



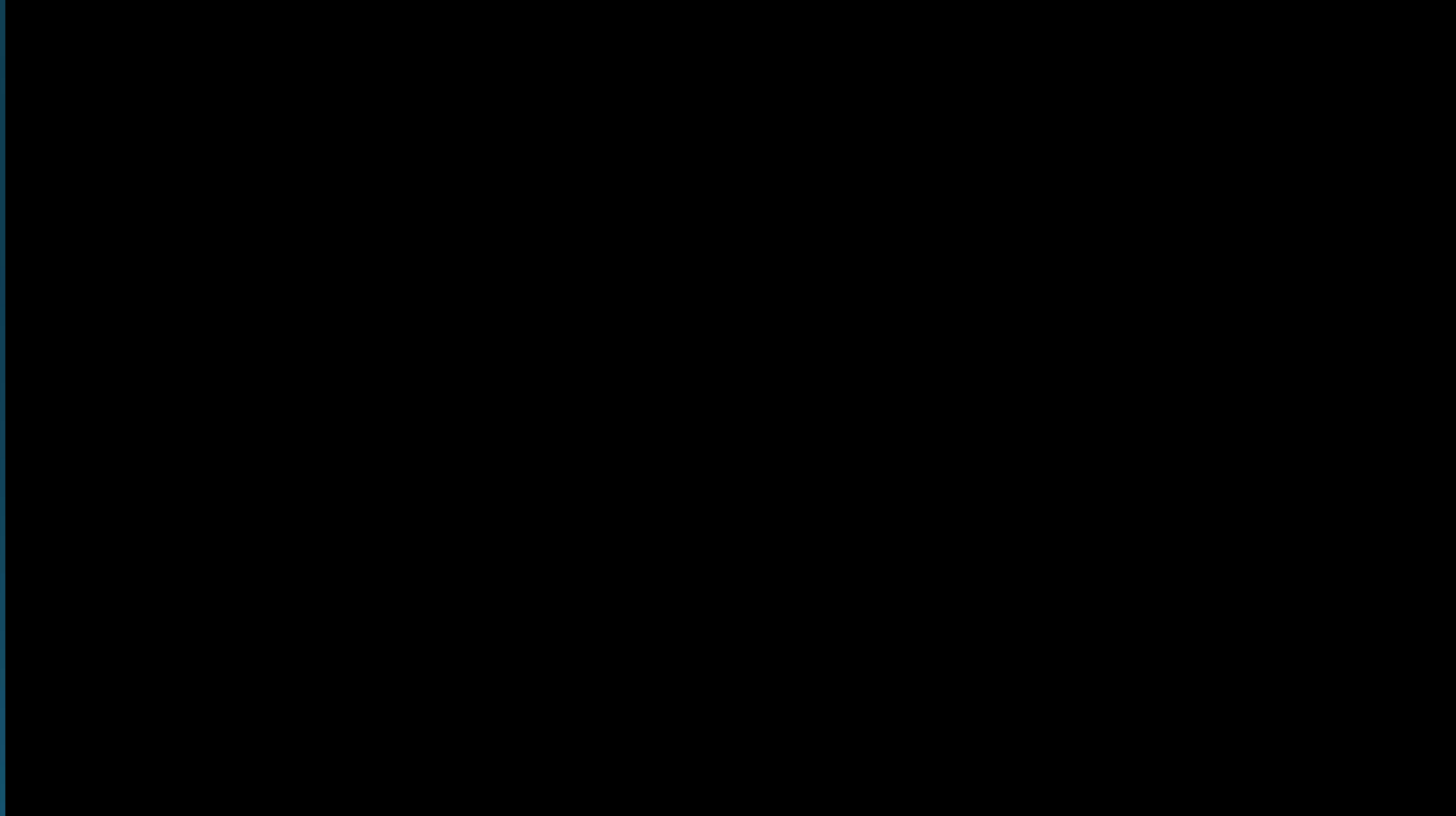
The Monongahela National Forest
Gauley Ranger District
Dyer, West Virginia

Presented by:

