



ARRI Newsletter

2016 ARRI Conference Perspectives on the FRA

2016 ARRI Conference	1
New AmeriCorps Intern	4
Survival and Productivity Field Studies	5
Tennessee Arbor Day Event	6
Richard Davis	7
Botanic Gardens	9
Tennessee's State ARRI Award	10
ARRI Planting Update	11



OSMRE Director Joe Pizarchik presenting his welcoming statements.

During the 10th ARRI Mined Land Reforestation Conference this year, we considered the Forestry Reclamation Approach from different perspectives. Doing so, we gained a unique understanding of different perspectives on the FRA held by industry, academics, citizens, state and government officials. This gathering of people, both new to ARRI and those who helped pioneer it, converged in Knoxville, Tennessee during the first week of August this year. We learned how the principles of ecology are used to establish forests on reclaimed mined land and how those practices can be tailored to different sites to re-establish ecosystem functions.



OSMRE forester, Patrick Angel (right), presents the Excellence in Reforestation Champion Award to Director Pizarchik.

Providing the welcoming statement was OSMRE Director Joe Pizarchik. Prior to his statement, he was presented the “Excellence in Reforestation – Champion Award” for his enthusiasm and support for ARRI’s mission over the years. He continued to show his support through his comments, where he praised the work of ARRI and his desire to see the FRA pursued in other regions.

Continued on Page 2





ARRI Conference

Continued from Page 1

The FRA is based on best available knowledge and science. As a result, occasional updates to the FRA are needed when new information is attained. Therefore, the next section of the conference was for both new and old members of ARRI. In this section, we covered the steps of the FRA and learned about updates in choosing the proper spoil, low compaction grading, non-competitive groundcover, and tree species selection. In the technical sessions that followed we learned about reforestation efforts in Pennsylvania, using national service programs to provide assistance to the ARRI and FRA missions, and heard about a unique approach to the FRA to establish bermudagrass under a loblolly pine plantation.



Keynote speaker Dr. Tammy Horn

The awards luncheon was presented by OSMRE Appalachian Regional Director Tom Shope. During the luncheon he covered state winners throughout the region, and presented the ARRI - Regional Award to representatives from Premier Elkhorn Coal Company.

Following the luncheon, technical sessions provided further insight into different aspects of the FRA. These sessions covered updates and efforts from Green Forests Work, a call to action from the USFWS for forest management to improve habitat for federally listed bat species, a project which adapted the FRA for Western Gulf soil and surface mining practices, and a case study which examined how reclamation practices influenced plant communities 6 to 8 years after mining.

To round out the first day, a panel was held consisting of members of the industry, academic community, and regulatory agencies. Fulfilling the theme of the conference "Perspectives on the FRA", they answered questions from the crowd regarding their experiences, difficulties, and successes with FRA practices.



Left and right: Tom Shope presents the Regional Award to representatives from Premier Elkhorn Coal Company. (from left to right: Chris Stanley, Ed Newell, Jeff Cornett)

Continued on Page 3



ARRI Conference

Continued from Page 2

On the second day of the conference a field trip was held. Participants first visited Zeb Mountain, TN where they were able to visit a variety of FRA plots of different ages. The first stop showcased 15 year old site with conventional reclamation, where arrested succession has taken place. On the next stop, a 10 year old operational plot was visited which had trees large enough to blend in to the un-mined area. Next was a 9 year old research plot which was planted under differing groundcover and fertilization rates. Native warm season grass was planted on this site which is serving as non-competitive vegetation for the large oaks growing there. The last stop at Zeb Mountain was a site which was end-dumped and planted with American chestnut in 2008. This site serves as a research plot to determine the best planting treatment for this ecologically important species. Unfortunately, the trees were large enough to develop furrowed bark which serves as a host site for the chestnut blight. Although these trees will soon die, their legacy will carry on through the information learned from this project.

Lunch was held at Indian Mountain State Park which was once an abandoned surface mine with several open pits. The land was reclaimed and has now been converted for recreational use. The final stop of the day was an active contour mine near Clairfield, TN. This mine is an operational FRA site.



Above left: A 15-year old site showing arrested succession. Above right: A 10-year old FRA site showing strong growth of mixed hardwoods and pine. Below left: A 10-year old FRA site blending in to the surrounding un-mined area. Below right: An 8 year old end-dumped FRA site with a large American chestnut.

