

APPALACHIAN REFORESTATION INITIATIVE

# ARRI Newsletter

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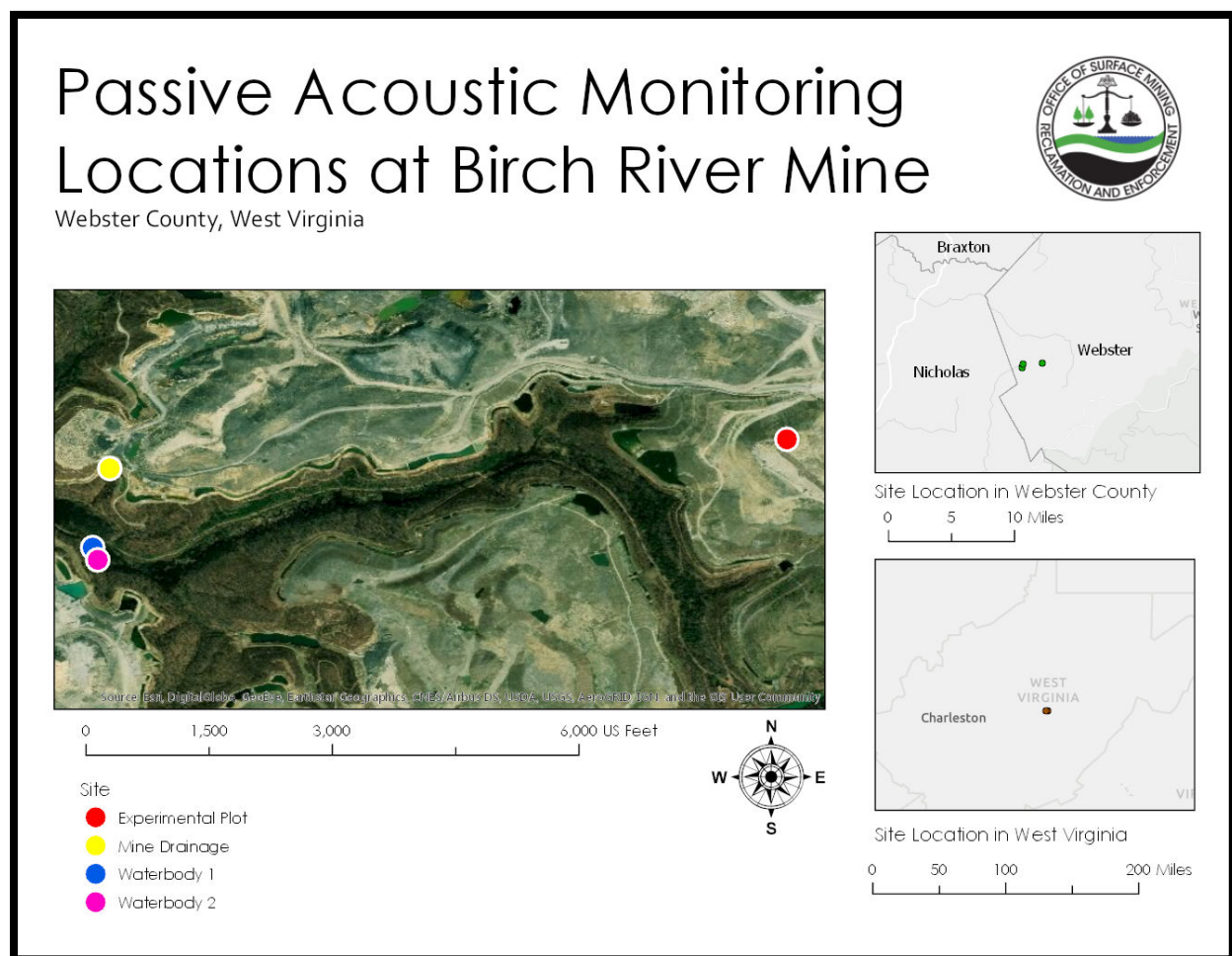
Volume 7

