Land Air & Water

Kentucky Energy and Environment Cabinet

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Land Air&Water

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From the Secretary's Desk

I'm preparing these remarks just as we are saying goodbye to a very long, trying winter. By the time you are reading these comments, I hope warm, sunny days are the norm. And with those warm sunny days, I hope opportunities to be outdoors enjoying the beauty of a Kentucky spring day abound.

One activity I know many individuals will be pursuing is planting trees. This year, with support of scouting troops and others throughout the state, we will have an increase in tree planting activities. This year will mark the first in what we expect to be an annual event, with the ultimate goal of planting 20 million seedlings over 20 years. Why are we pursuing such a bold tree planting initiative? Some important benefits of reforestation include erosion control, watershed enhancement, species protection and wildlife habitat improvement. An additional benefit, and one that is sometimes overlooked, is the ability of reforested lands to store carbon dioxide.

KENTUCKY'S 20/20 VISION FOR REFORESTATION
Planting 20 Million Seedlings in 20 Years

Opportunities for reforestation exist across the state, in both urban and rural areas. If we could plant 1 million seedlings a year—and with enough volunteer support we know we can do it—we will be able to achieve the goal of planting 20 million trees over 20 years. No other state has such an ambitious goal.

As we are just launching this initiative, details on planting events and potential partnerships are still in the planning stages. We hope that by the time the summer issue of *Land, Air and Water* goes to press, we can highlight more of these activities.

In the meantime, I hope you will consider your own tree planting activities—whether you volunteer for a local community initiative, launch an activity at a nearby park, or plant a tree or two in your own landscape. In residential settings, the value of trees is often taken for granted. Trees increase property values, and properly placed, they can help save on home energy costs. I encourage you to visit the Arbor Day Foundation's website at https://www.arborday.org/ for more information on just how significant trees are to our lives. Our own Kentucky Division of Forestry's website has important information regarding protection of our existing forested areas and urban tree settings. Visit http://forestry.ky.gov for more details.

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Land Air&Water

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Our Cover

A dwarf crested iris (*iris cristata*) photographed at the Brigadoon State Nature Preserve by Harold Kelley, of Glasgow. Kelley has been the volunteer preserve monitor for Brigadoon since 2000 and was awarded the Volunteer Stewardship Award in 2006 by the Kentucky State Nature Preserves Commission.

Liquid gold

Wastewater from chicken processing plant produces green energy

By Barbara Maggio Pauley
Office of the Secretary

Perdue Farms, while headquartered near the Chesapeake Bay, recently has brought a good deal of attention to Kentucky because of the sustainable energy practices at its Cromwell, Ky., chicken processing facility. Opened in 1996, Perdue's Cromwell plant employs 1,200 people and operates two working shifts and a cleanup shift. Processing 1.2 million chickens every week requires a lot of water, which Perdue draws from and returns (after cleaning) to the nearby Green River. The plant began substantially reducing air emissions after it covered a 15-million-gallon pond that had been used for more than a decade to store and treat wastewater.

With the help of stimulus grant funding from the Department for Energy Development and Independence and the Cabinet for Economic Development, Perdue developed an integrated waste recovery process that collects naturally occurring gases from waste in the pond.
Photo courtesy of Perdue Farms

"If it smells, it burns"

Describing the wastewater pond before it was covered, John DeVinney, Perdue's senior project manager and plant engineer, remarked that "below that very stinky mess was gold; it was fuel." Through a process known as methanogenesis, which is one of the critical steps in the reduction of organic matter, methane is formed by microbes that survive without oxygen. This process also releases much of the odor caused primarily by hydrogen sulfide, a byproduct of the decay process.

Through vision and a long-standing commitment to environmental stewardship, Perdue converted the smelly wastewater into renewable energy. In 2011, with the help of stimulus grant funding from the Department for Energy Development and Independence (DEDI) and the Cabinet for Economic Development, Perdue developed an integrated waste recovery process that collects the naturally occurring gases from the waste in the pond. The first step in this process was covering the three-acre pond with a geosynthetic impermeable cover. This converted it to an anaerobic digester that enabled Perdue to capture the gas, compress it and transport it to a bio-gas generator to be burned, reducing by 10,000 times gaseous pollution emitted into the air and improving surrounding land conditions. As an added benefit, Perdue's carbon footprint was reduced by 50,000 tons of carbon dioxide per year, or the equivalent of removing 9,000 cars from the roadways.

Perdue has realized increased profitability, productivity and energy savings as well. At its Cromwell complex, Perdue produces roughly 1,000 kilowatts of electricity using the renewable fuel engine—about the same volume used in 500 homes—and derives 20 percent of its hot water needs from the waste heat generated by the bio-gas generator.

Perdue worked closely with Warren Rural Electric Cooperative and the Tennessee Valley Authority (TVA) to become a partner in TVA's Green Energy Switch Program, a 10-year initiative to produce renewable power for TVA distribution. The cutting-edge bio-gas generator was the first of two renewable energy initiatives taken by Perdue as part of Green Energy Switch, and it has significantly reduced Perdue's carbon footprint while generating green energy and providing hot water from renewable energy.

"John has been willing to work with our university personnel, state agencies, and other industries to overcome hurdles and creatively solve problems many run away from," said Tim Hughes, DEDI's Division of Biofuels director. "Our relationship

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A view from the top

FAR LEFT: ***Combustion turbine stacks at an electric generating facility in Kentucky.*** **LEFT:** ***A ladder (on the left side of the stack) provides access to the testing platform where a test crew (circled) made the climb 150 feet to conduct a stack test.*** Photos by Andrea Keatley

By Kenya Stump
Division for Air Quality

Drive by any power plant and look toward the sky. Those tall stacks often have steam billowing from their openings, but what you can't see is the person standing on a platform testing the air emissions that are also coming out of those stacks.

The Kentucky Division for Air Quality (DAQ) has staff whose primary job is to inspect permitted sources throughout the state—from power plants to manufacturing facilities—and observe the testing of emissions from these sources. That means climbing those tall stacks to ensure that facilities are emitting pollution at or below acceptable levels as established in their air quality permit. Stack tests are a primary way that regulated sources demonstrate compliance with air quality regulations and requirements.

What does it take to be an air quality source test observer?

"You definitely can't be afraid of heights," says Jessica Dixon, a new employee at DAQ.

On a recent site visit, Dixon found herself 330 feet up in the air observing a stack test. "It doesn't really bother me being up so high," says Dixon. "My dad was a private pilot and would take me up in his plane when I was a kid."

One of Dixon's primary responsibilities is to review source test protocols, which describe the pollutant being tested, who will conduct the test, and the method to be used during the test. Test protocols are critical because they provide an opportunity for the facility, test team and DAQ to work through any potential problems prior to the test. For the test to be accepted, Dixon must review the procedures, witness the test when it is conducted by facility or contract testing staff, and confirm the test results by calculating data provided in the test report.

In some ways, the analysis after the test requires more time than observing the test itself.

"Stack tests have the potential to impact all aspects of the division, so it is important that we coordinate with our co-workers and make sure that everyone is aware of what is being tested and, once completed, what the results mean," said Andrea Keatley, section supervisor of the DAQ Technical Services Branch. Staff must be able to receive, analyze and evaluate the test data and then communicate the data and results to everyone involved in the test, from facility staff to consultants to co-workers. That also means giving a facility the bad news if it doesn't pass a test or if the test is invalid and needs to be repeated.

Stack tests provide valuable data that help division staff understand emission factors for various processes. DAQ engineers use emission factors to calculate potential emissions from a facility before it is operational. Facilities need this information to help them estimate potential emissions when they are applying for their permits to operate.

Ultimately, though, DAQ will require a facility to confirm their emission estimates by performing a stack test. Each time a facility conducts a test their emission factors are updated to reflect the most current operating scenario. The test also verifies that the emission control equipment is working according to manufacturer specifications.

"The division, the public and regulated communities need good air quality data to make informed regulatory decisions. Both emissions and ambient air quality data play a key role in the decision-making process," says Keatley.

Beyond communication skills and a strong background in science and math, every source test observer must complete on-the-job training. Whether studying various testing methods or taking classes, every test observer is always learning, especially about safety.

"We have to be ready for all types of facilities and all types of outdoor environments," says Keatley. "We may be on a rooftop or climbing a stack, and it's not always a perfect 70 degrees and sunny. Being up in the air exposes you to the elements, with little or no shade and nothing to block the wind."

Stack testing can last one to three days and requires long work hours.

"It is not uncommon for staff to arrive at the test site by 7 a.m. and get back to their office after 10 p.m.," said Keatley. "This leaves them just enough time to go home, sleep and come back the next day."

