are extensive, multiple advocacy organizations are asking the DEP to deny this request and instead crack down on the company's ongoing compliance problems. These organizations include the West Virginia Highlands Conservancy, West Virginia Rivers, Appalachian Voices, the Center for Biological Diversity, Coal River Mountain Watch, and Kanawha Forest Coalition.

[Sign the petition](#) to stop Rocky Run Mine from expanding into endangered candy darter habitat.

Note: This article originally appeared in [Appalachian Voices' Front Porch Blog](#).

The Highlands Voice: It's Not Just for Reading Any More

The Highlands Voice is the main way that the West Virginia Highlands Conservancy communicates with its members. But we would like to communicate with more than our members. We have a valuable perspective and information; we would like to communicate with everybody. We still offer electronic delivery. If you would prefer to receive it electronically instead of the paper copy please contact Crys Bauer at membership@wvhighlands.org. With electronic delivery, you will receive a link to a pdf of the Voice several days before the paper copy would have arrived.

No matter how you receive it, please pass it along. If electronically, share the link. If paper, hand it off to a friend, leave it around the house, leave it around the workplace. It's not just for reading. It's for reading and passing along.

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To get free I ♥ Mountains bumper sticker(s), send a SASE to P.O. Box 306, Charleston, WV, 25321. Slip a dollar donation (or more) in with the SASE and get two bumper stickers. Businesses or organizations wishing to provide bumper stickers to their customers/members may have them free. (Of course if they can afford a donation that will be gratefully accepted.)



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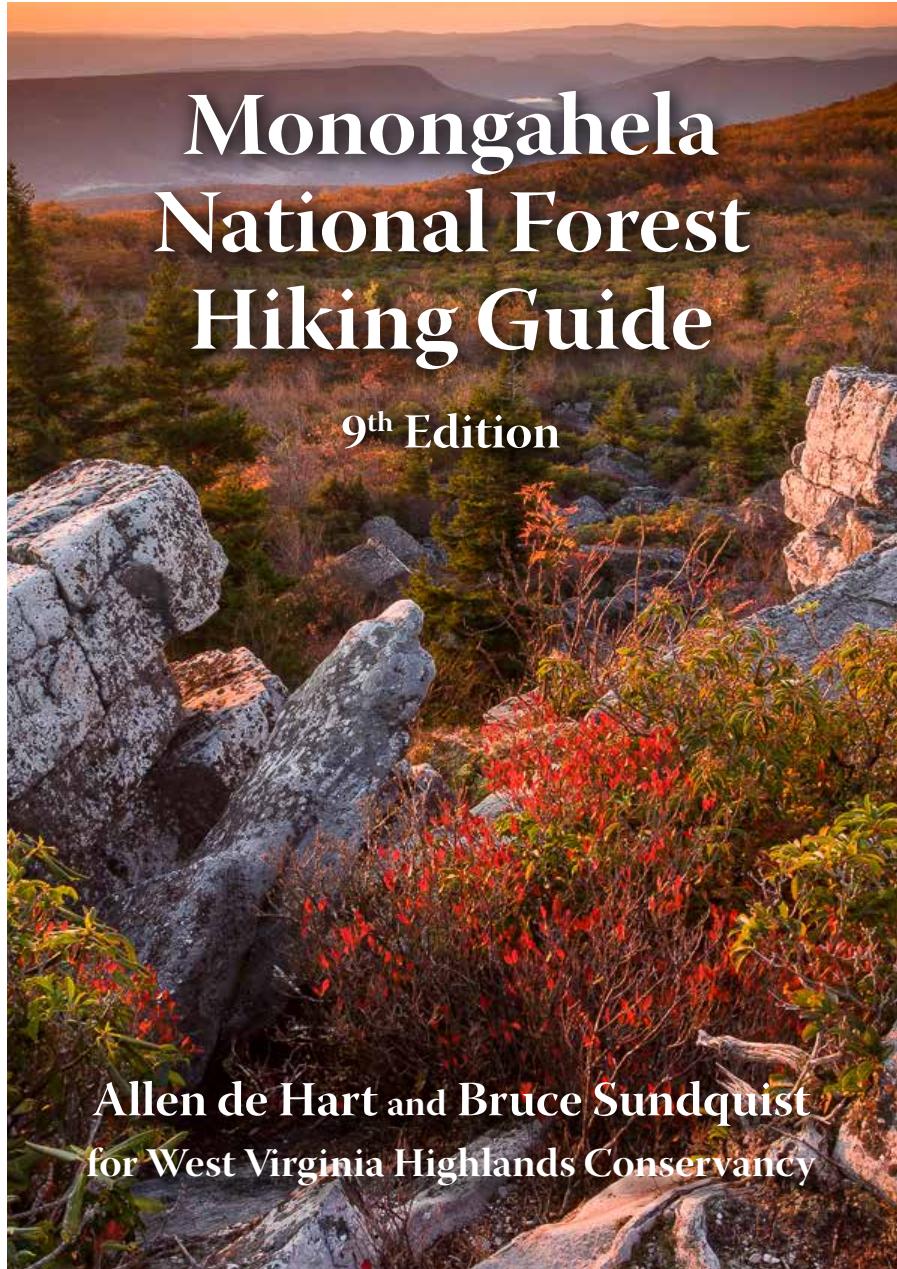
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Mon National Forest Hiking Guide



Celebrating the 50th anniversary of the West Virginia Highlands Conservancy, the new edition of the treasured guide to every trail in the Monongahela National Forest features brand-new topographic maps and Kent Mason's gorgeous photos, all in color.

The Guide has been updated with the cooperation of National Forest District Rangers and Recreation Specialists to reflect changes in the past ten years:

- newly designated wilderness areas
- new trails near campgrounds and sites of special significance
- a new complex of interconnected trails on Cheat Mountain
- rerouted and discontinued trails
- ratings for difficulty, scenery, access to water, and much else

The definitive guide to the Mon adds a wealth of information about history, wildlife, and botany; safety, preparation, and weather; horseback and mountain bike riding and cross-country skiing; as well as sources of further information on the Forest and its environs.