Issue 13

Fall 2019

## Passive Acoustic Monitoring for Bats on a Reclaimed Mine Land

*By Brian Dailey and Craig Walker*



**Figure 1: Detector locations at Birch River Mine. Story follows on Page 2.**

In April 2019, OSMRE Ecologists Brian Dailey and Craig Walker deployed passive acoustic monitoring equipment (hereafter bat detectors) to monitor bat presence at the Birch River Mine located in Webster County, West Virginia. Similar to undisturbed habitats, habitats on reclaimed mine lands such as waterbodies, old workings, and trees may be used by bats (including threatened and endangered species) as roosts, migratory stopovers, swarming sites, mating sites, foraging sites, drinking sites, or refugia. With the declining abundance of bats of multiple species due to habitat loss and white nose syndrome it is important to understand the various habitats bats are using on the landscape. Waterbodies, abandoned underground mines, and trees planted using the Forestry Reclamation Approach on reclaimed mine lands may provide important habitat for common and imperiled bat species. The objective of this study is to evaluate bat presence at a variety of habitats across the reclaimed mine including:

- a waterbody undisturbed by mining (two detectors deployed);
- a pond capturing mine drainage; and
- an experimental plot (planted circa 2008) that used the Forestry Reclamation Approach to determine the effects of applying soil amendments and topsoil substitutes on tree growth.

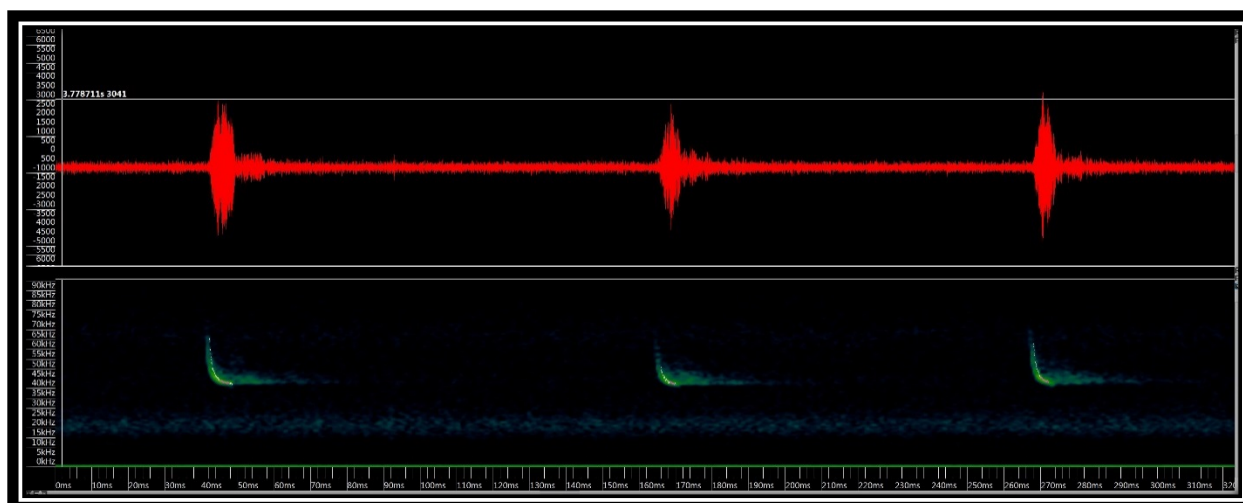
Passive acoustic monitoring for bat presence involves placing detectors in the field to record ultrasonic calls emitted by bats. Recording equipment generally consists of a microphone and a unit housing the: power source; detector; and file storage (e.g. SD memory card). Detectors are programmed on specified daily schedules with files recorded in the ultrasonic frequencies written to memory cards. Files are then transferred from the memory cards to a

computer and analyzed using specialized software packages. For this study, we paired two full spectrum detectors: the Wildlife Acoustics Song Meter SM4BAT FS Ultrasonic Recorder and Open Acoustic Devices AudioMoth 1.0.0 open-source full-spectrum acoustic recorder to compare recorded calls from each. Microphones were secured either to limbs of existing woody vegetation or atop telescoping poles at a height of approximately two meters at each of the locations.



**Figure 2: OSMRE Ecologist Craig Walker programming a bat detector at the experimental plot.**

Detectors were programmed to record from 30 minutes before dusk to 30 minutes after dawn and retrieved following 18 days of deployment. Files recorded to SD memory cards in the detectors were extracted and analyzed using Wildlife Acoustics Kaleidoscope Pro suite of software tools to visualize recordings, automatically identify bats, and analyze sound. Preliminary data analysis show the presence of multiple bat species across the range of habitats where detectors were deployed. Results from this study will be used to inform future OSMRE research into bat presence and activity around active and abandoned mine lands.