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The Upper Green River Biological Preserve

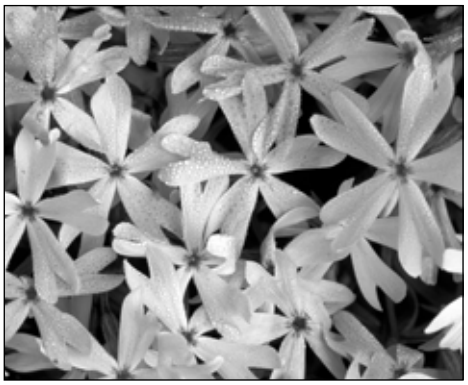
KHLCF and WKU develop education facility, protect the Green River

By Zeb Weese
Kentucky Heritage Land Conservation Fund

One of the goals of the Kentucky Heritage Land Conservation Fund (KHLCF) is to help provide environmental education opportunities for the citizens of the Commonwealth. For more than a decade, the KHLCF has helped Western Kentucky University (WKU) develop its Upper Green River Biological Preserve in Hart County into one of the state's most significant educational and research facilities, while also protecting a globally significant natural resource, Kentucky's own Green River. With the recent addition of the 375-acre Lawler Bend property, KHLCF and WKU have protected more than 1,500 acres of the Green River Watershed and more than 7 miles of river frontage between Mammoth Cave National Park and Munfordville.

"I can still remember when the first WKU tract was dedicated at the Green River Bioreserve," says Dr. Richard Kessler, chair of the KHLCF Board. "It is exciting to see KHLCF and WKU partnering on this growing project, which meets so many of KHLCF's objectives, including the protection of the incredible aquatic diversity of the Green River, as well as providing opportunities for research and environmental education."

The Green River is a priority area for conservation for several reasons. For the casual outdoor enthusiast the Green is an exceptionally scenic place to canoe, and for the dedicated conservationist it provides habitat for many rare species. To date KHLCF has helped more than a dozen partners protect nearly 2,500 acres on the Green, including Tebb's Bend with Taylor County Fiscal Court and Davis Bend with the Kentucky Wild Rivers Program. As the largest KHLCF site on the Green River, the WKU preserve is home to 11 rare species, including the fanshell, pink mucket, ring pink, clubshell, northern riffle shell and rough pigtoe mussels, as well as gray and Indiana bats. More than 600 plant species have been recorded on the preserve to date, including at least one rare wildflower, the cleft phlox (above). The riparian corridor is also home to dozens of nesting bird species and includes a large Great Blue Heron rookery.



According to Dr. Albert Meier of the WKU Biology Department, site manager of the preserve and member of the KHLCF Board, research on the property has led to 11 peer-reviewed publications, 12 master's degree theses, seven undergraduate honors theses, nearly 100 conference presentations, and more than $2 million in research grants focusing on ecology and restoration of natural habitats.

WKU students participate in land management on the natural area and get hands-on experience in invasive species management and controlled burning, as well as conventional field studies. The preserve is used for numerous courses offered by WKU, and it hosts local high school classes and other groups, including an annual Wounded Warrior weekend to benefit Kentucky veterans.

The KHLCF is funded in part by the sale of "Nature's Finest" license plates. With this Lawler Bend acquisition, the fund has now protected and conserved more than 86,000 acres in 67 counties. To learn more about the KHLCF and to locate natural areas near you, visit the KHLCF website at http://heritageland.ky.gov or contact Zeb Weese at 502-564-2320. You can also like the KHLCF on Facebook at https://www.facebook.com/KentuckyHeritageLands.

ABOVE: ***WKU Bioreserve.*** Photo by Zeb Weese
RIGHT: ***Cleft phlox.*** Photo by Dr. Thomas G. Barnes, University of Kentucky

Photo by Boone County Public Works

Lifecycle of a county's recycling process

By Cathy Guess
Division of Waste Management

Boone County in northern Kentucky has grown from crawling to walking when it comes to recycling. What started out as a small operation of six community recycling drop-off locations has grown into a newly built recycling facility that accommodates recyclables from 30 drop-off locations. This was accomplished with the help of Kentucky Pride Grant funds applied for and received by the county to buy the equipment necessary to make the growth possible.

Boone County is one of three counties, including Campbell and Kenton, that comprise the Northern Kentucky Solid Waste Management Area (NKSWMA). While NKSWMA is responsible for the implementation of overall solid waste management of the three-county region, each county is responsible for providing residential and commercial garbage collection access for the county and for any unincorporated cities that do not have collection agreements in place. Historically, the majority of recycling has been initiated by private businesses that have been instrumental in helping schools, churches, commissions and child care centers recycle their white paper, newspapers, magazines and aluminum by providing recycling bins and drop-off boxes that are picked up on a regular schedule. Boone County and the NKSWMA continue to work diligently to increase public recycling through education and outreach.

Kentucky Pride Grants

The advent of the Kentucky Pride grants, which began in 2007, has allowed numerous counties and regions to apply for and receive recycling grants to build infrastructure and purchase basic recycling necessities such as balers, skid steers, scales and Gaylords (heavy-duty corrugated cardboard boxes used to store commodities until they are baled). During 2010 and 2011, the Kentucky Division of Waste Management's Recycling Assistance Section invited all counties and cities to attend presentations at several area development districts to showcase the benefits of applying for and receiving recycling and household hazardous waste grants.

Long a proponent of recycling, Boone County Solid Waste Services Supervisor Kelly Chapman attended one of those presentations and later submitted a proposal to the Boone County Fiscal Court to increase the county's fledgling recycling efforts and save more than $43,000 a year in collection costs.

Boone County used its first Kentucky Pride Recycling Grant in 2010 to purchase recycling bins and a trailer to collect and maintain the original six community drop-off locations. The drop-off bins are located at no cost to schools, local parks, county fairgrounds and golf courses, allowing quick and convenient recycling access to the community.

"We are proud of our success and appreciative of everything we have learned through trial and error and with the assistance of the Recycling Assistance Branch."

Kelly Chapman

The Boone County Fiscal Court provided the 25-percent match, required of each grant recipient, in the form of a new recycling facility to handle the projected increase in recycling tonnage. The Kentucky Pride Grant for fiscal year 2012-2013 paid for an elevated sorting line, a horizontal baler with conveyor, two additional trailers and cardboard recycling drop-off boxes.

Another Kentucky Pride Grant for fiscal year 2013-2014 funds the purchase of a portable loading dock, additional drop-off boxes and concrete barrier blocks.

"Our solid waste management crew has worked very hard the last two and a half years to educate ourselves about recycling and to promote recycling in our community," said Chapman. "We are continually discovering new ideas and ways to improve recycling in our region."

The equipment funded through the 2012-2013 and 2013-2014 grants and the opening of the new county-funded Boone County Recycling Center in January is already seeing an increase in recyclables. Success can be measured by the increase in percentages from 2012 to 2013 for common municipal household commodities like cardboard by 36.03 percent, paper 27.10 percent, plastic 31.48 percent, glass 163.76 percent, aluminum 31.30 percent, steel cans 85.77 percent, clear No. 2 plastic 39.98 percent and colored No. 2 plastic 26.71 percent. These increases reflect Boone County's collection of recyclables and do not include the recyclables reported by Kenton and Campbell counties.

Success is also evident in interest from adjacent cities to regionalize with the Boone County Recycling Center. Private companies are also exploring the transport

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Water quality studies in the Kentucky coalfields

A closer look at the Pigeonroost Fork Watershed

By Richard J. Wahrer, Ph.D
Department for Natural Resources

TOP: Mined tributary of Pigeonroost Fork Watershed where benthic macro-invertebrate/ fish sampling was conducted.
ABOVE: Aerial photograph of a hollowfill.
BELOW: LIDAR image of same hollowfill.
Photos by DNR

The Department for Natural Resources (DNR) oversees all mining activities in Kentucky to ensure that impacts to both our environment and citizens are minimal. Water quality is of particular concern and its degradation can be caused by mining, residential development, roads, farming, logging, and oil and gas well operations. In July 2011, DNR received federal funding to create a monitoring network to measure the effects of coal mining in the state. The network now consists of 133 in-stream sampling sites, called trend stations, located at the headwaters of select watersheds. The trend station data provides a measure of the effects of these activities and should eventually allow DNR to predict impacts for each proposed operation in that watershed. Data from the trend stations includes air and water temperature, pH, specific conductivity and stream flow. Laboratory analyses of acidity, alkalinity, hardness, total iron, total manganese, sulfates, selenium and several other trace metals that may be associated with mining operations are also performed.

The Pigeonroost Fork Watershed in Martin County offers a unique opportunity for environmental research in that it contains active coal mining operations and many reclaimed mine sites, as well as unmined areas in its headwaters, a relatively rare occurrence in

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LIDAR: The next best thing in aerial imagery

By Kevin Devine
Division of Mine Permits

The days of labor-intensive traditional land surveys to collect detailed topographic information of Kentucky's ever-changing landscape are rapidly coming to an end. Two years ago, Kentucky, with initial support from the Kentucky Transportation Cabinet and the Division of Abandoned Mine Lands, began efforts to acquire Light Detection and Ranging (LIDAR) datasets to gather updated information about Kentucky's surface features. LIDAR is an optical remote sensing instrument that is mounted on aircraft that defines the earth's surface features by sending pulses of a laser in various wavelengths toward the earth and analyzing the captured reflectance of the laser bouncing off the ground, vegetation and man-made structures to create a digital model of such features.