Continued on Page 4



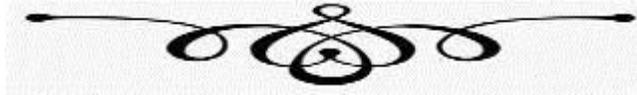
ARRI Conference

Continued from Page 3

A question was posed to the conference attendees – If a site is seeded in the fall, is it better to plant trees the following spring or wait until the annual cover has died before trees are planted? The attendees were split on the issue and posed valid arguments for either side. It is clear more research can still be done on the methods of the FRA. In order to better understand the arguments and viewpoints, all perspectives should be considered. Hopefully we accomplished this through the conference this year and hopefully we will continue to do so. The next ARRI conference will be held April 9-13, 2017 in Morgantown, WV. This conference will be held jointly with the WV Mine Drainage Task Force Symposium and the American Society of Mining and Reclamation's Annual Meeting. See you there!

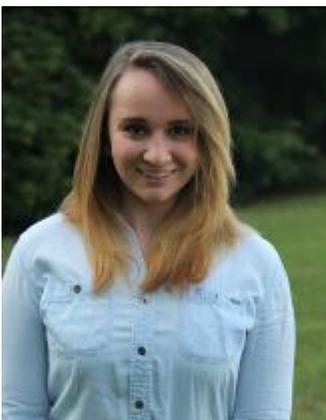


An operational FRA site which was planted this year near Clairfield, TN.



We Welcome Courtney Gover to the ARRI Team

Courtney graduated from the University of Kentucky in May and has joined OSMRE as an AmeriCorps intern for the next year. Her degree is in Biosystems and Agricultural Engineering, with a focus in Environmental Engineering. She will be working closely with ARRI and Green Forests Work (GFW). Her assignments will include performing data analysis, assisting both organizations with field work, and promoting the Forestry Reclamation Approach (FRA). She has a passion for wildlife and looks forward to learning the newest techniques in reclamation and habitat restoration.



Courtney is a native of Southeast Kentucky and is knowledgeable of the coal mining industry. She worked as an engineering intern at a coal mine and has worked on sites that were reclaimed to pasture land. This summer she was able to work on the Starfire site in Knott County, KY that was reclaimed using the FRA in the 1990's. One of her goals for the year is to gain experience informing mine operators of the potential of the FRA to be an efficient and cost effective reclamation option. Another goal she has is to reach out to communities by organizing a project/informational activity for youth in an effort to educate them about the importance of wildlife. This will be accomplished by partnering with a former teacher in her hometown. She also plans to encourage residents of Appalachia to participate in ARRI/GFW tree planting events in the spring of 2017. Courtney hopes that her experience as an AmeriCorps intern working with OSMRE will equip her with skills that she can utilize in her future career while allowing her to impact communities of Appalachia in a positive way.



Survival and Productivity Field Studies

Update from the field! OSMRE/ARRI AmeriCorps members Tiffany Heim and Courtney Gover have recently returned from many weeks of surveying and monitoring reforestation sites in Kentucky, Ohio, Maryland, and West Virginia. Monitoring and data collection of legacy mine sites, planted by the ARRI, Green Forests Work (GFW) and other partners benefit all of our reforestation efforts. The survival and productivity studies record successes and areas of concern in order to allow reclamation practitioners to make modifications in planting prescriptions, herbicide applications and mitigation techniques. AmeriCorps members working directly with ARRI and GFW will continue to monitor planted sites throughout the eight states in the summer and fall months of their term. Utilizing the AmeriCorps members in the field work is a great benefit to the reforestation initiative. Thanks to Scott Eggerud, Patrick Angel, Cliff Drouet, Tom Cunningham and to all of the partners throughout the region for their assistance and cooperation.

One example of the many sites surveyed is the Egypt Valley Mine site in Ohio. This project showed unprecedented results. The surveys revealed that between 18-20% of the white oak and red oak seedlings were affected by cicadas. Egypt Valley was planted during a year that cicadas appear, and as a result the oak seedlings suffered severe damage. Two other examples of sites surveyed were in Maryland and West Virginia. The Maryland site at Jennings Randolph Lake was divided into two sections: conifers and hardwoods. The species with the highest percent survival of these plots were Virginia Pine and Red Bud, respectively. The West Virginia AFRI site is located at the Boy Scouts of America property near Beckley. The plantings there were divided into 5 sections. The results here varied significantly between survey plots. Several of the plots were covered with thousands of red maple and/or sourwood seedlings, while others only contained 4 seedlings total. The West Virginia site also serves as a wildlife protection area. Deer browse was common throughout the areas surveyed.