**Figure 3: Waveform (upper portion of figure in red) and spectrogram of a SM4BAT recording auto-identified as a Tri-colored bat (*Perimoyotis subflavus*) recorded at the experimental plot.**

## Impressions of ARRI from a New Core Team Member

*By Stefanie Miller*

I'm a surface mining reclamation specialist with OSMRE. I've been working here for over 8 years now and I recently joined ARRI as a core team member representing Maryland. I've been inspecting both regulatory and AML sites in MD for a few years now and I've always been intrigued by the success of the Forestry Reclamation Approach. I've been on a lot of mines planted with traditional compaction methods over the years. The growth rate with FRA is much faster and the trees seem healthier. These experiences have made a positive impression and piqued my interest in becoming more involved. So when the opportunity arose to join the Core Team, I took it.

This year was my first trip to the ARRI conference and I found it very welcoming, informative and well-run. At the conference, I had the opportunity to attend my first in person meeting with the rest of the team, many of whom I had not yet met. One thing discussed was the awards process and how there were

only two nominations this year. I know there are so many great and deserving projects out there that deserve to be recognized. I hope to see more this coming year.

The recognition for hard work is well deserved by every recipient that gets nominated.



**Stefanie Miller, new ARRI core team member**

## ARRI Conference Speakers

There were many great, informative presentations at this year's conference. Too many to talk about so I'll just point out a few



highlights that I found interesting and useful as a newcomer.

Glenda Owens, Acting Director of OSMRE, gave a great synopsis on the background of ARRI, from its inception up through the present. This year happens to be the 15<sup>th</sup> anniversary of ARRI. ARRI was formed with the goals of planting more high-value hardwood trees on reclaimed coal mine lands in Appalachia, increasing the survival rates of those trees and expediting the establishment of forest habitat through natural succession. She stated that in those 15 years since its inception, 120 million trees have been planted by 175,000 operators and the FRA was now moving outside of Appalachia beyond the original 7 states where it was developed.

Pam Snyder of KY Division of Forestry spoke on a topic with which I was previously unfamiliar, the White Oak Initiative, newly established in 2017. Their goal is to ensure the long term sustainability of the white oak. This concern arises from the declining populations of young trees. These issues stem from lack of active forest management, widespread insects and disease and the changing climate conditions. This group, much like ARRI in the beginning, is still at the stage of organizing and forming partnerships. They are currently working on a regional conservation plan. They hope to eventually provide research, technical assistance, assistance with on the ground implementation, better communications and help at the policy level.

Brian McCarthy of Ohio University and the American Chestnut Foundation gave an informative talk on the current state of chestnut restoration. The American chestnut originally reigned over 200 million acres of eastern woodland from Maine to Florida. They succumbed to a lethal fungus infestation, known as the chestnut blight, during the first half of the 20th century. The American Chestnut

Foundation is committed to restoring the American chestnut tree to our eastern woodland to benefit our environment, our wildlife and our society. The main method they have been using is to backcross breed American chestnuts with Chinese chestnuts in order to produce a blight resistant American chestnut tree. Brian spoke of the intricacies of chestnut breeding during his presentation. The researchers have discovered that there are more genes involved in blight resistance than previously believed, which makes the whole process a bit more complicated. That said, there has been a good bit of success as some of the trees are now producing nuts and volunteer trees are establishing. He spoke about the way forward being biotechnology along with mapping of the genome. In the biotechnology program, individual genes are being tested in American chestnut for their ability to enhance pathogen resistance using the tools of genetic engineering and molecular biology. Through this search a gene that produces an oxalate detoxifying enzyme has been found to enhance blight resistance significantly.



