Forestry Reclamation Approach

Public Law 95-87
95th Congress

An Act

Aug. 3, 1977
[H.R. 2]

To provide for the cooperation between the Secretary of the Interior and the States with respect to the regulation of surface coal mining operations, and the acquisition and reclamation of abandoned mines, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Surface Mining Control and Reclamation Act of 1977".

Surface Mining Control and Reclamation Act of 1977.
30 USC 1201 note.

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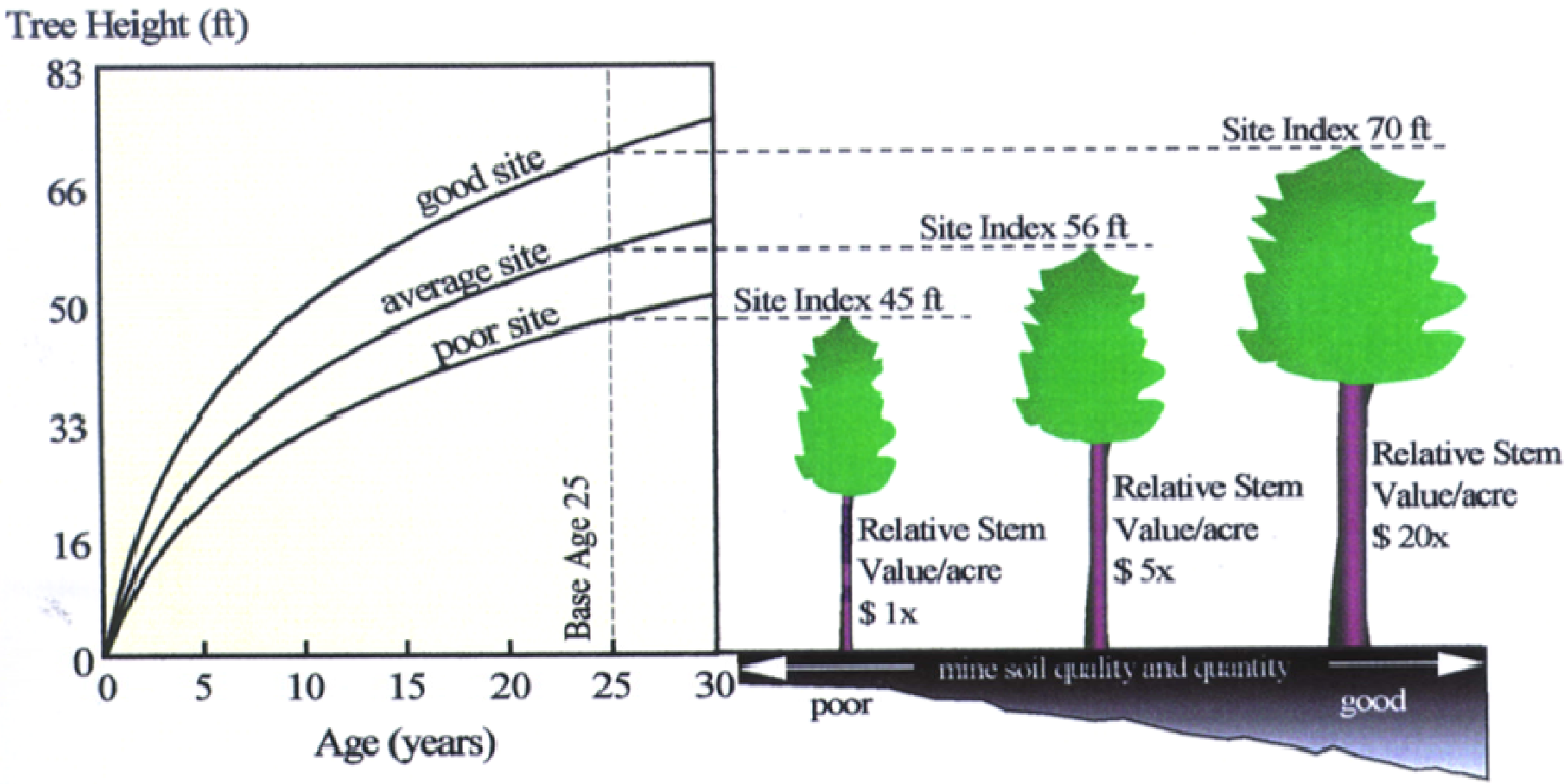