The results of these surveys will assist in determining several aspects of future tree plantings. These factors include: species planted, ground cover used, herbicide use, and planting strategy. The results will be applied to plantings on sites that similar in the future.



Tiffany Heim, an AmeriCorps Intern, working with Scott Eggerud in Maryland.



Courtney Gover on left and Tiffany Heim on the right, AmeriCorps Interns, working on a site in Kentucky.



Tennessee Arbor Day Event



A group of young tree-planters posing with blight-resistant American chestnut seedlings.



Students and volunteers working diligently to re-forest the FRA-prepared Arbor Day site.

On April 19th, over 90 students and volunteers gathered on the highest point at Kopper Glo Mining's Clear Fork Surface Mine. This was the eighth annual Arbor Day event organized by ARRI Core Team members in Tennessee and the Coal Creek Watershed Foundation. It was also the third event hosted by Kopper Glo Mining, LLC. From the top of the mountain, students could see their school down in the valley below. It was not the first time participating in the annual Arbor Day Event for many of the students. When asked why they were on top of the mountain, they all responded enthusiastically – "To plant trees and return the land to a forest."



Students and volunteers working diligently to re-forest the FRA-prepared Arbor Day site.

Continued on Page 7

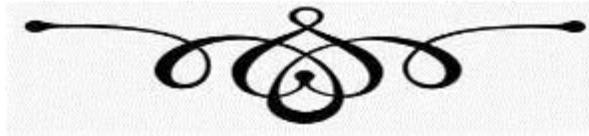


Tennessee Arbor Day Event

Continued from Page 6

The 5th through 8th grade students from Clairfield and White Oak schools live in the middle of Tennessee's coalfields but many had never visited a coal mine prior to attending Arbor Day events. The schools are able to use the event as an opportunity for students to learn about the coal industry and environmental protection within their community. ARRI core team members taught the students and volunteers about reforestation, and how proper tree planting techniques influence seedling survival. Barry Thacker, founder of the Coal Creek Watershed Foundation, educated the students about the history of the American chestnut, then provided 30 blight-resistant hybrid seedlings grown from seed on the back porch of his office. In addition to the chestnuts, Kopper Glo Mining provided the 1,000 mixed hardwood seedlings needed to re-forest 1.5 acres of land on top of the mountain.

Although many of the students initially viewed the event as a chance to be outside and have fun with their friends, they immediately embraced the opportunity for hands-on learning. Students quickly learned that pines were easier to plant than oaks, because of the oaks' sprawling tap-roots systems. They also learned chestnuts need an even bigger hole in the ground than oaks, because the chestnuts were grown in large containers with loose potting soil. As a result, bartering one species for another became a common occurrence. By the end of the event, students were seen correctly naming tree species and gently tugging the seedlings to ensure they were planted correctly.



Richard Davis: His Legacy in Virginia



Richard began his career with the Division of Mined Land Reclamation in 1980 as a reclamation inspector on the enforcement side of the Division. As a reclamation inspector he gained valuable experience throughout the coalfield regions of Virginia. He worked at this position until 1994. From 1994 through 2009 he worked in the Abandoned Mined Lands program as an AML inspector. In December of 2009 he obtained the position of the AML Projects Coordinator. Richard has a Master's Degree in biology. Richard also serves as an instructor for the OSM Course –Soils and Revegetation.

Richard (second from right) plants a tree on Arbor Day

Continued on Page 8



We want to recognize and thank Richard Davis of DMLR for his contributions and service as an ARRI's member and core team member in Virginia. Richard Davis was a founding member of the first ARRI's organizational meeting in 2004, and subsequent first ARRI's core team member for Virginia. He was instrumental in the early organizing and expansion of ARRI's in Virginia. He was an early promoter of the FRA practices in Virginia and worked with our very active Science Team members in Virginia, including Dr. Burger and Dr. Zipper of Virginia Tech. Through his patient teaching style and hard work he help expand the FRA practices to include nearly all surface mining and AML projects in Virginia. He planned and organized the first Arbor Day in 2005 and has continued very successful Arbor Day events through this years, 2016.