**Brian McCarthy of Ohio University and Cliff Drouet of OSMRE in conversation at the Jockey Hollow mine site.**

Jeff Skousen from WVU spoke about the growth rates of trees planted during FRA. I found it encouraging to know that although growth is delayed on mine spoils, that the trees

do eventually follow the same pattern as any forest. First they sleep, then they creep and then they leap. The Sleep, Creep Leap concept is a principle that applies to many perennial species of plants. Essentially it means that at first they don't appear to be doing anything. This is the time in which their roots are establishing themselves underground. The next stage is when they creep. Root growth continues but they also start to show more above ground signs that growth is happening. Finally they enter the leap stage when they really take off. The roots are well established at this point and they reach their peak performance above ground. For native soils, there is generally a 1 year sleep period while trees in mine spoils tend to sleep the first 2 years or so. A tree planted in native soil will usually creep in year two and leap in year three. The mine spoil planted trees tend to sleep in years 3-5 and then they leap. A lot of this also depends on the quality of the spoil as brown sandstone spoils tend to grow bigger trees with better diversity than gray sandstones.

Rebecca Swab spoke as a representative from the Wilds. The Wilds is a private, non-profit conservation center located on nearly 10,000 acres of reclaimed mine land in rural southeastern Ohio. The land was surface mined for coal in the 1940's through the 1980's. A well-known and rather behemoth dragline dubbed the Big Muskie last mined here in 1991. The mission of the Wilds is to lead and inspire by connecting people and wildlife. The Wilds is home to several exotic species including rhinos and giraffes as well as being a breeding facility for the native Hellbender Salamander and American Burying Beetles. Rebecca presented on their project involving restoration of understory growth in a reclaimed forest. Invasives are often an issue in reclaimed mine lands, so they are experimenting with removing them and re-planting with natives. Results are looking positive so far, although it is rather

labor intensive. They hope to be able to expand this program in the future as a way to fully restore their reclaimed forestlands.

## ARRI Regional Award Presented



**Regional Director Tom Shope presents the Excellence in Reforestation award to Clintwood Elkhorn Mining, LLC. Virginia's DMME's Lawrence Tankersley accepted the award on Clintwood Elkhorne's behalf.**

The ARRI Conference is also when the 2018 Excellence in Reforestation Regional Award is given. The award, presented by OSMRE regional director Tom Shope, is given annually to those individuals, companies or organizations that best exemplify the use of the Forestry Reclamation Approach in reclaiming active and abandoned mine lands. Award nominations are due by March 31 of each year. The Awards committee is comprised of a panel of judges made up of State and OSMRE core team members and a science team member. This year's winner was Clintwood Elkhorn Mining, LLC for 410 acres of reclaimed forest at their Bee Branch Surface Mine in Buchanan County, VA. Congrats to them on their achievement

## ARRI Field Trips



**Conference attendees observing saplings amid the Queen Anne's lace during the site visits.**

Day two of the conference was full of field trips to see several applications of the FRA. Egypt Valley and the Kalt property are two adjacent projects where mining done mainly in the 1970's and 1980's had been reclaimed to pastureland. Egypt Valley Wildlife area was established in 1995 with 14,300 acres and has since been increased to 18,011 acres and contains Piedmont Lake. It is popular for hunting, fishing and other forms of wildlife recreation. Piedmont Lake is considered one of the state's top fishing lakes. Egypt Valley (86 acres) was planted in 2016 with 61,286 seedlings. The Kalt property (97.8 acres) was planted in 2018 with 66,689 seedlings.

Next was the Anderson property, a 321.3 acre project mined in the late 1970's and early 1980's. This was the oldest of the three sites and tree growth was much further along here. Jockey Hollow is a 3,469 acre wildlife area established in 2004 and is managed as a public hunting area for forest wildlife.

Overall the conference was very enjoyable and informative. There was a little bit of something there for everyone, from the scientists to the layperson who just likes to see the trees thriving. The attendees and presenters are all very welcoming and happy to discuss topics of

mutual interest. Looking forward to attending again next year.

## American Chestnuts and American Elms

“A strategic combination for mine land reforestation!”

***By Michael French and Patrick Angel***



### **Disease resistant American chestnut**

In addition to the oaks, pines, maples, poplar, hickories, cherry, redbud, hazelnut, dogwoods, and other native trees and shrubs that ARRI and GFW have been planting in our efforts to restore native forest types across Appalachia, we have also been planting species that have experienced declines due to introduced fungal diseases. ARRI and GFW have been planting potentially disease-resistant American chestnuts (*Castanea dentata*), and more recently, Dutch elm disease tolerant American elms.