The Monongahela National Forest has long been known as a 'Special Place.' The hiking, backpacking, and cross-country skiing opportunities it provides are among the best in the eastern U.S. New wilderness and back country trails have been added to the outstanding areas we have appreciated for decades – Otter Creek Wilderness, Dolly Sods Wilderness, Flatrock Plains, Roaring Plains, Blackwater Canyon, Spruce Knob, North Fork Mountain, Shaver's Mountain, Laurel Fork Wilderness, Cranberry Wilderness -- and there are lesser-known gems to be found in between.

Profits from the sale of these guides support a wide variety of worthy environmental projects for the West Virginia Highlands Conservancy.

Send \$18.95 plus \$3.00 shipping to: West Virginia Highlands Conservancy, P.O. Box 306, Charleston, WV 25321 OR Order from our website at www.wvhighlands.org

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The Highlands Voice is always printed on recycled paper. Our printer uses 100% post consumer recycled paper when available.

The West Virginia Highlands Conservancy web page is www.wvhighlands.org

WV Stands to Benefit from New Methane Rule

By Morgan King

Born and raised in Kanawha County, I've spent most of my life near the Kanawha River. Growing up, I witnessed extractive resources move through the area on our waterways and railroads. I would count passing train cars piled high with coal and tanks filled with oil and watch barges filled with more of the same extractive resources move sluggishly along the river.

Observing these transport systems for the raw materials essential to our energy economy in West Virginia was a part of daily life. In college and graduate school, I learned how extraction affects our air and water while contributing to the climate emergency.

When we discuss climate change causes, carbon dioxide understandably dominates the conversation. But, at over 80 times more potent than carbon dioxide at trapping heat within the first 20 years in the atmosphere, methane plays a dangerous role as the second most abundant greenhouse gas. Methane is estimated to cause 20 percent of global emissions and 25 percent of the global warming we've seen to date.

According to the Environmental Protection Agency (EPA), the largest sources in the United States are oil and gas systems (32 percent) and enteric fermentation by livestock (27 percent). Yet, research by the Environmental Defense Fund revealed emissions from oil and gas production to be 60 percent higher than EPA's estimate.

It's clear – cutting methane pollution from the oil and gas industry is the fastest way to address climate in the near-term. Limiting global warming is lifesaving for communities bearing the brunt of climate impacts, like severe flooding which West Virginians know well.

Beyond climate, methane emissions from oil and gas jeopardize the health of workers and communities closest to development. Volatile Organic Compounds, or VOCs, are released alongside methane during operations. VOCs worsen respiratory diseases and increase the risk of cancer and cardiovascular diseases. Nitrogen oxides produced by gas flaring and engines at natural gas facilities react with sunlight, methane, and VOC pollution to form ozone. This smog impairs lung function, triggers asthma attacks, and aggravates diseases like bronchitis and emphysema putting children, the elderly, and people with respiratory conditions at highest risk.

Climate change exacerbates weather conditions, like hotter temperatures and stagnant air, that intensify the ozone smog levels. So, methane pollution creates a feedback loop—more emissions increase global warming and health risks.

Worse still, proximity to oil and gas development exacerbates existing public health crises. West Virginia ranks highest nationally for prevalence of heart attack and coronary heart disease, has the second highest cancer mortality rate, and is among the worst ranked for chronic respiratory disease making West Virginians vulnerable to these pollutants.

More than 17.3 million people live within a half mile of active oil and gas production operations nationwide. Many active and abandoned oil and gas wells in West Virginia put our neighbors at risk. Over half of West Virginians live within a mile of an active well, and there are 6,500 abandoned and orphaned wells leaking methane statewide.

Low-producing wells are unique perpetrators of methane pollution in the country, making up eight in ten of all wells, producing just six percent of our oil and gas, and causing half of all well-site pollution. Appalachia has the highest number of low-producing wells and experiences the most methane pollution from these wells in the country. My home of Kanawha County has 3,303 of these low-producing but high-emitting wells, the highest in the state.

While this sounds grim, there is good news. Last November, EPA proposed an updated rule to address methane emissions and toxic pollution from large and leak-prone small well sites, along with inspections of abandoned wells until closure.

The proposal is a common-sense solution for the oil and gas industry. Plugging leaks and reducing emissions are cost-effective, helping the bottom line of operators, while creating thousands of jobs nationwide. The value of gas wasted each year in the country from leaks at low-producing wells is \$1.3 billion, enough to run 3.6 million homes for a year.

Whereas Appalachia and West Virginia are most affected by low-producing and abandoned oil and gas wells, the region stands to see more job creation and better health outcomes by embracing EPA's methane rule.

Morgan King is the climate campaign coordinator for [West Virginia Rivers](#).

Energy Efficiency *continued from page 4*

The help could take the form of offering low-cost financing of efficiency improving equipment, giving away more efficient light bulbs, offering rebates for the installation of energy efficient equipment, etc. Such programs help consumers, reduce emissions, and (by eliminating the need to construct or buy power plants) can help the utility companies. Everybody wins.

It is not as if the West Virginia Public Service Commission and our utilities are doing nothing. American Electric Power has a program that provides assistance for those who wish to become more energy efficient. First Energy (parent company to Mon Power), on the other hand, does nothing or next to nothing. It has demand reduction programs in other states served by other subsidiaries. It has nothing in West Virginia.

It doesn't have to be this way. Other states have programs, mandated by their equivalent of our Public Service Commission, that require that utilities seek ways to reduce demand. We could have that, too, were it not for our apparent policy goal of increasing emissions of carbon dioxide.

There may be no such thing as a free lunch when it comes to reducing carbon dioxide emissions. Energy efficiency is as close as we can get. Only West Virginia's adherence to its unstated goal of increasing emissions is preventing us from taking steps to increase energy efficiency.