His legacy in Virginia with respect to the FRA will include his early success with establishment of trees on numerous AML projects with forest land use. His accomplishments include stream restoration projects and development of the new ground cover requires in Virginia, which are compatible with establishing productive hard wood species on mine lands in Virginia. Richard served on numerous ARRI award teams and recently was nominated to represent the ARRI's as regional state leader. Again we want to thank Richard and wish him the best with his new assignments and duties for DMLR. He leaves the Virginia ARRI's team at a high point in the organization with his solid leadership and continuing support.

Richard Davis

Continued from Page 7



Richard teaches DMME visitors about trees



Richard with Congressman Griffith on Arbor Day.



Planting at the Pittsburgh Botanic Garden



Volunteers planting trees on land ripped in accordance with the principles of the Forestry Reclamation Approach

On April 9, 2016, 20 volunteers, including staff from the Office of Surface Mining Reclamation and Enforcement's Appalachian Regional Office, gathered at the site of the Pittsburgh Botanic Garden to plant trees on a former coal mine that will be part of the Garden. The site is being reclaimed with some of the proceeds from the sale of the coal going towards expanding the Garden's grounds. Approximately 600 trees consisting of mixed hardwoods including American chestnut were planted. The site was well prepared for tree planting using the Forestry Reclamation Approach.

The Pittsburgh Botanic Garden is transforming 460 acres of abandoned mine land just 10 miles outside the city into a world-class botanic garden. Once completed, the Pittsburgh Botanic Garden will be one of the largest botanic gardens in America and will comprise 18 distinct gardens, five diverse woodland experiences, an enhanced visitor's center, an amphitheater for outdoor concerts and performances, a celebration center to accommodate weddings and corporate events, and a center for botanic research. The first 60 acres of the Garden, the Woodlands, opened on August 1, 2014, with Secretary of the Interior Sally Jewell and a host of other dignitaries in attendance. This parcel includes stunning meadow and serene woodland experiences along three miles of groomed trails. The tree planting that took place on April 9th will be one of many that the Garden has planned in the coming years to realize its vision. More information about the Garden can be found at its website: <http://pittsburghbotanicgarden.org/>





Tennessee Presents its ARRI Excellence in Reforestation State Award



At left, Crossville Coal's Mine Manager – Mike Webster. At right, the family of Mike Webster accepting the award on his behalf.

The Knoxville Field Office annually recognizes exemplary performance and execution of the FRA for the previous calendar year. This year, the Crossville Coal, Inc. Turner Surface Mine, permit number 3189 was Tennessee's 2015 ARRI Excellence in Reforestation State Award winner for implementation of FRA techniques.

Crossville Coal's Turner Surface Mine is a 389.5 acre surface mining operation in Cumberland County, Tennessee. The land was historically wooded and undeveloped prior to any mining. The pre-mining timber tree species included pine, white oak, black oak, scarlet oak, chestnut oak, black gum, sweet gum, hickory, yellow poplar, and black locust. However, extensive historic logging in the area left dense stands of unusable small trees and shrubs with no saw timber quality species available. After a short mining operation, Crossville Coal, Inc. began reclamation of the site.

After learning about the FRA through presentations by ARRI core team members, Crossville Coal enthusiastically adopted the FRA in a retroactive manner through permit revisions. These revisions have progressively increased the acres reclaimed using the FRA. Final grading was conducted to include as much organic material, fragmented rock, and woody debris as possible to create a micro-topography similar to natural forest conditions. The site was seeded at reduced rates according to the FRA with a minimum mandatory ground cover of 30%. The ground cover includes: 5 lbs. of orchard grass, 2 lbs. of weeping lovegrass, 3 lbs. of ladino clover, 3 lbs. of alsike clover, 5 lbs. of birdsfoot trefoil, 2 lbs. of redtop, and 10 lbs. of perennial rye. After consulting the tree species selection spreadsheet included in Forest Reclamation Advisory #9, the company selected 14 mixed hardwood species planted at 800 stems per acre for their approved FRA areas.

