MINED LAND RECLAMATION

USING THE FORESTRY RECLAMATION APPROACH

Eric Oliver Mineral Resources Program Specialist, PA DEP

ARRI Core Team Leader

APPALACHIAN REGIONAL REFORESTATION INITIATIVE (ARRI)

ARRI is a broad-based group working to re-establish forest habitat on active and abandoned mine lands.

ARRI'S GOALS:

- •PLANT MORE HIGH-VALUE NATIVE TREE SPECIES (GENERALLY HARDWOODS)
- •INCREASE THE SURVIVAL RATES AND GROWTH RATES OF PLANTED TREES
- EXPEDITE THE ESTABLISHMENT OF FOREST HABITAT THROUGH NATURAL SUCCESSION



ARRI STARTED AS A JOINT EFFORT BETWEEN OSM AND THE APPALACHIAN COAL STATES















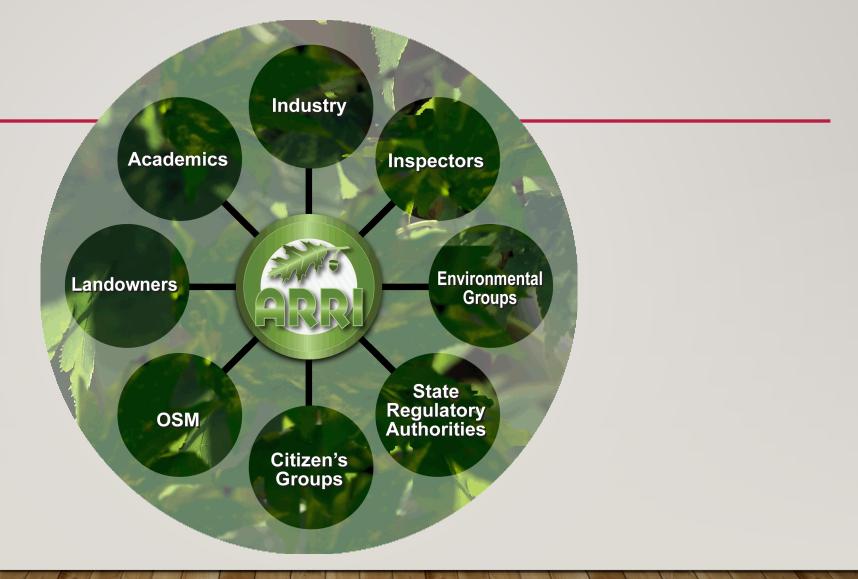








ARRI PARTNERSHIPS



ARRI CORETEAM

- Made up of both state and federal regulatory and permitting staff
- All of the Appalachian coal states are represented
- Work with operators and landowners to find projects and bring them to completion
- Work with the Science Team to develop Forestry Reclamation Advisories that help guide project partners to special practices that enable successful reforestation



ARRI'S SCIENCE TEAM

- OHIO UNIVERSITY
- OHIO STATE UNIVERSITY
- PENN STATE UNIVERSITY
- PURDUE UNIVERSITY
- SOUTHERN ILLINOIS UNIVERSITY
- UNIVERSITY OF KENTUCKY
- UNIVERSITY OF MARYLAND
- UNIVERSITY OF TENNESSEE
- VIRGINIA POLYTECHNIC INSTITUTE
- WEST VIRGINIA UNIVERSITY
- WEST VIRGINIA STATE UNIVERSITY

- US FOREST SERVICE
- US GEOLOGICAL SURVEY
- TACF
- OSM
- INDIANA UNIVERSITY OF PA
- AMERICAN BIRD CONSERVANCY
- **GREEN FORESTS WORK**
- S. F. AUSTIN STATE UNIVERSITY

THE FIVE MAJOR COMPONENTS FOR THE FRA

- I. Reduce Compaction
 - Grading or Ripping Techniques
- 2. Reduce Competition
 - Tree Compatible Ground Cover
- 3. Proper Species Selection
- 4. Proper Planting Techniques
- 5. Create the Best Possible Growth Medium
 - With Materials Available On the Site