Does the Eastern US Have Room for Cougars?

By Peggy Clark



A mountain lion is photographed by a motion-triggered trailcam at Kofa National Wildlife Refuge in Arizona. (USFWS)

Klandagi in the East

Before European colonization, the land that is today the eastern United States was home to a richer biodiversity of plants and wildlife. The idea of a former pristine, untouched wilderness is a myth, though—the Native Americans passed down land stewardship practices and knowledge across generations. Many tribes revered the cougar—also known as puma, panther, or mountain lion—as a teacher. The Cherokee name for the cougar, Klandagi, meaning lord of the forest, reflects their special reverence for the animal. According to the Cherokee creation myth, the cougar and owl are blessed with vision in darkness because only they were able to stay awake during the seven days it took the Great Spirit to create the world.

It was the relentless persecution of predators by the European colonizers, along with habitat loss and the overhunting of deer, their primary prey, that led to the cougar's destruction in the east. By 1900 the last cougars had been killed off east of the Mississippi River, with the sole exception of an isolated, endangered

population in southern Florida. In many ways, the U.S. government's treatment of Indigenous people parallels its treatment of its native carnivores.

Indeed, some tribes like the Tongva from what is today Los Angeles, California, directly see the story of the sacred cougar reflected in the history and deliberate displacement of their people. "He mirrors us. He was born on this land, like those who came before him," read a tribute to the famous cougar P-22, who lived in Los Angeles' Griffith Park for a decade.

Today cougar populations in North America exist in just 16 U.S. states (some of which only have small, tenuous populations), three Canadian provinces (British Columbia, Alberta and Saskatchewan) and Mexico. It's important to note though that the eastern cougar is not a separate, extinct animal—it never existed as a genetically distinct species or even subspecies. All cougars in North America, including the Florida panther and extirpated eastern populations, are classified as *Puma concolor* couguar. Thus, if cougars from the west recolonized the east,

they would be the same kind of animal that historically roamed there. Today, the eastern half of the country is much more densely populated than the western half, where cougars currently still exist. So, is there enough wild space to return cougars to the east?

The Eastern Habitat Study

In January 2023, scientists with *Panthera*, an organization dedicated to preserving wild cats worldwide, published a study that determined the most suitable areas of habitat for cougars in the east. The researchers looked for the largest areas of potential cougar habitat that could support a healthy population even in isolation. This chosen threshold area was a minimum of 6,000 square kilometers of good habitat, with no interstate highways dividing it. With the strategic placement of wildlife crossings over roadways, the space of connected habitat could grow even larger. For comparison, Yosemite National Park is roughly 3,000 square kilometers in size, while Yellowstone is just under 9,000 square kilometers. Both western parks have cougar populations.

What Makes Ideal Cougar Habitat?

The [Panthera study](#) analyzed several different factors to determine the best potential areas for cougar restoration in the eastern U.S. They considered the following limitations:

- **Habitat area:** the minimum size to sustain long-term genetic diversity was estimated at 6,000 square kilometers or greater.
- **Land cover:** cougars prefer to avoid open habitat. This ruled out agricultural fields and grasslands.
- **Forest cover:** cougars need structured cover for survival and to stalk and ambush prey. The study selected areas that had 53 percent or more forest cover.
- **Livestock density:** cougar survival is higher in areas with low livestock density because conflict with humans due to predation on livestock can be more easily avoided.

continued on next page

Cougars in the Eastern US *continued*

- Therefore, areas heavily concentrated on domestic cattle or sheep production were excluded. The study looked for areas of land that had a livestock density of less than 14.5 animals per square kilometer.
- **Housing density:** cougars need areas with low housing density and development. The chosen threshold was a housing density less than 68 units per square kilometer. This factor excluded major cities and densely populated suburbs.
 - **Human development proximity:** cougars avoid habitat immediately adjacent to people. Therefore, space within 600 meters of a house or human structure was excluded from the overall square mileage.
 - **Deer:** the cougar's main prey. White-tailed deer are very abundant throughout most of the east.
 - **Winter snow:** cougars follow their prey for survival. Deer and elk avoid areas of very deep snow, so the average winter snow could not be too deep. The threshold was an average winter snow depth of 50 centimeters or less.
 - **Highways:** major interstate highways fragment cougar habitat and create major obstacles. Without wildlife overpasses or underpasses, cougars can be struck and killed trying to cross busy roads. This excluded land within 170 meters of interstates or major arterial highways.
 - **Sociocultural values:** human social tolerance for cougars is a major factor. The study looked at residents' attitudes towards wildlife, with the ideal attitude being one of mutualism instead of domination. Where mutualistic attitudes prevail, the people living in the area prioritize coexistence with wildlife and are more likely to value large carnivores like cougars. Colorado State University's wildlife values survey has published results for every state. Out of the 17 potential habitat areas studied, the patches in Vermont and New Hampshire scored the highest on mutualism, and the Ouachita Mountains area of Arkansas scored the lowest.

Results

Using these restrictions, the study found

17 suitable patches of potential cougar habitat 6,000 square kilometers or larger. Each of these areas could, in isolation, support a genetically healthy, self-sustaining cougar population. 13 of these were 10,000 square kilometers or larger. The smallest area was in the Ouachita Mountains of Arkansas, and the largest was in the Wisconsin Upper Peninsula. The area in Vermont and New Hampshire marked by a red circle was also suitable and adjacent to several other habitat regions—it was simply divided by highways into patches smaller than 6,000 kilometers. Perhaps this would be a good place to build a wildlife crossing.

Most of these habitat areas were adjacent or nearby other patches, separated by interstates or cities. Three were isolated islands of ideal potential cougar habitat - the Ouachita Mountains of Arkansas (#1), Ozark Plateau of Missouri (#9), and the Great Smoky South of western North Carolina (#10).