Prior to LIDAR, Kentucky's topographic maps and features had not been updated by the U.S. Geological Survey (USGS) since the 1980s. Kentucky's landscapes have not remained static for 30 years and have undergone significant changes to the surface, especially in areas where surface mining, major urban development and land use changes occurred.

LIDAR enables both government and the private sector to obtain extremely accurate terrain information, confidently generating 2-foot contours on bare earth, compared with 20- to 40-feet contour intervals based off USGS topographic maps. These datasets can also be brought into standard mapping software such as ESRI ArcGIS.

Black Leaf Chemical property cleanup

By Virginia Lewis
Division of Waste Management

Kentucky's Superfund Program

In the Superfund Program, the government guides and oversees the companies' or individuals' cleanup efforts and ensures that regulatory requirements are met. In cases where a responsible party cannot be found or is unable to act, the program may be able to take a direct role in addressing site issues if sufficient funding exists.

While the program's primary objective is the protection of human health and the environment, cleaning up and redeveloping contaminated sites has resulted in positive economic and social impacts in many communities. By eliminating or reducing real and perceived health and environmental risks, Superfund cleanups help convert vacant and underutilized land into productive resources; reduce blight, uncertainty, and other negative perceptions; and improve the aesthetics and general well-being in the communities surrounding the sites.

During the last two decades, 5,471 Superfund sites have been cataloged in Kentucky; 667 are active sites and the remaining 4,804 sites have received no further action letters or have hazardous waste that is being managed in place.

ABOVE: ***Fencing, an alley and yards separate most of the homes from the property.***
LEFT: ***Abandoned buildings and other structures dot the former Black Leaf Chemical site.***
Photos by Virginia Lewis

The former Black Leaf Chemical property in Louisville, Ky., is one of 667 active Superfund sites in the Commonwealth today. A large residential cleanup action is nearly complete, responsible parties have been identified, and plans to begin work at the site are underway.

Years of Industrial Activity near a Residential Neighborhood

The large 29-acre site lays vacant, but for most of the past 100 years it has been the location of various industrial activities. In fact, the site is actually named after a nicotine-based insecticide, Black Leaf 40, which was once produced there.

The Park Hill neighborhood, a densely populated residential area, lies directly north of the Black Leaf property. Fencing, an alley and yards separate most of the homes from the site. Soil testing results indicated that polycyclic aromatic hydrocarbons (PAHs), arsenic, lead and pesticides, which were released at the facility, had migrated off-site to the alley and nearby residential properties. As a result, over the last year this Superfund site has received more attention and government funds for off-site cleanup than any other Superfund site in the state.

Taking Protective Measures While Searching for Responsible Parties

Ideally, whoever causes a release of hazardous substances or whoever possesses or controls the release (property owner) is considered to be the responsible party and is required to address the problem. In the case of Black Leaf Chemical, the property had changed hands several times over the years. State and federal government agencies spent considerable time in conducting research to identify the responsible parties.

As potential responsible parties were being investigated, protective measures were being taken by state and federal agencies to control contamination found onsite and to remove contamination found on off-site residential properties. The Kentucky Department for Environmental Protection (DEP) and the U.S. Environmental Protection Agency (EPA) spent more than $2 million replacing soil and sod in 68 Park Hill residential yards that neighbor the site.

The state addressed 58 properties while EPA addressed 10. In total, nearly 9,000 tons of soil and material were removed and disposed of at the Outer Loop

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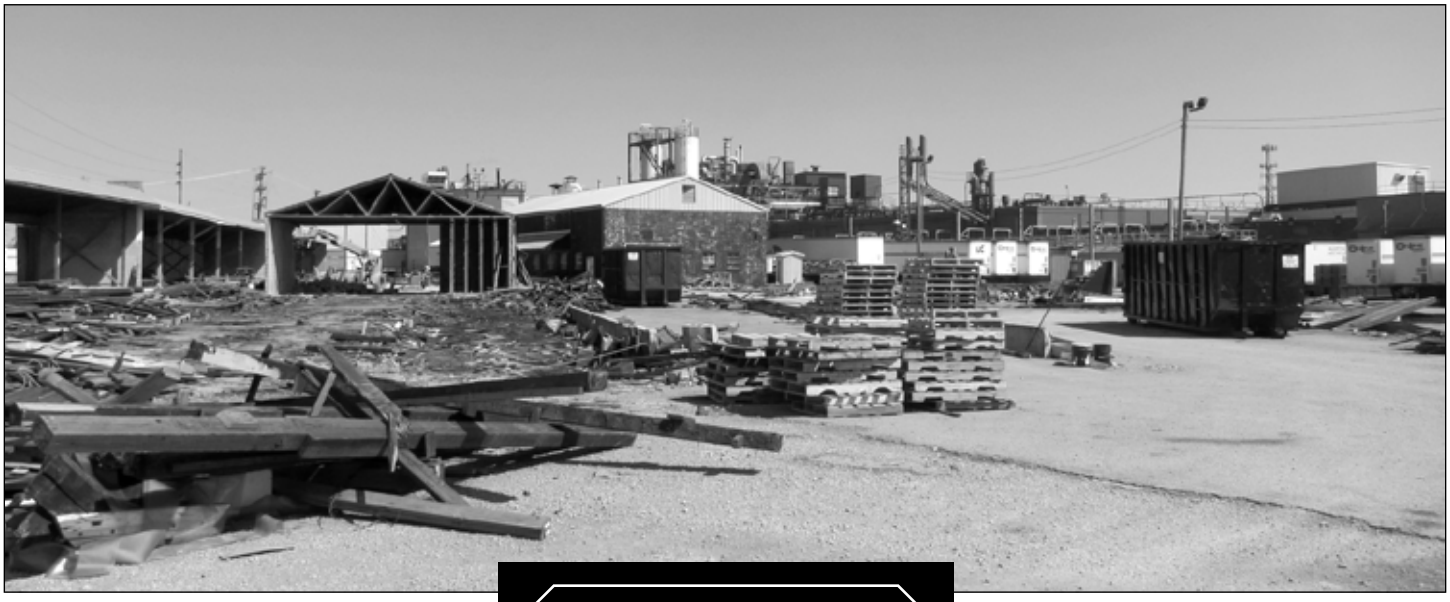
The J.M. Smucker Co. does expansion the right way

Company is ***choosy,*** minimizing impacts to the environment and neighbors

By Mary Jo Harrod
Division of Compliance Assistance



ABOVE: ***Multiple buildings stood on the site of The J.M. Smucker Co. facility in Lexington, home to a future expansion project.***

BELOW: ***The company successfully removed the buildings, reusing as much of the materials as possible, without disturbing the land nor the neighboring residents with noise or dust.*** Photos courtesy of The J.M. Smucker Co.

For more than 115 years, The J.M. Smucker Co. has been a leading marketer and manufacturer of fruit spreads, retail packaged coffee, peanut butter, shortening and oils. The company's leading peanut butter brand, *JIF*®, is produced at the company's Lexington plant, which is the largest peanut butter-producing facility in the world.

The Lexington site is on 28 acres and includes multiple older buildings recently purchased from a neighboring lumber yard. In order to facilitate an expansion of the plant, Smucker was looking for an environmentally friendly way to remove the buildings from the property.

Environmental responsibility is a natural part of the Smucker heritage, and it's not surprising that the company has been a member of the Commonwealth's voluntary environmental leadership program, KY EXCEL, for nearly eight years. In addition, LEED (Leadership in Energy and Environmental Design) construction has been at the forefront of the company's expansion projects. To date, five of the company's buildings have achieved LEED certification, including the *JIF* Learning Center in Lexington. Continuing with this focus on sustainability, it was important to the company to remove the older buildings in a way that would have the least impact on the environment, plant operations and neighboring residents.

Smucker obtained demolition permits for the salvage company to remove the buildings and reuse as many materials as possible. One of the buildings was constructed of concrete blocks and had a wooden roof. The concrete blocks were ground up and the wood reused.

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Kentucky Brownfield Redevelopment Program

New regulations make it easier to reuse property, create jobs in the Commonwealth

By Virginia Lewis
Division of Waste Management

The Kentucky Brownfield Redevelopment Program, established by House Bill 465, is now operating with newly minted regulations that became effective Feb. 3, 2014.

"This is now, in my opinion, the most aggressive state program in the United States to spur redevelopment and reuse of brownfields," said Shawn Cecil of the Kentucky Department for Environmental Protection Commissioner's Office. "The department is proactively looking for ways to encourage property redevelopment and reuse and all the good that comes with it. In this case, we're looking to bring industry to vacant and underused properties as well as jobs to the state."

TOP: ***The former Miracle Dry Cleaners is a diamond in the rough for local resident and real estate developer Andy Blieden.***
MIDDLE: ***The property was covered in graffiti and vines prior to the cleanup.***
BOTTOM: Holes in the roof are proof of the building's disrepair. Photos by Perry Reisert

From a Participant's Perspective

"I say thank goodness for House Bill 465," said Andy Blieden, a real estate developer who lives in Louisville, Ky. "Without it this deal would have never happened.