American chestnut was eastern North America's most important nut producing trees and one of its most important timber trees until an



introduced fungus known as the chestnut blight decimated its populations. The American Chestnut Foundation (TACF) has been providing us with their most advanced generations of backcrossed chestnuts that are approximately 15/16 American chestnut and 1/16 Chinese chestnut since we started our mine-land reforestation initiatives many years ago. Both TACF and ARRI/GFW have benefitted from this partnership. ARRI and GFW have assisted TACF by outplanting their backcrossed chestnut seedlings across the Appalachian coal fields region, which overlaps almost perfectly with the native range of the American chestnut. Mine sites in the eastern coal fields are usually on elevated sites where the seed can eventually



**This disease-resistant American chestnut grew to a height of 18 feet in just seven years on FRA compliant, brown weathered sandstone at Bent Mountain in Pike County Kentucky.**

rain down into the valleys below. Course textured, well-drained, and rocky mine spoils prepared using Forestry Reclamation Approach

techniques can be very favorable growth mediums for chestnuts, resulting in remarkably rapid growth and early flowering.

ARRI and GFW have benefitted greatly from the collaboration with TACF by using the chestnuts provided as “the chrome bumper that sells the car” which incentivizes landowners and mine operators to use the Forestry Reclamation being provided to us by researchers with the United States Forest Service (USFS). For several years, USFS researchers have been collecting seeds from American elms that have shown resistance to Dutch elm disease and have been creating 1-0 bare root American elm seedlings at the Indiana Department of Natural Resources tree seedling nursery in Vallonia, Indiana. USFS researchers and their partners have been planting them in a variety of locations, including National Forests. They have graciously donated a few hundred in recent years to ARRI and GFW so that we can plant them in numerous locations and track their survival and growth rates. It is hoped that they will perform well and that these plantings will help with not only the restoration of native forests, but also the restoration of imperiled species. Approach. There is a mystique surrounding this iconic species that often allows us to promote the reforestation of American chestnut/upland oak forest types as the post-mining land use for many sites. American chestnuts are then planted along with other high-value hardwood species to create healthy, productive forests on mine sites that might otherwise be reclaimed with conventional grassland reclamation.

American elm (*Ulmus americana*) is a native North American tree species that was widely used as a shade and street trees until it experienced a massive decline due to the introduction of Dutch elm disease. The native range of the American elm extends from Florida to Newfoundland west to North Dakota and Texas. American elm grows in full sun or part

shade. It prefers well-drained soil with a pH between 5.5 and 8.0, but can grow well with poor drainage or compacted soil. On the other hand, it can do well in wetlands or other moist sites and it can tolerate infrequent, short flooding. Because of its versatility and fast growth rate, it may be well suited for riparian buffer plantings as well as reclamation projects.



**Ulmus Americana, the American elm, used as a shade tree and to line streets until it experienced a massive decline due to the introduction of Dutch elm disease.**

ARRI and GFW have recently added Dutch elm disease-tolerant American elms to some of our planting mixes across the Appalachian coal fields to see how they perform in reclamation plantings. The elms are being provided to us by researchers with the United States Forest Service (USFS). For several years, USFS researchers have been collecting seeds from American elms that have shown resistance to Dutch elm disease and have been creating 1-0 bare root American elm seedlings at the Indiana Department of Natural Resources tree seedling nursery in Vallonia, Indiana. USFS researchers and their partners have been planting them in a variety of locations, including National Forests. They have graciously donated a few hundred in recent years to ARRI and GFW so that we can plant them in numerous locations and track their survival and growth rates. It is hoped that they will perform well and that these plantings

will help with not only the restoration of native forests, but also the restoration of imperiled species.

## Tennessee Celebrates its Eleventh Annual Arbor Day Event

*By Chris Miller*



**Forty students participating in this year's event which was held at Kopper Glo Mining, LLC's Cooper Ridge Surface Mine in Claiborne County, TN.**

Tennessee's ARRI core team members and the Coal Creek Watershed Foundation (CCWF) celebrated their 11<sup>th</sup> Annual Arbor Day together as event coordinators. This year's event was held at Kopper Glo Mining, LLC's Cooper Ridge Surface Mine in Claiborne County, TN. Kopper Glo has been an advocate of the FRA for many years, and have hosted several Arbor Day events. The one-acre site selected for this year's event is situated on a Title V contour surface mine.