Putting it all together, the three most suitable regions for cougars in the East would be:

1. The New England states, New York and northern Pennsylvania (seven habitat areas, 116,374 square kilometers total)
2. The Great Lakes region (four habitat areas, 99,293 square kilometers total)
3. The Appalachian Mountains, including most of West Virginia and parts of eastern Kentucky, western Maryland, and southwestern Virginia (three habitat areas, 62,725 square kilometers total)

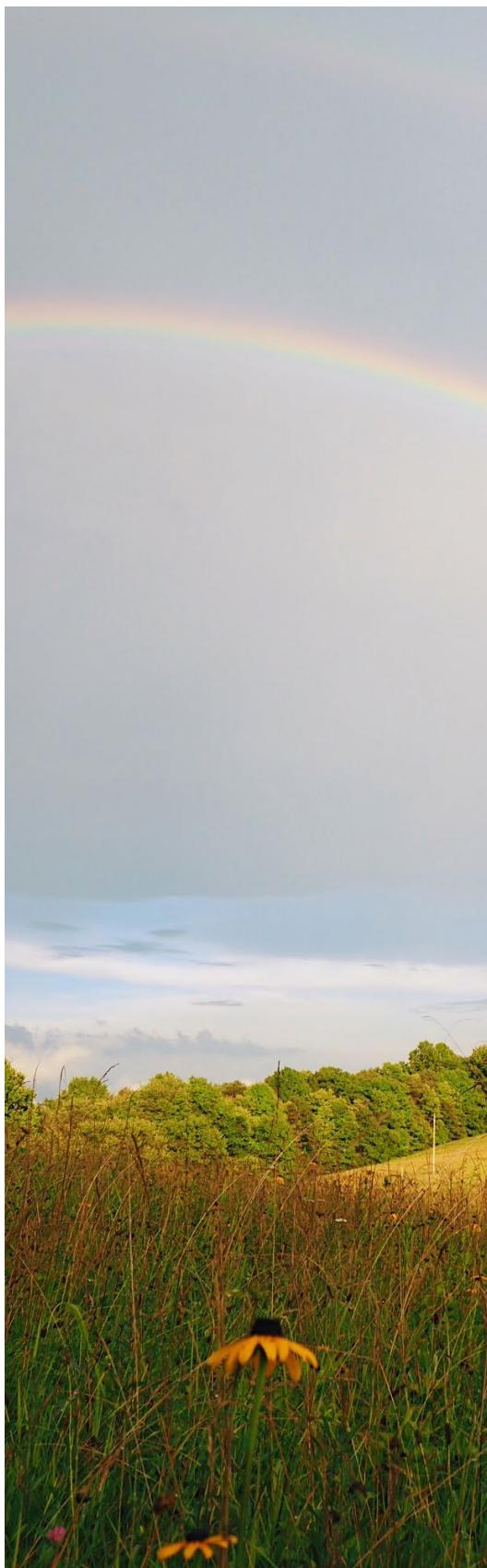
Why Reintroduce Cougars?

Some may ask why there is a need to restore a top carnivore back to its former range. Reintroducing any apex predator is a highly controversial and contentious issue. Many people are afraid of cougars and see them as a looming, potential threat to public safety or their pets. The actual occurrence of cougar attacks is quite rare (only one fatality every five years on average), but these incidents tend to garner the most media attention, which can negatively alter people's perception of cougars. Regardless, a look at the science reveals the east would indeed benefit from having cougars back. In fact, the absence of cougars in the east has had negative consequences for not just the ecosystem, but human

health and safety concerns as well. Beyond their aesthetic or symbolic value, several reasons to support the restoration of cougars include:

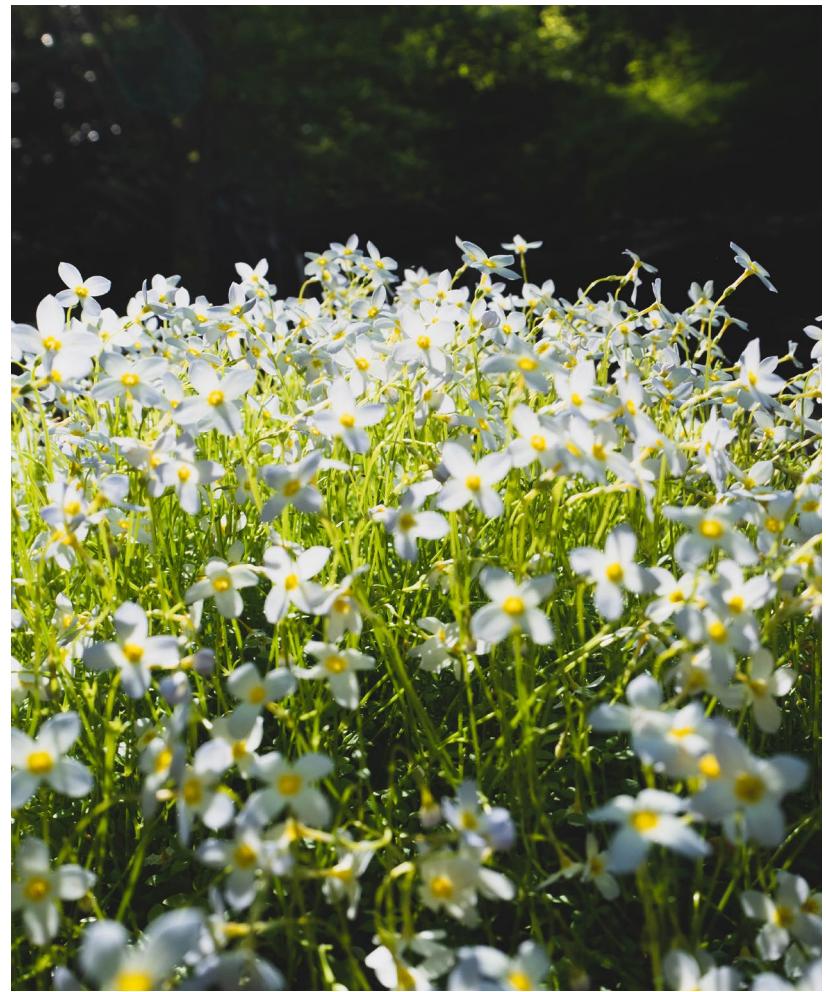
- First, cougars reduce the rate of deer-vehicle collisions on roadways. A University of Washington study published in 2016 estimated that the restoration of cougars in the east would reduce the current rate of deer collisions by 22 percent within 30 years. Each year, that estimate amounts to preventing five human deaths, 680 injuries, and avoiding costs of \$50 million in damage. On an individual level, a single eastern cougar could prevent at least eight road collisions between deer and vehicles and save \$40,000 within six years. The paper summarizes that "cougars would indirectly save far more people from death (five per year) and injury (680 per year) by reducing [deer-vehicle collisions] than they would likely directly kill (<1 per year) or injure." Note that West Virginia, a state with one of the highest percentages of potential cougar habitat, also has the highest rate of deer-vehicle collisions in the nation.
- Cougars help prevent over-browsing of forests by selectively trimming the deer population. The east's three remaining top predators—black bears, bobcats, and coyotes—will all sometimes prey on deer (usually fawns) but are wide-ranging generalists in their diet. In isolated areas like islands in the east, bobcat reintroduction efforts have had positive effects on the health of both the local deer and plant communities. The larger cougar, which is more specialized in hunting deer, could produce similar results on a wide scale.
- Cougars may be a factor at controlling the spread of diseases in deer such as Chronic Wasting Disease. A Colorado study found that cougars selectively removed infected mule deer—including in the hard-to-detect early stages of the fatal disease. Cougars can feed on Chronic Wasting Disease-infected deer without getting sick themselves and absorb the prions rather than shedding them.