The mine manager, Mike Webster, thoroughly understood and embraced the objectives and goals of the FRA. He actively reached out to federal inspectors and ARRI core team members for advice and recommendations on species selection, site preparation advice, and tree planting timing. Mike pursued this excellent reclamation while battling cancer over the past few years. For these reasons, ARRI core team members were proud to nominate Crossville Coal for

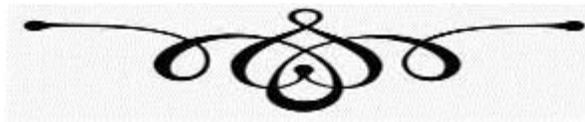
Continued on Page 11



Tennessee Presents Reforestation State Award

Continued From Page 10

the state and regional ARRI awards. Mike was present at the 2016 ARRI conference where he learned that his hard work led to Crossville Coal being awarded this year's ARRI – Excellence in Reforestation TN State Award. Unfortunately, he passed away in mid-September before being able to accept the award. In commemoration of his legacy and efforts, his family accepted the award at the 2016 TN Mining Conference in Nashville, Tennessee on November 4. We will remember Mike's hard work and determination in everything he pursued.



ARRI Planting Update

There were 29 volunteer tree planting events during the spring of 2016. The planting season started out in late February in Texas where ARRI and Green Forests Works partnered with Stephen F. Austin State University and Nacogdoches Independent School District on three separate events. From Texas we moved north to Kentucky with a series of events in March at the University of Kentucky's Robinson Forest in Breathitt County Kentucky where we ripped up a legacy surface mine site for volunteers to plant shortleaf pine and hardwoods. Volunteers came from Appalachian State University, Drew University, Xavier University, Radford University, University of North Carolina-Chapel Hill, Keene State College, University of Massachusetts-Boston, the Missouri Institute of Science, Berea College, Viper Elementary, Perry County Central High School, and Hazard High School.

From there we move to a site located on the Daniel Boone National Forest in Laurel County Kentucky where volunteers planted a mixture of white oaks. This project was made possible by the bourbon company known as Angel's Envy who wanted to fund a project that replants white oak trees. The bourbon industry in Kentucky harvests white oak trees for the purpose of making staves for their wooden barrels that they char to flavor their brand of bourbon. Volunteers from the Angel's Envy came from Chicago and joined Emory University, the Sierra Club, and numerous troupes from the Boy Scouts of America to plant at this site in a series of separate events.

There were several ARRI/GFW volunteer events on The Wilds in Muskingum County in southeastern Ohio and also at the Pittsburgh Botanic Garden at Oakdale, Pennsylvania. The regulatory authority in Kentucky held two separate Arbor Day event with ARRI/GFW assistance: one in Muhlenberg County in western Kentucky on a reclaimed AML site and one with Premier Elkhorn Coal Company at their ESCO Mine in Letcher County Kentucky. The state of Virginia organized a volunteer tree planting event with ARRI/GFW assistance for about 200 sixth grade students from five Buchanan County schools at the Poplar Gap site in Buchanan County Virginia. ARRI and GFW also assisted with Arbor Day events in Maryland and Tennessee. Two planting events occurred on May 13 and May 14 at the Flight 93 National Memorial near Somerset, Pennsylvania involving about 300 people in partnership with the National Park Service. The planting season wrapped up with two events planting red spruce at high elevations on the Monongahela National Forest near Elkins, Preston County, West Virginia and a group effort of about 200 elementary school kids planting American chestnuts on a mine site near Belfry in Pike County Kentucky. The volunteer events resulted in the planting of over 135,000 trees on about 200 acres involving over 2,000 volunteers, the vast majority of whom were youth defined as 24 years old or under.



**APPALACHIAN
REGIONAL
REFORESTATION
INITIATIVE**

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 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 see our website at: <http://arri.osmre.gov/>

GOALS OF ARRI

- Plant more high-value trees on reclaimed coal-mined lands in Appalachia.
- Increase the survival rates and growth rates of planted trees.
- Expedite the establishment of forest habitat through natural succession.



ARRI Core Team Leaders:

Lawrence Tankersley, Virginia DMME
Mike Bower, OSM Appalachian Region

Science Team Leaders:

Dr. Brian Strahm, Virginia Tech
Christopher Barton, University of Kentucky

Science Team Liaisons:

Dr. Patrick Angel, OSM Appalachian Region
Chris Miller, OSM Knoxville Field Office

ARRI News Editor: Mike Bower