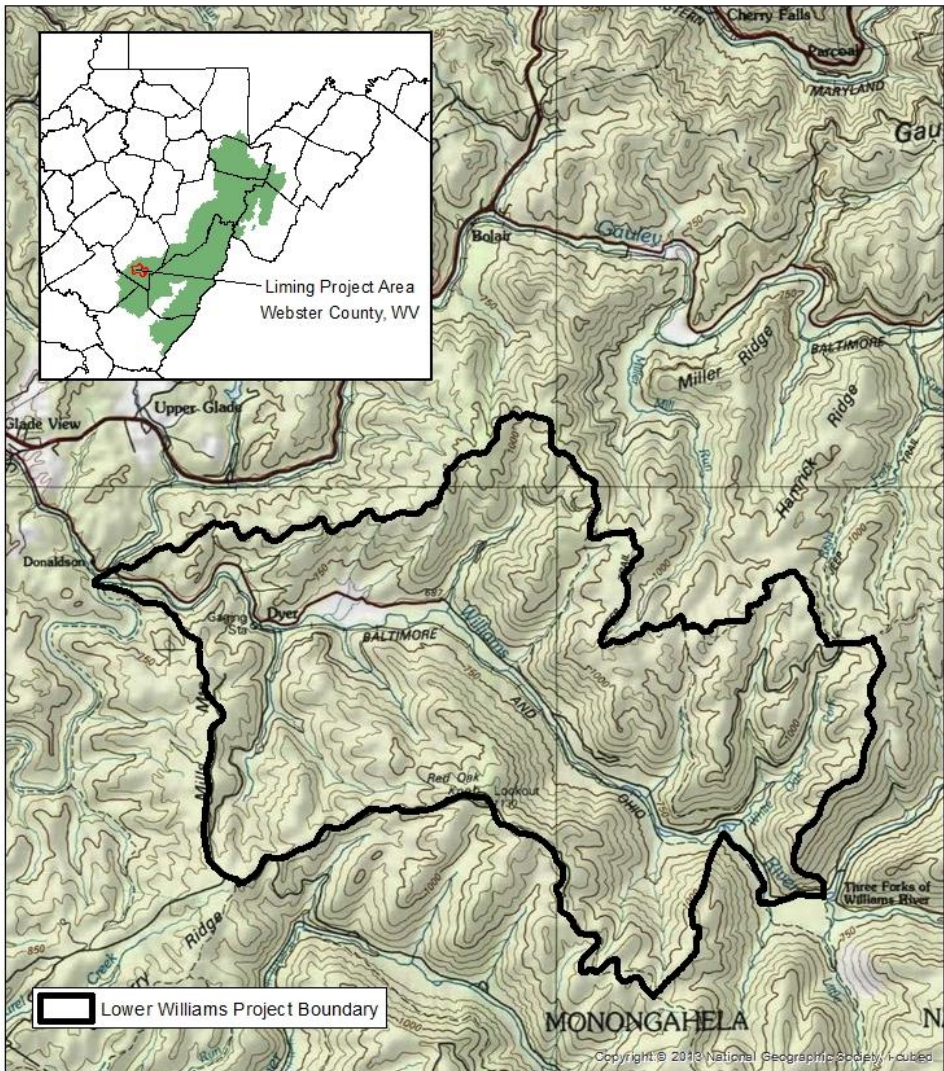
Stephanie Connolly, Forest Soil Scientist and Project Manager

2018 Lower Williams Terrestrial Liming Project
Logistics and Details

Here it is! Unit application



Lower Williams River Watershed



Proposed Liming Lower Williams Project Area Webster County, WV Monongahela National Forest

Original data was compiled from multiple source data and may not meet the U.S. National Mapping Accuracy Standard of the Office of Management and Budget. This map has no warranties as to its contents or accuracy.