continued on page 19

Come Sunday Morning

Out behind the mansion,
now a retreat house
the virus closed to guests,
an old road meanders
through manicured gardens,
out by the weathered barn
(where once an elderly
raccoon danced madly
on the hot tin roof),
into gently undulating hills,
the leased farm field
with first hay being mown
and rolled into huge cylinders,
with corn thigh-high healthy,
with great, fallow fields,
all the careful patchwork
of an enormous, living quilt.
Red winged blackbirds,
blue birds, finches,
an occasional killdeer
accompany my ambling.
It's so still I can hear
the corn grow, or perhaps
wind ruffling its husks.
Lifting my eyes to the hills
I see across the gentle valley
another farm's serenity,
and the ominous equipment
of foreigner's fracking pad.
On the far horizon,
across the river marked
by a ribbon of morning mist,
the immense chimneys
of an electric plant point
witchy fingers, belch
toxic smoke at our
innocent, limpid sky.
"This land is home to me,"
but its peace is precarious.
Danger creeps quietly in
on things more dangerous
than little cat's feet.

Submitted by Bonnie Thurston

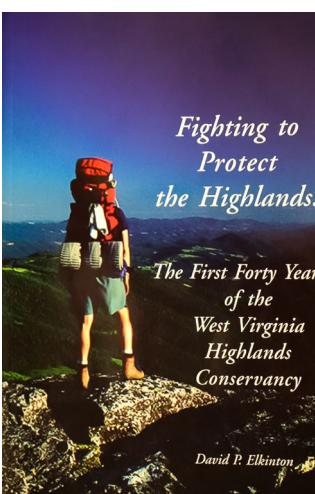


Motion and rest. That is the cycle of nature. As in Spring, when things come alive and bloom and young are born, the change of growth brings a harvest by fall, and in the winter, all rest and contemplate. During times of change, it is important to incorporate equal qualities of activity and quietude and stability. The Great flowing river with the rooted tree standing by it is an image loved by many, that subconsciously reminds us of this.

In times of contemplating which changes to make, it is important for us to assess which changes will assist our growth, and which ones will nurture, comfort and give us stability.

If you move the tree by the river, it soon washes away more of the bank, and the tree starves. Change is for the purpose of reminding us who we really are, like Dorothy following the Yellow Brick Road, the road of growth and evolution. It is important to follow what has heart and meaning, not only what has financial reward.

~tohi. Paula Stahl



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THE WAY THE VOICE WORKS

The Highlands Voice is the official publication of the West Virginia Highlands Conservancy. While it is the official publication, every story in it does not represent an official position of the Conservancy. While all of our members share the general goal “to promote, encourage, and work for the conservation—including both preservation and wise use—and appreciation of the natural resources of West Virginia and the nation,” our members often have differing views upon the best way to do that.

As a result, stories in *The Voice* often reflect different points of view. The Conservancy itself, however, only speaks through its Board. The only stories that reflect the official policies of the Conservancy are those reporting Board actions, including litigation positions we have taken, comments on proposed regulations, etc.

Guidelines for Responsibly Collecting Ramps on Monongahela National Forest



(U.S. Forest Service - Monongahela National Forest)

Digging and eating ramps in the spring is a traditional activity throughout Appalachia, especially in Monongahela National Forest's gateway communities. While collecting ramps for personal use is permitted on the Forest within established limits, commercial harvesting of ramps in the Forest, including re-selling ramps collected for personal use, is prohibited.

Personal use is defined as two gallons per person in possession at any one time, about the amount that fits in a typical plastic grocery bag. This equals about 180 whole plants, including roots and leaves. Individuals may not collect ramps on behalf of someone else.

We encourage people who are taking advantage of the spring-like conditions and already collecting ramps in the Forest to follow these guidelines to ensure abundant ramps in the future:

- Collect ramps only in patches with more than 100 plants.
- If you find a patch that has already been harvested, move on to another area.
- When collecting ramps from a large clump, take only one-fifth of the plants. Leaving behind most of the plants will allow them to mature and go to seed, and the patch will recover faster.
- If digging bulbs, use a soil fork or a small hand trowel and a knife rather than a large shovel. Shovels disturb the root system of neighboring ramps and other plants much more than these smaller tools. To dig ramps, loosen the soil with the soil fork or hand trowel and use the knife to cut the ramp roots beneath the bulb.
- After you dig a ramp, cover the bare soil with leaves. This will reduce the likelihood of invasive species taking root.