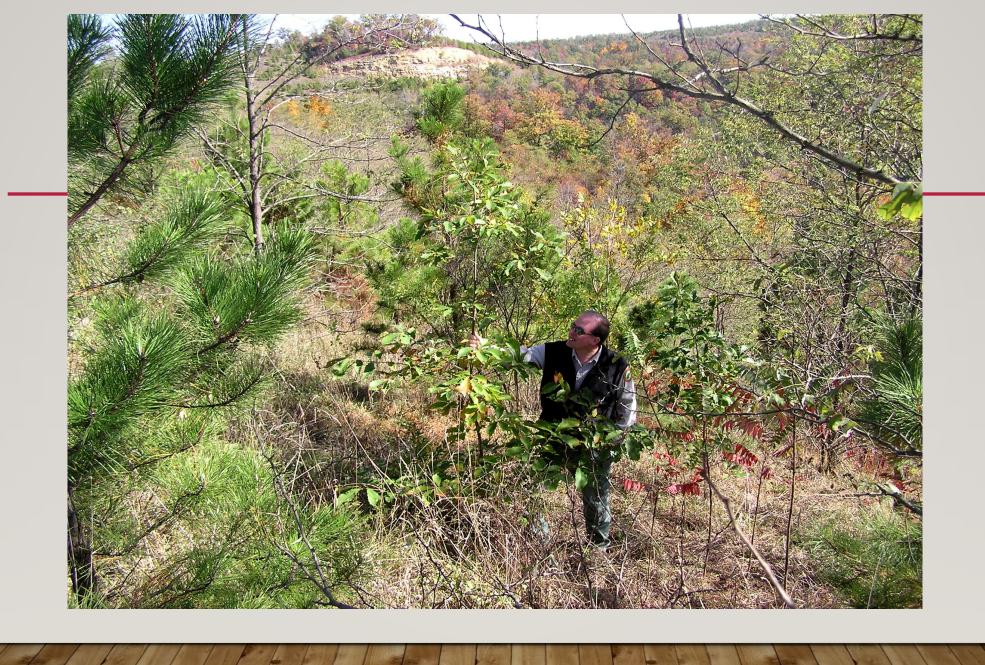
GROWTH MEDIUM:

- 4 feet thick
- As much topsoil as possible
- Some subsoil
- Sandstone
 - Weathered, near surface
 - Unweathered, nutrients
- Organics
- Paste pH 5.0-7.5
- Low soluble salts

MINIMIZE COMPACTION OF GROWTH MEDIUM

- Innovative methods of placement
- End dumping on flatter slopes with strike off
- Minimal passes pushing material downslope
- Push up method
- Ripping of over-compacted slopes









MOSHANNON STATE FOREST

2018-2019

MOSHANNON STATE FOREST

- DCNR was sole property owner
- Approx. 55 total acres that were reclaimed in the early 2000's by DEP BAMR
- Silviculture permit exemption, E&S plan to Elk and Clearfield County
- E&S controls used: Veg Filter Strips, Furrows, Forested Filter Strips, Silt sock, Seeding and Mulching
- Cross ripped in June 2018 with single shank D-8 dozer
- Planted in May 2019 by combination of volunteer and professional planters
- White pine, Aspen, Red Oak, American Chestnut, American Elm along with wildlife shrubs planted
- Funding/support from PEC, DCNR, and DEP used to complete the project
- Species of concern: Golden Winged Warbler, Bats, and various game species









ROUND KNOB BOND FORFEITURE PROJECT

2019

ROUND KNOB BOND FORFEITURE

- Private landowner
- Approx. 36 acres that were regraded by a contractor.
- NPDES permit and controls for the mining activities remained.
- Cross ripped in April 2019 with dual shank D-10 dozer
- Planted in May 2019 by professional planters
- White pine, Aspen, Red Oak, American Chestnut, Sycamore, Black Cherry, Black
 Willow, and Red Spruce along with wildlife shrubs and species planted
- Funding/support from PEC, SRBC, and DEP used to complete the project
- Species of concern: Golden Winged Warbler, Bats, and various game species
- Biosolid application prior to tree planting.













MAY 2021





MAY 2021

PINCHOT STATE FOREST

2017-2018

PINCHOT STATE FOREST- AVONDALE

- DCNR was sole property owner
- E&S plan approved by Luzerne County
 - Required 36" silt sock installed up slope of collection ditch, (approx. \$40K added to the cost of the project)
- Cross ripped single shank Komatsu dozer
- Planted in April 2017 and April 2018 by volunteer planters
- White pine, Aspen, Red Oak, American Chestnut, along with wildlife shrubs planted
- Funding/support from PEC, DCNR, and DEP used to complete the projects
- 11 acres done in 2017 and about 6 acres done in 2018









LAUREL RUN AML PROJECT

2019

LAUREL RUN AML PROJECT

- 2 private landowners
- Approx. 12 acres planted over 3 years
- E&S plan approved and implemented by PA DEP BAMR for the regrading
 - Super Silt fence and brush windrows included
- Ripped on contour only with a triple shank dozer
- Planted in May 2019 by DEP staff and guests, May 2020 w Pros, April 2021 w MCWA and Boy Scout Troop 57
- Maples, Red Oak, American Chestnut, American Elm, Cherry, Crabapple along with other species and wildlife shrubs planted
- Funding/support from GFW, CBF and DEP used to complete the projects









SEPTEMBER 2021







SEPTEMBER 2021

TIME FOR QUESTIONS?

FOR ADDITIONAL INFORMATION:

http://arri.osmre.gov

Eric Oliver 814-342-8126

eoliver@pa.gov