Study conducted by Jim Burger, Virginia Tech


Forestry Reclamation
Agronomic Reclamation
Undisturbed Soils

Forestry Reclamation Approach (FRA)

1. **Select the best tree growth medium**
2. **Replace 4-6’ of tree growth medium using low compaction final grading**
3. **Plant tree-compatible ground cover**
4. **Plant native hardwood trees**
5. **Use proper tree planting techniques**

FRA STEP 1

Select the best tree growth medium

1) **Topsoil and subsoil including organic material**
2) **Brown weathered sandstone**
3) **Gray sandstone/shale**
4) **Shale**

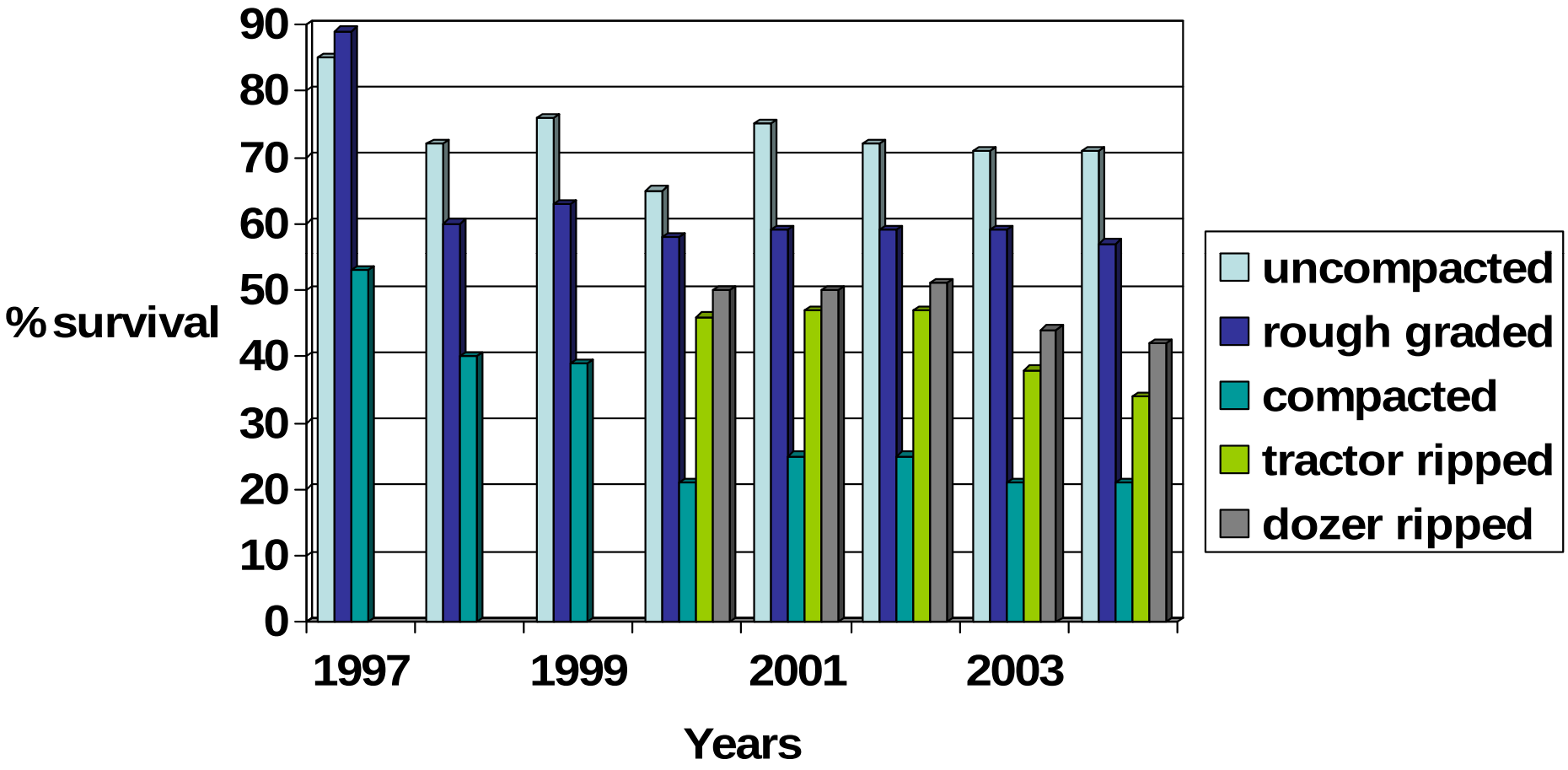
FRA Step 2

Replace 4-6’ of tree growth medium using low compaction final grading

1) **Avoid rubber tire equipment during final grading**

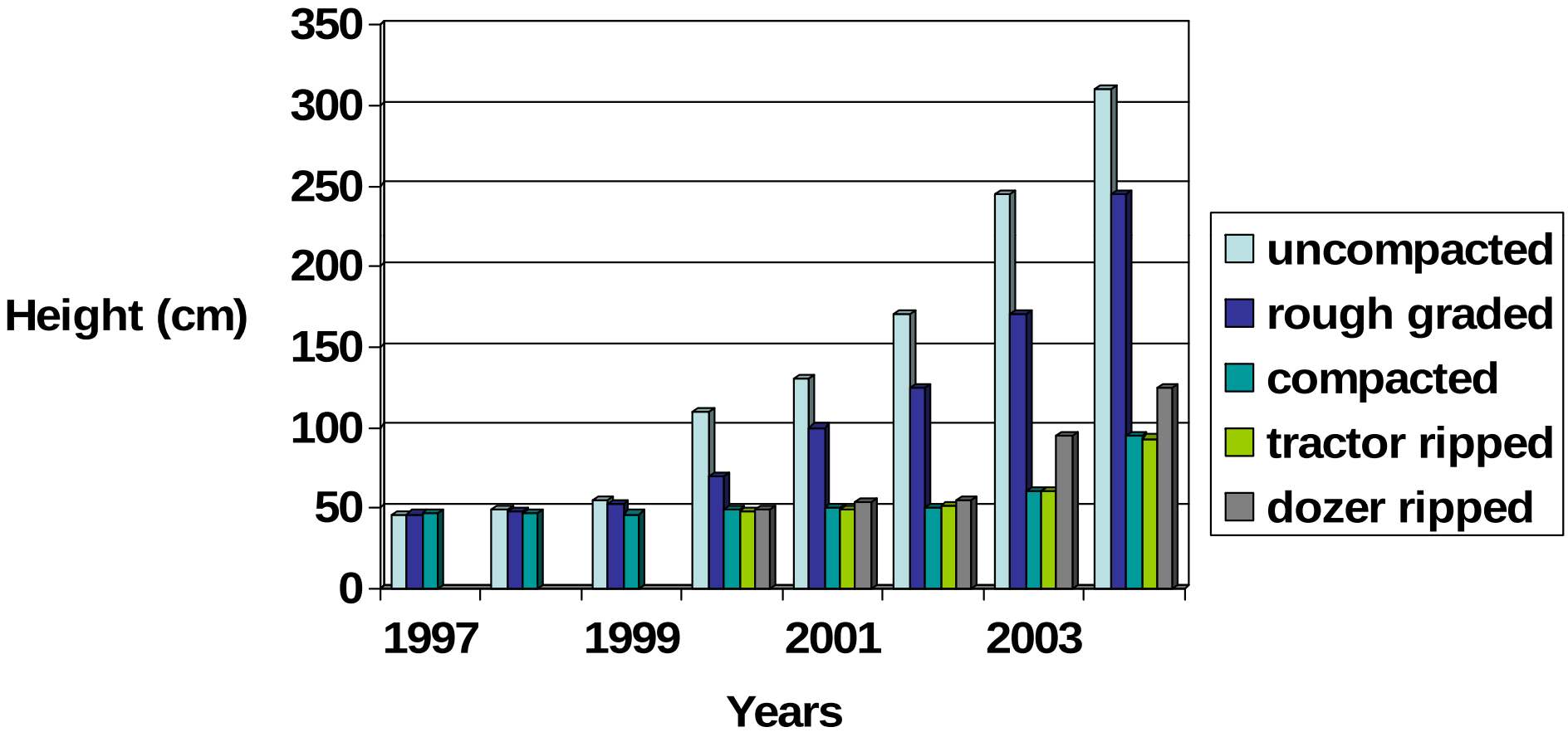
2) **Limit the number of dozer passes during final grading**