"I started attempting to acquire this property in November 2008. It was a dry cleaners that had been closed and boarded up since 2002. I live in the block directly behind it and own other property near it. It had become an eyesore on the street and I wanted to own it so I could fix it up," Blieden said.

Blieden obtained a contract with the seller in 2009 but after doing his due diligence, found that the property was a mess and needed to be cleaned up. The owner refused to pay for the cleanup and the deal died.

In 2010 he went back to the table and got another contract. The building was in gross disrepair and, unlike its state in 2008, was past the point of no return, which devalued the parcel even more. Blieden informed the seller he'd clean up the site, but the deal fell through a second time as Blieden could not obtain a bank loan on the property because of the contamination, and he could not afford to have the liability of cleaning up a site he didn't contaminate.

Blieden said that finally in 2013, he went back one more time.

"I was sick of driving by this property every day and having to see it," he said. "It was covered with graffiti and had indigents living inside. Windows were smashed out; the front door had been kicked in. A concrete block wall had caved in and vines were growing inside the building. The roof was failing; rain was pouring in. I told my brother that I wanted to buy it again and he said, 'Have you totally lost your mind?'"

Blieden tried to buy it one last time.

"To my surprise House Bill 465 had

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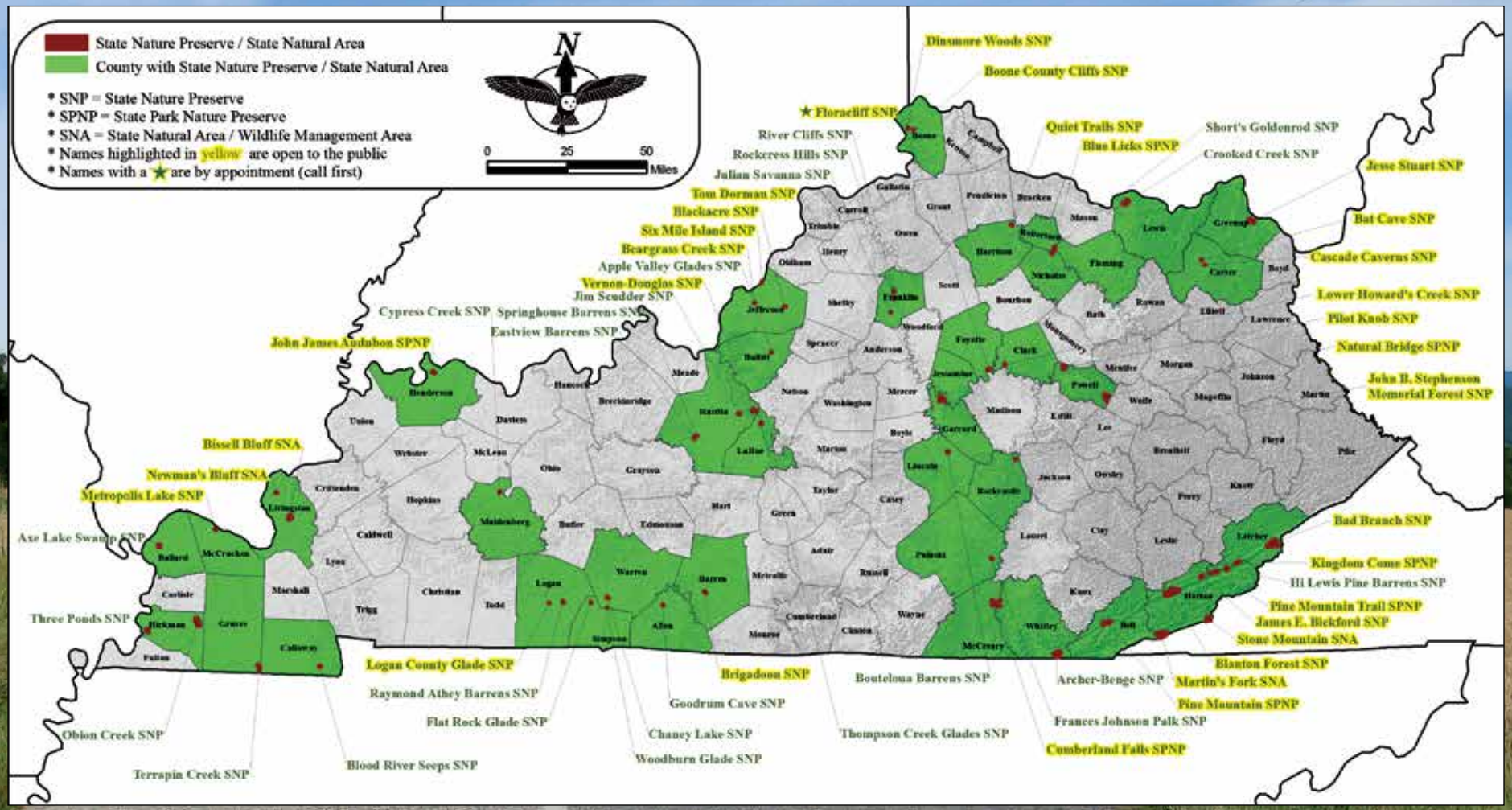
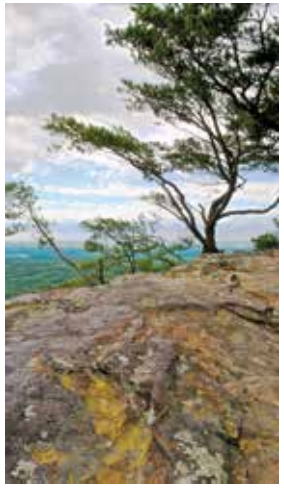
Road Trip

Explore Kentucky's nature preserves

Kentucky is home to thousands of acres of beautiful plant and animal life within its 61 Kentucky state nature preserves—more than 27,121 to be exact —from the bottomland swamps in the west to the rich Appalachian forests in the east—all protected and preserved for generations to explore and enjoy. These properties are part of the state's nature preserve and natural areas system. There are many rare natural communities protected within the preserve system, some of which are found nowhere else in the world. So take a road trip in 2014 and visit some of Kentucky's best-kept secrets. Contact the Kentucky State Nature Preserves Commission at 502-573-2886 or visit http://naturepreserves.ky.gov for more information.



Blanton Forest State Nature Preserve
The trails at Blanton Forest in Harlan County wind through towering hemlocks along Watts Creek and through a sandstone jumble known as the "Maze." KSNPC photo



Pilot Knob State Nature Preserve
The summit of Pilot Knob is where Daniel Boone caught his first view of the Bluegrass region in 1769. On clear days Richmond is visible from this Powell County knob.
Barry Howard photo

Bad Branch State Nature Preserve
A view from High Rocks at Bad Branch in Letcher County is worth the hike to the top of Pine Mountain. A shorter trail through a sandstone gorge leads to the 60-foot Bad Branch Falls. KSNPC photo

Brigadoon State Nature Preserve
Brigadoon protects 184 acres in Barren County. Memorable features include lush spring wildflower displays and great views of old-growth oak, beech and poplar trees. Harold Kelley photo

Vernon-Douglas State Nature Preserve
The rugged terrain at Vernon-Douglas in Hardin County holds many surprises, including mature oaks and delicate spring wildflowers.
D. Payne photo

Pull out for quick reference!

A view from the top

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With long days and testing preparation comes understanding air regulations. Not only does DAQ staff need to be comfortable with the regulatory language associated with their jobs, but they need to be able to explain it to the test facilities and their staff who may not be as familiar with the technical language.

For 40-year veteran test observer Jerry Slucher, the job never gets dull. He has seen almost everything, including going through decontamination when he was exposed to mercury during an observation event. And, like other source test observers, he enjoys the traveling part of the job, getting to see and learn the interesting manufacturing processes, and meeting the people that the division serves every day. According to Slucher, most things have remained the same during the past four decades.

"The technology is improving, but the chemistry and math are still the same. Pollution control technology is getting better every day, but you can't eliminate the human element," said Slucher. "No matter how much the technology improves, there will always be a need for a real person to evaluate compliance."

Jerry Slucher is observing NO_x, CO and VOC measurements inside the testing trailer at an electric generating facility. DAQ photo

At the end of the day, DAQ's source test observers have a strong commitment to their job because they fundamentally know how important it is to Kentucky's citizens and their environment.

The J.M. Smucker Co. does expansion the right way

Continued from Page 7

"The buildings had several roll-up garage doors and light fixtures," said Larry Agee, plant engineer. "We reused everything except for one shingled roof. Only seven 40-yard dumpsters of material were sent to the landfill. Since 50,000 square feet of buildings were demolished, we drastically minimized the amount of material that went to the landfill."

Though the cost was more than the conventional way of bulldozing structures and hauling them away, the removal was done in an environmentally sound manner resulting in materials being reused and others being sold netting funds for the expansion project. Consequently, Smucker saved on landfill fees and fuel for trucks that would have hauled the materials to a landfill.

Since no dust was created, the company didn't have to pay to wash dust off any neighboring vehicles—a definite benefit for the company and the surrounding residences.

"We do things because we feel that it is the right thing to do," said Agee. He said that having the right contractor in place was key to a successful project.