By following these guidelines for harvesting ramps, we can ensure that our children and grandchildren can enjoy ramps for generations to come.

For more information about the ecology of ramps in Monongahela National Forest contact Education Specialist Amy Lovell at amy.lovell@usda.gov or (304) 413-6675.

A Little More on Cougars in the Eastern US

- Cougars can reduce the prevalence of tick-borne diseases such as Lyme disease. This disease is spread by deer ticks, which become infected after feeding on mice. In addition to their role as natural predators of deer, cougars also keep the numbers of coyotes in check, thereby increasing the numbers of small carnivores like foxes that are primarily mouse predators.
- Cougars are ecosystem engineers. Their presence has a cascading effect benefiting a wide variety of species that scavenge their kills, from birds to beetles.

Can They Return on Their Own?

There have been a number of confirmed cougar sightings in some midwestern states. However, the chance of cougars recolonizing the east on their own faces several logistical challenges. To confirm a breeding population exists in an area, we would also need to find a female cougar with cubs or displaying signs of nursing. Long distance dispersers are mostly subadult males between one and a half and three years of age. Females usually stay close by their mother's ranges and form matrilines in a population.

Each individual cougar venturing east faces the threat of vehicle collisions, intolerance, a lack of connectivity and state policies. Many of these individuals originate from the Black Hills of South Dakota.

In 2011 one male cougar, documented in the book Heart of a Lion, traveled from the Black Hills all the way to Connecticut but was unfortunately struck and killed by a vehicle attempting to cross a road.

In 2016 a rare female disperser from the Black Hills was confirmed in central Tennessee, though she has not been seen in the area recently and her fate remains unknown. Only a few lucky individuals make it this far. Wildlife corridors, education, and policy reform must occur if these travelers are to survive.

For links and references see The Highlands Voice online at wvhighlands.org

Thoughts on ORVs on Public Lands

By Dave Johnston

I retired to West Virginia in large part because of its wide selection of wild and scenic natural areas provide excellent opportunities for immersion in nature, enjoyment of wildlife in its natural environment, broad and largely undisturbed vistas, and the study and understanding of natural processes. Through protection and sensitive management of these resources, West Virginia has the opportunity to move from an economy based largely on extracting natural resources to one where our resources are managed sustainably for the long term economic, health, and social benefit of the residents of our state—and for the visitors who help support our recreation economy.

West Virginia has generally done a good job of preserving and managing its state public lands to provide opportunities for a variety of activities and usage interests, while retaining their natural qualities. West Virginia State Parks provide opportunities for more developed non-motorized recreation. State forest and wildlife management areas provide a wilder, more primitive experience. All of these public lands encourage traditional pursuits where hiking, wildlife viewing, mountain biking, hunting, and fishing can be enjoyed without intrusion of incompatible activities for a wide variety of visitors, allowing everyone to connect with and appreciate the natural values of our state.

There are, however, activities and uses that are incompatible with the natural public lands of West Virginia. Off-Road Vehicles (ORV, ATV, UTV, Special Purpose Vehicles and the like) have a huge impact on our state public lands, far more than any other recreational use of state lands. Motorized trails are wide and inherently disruptive of normal vegetation and drainage patterns, having characteristics of neither properly constructed roads nor foot, bike or horse paths. One estimate indicates that motorized trails cost \$30,000 per mile to build and \$14,000 per year to maintain.

ORVs disrupt the habitat and living patterns of wildlife. The frequent imposition of loud mechanized equipment tends to drive away even more adaptable wildlife, further limiting their range. This interferes with the ability of other visitors to enjoy encounters and observation of wildlife, and of hunters and anglers to responsibly and sustainably engage in harvesting wildlife.

The noise and exhaust of ORV travel far, and effectively exclude a wide area surrounding the trails from enjoyment by visitors pursuing normal recreational activities compatible with a natural area. ORV riders often leave the designated trails and spread their impact into adjacent forest. When they cross streams and wetlands, the natural bank is destroyed, and mud and sediment impact our trout and other species of fish. Detailed information about the damages to public lands caused by ORV can be found at the Allegheny-Blue Ridge Alliance [website](#).

Unlike multi-use non-motorized trails already present on public lands, ORV trails effectively cannot be used for anything else, with the



result that large tracts of public land are removed from availability for general use, and instead become dedicated to a single disruptive and incompatible activity.

Every year it seems some people in our West Virginia legislature attempt to expand motorized trails and allow ORVs on our public lands. No doubt claims of economic benefits will be touted. Yet that neglects the fact that many visitors, both from outside the state and from within, will be less inclined to go to state public lands and surrounding businesses once the natural values of those lands are degraded by the presence of ORV trail systems. This will affect not only the local area, but also the state as a whole as it becomes known beyond our borders that West Virginia's parks and forests are no longer natural areas protected from intrusion of loud motorized vehicles.

This year is no different. Proposed legislation allows for "connector" trails from ORV trails on private land to state lands to permit access to their facilities. This is reasonable in limited situations, provided that any proposed connector trail does not result in ORV trail networks on public lands, are subject to appropriate criteria for determining the need or appropriateness of a connector, and are sited, designed, and constructed in such a way to minimize the impact on the existing natural characteristics of our unique West Virginia parks and forests.

But there have been attempts to amend the bill to open public lands to Off-Road Vehicles. I urge all Delegates and Senators to oppose any expansion of motorized trails or Off-Road Vehicles on the public lands of West Virginia, including all state parks, forests, wildlife management areas and rail trails.

Another False Solution to Issue of Plastic Waste

By Randi Pokladnik

As consumers become increasingly aware of the health risks and environmental issues associated with a world drowning in plastics, the petrochemical industry is advocating another false solution to address the plastic crisis facing the planet: Advanced recycling or chemical recycling.