Average Tree survival Rate for Different Spoil Conditions
Starfire Mine



Dr. Don Graves, University of Kentucky

Average Tree Height for Different Spoil Conditions
Starfire Mine

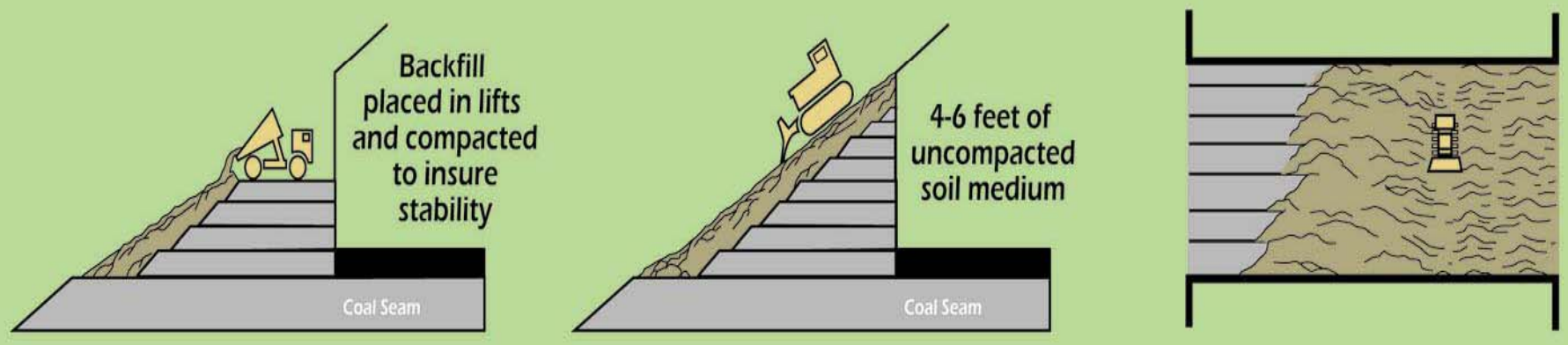


Dr. Don Graves, University of Kentucky


WHITE ASH
UK

DIAGRAM 3. CONTOUR MINING OR OTHER SLOPED AREAS

Recommend no more than two passes with equipment to remove excessively large rocks and shape to final backfill configuration.



ARRI CFoldBroDiag3F.eps

Illustrations not to scale.

DIAGRAM 1. AREA MINING OR MOUNTAINTOP REMOVAL METHODS

ARRI CFoldBroDiag1F.eps

Illustrations not to scale.

FRA Step 3
Plant tree-compatible ground cover

1) Avoid aggressive ground cover such as tall fescue and sericea lespedeza

2) Provide erosion control without controlling tree growth

3) Apply soil amendment rates based on tree requirements

White Oak Reforestation Project

Tree Compatible Ground Cover

Species	Rate (lbs/acre)
Annual Grasses:	
annual ryegrass (spring & fall)	5-15
millet (summer)	10
Perennial Grasses:	
perennial ryegrass	10
orchardgrass (steep slope)	5
timothy	5
Legumes:	
ladino or white clover	3
Fertilizer:	
Nitrogen (as N)	50-75
Phosphorus (as P)	80-100
Lime:	adjust to pH 5.0-6.5

Warm-Season Grasses

- little bluestem
- side oats grama
- eastern gramagrass
- broomsedge bluestem
- Indian grass

❖Seeded with annual grasses, typical rates 8-10 lbs. total NWSG seed/acre

FRA Step 4
Plant native hardwood trees

1) Nurse trees – redbud, dogwood, etc.

2) Crop trees – red oak, white oak, white ash, yellow poplar, maple, american chestnut, etc.

FRA Step 5
Use proper tree planting techniques

1) Keep seedlings cool and roots moist

2) Protect seedlings from freezing and direct sunlight

3) Ensure trees are planted properly under close supervision

White Oak Project – trees 3 years old

White Oak Project – trees 5 years old

Appalachian Regional Reforestation Initiative

- The ARRI Core Team includes members from each OSM Office and each State Regulatory Authority in the region

- The ARRI Science Team includes members from academic institutions in the region