We thank CCWF and Kopper Glo for their continued support of ARRI and our mission to restore productive forests on coal mined land.





**The loose rocky soil soaked up all the rain and made for easy planting conditions.**

The one-acre site selected for this year's event is situated on a Title V contour surface mine that is being reclaimed according to the FRA. This federal SMCRA permit is in the process of converting 1,496 acres of previously mined land into healthy forestland, while removing old highwall and abandoned pits. All available material is being used to reclaim the highwall with loosely compacted spoil capping the compacted core of the backfill. Although heavy rains had threatened postponing the event the week prior, site conditions were ideal on the day of the event due to the use of the FRA. The loose, rocky soil soaked up all the rain and made for easy planting conditions.

On the morning of the event, around 40 students from nearby Clairfield School and 20 adult volunteers showed up to plant several hundred mixed hardwood seedlings on the reclaimed site. Among those seedlings provided by Kopper Glo were American Chestnuts grown from seed by Barry Thacker (CCWF), sourced from the American Chestnut Foundation. Prior to planting, he educated the students about the history and importance of the chestnut to their ancestors who lived in the region. Afterwards, ARRI Core Team member Chris Miller educated the students on proper tree planting techniques for both potted chestnuts and bare-root seedlings. Dave Turner, of the Tennessee Department of Environment and Conservation, spoke about

how the FRA can improve the hydrology of the receiving streams. Lastly, Michael Studer, Tennessee's State Apiarist, stressed how native groundcover and nurse trees advocated by the FRA can provide vital habitat for Tennessee's native honeybee population.

The 5th through 8th graders in attendance did a great job planting the trees and were excited to get out of the classroom to spend some time outdoors. Although they considered it a break from school, they were unaware of how much they learned.



**Chris Miller educated the students on proper tree planting techniques for both potted chestnuts and bare-root seedlings.**

## **2019 ARRI Conference - Restoring Productive Forests on Mine Lands in Ohio**

***By Christian Canary and  
Jake Levine***

The 2019 Appalachian Regional Reforestation Initiative (ARRI) annual conference was held in Cambridge, Ohio on July 24-25, 2019. This year's theme was "Restoring Productive Forests on Mine Lands in Ohio".

Glenda Owens, Acting Director of the Office of Surface Mining and Reclamation and Enforcement (OSMRE), provided the welcome and gave a detailed overview of ARRI. Steven Gray, the assistant director of the Ohio Department of Natural resources (DNR), offered additional welcoming remarks and discussed the wide range of mined land reclamation projects occurring in his State.

Martin McAllister, the Appalachian Project Manager for The Nature Conservancy, delivered the keynote address, an in depth look at the twin challenges of climate change and habitat loss and the critical ways that reforestation can address these.



**Regional Director Tom Shope delivers congratulatory remarks to Excellence in Reforestation award to Clintwood Elkhorn Mining, LLC.**

The day continued with presentations by experts in the science, policy and implementation of reforestation on active mining operations, abandoned mine lands and previously reclaimed mine lands. During the lunch hour, Appalachian Regions 1 and 2 Director Tom Shope presented the annual Excellence in Reforestation Regional Award. Clintwood Elkhorne, Inc., claimed this year's award for its exemplary reforestation project at the Bee Branch surface mine in Buchanan County, Virginia.



**Observing successful tree survival and growth at the Jockey Hollow site visits.**

The second day was dedicated to site visits of several projects in Ohio where the Forestry Reclamation Approach (FRA) was used in the reclamation of coal-mined lands. The FRA is a method for reclaiming coal-mined land to forest under the Surface Mining Control and Reclamation Act. The FRA is based on knowledge gained from both scientific research and experience. Site visits included tours of Egypt Valley Wildlife Management Area, two private property reforestation sites, and Jockey Hollow Wildlife Management Area. At each of the four sites, topics of discussion included the history of the site, landowner objectives, project planning, funding sources, site preparation, tree planting/species selection, monitoring and comments from the landowner.