Chemical recycling uses incineration processes including pyrolysis, gasification and solvolysis to break down plastic waste. The industry claims this will make plastic production “circular” by using plastic to make more plastic and keeping hard-to-recycle plastic waste out of landfills. A 2019 study by the U.S. Department of Energy estimated the U.S. discarded 44 million metric tons of plastic, and 86 percent of this plastic ended up in landfills.

The public relations departments of the plastics industry and the American Chemical Council are working overtime to convince politicians and citizens that chemical recycling is the answer to the enormous problem of plastic wastes. However, like carbon capture and blue hydrogen, this process is just another way to greenwash an industry that is responsible for 400 million tons of plastic waste each year. From cradle to grave, the entire process of plastic production has a significant carbon footprint. Even the United Nations has declared plastic wastes as a serious threat to humanity and the planet.

By using the term recycling, the industry is misleading consumers and decision-makers. Recycling means “to return a material to a previous stage of a cyclic process.” If the waste plastic material was indeed turned back into a similar plastic, it would provide a benefit to the environment by reducing the need for fossil-fuel-based feedstock to create virgin plastic. But this is not the case with chemical recycling where the majority of plastic wastes are being converted and used as a fuel source.

The technology of chemical recycling can be grouped into two main categories: Heat-based and solvent-based. There are two primary methods that use heat and pressure to break down the long chain plastic poly-

mers: Pyrolysis and gasification. Both apply high temperatures to the waste plastic in a low oxygen setting or an oxygen-depleted reactor. Solvent-based depolymerization is a bit more complicated as it relies on heat as well but also includes various steps and solvents to break bonds, to strip out impurities, or to retain intact polymers.

A study released in September shows that reuse and mechanical recycling of plastic packaging are better choices when it comes to reducing greenhouse gas emissions. “Emissions from mechanical recycling are lower than those from chemical recycling by a factor of nine.” The study also points out that reducing the amounts of unnecessary packaging also will help move the world toward a zero-emission economy.

Other factors to consider, aside from the fact that the majority of facilities are not truly recycling any plastic, are the large quantities of hazardous waste generated, the amounts of toxic air pollutants released and the fact that facilities are “disproportionately located in communities of low income or people of color, or both.”

Agilyx, located in Tigard, Oregon, is one of the few commercial-scale facilities in operation. It uses pyrolysis to turn polystyrene into the monomer styrene, which is used to make more polystyrene. Much of the styrene however is used as a fuel source. The plant released 500,000 pounds of hazardous waste in 2019. Styrene is made from benzene, a known carcinogen. PureCycle, located in Ohio, also is a large-scale hazardous waste producer with more than 2,200 pounds of hazardous waste generated per month.

Chemical recycling requires a considerable amount of energy and obtains this by burning fossil fuels, thus adding more carbon dioxide to the atmosphere. “In 2019 alone, the global production and incineration of plastic accounted for more than 850 million metric tons of greenhouse gases released to the atmosphere, approximately equal to the emissions from 189 five-hundred-megawatt coal

power plants.”

Additionally, when plastic is burned, the carbon portion of the polymer is combusted, but other toxic additives used in plastic production remain in the residue. If the plastic is used for fuels or chemical feedstocks, the non-combustible materials will remain intact. These toxins can be carcinogenic or endocrine disruptors and include: Dioxins, furans, heavy metals, flame retardants, PAHs, VOCs, phthalates, bisphenol A, chlorine and fluorine. The “EPA provides little information about emissions and relies heavily on self-reporting by the industry.”

The American Chemistry Council has promoted chemical recycling and is “actively trying to influence state and local governments and decision-makers to approve new plastic expansion projects, remove regulatory obstacles, and award public money or tax breaks to pass some of the needed investment on to taxpayers.”

The American Chemistry Council and other trade associations support bills which would allocate money (HR 5115) for recycling infrastructure including chemical recycling as well as funding dollars for research (HR 7728) on the technology.

A 2020 Greenpeace report “Deception by the Numbers” looked at financial investments for 51 chemical recycling projects. They found since 2017, \$506 million had been awarded through public funds such as bonds, loans, grants, tax credits and other incentives. Of that \$506 million, “89 percent was spent on waste-to-fuel/plastic-to-fuel.” Taxpayers are not paying for plastic recycling but rather paying for fuels for the petrochemical industry. One of the major sticking points when it comes to regulations is the classification of chemical recycling. It is being defined as a manufacturing process rather than a waste incineration process.

This means facilities are subject to less stringent air and water quality requirements.

continued on page 22

A New “Durable” (sic) Definition of Waters of the US

By John McFerrin



On Dec. 30, 2022, the United States Environmental Protection Agency (EPA) and the U.S. Army Corps of engineers announced a rule establishing a definition of “waters of the U.S.”

In announcing the rule, the agencies involved said,

“The final rule restores essential water protections that were in place prior to 2015 under the Clean Water Act for traditional navigable waters, the territorial seas, interstate waters, as well as upstream water resources that significantly affect those waters. As a result, this action will strengthen fundamental protections for waters that are sources of drinking water while supporting agriculture, local economies and downstream communities.”

The agencies described the rule as “final” and “durable.” To which longtime observers responded, “Final? Ha!” “Durable? Ha!”

The agencies are required to describe the rule as “final” because that indicates that this is the rule; when it takes effect in March 2023, this is the law. All rules are first published as drafts. Agencies then receive public comments, make revisions, etc. Describing a rule as final signals that this is it, this is what the law is.

For those who would benefit from a less expansive definition of “waters of the United States” and their lawyers, it is the equivalent of horse racing’s ringing the bell and shouting, “They’re off!” It’s time to head to the courthouse. In West Virginia, the constituencies for a less expansive definition include the mining companies who make a living filling streams.