THE APPALACHIAN REGIONAL REFORESTATION INITIATIVE (ARRI)
FOREST RECLAMATION ADVISORY

Forest Reclamation Advisory No. 7

PLANTING HARDWOOD TREE SEEDLINGS ON RECLAIMED MINE LAND IN APPALACHIA

V. Davis, J. Franklin, C. Zipper, P. Angel

Introduction

The Forestry Reclamation Approach (FRA) is a method of reclaiming surface coal mines to [illegible]-mining land[illegible] Forest [illegible]n Advisory [illegible]. "D[illegible]op[illegible]ee [illegible]chniques[illegible]tep 5 of [illegible]FR[illegible]hen [illegible]the other[illegible]A steps, p[illegible]er tr[illegible] [illegible]an help t[illegible]sure re[illegible]sta[illegible]n succ[illegible] [illegible]op[illegible]are[illegible]d pla[illegible]e see[illegible] essential to any reforestation effort. Appalachian coal mines reclaimed using the FRA will often be rough, rocky, and on steep terrain. Thus, hand planting is the usual method for planting hardwood tree seedlings. Professional tree planting companies with experience in hand-planting reclaimed mines can provide excellent results. Most of these companies offer a complete service that includes obtaining, handling and planting hardwood tree seedlings. State forestry departments and consulting foresters can also provide valuable assistance.

Any mined-land tree planting process entails several steps, each of which must be executed competently to assure a successful reforestation project. They are:

- Selecting and Ordering Seedlings
- Site Preparation
- Proper Handling and Storage of Seedlings
- Preparing Seedlings for Planting
- Planting Tree Seedlings
- Post-Planting Care and Assessment

Selecting and Ordering Seedlings

Nurseries produce seedlings either as bare-root or containerized stock. Bare-root seedlings grown in nursery beds are relatively inexpensive when purchased in bulk. Less common species are produced in smaller quantities, usually in containers, and are delivered in soil-filled containers or with a plug of soil surrounding the roots. Most hardwood seedlings for reforestation are purchased as bare-root stock grown in a nursery for one year and are referred to as 1-0 seedlings. Bare-root hardwood 1-0 seedlings should have a vigorous root system.

Mine operators and reclamation practitioners are [illegible]cou[illegible]to[illegible]efo[illegible]n in the [illegible]opr[illegible]er[illegible]durin[illegible]e s[illegible]her and calculate [illegible]e[illegible]er [illegible]r[illegible]ed[illegible]oming [illegible]in[illegible]Advar[illegible]placement of tree [illegible]e[illegible]la[illegible]mn[illegible]r fal[illegible]ur to six months [illegible]ho[illegible]the[illegible]nned[illegible]nti[illegible]e[illegible]e the desired number and species of tree seedlings. If large numbers of seedlings or uncommon species are needed, coordination with the nursery a year or more in advance may be required.

Photo 1. Many state and privately owned nurseries have increased production in response to recent demand for quality hardwood seedlings.

Use of seedlings grown from seed collected from the same geographic region where they will be planted will increase the long-term reforestation success. Seed origin should be as close in latitude as possible to the planting site and within the same USDA Hardiness Zone (map available from http://www.usna.usda.gov/Hardzone/), while distance in an east-west direction is less important. The nursery manager should be able to provide information concerning seed origin.

APPALACHIAN REGIONAL REFORESTATION INITIATIVE

2010 Mined Land Reforestation Conference

June 7-10 Pittsburgh, PA

"Applying the Forestry Reclamation Approach in Modern Mining Operations"

To be held in conjunction with the annual conferences of the American Society of Mining and Reclamation, the Western Pennsylvania Coalition for Abandoned Mine Reclamation, and Stream Restoration, Inc., June 5–10, 2010.

Registration

You can register on-line by selecting the registration link at the ARRI website located at:
http://arri.osmre.gov/
or by directly accessing the conference website at:
http://www.pghminingreclamationconf.com

The registration fee for the full conference, June 5-10, is $270 until May 10 ($325 after May 10), which includes all conference materials, breakfasts and lunches for Monday, Tuesday, and Wednesday, and refreshment breaks. Alternatively, you can register for a single day's activities for $100 per day until May 10 ($125 per day after May 10). Conference attendees are invited to attend the ARRI field trip to Cadiz, OH, on Thursday, June 10. There is no additional charge for the field trip, but the tour is limited to the first 200 people. Lunch and refreshments on the field trip will be provided by Oxford Mining Co. Please mark on the registration form your anticipated participation.

Please see the conference website for additional information including deadlines for registering, late registration fees, fees for students and non-profit organizations, exhibitor fees, and details on technical and social tours taking place prior to, and after, the conference.

Tennessee mine site reforested in 1959

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