"Do your homework on contractors to hire," advises Agee. "If you are undertaking a big demolition, get references. Determine a realistic schedule upfront. We thought our project would take a month, but it lasted four months.

"This method of removing structures is fairly new, so be aware that there are not many salvage companies that remove buildings piece by piece," he continued.

Scott Rose, operations safety leader for Smucker, said the permitting process is easier when the land is not disturbed.

"All of the buildings were taken down to the ground level, piece by piece, leaving the concrete driveway," Rose said.

There were no complaints about noise, dust or scattered debris. Smucker's daily business was not interrupted, plus the process provided jobs for 10 to 15 people, tearing boards off buildings and taking nails out of wood. Lumber was banded and taken out by trucks to be milled down and used for floors.

"Sustainability is always at the forefront of everything we do," said Agee. "Working together with our contractor, we were able to successfully prepare our property in Lexington for expansion, while also remaining mindful of our impact on the environment and our neighbors."

New KY EXCEL Members

KY EXCEL members commit to a variety of projects that set a positive example and go beyond environmental regulations. Join KY EXCEL by calling 1-800-926-8111 or visit http://dca.ky.gov/kyexcel/ for more information.

Advocate
Danielle Crosman—Franklin County

Master
North American Stainless—Ghent (upgraded from leader level)

Kentucky Brownfield Redevelopment Program

Continued from Page 8

been passed and I had people at the city of Louisville like Theresa Zawacki and the state that wanted to help me. I found out I could buy the property and develop it without having the liability of the environmental problems. And I could get financing on it.

"Everyone I worked with at the state were excited about helping me and great about finding solutions that worked for everyone," Blieden continued. "This is an excellent example of a public/private partnership that works. I was not asking for anything for free. I just needed the chance to do what I do for a living, which is develop underproducing real estate in good locations. I received great insight and direction from the state that made the deal happen. We did not get lost in paperwork. The state was able to react quickly to what we needed to do to get the deal closed."

According to Blieden, in the short term there will be 55 construction jobs created. He's also close to signing a lease with a national company that will create between 75 and 100 new long-term jobs at the site.

A Promising Future

The new Brownfield Redevelopment Program is generating a lot of interest and has achieved early success. Blieden is one of more than 25 program applicants so far. The future of the program, the opportunities available to participants, and the benefits to the communities across the Commonwealth are promising.

"We have achieved a win/win situation for every party involved—from the consumer that goes to the new store, to the employee that got a new job, to the neighborhood that has had a severe blight cleaned up, to the city that has a beautiful new building, to the state that has created additional tax revenue," said Blieden. "Just as important was the help one Kentuckian gave to another. And, all because one guy kept driving by a dilapidated building shaking his head and saying why doesn't someone do something about that."

For more information on the Brownfield Redevelopment Program, call the Kentucky Division of Waste Management's Superfund Branch at 502-564-6716 or email Shawn.Cecil@ky.gov or call 502-564-6716, ext. 4754.

Top 7 reasons the new Brownfield Redevelopment Program works

1. A buyer can purchase previously used property without the risk of taking on environmental investigation or cleanup.
2. The only restriction on future use of the property is with respect to risk posed by any contaminants present.
3. The program utilizes the same criteria as the federal program, making a qualified applicant in Kentucky's program likely to be qualified for federal protection, but with the added certainty of putting Kentucky's findings in writing and having state concurrence on buyer care obligations.
4. There are incentives, including tax credits for remedial costs, grants for governments and nonprofits or public/private partnerships, utility tariffs, and Kentucky's Revolving Loan Fund/Grant Fund.
5. The program can provide a boost to economies of both small and large communities. It helps get vacant properties back into productive reuse and can be a stimulus for jobs and generating tax revenue.
6. Reuse and management of already contaminated properties is made easier, improving the overall safety and security of the property, which may have been abandoned or sat vacant for years. It also reduces the need to develop Kentucky's greenfield land for new industrial activity.
7. Getting more contaminated properties under cabinet-approved property management plans, which are designed to address possible risks to the public, improve public health, safety and the environment.

Adding more tools to the toolbox

By Herb Petitjean
Division of Waste Management

An old salvage yard, a former gas station, closed car dealership, former strip mine and former bakery are all properties that had real or perceived environmental contamination, but that are experiencing new life as redeveloped properties. (Read Case Studies at http://dca.ky.gov/Pages/ResourceDocuments.aspx.) These types of properties are known as brownfields, and now Kentucky has another tool to help in their revitalization.

The Kentucky Brownfield Redevelopment Program has received an $850,000 grant to establish the Cleaner Commonwealth Fund to remediate environmental contamination on brownfield properties. In March, the program issued a Request for Proposals (RFP) in which three to five subgrants totaling $140,000 will be offered to local governments and nonprofits. Applications will be ranked based on a list of criteria within the following areas:

- Remediation plan
- Project description and feasibility of success
- Documented economic, health and/or environmental needs in the community
- Community engagement and partnership
- Project benefits

The awardees will be announced and contracts signed soon so that the recipients can begin work on July 1. A similar RFP will be issued again in late summer or early fall. In the first half of 2015, the program will request proposals for loans. The private sector, along with local governments and nonprofits, will compete for one or two low-interest or no-interest loans totaling $520,000.

The Cleaner Commonwealth Fund and the new liability protections regulations add to the growing number of resources the Brownfield Redevelopment Program has in its toolbox. Call 800-926-8111 to get the tools you need to fix up that old, abandoned property in your community.

Owensboro riverfront is revitalized

Brownfield investment yields recreational space, hotels along water's edge

An aerial view of the waterfront featuring Smothers Park, hotels and businesses. **INSET:** *Construction of the convention center (left) and Hampton Inn to be completed this year.*
Photos provided by the city of Owensboro

By Mary Jo Harrod
Division of Compliance Assistance

Situated on the banks of the Ohio River, the western Kentucky city of Owensboro was once the home of the former Executive Inn. Built in 1977, the hotel and conference center sat on 15 acres adjacent to the river in the downtown area, which had previously been operated as a manufactured gas facility. This prime location contained an interwaterway canal where ship captains docked their boats in the late 1800s.

The Executive Inn was a major entertainment destination featuring celebrity performers, drawing big crowds and equally big tourism dollars to the city. In 2008, a fire closed the hotel, and it was razed in 2009. In an effort to revitalize the area, city officials prepared a strategic redevelopment plan using the riverfront property as its focal point.

> ***"It will be a great economic development tool and draw thousands of people from everywhere to our city."***
>
> Ron Payne
> Owensboro mayor

Because the riverfront area was considered a brownfield, the first step in evaluating it for any possible environmental contamination was to implement a brownfield assessment grant from the U.S. Environmental Protection Agency (EPA). Aging aboveground storage tanks at the former hotel's marina, unknown material used to backfill the canal, and residual wastes from the gas facility had the potential to negatively impact the river.

Linebach-Funkhouser Inc., the city's environmental consultant, completed both Phase I and Phase II environmental site assessments and found contaminants. The city's redevelopment team advised the EPA and the Kentucky Department for Environmental Protection (DEP) of the situation and devised a reuse strategy to manage the contamination in place by using the proposed structures and parking features as barriers to exposure. This method, commonly known as capping, prevents human contact with hazardous materials and helps control redevelopment costs.

The riverfront redevelopment project includes a six-acre

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Academy teaches wildfire training skills

Prepares KDF firefighers for emergencies, nature disasters

TOP: ***Academy participants watch as fire progresses on land so that they can track it back to its origin. The grassy field dried out quickly and ignited easily following an all-day rain before the exercise.***
TOP RIGHT: ***After a fire has gone out, investigators determine how it was set and where it started.***
ABOVE: Thirty-seven KDF employees attended this year's training in Shelbyville, Tenn. Photos by Mike Harp, KDF

By Jennifer L. Turner
Division of Forestry

They call it "The Academy" but its official name is the Tennessee-Kentucky Wildland Fire Academy, where federal and state agency firefighters participate in wildfire and natural disaster training each year during January. This year, 37 Kentucky Division of Forestry (KDF) employees attended the academy, some as students and some as instructors.

"This was the 12th year for the academy, the largest such program in the nation," said Deanna Hayes, a business management assistant with the U.S. Forest Service's Cherokee National Forest. The training takes place at the Tennessee Fire Service and Codes Enforcement Academy in Shelbyville, Tenn.

A variety of classes is offered and designed to help students increase their wildfire training skills and understand the many aspects of suppressing fires. KDF employees received training in Wildland Fire Origin and Cause Determination, Wildland Fire Chain Saws, Engine Boss, Basic Incident Command System, Helicopter Crewmember, Intermediate Wildland Fire Behavior, Ignition Operations, Followership to Leadership, Basic Air Operations, Introduction to Incident Information, and Crew Boss.

A new wildland arson investigation class was offered this year and taught by KDF's Fire Chief Luke Saunier, KDF Assistant Fire Chief Mike Harp and Georgia's Assistant Fire Chief and Chief of Law Enforcement for the Forestry Commission Brian Clavier. Eighteen KDF employees learned how to conduct arson investigations, which account for 61 percent of wildfires in Kentucky.