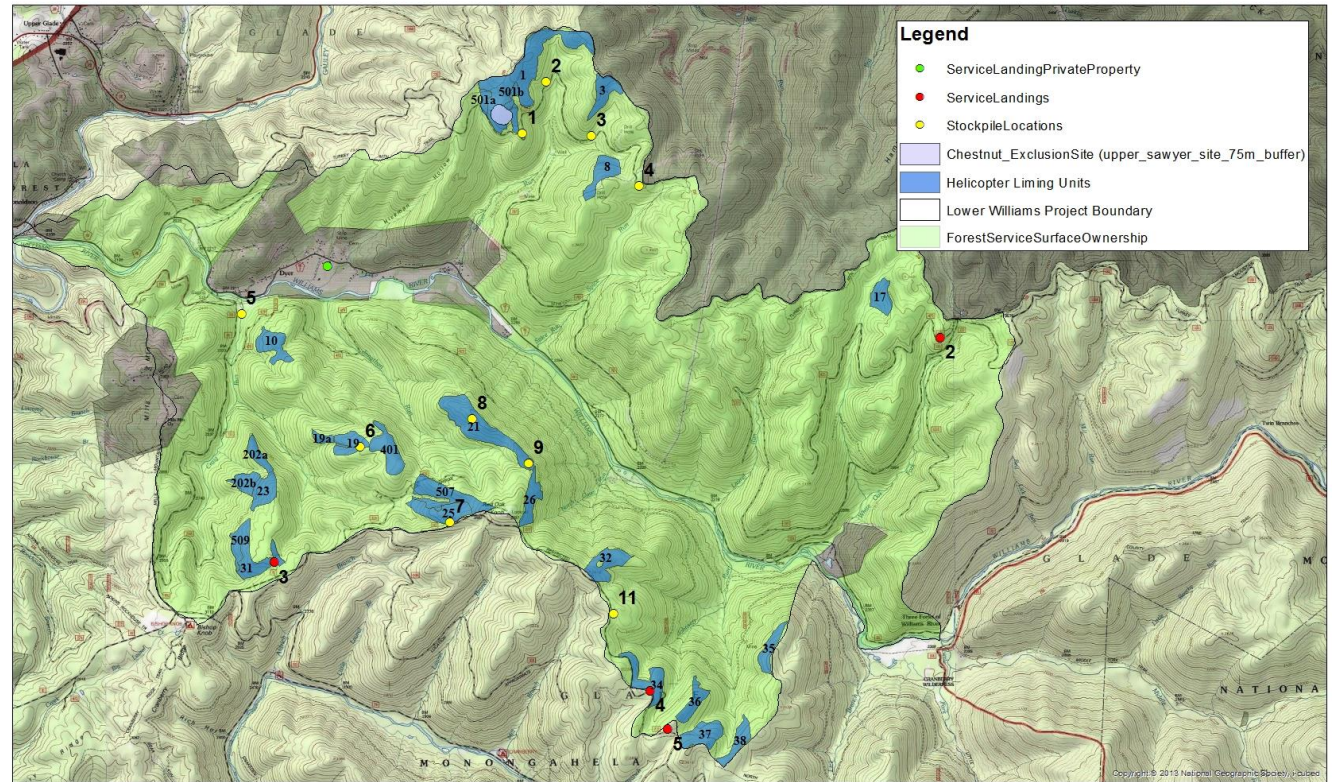
0 0.5 1 2 Miles



Quadrangles:
Webster Springs,
Webster Springs SW,
Camden on Gauley,
Cowen



MNF GIS
UTM, Zone 17
NAD 83
SMS
08/30/2017



Lower Williams Liming Project Area Monongahela National Forest

Original data was compiled from multiple source data and may not meet the U.S. National Mapping Accuracy Standard of the Office of Management and Budget. This map has no warranties as to its contents or accuracy.

0 0.5 1 2 Miles



MNF GIS
UTM, Zone 17
NAD 83
SMS
11/30/2017



Quadrangles:
Webster Springs,
Webster Springs SW,
Camden on Gauley,
Cowen

Brief History

- **2000** Forest plan for the beginning of Forest Land Management Plan Revision
- **2001** Public pursues the Forest to take on acid deposition as a driving issue
- **2006** MNF Long Range Management Plan published and provides new direction for Forest to assess and manage for the effects of acid deposition
- **2007** Forest signs Decision for Lower Williams Vegetation Management EIS
- **2011** Forest signs Decision for Lower Williams Terrestrial Liming EA
- **2012 – 2014** Soil and Foliar Chemistry Background Monitoring
- **2015** Forest provides expert testimony for the Department of Justice in Clean Air Act case against Mead Wesvaco
- **2016** DOJ settles with Mead Wesvaco
- **August, 2017** Forest pursues the implementation of the Lower Williams Terrestrial Liming project by announcing pre-bid meeting for contract to potential contractors
- **Fall 2017** Contract Awarded (FY18)
- **January, 2018 – March, 2018** Project Implementation
- **Late March, 2018** First stream chemistry post application
- **Summer 2018** West Virginia University takes over monitoring of project
- **Spring 2019** Soil chemistry monitoring YEAR 1