Describing the rule as “durable” is wishful thinking. Disputes over the definition of “waters of the United States have gone on since the federal Clean Water Act was passed in 1972. The Act protected the “waters of the United States” without defining what that phrase meant. We have been arguing about the definition ever since. The Obama administration did a careful review of the science and past court cases and came up with one rule. The Trump administration took the “I ran on getting rid of this rule, so we are getting rid of it” approach. Now the Biden

administration has published a new final rule.

The sprint to the courthouse has already begun. Industry groups in Texas have already filed a court challenge to the new rule. A coalition of Attorneys General from 24 Republican states (including West Virginia) have filed suit in North Dakota.

For a more complete history of the rule, see the [January 2019 issue](#) of The Highlands Voice. For a more detailed discussion of the new rule, you could search “waters of the U.S.” or even WOTUS. There is such public interest in this rule that there are lots of sources of information. One helpful discussion can be found [here](#).

False Solution to Plastic Waste continued from page 21

Currently, there are 20 signed state laws, including HB 166 in Ohio and SB 4084 in West Virginia, that redefine waste to exclude “advanced/chemical recycling.” One of the few states to kill an industry-backed bill was Rhode Island. A June 27 issue of Plastic News reported that two senior Democrats had “significant questions about the bill.” Environmental groups in the state argued that the state should focus on reducing single use plastics. The Conservation Law Foundation said “there was no evidence to support the claim that new plastics were being made, and instead materials were being burned creating climate-changing gases and air pollution.”

A final concern with these dangerous facilities is where they are located. In most cases, poor communities of color seem to be the sites for the majority of waste-to-energy plants. You will not see a chemical recycling facility in a rich suburb. Many lawmakers admit this is clearly a case of environmental injustice. They are writing and passing laws hoping to address the disproportionate amounts of hazardous facilities, like chemical recycling, located in poor communities, near schools, close to water sources and adjacent to parks and public lands. (Rhode Island HB 5923).

SOBE Thermal Energy Systems is proposing a “recycling facility for tires and plastics” in Youngstown. Basically, they will be using gasification to create a fuel that will be burned to create steam to heat some downtown buildings.

When the CEO of SOBE, Dave Ferro, was questioned about this facility his reply was, “his plant would be as clean or cleaner than natural gas.” Any peer reviewed analysis of the incineration of plastics/tires will point out the toxic air pollutants created in the process (dioxin and furans) as well as all the plastic additives that will not be fully destroyed. This facility will subject the community to a constant stream of toxins in their air, land and water. I urge anyone who thinks this is a good idea to do the research, read the scientific studies. Do not buy into industry claims that this is recycling. It is simply a dirty waste-to-energy project.

Pokladnik, a resident of Uhrichsville, holds a bachelor's degree in chemistry, master's and doctorates in environmental studies and is certified in hazardous materials regulations.

The Drinking Water Treatment Process *continued*

By Rick Watson

Filtration: Clear water from the top of the clarifier is discharged to filters. Filtration removes additional solids from the water the clarifier has not removed. Typically, surface water filters are comprised of several different media types and sizes. Materials commonly used for drinking water filtration are gravel, sand and granular activated carbon (GAC). Filtration helps remove chemicals, parasites, bacteria and viruses. When the water treatment plant does not include GAC in its filters, powdered activated carbon (PAC) is sometimes added during the coagulation, flocculation, and sedimentation process to remove organic contaminants or unpleasant taste or odor.

Disinfection: Following filtration, the water is disinfected and then discharged to the distribution system. Effective filtration prior to disinfection is essential because excessive suspended solids interfere with the disinfection process and make it less effective. Chlorine addition prior to distribution is the most common form of public drinking water disinfection. While not true of all states, West Virginia requires all public water systems chlorinate their drinking water. Chlorine is highly effective, relatively safe, easy to dose and feed and inexpensive. Residual chlorine in the distribution system also prevents re-contamination between the treatment facility and the consumer. While chlorine can cause formation of disinfection by-products, trihalomethanes (TTHM) and haloacetic acids (HAA5), adequate solids removal before chlorination, proper chlorine feed rates, and residual monitoring can minimize or eliminate this problem.

Ultraviolet (UV) light and ozone are also sometimes used to disinfect drinking water. UV and ozone do have some advantages over chlorine. These disinfection processes do not form disinfection byproducts. They can also be more effective against chlorine resistant microorganisms, such as Cryptosporidium and Giardia, and some chemical contaminants (e.g., pesticides, industrial solvents and pharmaceuticals). Among the drawbacks to UV and ozone are cost and their inability to prevent regrowth or recontamination during storage and distribution. Also, determining if disinfection

has been completely accomplished is not possible because UV or ozone do not leave a measurable residual.

Less Common Water Treatment Processes

Aeration: Aeration is sometimes used in the drinking water treatment process. When used, it is typically a pretreatment step. Where gases or volatile organic compounds (VOCs) are present in the raw water, aeration is an economical, efficient method used to remove these contaminants or reduce them to acceptable levels. Aeration can also, when combined with post-aeration sedimentation and pH adjustment where necessary, be used to oxidize and remove metals from drinking water.

Ultrafiltration: Increasingly, water treatment plants are using membrane ultrafiltration rather than traditional gravel/sand filters. Ultrafiltration was, and still is, more commonly used for industrial or pharmaceutical water treatment. However, because it effectively removes bacteria, Cryptosporidium, Giardia, and potentially viruses, it is being used more frequently for drinking water treatment. Although capital and maintenance costs of ultrafiltration have decreased in recent years, this technology remains more expensive to install and maintain than traditional gravel/sand filtration. When used for drinking water treatment these technologies are most commonly applied when it is necessary to remove high concentrations of sodium and chlorides or other compounds not easily precipitated and removed using sedimentation and traditional filtration.

Richard Watson has a Master's of Science in Engineering and spent 45 years working in drinking water and wastewater as a regulator and a consultant.

For a list of references, see the article online at wvhighlands.org

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