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Liquid gold

Continued from Page 1

with Perdue exemplifies how public/private partners can find synergistic opportunities."

Hatchery waste to renewable energy

In 2013, DEDI provided Perdue with a $145,000 match for another "green" project (estimated to cost $290,000) that diverts and recycles organic hatchery waste. This project includes the purchase and installation of equipment that recovers organic waste from hatchery operations while cleaning the spent eggshells for use in the surrounding soil. The protein and water mixture for the cleaning process is delivered to the same anaerobic pond that has been producing bio-gas for conversion to electricity and heat. Using DEDI's match, Perdue installed new piping and catch basins, eggshell washing equipment, an eggshell press, and a place to store cleaned and finely ground eggshells for application as a crop supplement and soil amendment. An added environmental benefit is the annual diversion of approximately 1,500 tons of organic waste away from the nearby Ohio County landfill.

Perdue has been working closely with researchers at the U.S.D.A. Animal Waste Research Unit in Bowling Green to help improve both the efficiency of its digester and the use of waste products as soil amendments. It anticipates completion of its hatchery waste project in late March.

Lifecycle of a county's recycling process

Continued from Page 4

of their co-mingled recyclables to the center.

"We are proud of our success and appreciative of everything we have learned through trial and error and with the assistance of the Recycling Assistance Branch," continued Chapman. "The division's financial assistance through the Kentucky Pride Fund and technical staff support allow the Boone County Recycling Center to offer our region expanded recycling opportunities."

For information on the Boone County Recycling Center expansion, email kchapman@boonecountyky.org or Melissa Grandstaff at mgrandstaff@boonecountyky.org or call 859-334-3151. For information about Kentucky Pride grants, visit http://waste.ky.gov/RLA/grants/Pages/default.aspx. For information about recycling, visit http://waste.ky.gov/RLA/recycling/Pages/recycling.aspx or call 502-564-6716.

Academy teaches wildfire training skills

Continued from Page 14

"Kentucky needs a stronger wildland arson investigative presence, so I worked with the wildland academy and Georgia officials to offer the course," said Saunier.

Mike Silliman, a forester in Kentucky's north central region, said the class would help his job by "possibly lowering the fire occurrence related to arson in Kentucky. If investigations are performed and the public is made aware of this, then arsonists will be less likely to set fires, especially if some arrests are made."

"I believe it will be very beneficial to our jobs in the future to determine the accurate cause of our wildfires," said Chad Brothers, a ranger from KDF's west region. "Now that more of us are trained throughout the state, during a busy fire season we can move investigators to the fires in problem areas. It's difficult for the ranger in that area to run a fire crew and keep up with all the occurrences, etc. I look forward to using the knowledge we learned and I believe it will help keep our fire numbers down," continued Brothers.

The academy also offers several courses that help students understand the basic structure of how decisions are made during a wildfire occurrence utilizing the Incident Command System (ICS). Developed by the USDA Forest Service in the early 1970s, the ICS is a single standardized incident management system used by all emergency response disciplines to provide accurate information, strict accountability, planning and cost-effective operations, and logistical support for any incident. The courses teach leadership, delegation of authority, briefings, organizational flexibility, transitions and transfers.

"Specifically, I learned that the ICS is divided into four sections—operations, planning, logistics and finance/administration. These sections are under the authority of the incident commander," said KDF Forester Sean Godbold, who took the Basic ICS class.

Haley Frazier, inventory forester, said this was her second time attending the academy and she requested the Engine Boss class, which includes engine and crew capabilities, fire size-up considerations, tactics and wildland/urban interface situations. Frazier stated that any training she takes helps further her experience and knowledge for the many different aspects of her job.

"This class really emphasized decision making skills in a leadership role, as well as specific things to think about as an engine boss on a wildland fire," she said. "The things I learned will not only help me excel as an engine boss, but will help me prioritize tasks and be a strong leader while completing my daily job."

KDF employees who have attended the academy have been called on to use their training on many incidents within Kentucky, as well as out of state. They have provided aid after Hurricane Katrina, the BP oil spill, as well as numerous ice storms, tornadoes and wildland fires. And, with the western part of the United States in its third year of a drought, there is a greater likelihood that Kentucky will be asked to help again this summer.

"We're ready," said KDF Director Leah MacSwords, demonstrating that Kentucky and other states benefit from the skills students gain while at the academy.

Black Leaf Chemical property cleanup

Continued from Page 6

Landfill. Most of the scheduled residential work is complete, barring the placement of sod on 13 properties, which is expected to happen sometime this spring.

EPA also put barriers and retention basins in place to catch sediment and keep it from leaving the former Black Leaf site. The sediment, not water runoff, would be the culprit for recontamination of properties. EPA also installed improved fencing around the site to control access, and operated air monitors during early excavation activities to ensure the soil removal did not generate dust in levels that would impact the health of the residents.

Photo by Virginia Lewis

Investigating Further and Moving Forward with Site Cleanup

Once identified, the Black Leaf responsible parties submitted a proposed site characterization plan to the state for review that includes the proposed sampling procedures and methods to determine the nature of contamination on the 29-acre site. After the plan is finalized, the responsible parties and their consultants are expected to begin site characterization field work this spring. Only after the site and contamination are fully characterized will a custom-tailored cleanup plan be developed and executed. The plan must be approved by the state and be protective of human health and the environment.

Throughout the process, information will continue to be shared with residents, community groups and media. Anyone with questions may contact Tim Hubbard or Sheri Adkins with the Kentucky Division of Waste Management at 502-564-6716. For properties that were cleaned up by EPA, contact Art Smith at 502-582-5161.

Water quality studies in the Kentucky coalfields

Continued from Page 5

the East Kentucky coalfield. By comparing data from mined areas with that of unmined areas, scientists can better determine the impacts of mining on water quality.

The watershed encompasses 25 square miles and is sparsely populated with 61 residences. Pigeonroost Fork is seven miles long, fed by seven main tributaries, one of which is Hobbs Fork, designated by the Kentucky Division of Water as an outstanding state resource water (OSRW).

Extensive mining has occurred in the northwest quadrant of Pigeonroost with active mining and fully reclaimed mine sites covering 79 percent of the watershed acreage. From April 2012 to August 2013, DNR staff collected monthly water samples upstream and downstream of the tributaries associated with active mining operations to chemically analyze mine discharge water and to determine the cumulative effects in water quality by also sampling at the mouth of the watershed where trend stations are located. Similarly, samples from unmined areas were collected to provide a baseline reference to gauge possible mining impacts. Elements of concern, such as selenium, lead and sulfates, can then be tracked from the mouth of the watershed to its possible source.

Preliminary findings

Sampling to date indicates that total manganese and total iron concentrations in the smaller individual tributaries may be small, but as the tributaries merge, they tend to contribute to the total concentration at the trend station at the mouth of the watershed. In other words, one could have a cumulative effect in the watershed that could exceed the standard. For example, suppose the standard concentration of any substance was 5 milligrams per liter (mg/L) and all tributaries measured 2 mg/L. The trend station measurement could be 4 mg/L or higher. At no time did water samples indicate that water quality standards were exceeded.

A benthic macro-invertebrate/fish survey was also conducted on a mined tributary and an unmined DOW-designated OSRW tributary with surprising results:

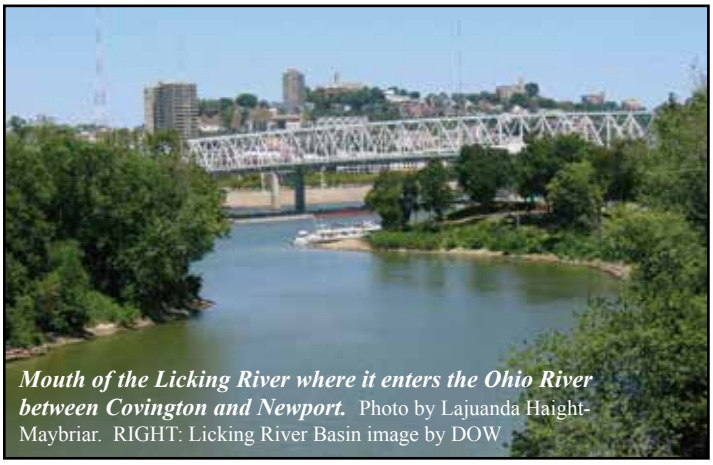
- Unlike previously published research on the effects of mining on benthic macro-invertebrate communities in headwater streams, this study showed the mined and unmined streams had similar species populations of sensitive, pollution-intolerant organisms.
- The fish populations of the mined stream was more diverse in the number of species and individuals than the unmined stream.

This project led to a more detailed study of the effect of a hollowfill on the water quality of the receiving stream. Discharges from several hollowfills in this watershed, varying in age from 10 to 30 years were sampled for pH, conductivity, total dissolved solids, total iron, total manganese, sulfates, selenium and other trace metals. Geologic data near the hollowfills, discharge monitoring report data from the sediment ponds of the fills and surface water monitoring data from 1973 to the present were included in the study. Due to an extensive tree canopy and mature vegetation on the reclaimed mining areas, Light Detection and Ranging (LIDAR) technology was used to locate many of the older hollowfills (see sidebar on Page 5).