**A record number of 125 people attended this year's conference in Cambridge, Ohio.**



This year's conference saw a record attendance of 125. Each attendee had the opportunity to network and collaborate with other individuals from government, academia industry and the non-profit world. Now in its 15<sup>th</sup> year, the conference, is an essential forum for maintaining the professional relationship and partnerships that enable effective reforestation work across agencies and mining operators. Previous conferences have produced new ideas for scientific advisories, brought new partners into the fold and accelerated the momentum behind reforestation on mined sites.



**Student attendees discussing a research poster during a session break.**

The conference was a partnership between OSMRE, Ohio DNR, the Natural Resources Conservation Service and Ohio University. OSMRE foresters Cliff Drouet and Scott Eggerud, inspector Steve Roberts, and environmental specialist Jake Levine all played key roles in planning and executing the conference.

## Maryland's Arbor Day

*By Stefanie Miller*

The Maryland Department of the Environment, Abandoned Mine Land Division hosted an Arbor Day Event on Wednesday, April 24, 2019. Thirty-three students from area high schools attended to plant trees at the site of the Gordon Landslide AML project. This project is

located at the site of the abandoned Detmold Mine.



**Students from Mountain Ridge School ready to start planting.**

The volunteers from Mountain Ridge High School and the Career Center arrived via the bus with their teachers, Tom Koszikowski and Carol Garner. Bus driver Bill Guthie also participated.



**Mark Carney instructing the students on the use of the dibble bar.**

The goal of the Arbor Day Event was to improve the habitat and aesthetics of the site while educating the students on various topics such as the history of coal mining in Maryland, the environment and other topics.



There were 50 “Dutch Elm Disease Resistant” American elm saplings planted on the site. The elms were donated by the US Forest Service and were grown at the Indiana State University. Also planted were 1000 flowering shrubs and hardwoods that included white pine, sycamore, black locust, black cherry, indigo bush and northern red oak.

Attending from OSMRE were Christian Canary, AML and Regulatory Specialist; Stefanie Miller, Reclamation Specialist; and Scott Eggerud, OSMRE forester, all members of the ARRI program.



**Mike Garner discussing the project.**

In attendance from MDE were Mark Carney, AML Engineer; Ed Larrimore, Mining Program Director; Mike Garner, AML Director; Tim Miller, AML Engineer; Erik Schafer; Natural Resources Planner; and Matthew Rowley, Forester.



**Volunteer Students from the Career Center.**



**There were 50 Dutch elm disease resistant American elm saplings planted.**

The following is a quote from OSMRE forester, Scott Eggerud: *“We’re gonna plant on the contour. That means stay on the same elevation”.*

## **Eighth Year ARRI Event Compliments Tower of Voices**

***By Chet Edwards***

On Sunday September 9<sup>th</sup>, 2018, The Flight 93 Partners dedicated the final feature of the Flight 93 National Memorial. The 93 foot Tower is conceived as a monumental musical instrument holding 40 wind chimes, representing the 40 passengers and crew members. It was constructed as a landmark feature near the Memorial entrance, which is visible from US Route 30\Lincoln Highway. The Tower provides

a living memorial in sound to remember the 40 through their ongoing voices. The eighth year ARRI event was designed to reforest the surface mined areas that border the Tower Plaza, which in time will provide a picturesque background for the Tower.



**The 93 foot Tower in the background holds 40 wind chimes representing the 40 passengers and crew members of Flight 93.**

ARRI\Plant a Tree for Flight 93, 2019 was held on April 26th and 27th. As is customary, the two day event begins each morning with opening ceremonies presented by Park Superintendent, Steve Clark. On Friday, Captain Bateshanksy, the CO of the USS Somerset presented a memorable story to the volunteers about how the commemoration of the 40 passengers that perished on Flight 93 was built into the USS Somerset so that it would be a motivation to the sailors that serve on her how we come together in desperate times. On Saturday, the group heard an emotional message from Patrick White, cousin of Louis J. Nacker II, who was a native Pennsylvanian that was on board Flight 93. These ceremonies not only pay homage to the ones who lost their lives that day, but also inspire the volunteers to honor them by planting trees which are a living memory to each one of the 40.