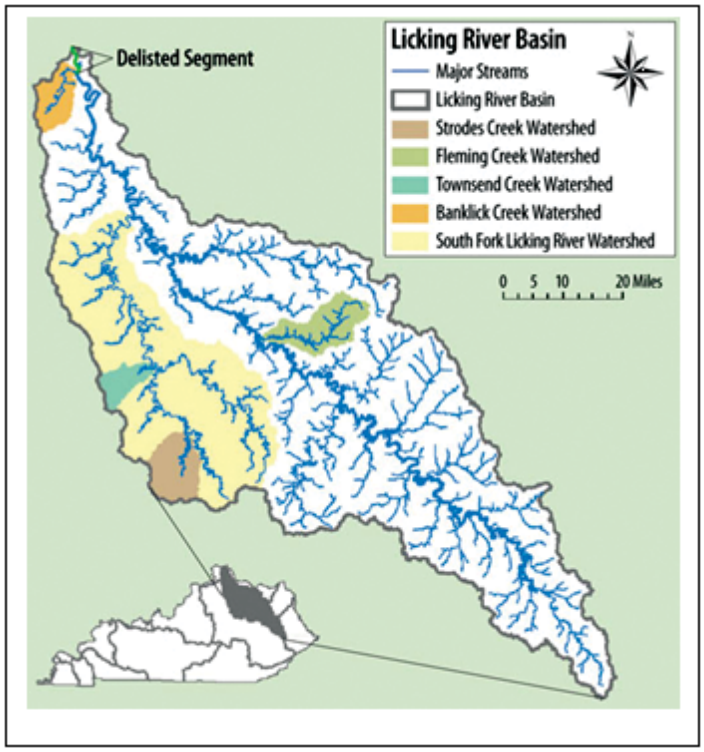
Preliminary results from sampling at the toe (bottom) of eight hollowfills showed wide variation in the concentrations of conductivity, total dissolved solids, sulfates and selenium as the hollowfills aged. It should be noted that:

- Newer hollowfills discharged less selenium than the older fills.
- Older fills discharged less total iron and total manganese than the newer fills.

The researchers now plan to compare historical data from discharge monitoring reports and surface water monitoring points to the sampling points in the current study to better understand the trend of water quality from the hollowfill, through the sediment pond, to the tributary, to the main stem and to the mouth of the watershed. Statistical analyses will include how analytes are correlated (or not) and which analytes may predict or characterize the water quality health of the watershed.



Mouth of the Licking River where it enters the Ohio River between Covington and Newport. Photo by Lajuanda Haight-Maybriar. RIGHT: Licking River Basin image by DOW



Watershed restoration efforts in the Licking River Basin

Education, best management practices bring improvements to water quality

By John Webb and Allison Fleck
Division of Water

A segment of the Licking River in northern Kentucky that formerly failed to support its aquatic life designated use now shows sufficient improvement in water quality to warrant removal from the state's list of impaired waters.

In 1999, data collected by the Kentucky Division of Water (DOW) indicated that the lowermost segment of the Licking River did not meet Kentucky's water quality standard for dissolved oxygen, which is necessary to support aquatic life. In 2000 DOW added that section of the river to the Clean Water Act (CWA) Section 303(d) list of impaired waters for only partially meeting its aquatic life designated use. Suspected pollution sources included combined sewer overflows, urban runoff and storm sewers, impacts from agriculture, improperly treated wastewater and loss of riparian habitat.

From 1999 to 2006, Kentucky invested CWA section 319(h) nonpoint source pollution funding in four watersheds that are all tributaries to the larger Licking River. The four included Banklick Creek, Townsend Creek, Strodes Creek and Fleming Creek.

In the Banklick Creek Watershed, the funding was used to help establish the Banklick Watershed Council, a group composed of local agencies, officials and concerned citizens who worked with local stakeholders on an education and outreach campaign that was essential to the success of stormwater management programs and the implementation of nonpoint source best management practices (BMPs).

Efforts to restore the Townsend Creek Watershed began in 2005 and focused on building capacity through field days and landowner meetings. This coordinated effort prompted landowners to implement agricultural BMPs, such as installing stream crossings, excluding livestock from streams, restoring riparian areas, and stabilizing areas frequently used by livestock.

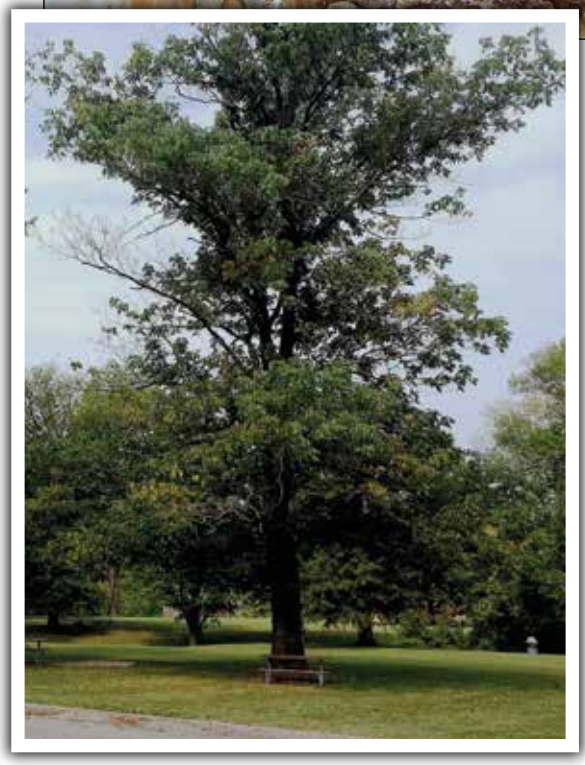
In the Strodes Creek Watershed, the Strodes Creek Conservancy has worked with landowners since 2003 to conduct watershed planning, repair and replace septic tanks, exclude livestock from streams, restore riparian areas, and acquire and protect land.

Within the Fleming Creek Watershed, stakeholders implemented agricultural BMPs that helped to restore a 4.8-mile creek segment and developed and implemented a subwatershed plan.

In 2004, DOW collected monthly samples to reassess conditions along the impaired segment of the lowermost Licking River. The data showed that dissolved oxygen levels ranged from around 6.0 milligrams per liter (mg/L) to 8.0 mg/L during the sampling season, well above the minimum level required for aquatic life use support. As a result, DOW removed this segment (river miles 0.0–4.6) from the state's list of impaired waters in 2006. This represents a move from partial to full support of the aquatic life designated use for this segment of the Licking River.

"When you are talking about a watershed of this size, there are no easy fixes," said Paulette Akers, manager of the DOW's Watershed Management Branch. "This was only possible because of the work of many people—the local people who do education and champion projects to address problems they identify in their own community. When we all work together, we can really make great improvements in water quality."

This segment of the lowermost Licking River remains listed as impaired for failing to meet the primary contact recreation designated use because of elevated bacterial levels. To read more about the Licking River watershed restoration project, visit http://water.epa.gov/polwaste/nps/success319/ky_lick.cfm. You may also contact john.webb@ky.gov.



Tiny beetles ravage state park

General Butler partners with KDF to salvage ash trees

By Jennifer L. Turner and Eric Gracey
Division of Forestry

Frequent visitors who hike the trails in the woodland forest at General Butler State Resort Park walk beneath a canopy of mature trees, including tulip, beech and hickory. But this spring, they will take notice of the absence of many trees throughout the park. Their removal is the result of the Emerald Ash Borer (EAB) infestation to the region. The Department of Parks (Parks) and Kentucky Division of Forestry (KDF) have worked together since October 2013 to preserve as many ash trees as possible and to harvest any trees that could not be saved.

In June 2012, Parks and KDF officials visited General Butler State Resort Park in northern Kentucky and confirmed that the dying trees showed all the symptoms of EAB. The exotic beetle, discovered in southeastern Michigan near Detroit in 2002, was first confirmed in Kentucky in 2009. The adult beetles nibble on ash foliage but cause little damage. Eventual death of the tree is caused by larvae (the immature stage) that feed on the inner bark making a series of winding S-shaped tunnels, which disrupt the tree's ability to transport water and nutrients.

"Once attacks begin, ash tree death can come in as little as two to three years," said Jody Thompson, KDF forest health specialist. "Branch tips start dying throughout a tree's canopy followed by the entire branch. The tree canopy will eventually reach a stage where it simply falls apart. This means that anything near the tree is in danger."

Having dealt with EAB infestations, KDF personnel outlined various options for tree removal and provided Parks officials with a tour of an active EAB-initiated harvest to illustrate how General Butler might look following the process. Parks also contracted with the Kentucky State Nature Preserves Commission and consulted with the U.S. Fish and Wildlife Service to evaluate the 791-acre property for any registered threatened or endangered species—specifically Running Buffalo Clover and the Indiana bat.