Steve always thinks of some special way to get the volunteers energized. This year was no different when he held up a seedling that would be planted during the event and said “this small, fragile little guy does not look like it would make it out there”. Then, he unveils a photograph of an 8 year old white pine that was planted on the first year, and said, , “Yes, they will!”



**Park Superintendent, Steve Clark, holds up a seedling that would be planted during the event.**



**Picture of an eight year old pine planted at the first Flight 93 event.**



ARRI/Plant a Tree is the biggest event that occurs at the Flight 93 National Memorial. Dedication and the hard work of the Friends of Flight 93, together with many volunteers, ARRI partners, and the National Park Service is what has made the eight year history of this event so successful. This year was no exception. Under the supervision of ARRI core team members, PA DEP, and NPS; student volunteers from Penn State Altoona, University of Kentucky, and Indiana University Pennsylvania, prepared 100 seedling buckets each day with a combination of 6800 high value hardwood seedlings, wildlife shrubs, and American chestnut seedlings.



**University volunteers prepare a 100 buckets a day for planting.**



**The buckets contain a combination of high value hardwood seedlings, wildlife shrubs, and American chestnut seedlings.**

Even with the threat of severe thunder storms and high winds on both days of the event, 416 lively volunteers (insert photo 6 here) from a

variety of businesses, schools, energy companies, foundations, and government agencies were not discouraged to participate. A shout out to our own Tom Shope for being a team leader of one of 10 teams on Saturday that helped complete the plantings; and a big Thank You for all the support you've given to ARRI during your time at OSMRE.



**Even with the threat of severe thunder storms 416 volunteers participated in this event.**

When it was all said and done, 13,600 trees were planted during 2019 ARRI\Flight 93 Plant a Tree bringing our total to 130,950 trees on 190 acres; that's one step closer to our goal of 150,000 trees.

At the end of the opening ceremony on Saturday, Steve Clark told the group a story that when the idea of a building a National Park at the crash site of Flight 93 was proposed, there were some in government that thought it was not a good idea. They said the memory of Flight 93 would fade and attendance couldn't be



sustained. With a smile on his face, Steve said, “they were wrong. Every year attendance has increased. In 2018 over 450, 000 people came to Flight 93.” Yes, The Flight 93 National Memorial is a special place and it holds a significant place in the hearts’ and soles’ of each of the volunteers that come to ARRI/Plant a Tree. I am proud ARRI will be a part of this living legacy.



**The Flight 93 National Memorial is a special place and holds a significant place in the hearts and soles of each volunteer.**

## Daniel Boone National Forest mine site planted with high-value trees!

*By Patrick Angel*

During the 2019 spring tree planting season, Green Forests Works conducted a series of highly successful volunteer tree planting events on a legacy strip mine on the U.S. Forest Service’s Daniel Boone National Forest in Pulaski County, Kentucky.

Numerous volunteers came from all over the eastern US to participate in the reforestation on the old mine site. Alternate spring break college and university groups came to plant from Radford University (Virginia), Berea

College (Kentucky), the University of North Carolina (Chapel Hill), Xavier University (Ohio), Franklin & Marshall University (Pennsylvania), the University of Maryland, Morehead State University (Kentucky), Centre College (Kentucky), the University of Kentucky Lewis Honor College, and Marian University (Indiana).



**Volunteers preparing to plant trees at the site where a total of 34 acres of mixed hardwoods were planted.**



**Three Boy Scout troops from central Kentucky were among the volunteers.**

Other volunteer groups included three Boy Scout troops from central Kentucky, a group called the Kentucky Writers and Artists for Reforestation, the Sierra Club, Angel’s Envy Bourbon Company, and Philly Insurance.

Thirty-four acres of trees were planted with mixed hardwood species with a disease-resistant American chestnut and American elm component.



The Appalachian Regional Reforestation Initiative was started in 2004 with the goal of encouraging the planting of high-value hardwood trees on reclaimed coal mine sites using the Forestry Reclamation approach.

ARRI is a coalition of the States of the Appalachian Region, the Office of Surface Mining and their many partners in industry, environmental organizations, academia, local, State and Federal government agencies and local citizens who have come together to support this valuable initiative.

For more information on ARRI visit our website at:  
<https://arri.osmre.gov/>

## **ARRI Core Team Leaders:**

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DMME

**Scott Eggerud**, OSMRE  
Appalachian Region

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