On Sept. 16, 2013, KDF participated in a public meeting at General Butler where Department of Parks Commissioner Elaine Walker outlined three options that, ultimately, included the safety of all visitors to the park:

1. Treat all ash trees. However, treatment is expensive and

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TOP: ***A tree near the lodge at General Butler State Resort Park exhibits distinct "s-shaped" tunnels under the bark where EAB larvae have fed, distroying the tree's tissue.*** **ABOVE:** ***An ash tree within the park with EAB damage displays a dying canopy with bare branches due to a lack of water and nutrients.*** **RIGHT:** ***EAB are tiny in size (about one-half inch long) and metallic green in color as shown on this penny.***
Photos by Ron Vanover, Department of Parks

Owensboro riverfront is revitalized

Continued from Page 13

Smothers Park with a playground, veterans' memorial, three fountains, a cascading waterfall and seating where the public can relax and watch the river traffic.
A new convention center and high-rise condominium project will be completed this year, and two hotels and businesses are also located on the riverfront. More businesses are moving to the area, creating more economic value.

Charles A. Leachman II, senior geologist for Linebach-Funkhouser, says the estimated cost for the environmental assessment and protection planning effort was $170,000. Approximately $100 million has been invested in the new development, and the city of Owensboro has received $35 million in tax revenues from the two hotels alone.

"In terms of brownfield redevelopment, the city's riverfront project is about as good as it gets," says Amanda LeFevre, environmental education specialist with DEP's Division of Compliance Assistance. "The investment of time, money and resources by both public and private entities has yielded a place where families can play, businesses can grow and a community can come together. Already, the city is seeing spinoff investment with the opening of new restaurants and businesses in the downtown area. Hopefully, this will serve as an inspiration to other communities with areas that struggle with disinvestment and blight," says Lefevre.

Leachman says it's crucial to anticipate regulations that could cause roadblocks and that it's important to create a team environment between the client, regulator and consultant to build trust and allow streamlined work to proceed.

"This redevelopment process was predicated upon an upfront partnership between the city of Owensboro, DEP and Linebach-Funkhouser Inc.," says Leachman. "By keeping these entities in the loop, forward-thinking strategies were utilized that will benefit the Owensboro community for many years to come."

In addition to tax revenue and several million dollars in the new development, results from the environmental success of the riverfront property include 100 new jobs and the lowest unemployment rate in the Saint Louis Federal Reserve Region for Kentucky.

"For me, the opening of the new Owensboro Convention Center means fulfillment of a commitment I made the night I was first elected mayor—that four years from that night looking into the future Owensboro would be a much different city for the better," says Ron Payne, mayor of the city of Owensboro. "It certainly is a source of pride for me and I believe will be for our community when they have a chance to visit the center. It will be a great economic development tool and draw thousands of people from everywhere to our city. It is so much more than just a building; it, along with so many other projects we are completing, is our future, and it is a very bright future."

Owensboro is proud of its new riverfront and honored by the praise the project has received. It was one of only 10 towns in the nation named an All-American City for 2013.

"The city of Owensboro has utilized progressive economic policies with upfront environmental due diligence to lay the foundation to a vibrant and modern downtown area that will continue to produce significant long-term benefits," says Leachman.

Tiny beetles ravage state park

Continued from Page 18

does not affect trees already heavily damaged and likely to die.

2. Do nothing. This creates hazardous conditions to people and property, resulting in Parks paying for the removal of hundreds of dying trees at a later date.

3. Partner with KDF and conduct a selective ash harvest of the still-living trees for their economic value. Money from the harvest would be used to treat ash trees in high-profile areas, remove hazardous trees that could not be commercially logged, and replace ash trees with other native tree species.

Participants at the public meeting voted overwhelmingly for option No. 3.

At Parks request, KDF began marking and collecting volume estimates on commercial ash trees in October. Other miscellaneous hardwoods that were in poor health and posed a risk to public safety were also included, estimating that 281,467 board feet of lumber would be harvested. In all, 1,892 trees were marked on 118 acres—1,836 of them ash trees.

"Many things can kill a tree. However, extensive damage is one of the most common causes of a tree dying as fast as you will see with EAB," continued Thompson. "With the amount of ash trees growing in northern Kentucky, and their nearly simultaneous decline, the impact to many areas is enormous."

Atwood Lumber and Mats in Carrollton began logging and selling the timber the week of Thanksgiving and the project was completed March 31. This reduced the impacts on General Butler's busy tourism season, while protecting Indiana bats that are in caves hibernating during that time.

KDF has monitored the harvest and the protection of water quality through its inspection mandates under the Kentucky Forest Conservation Act and will work with Parks to ensure the continued health of the forests.

While the removal of trees at General Butler isn't part of Park's mission, the removal of hazardous trees to protect visitors and being responsible stewards of the land is, and that is what Parks has been able to achieve with the help of KDF. Instead of rotting on the forest floor, high-quality ash trees are being utilized by the furniture industry and lower-quality trees being used to produce heavy equipment mats.

Kentucky students accept *Mission H_20*

LEFT: ***Phoebe Wagoner of Nicholas County takes first place in the Jim Claypool Art Contest. She is flanked by (left to right) Energy and Environment Cabinet Secretary Len Peters, Division of Conservation Director Kim Richardson and Kentucky Association of Conservation Districts Vice President David Rowlett.*** **RIGHT:** ***Allison Ingram of Green County is the first-place winner of the writing contest. She is also flanked by (left to right) Len Peters, Kim Richardson and David Rowlett.*** Photos by David Hargis

By Johnna McHugh
Division of Conservation

Last year, Kentucky students were given a mission—to recognize the role that water plays in their everyday lives and to understand the importance of the Earth's water cycle and the effects of pollution to Kentucky lakes and streams. *Mission: H_20* was the topic of the 2013 Jim Claypool Art and Writing contests.

For nearly 70 years, students have been learning about conservation efforts in the classroom through information provided by the Kentucky Farm Bureau Federation, the Kentucky Association of Conservation Districts (KACD) and other partners. An online study guide was available to students and teachers on the Kentucky Division of Conservation and Kentucky Farm Bureau websites, as well as printed copies of the guide were distributed by the KACD to local schools. The students then used what they had learned to create posters and essays to demonstrate their knowledge of the *Mission: H_20* topic.

Last year, more than 66,000 first-grade through 12th-grade students participated in the art and conservation writing contests. Students submitted 49,076 art entries from 99 counties and 17,004 essay entries from 94 counties.

All students' entries were judged at the county level by conservation district supervisors, Kentucky Farm Bureau members and county officials. One art winner and one writing winner were selected from each county. The winning students' entries are then judged by a statewide panel of environmentalists, conservationists and educators. State, area and county winners receive monetary awards sponsored by the Kentucky Farm Bureau. Local conservation districts also provide local awards to the winners.

The Jim Claypool Art Contest state winners are:

- First Place: Phoebe Wagoner, Nicholas County, Nicholas County Elementary School
- Second Place: Savannah Gumm, Taylor County, Campbellsville Middle School
- Third Place: Ellie Copas, Monroe County, Tompkinsville Elementary School

The Conservation Writing Contest state winners are:

- First Place: Allison Ingram, Green County, Green County High School
- Second Place: Madison Kellione, Harrison County, Harrison County High School
- Third Place: Jay Phillips, Harlan County, Harlan County High School

These state winners, along with the area winners from each of KACD's nine geographical areas, were recognized in February at the 2014 Biodiversity Day in Kentucky celebration in Frankfort. In addition to the monetary awards, all area and state winners were presented a framed nature print from the Kentucky Conservation Committee. The six state winners also received "A Guide to the Freshwater Mussels of Kentucky" from the Kentucky State Nature Preserves Commission.

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Seedling nurseries: growing trees for healthy and productive forests

The Washington hawthorn can attain a height of 25 feet to 35 feet. Planted extensively as an urban landscape tree, it produces white blooms in clusters, in late spring to early summer. The flowers yield to red berries that persist throughout winter and are eaten by birds, such as cedar waxwings. The bark is attractive and the branches bear thorns. Summer leaves are a shiny, dark green; fall foliage ranges from orange to red.

Seedlings are available from early fall to early spring from the Division of Forestry's nurseries. Orders are shipped at your request for planting projects during the dormant period throughout the winter.

To obtain an order form, visit http://forestry.ky.gov/statenurseriesandtreeseedlings/Pages/default.aspx or call the Division of Forestry at 1-800-866-0555.

Just the Facts: Washington hawthorn (crataegus phaenopyrum)

- ***Range:*** The Washington hawthorn can grow in Zones 4-8. They prefer full sun and can tolerate many soils types, including acidic, alkaline, loamy, moist, sandy, wet and clay. It also is considered drought tolerant.
- **Wildlife Uses:** Produces abundant fruit eaten by birds and mammals, attracts butterflies and is an important plant for many nectar-feeding insects.
- **Tree Trivia:** The tree was reportedly first grown near Washington, D.C., hence the common name. It is sometimes called "Washington thorn" because of its prominent thorns. The berries of the Washington hawthorn can also be used in jams and preserves. The wood of Washington hawthorn is sometimes used for tool handles and fence posts.