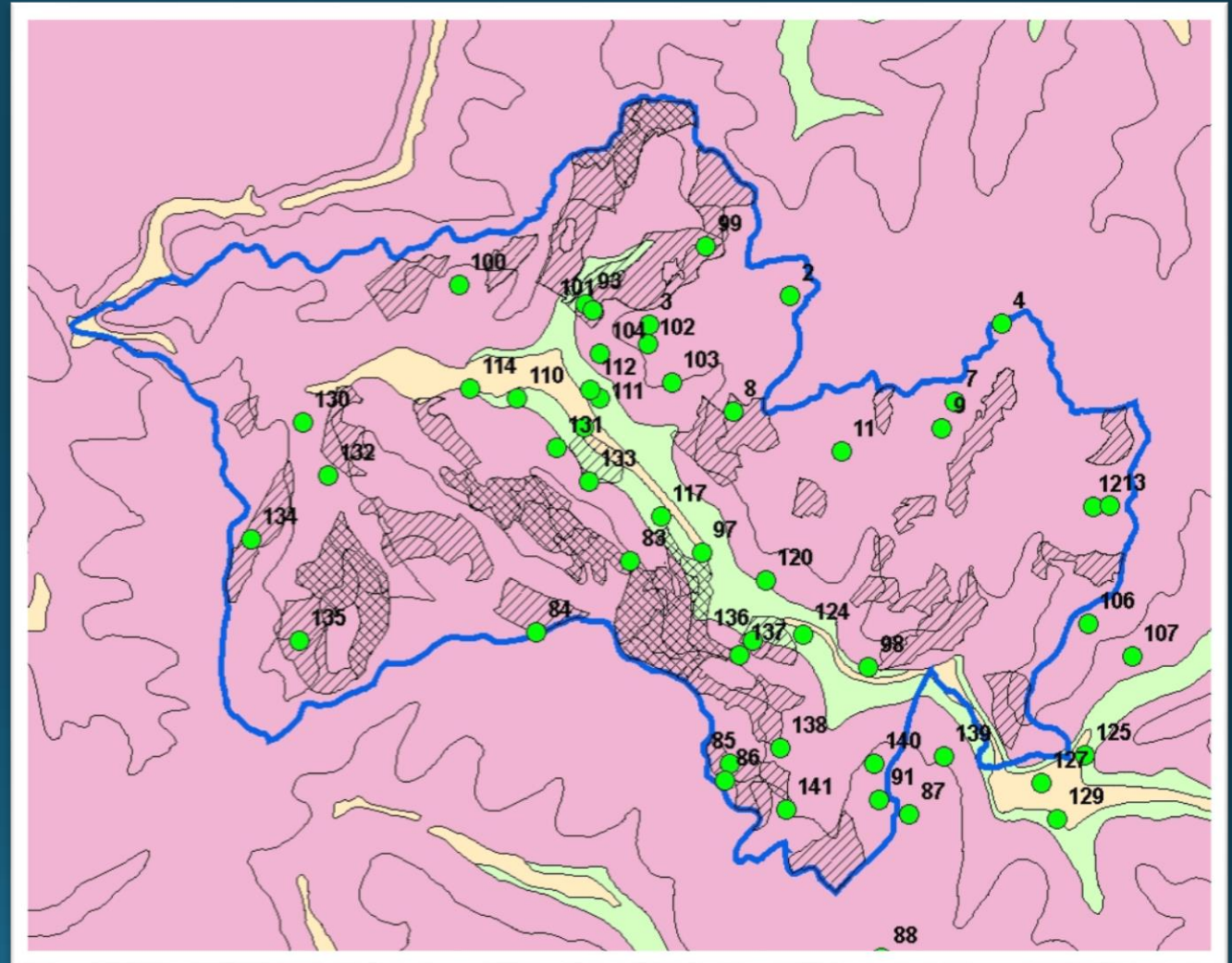
Basic Soil Water and Air Resource Conditions for Lower Williams River Watershed

- Allegheny Northern Hardwood Forest
 - Mixed White Oak, Northern Red Oak, Red Maple, Sugar Maple, Black Cherry, Basswood, Yellow Poplar, Frasier Magnolia, and Hemlock
- Geologic Formations
 - Pottsville Sandstone Geology – Ridges and sideslopes
 - Mauch Chunk – Basin terraces and toeslopes of watershed
 - Quaternary Alluvial Deposits – Williams River floodplain
- Dominant Soil Types
 - Inceptisols
 - Ultisols
- Air Quality NO_x and SO_x trends

Monitoring

- Soil chemistry monitoring started in 2005
- WVU Study - Solving for γ : digital soil mapping using **statistical models and improved models of land surface geometry** by *Roecker, Stephen M., M.S., West Virginia University, 2013, 108; 1524652*
- Lower Williams Vegetation Management Project
- Additional site specific monitoring for Lower Williams Liming Project
- Two distinct geologies
 - Pottsville – Acid Sandstones and shales
 - Mauch Chunk – Slightly Acid to Slightly Alkaline Sandstones and Shales
- Water Chemistry Monitoring 2001

Lower Williams Watershed Soil Chemistry Monitoring Pits



Pink = Pottsville Formation; Green = Mauch Chunk Formation; Yellow = Alluvial Deposits

The Project

- Apply 3 to 5 tons/acre of limestone sand during leaf off to 777 acres of northern hardwood forest in the Lower Williams River Project Area.
- Purpose of the project is to improve soil quality and add base cations back to selected stands as evaluated and decided upon in the LW Terrestrial Liming EA.
 - https://www.fs.usda.gov/nfs/11558/www/nepa/42897_FSPLT2_054175.pdf
- Units have either been already harvested historically in the last 30 years, recently in the last 4 years, or are scheduled to be harvested within the next two years.

Project Funding

- Forest Funding received through a US Court Settlement with Mead Westvaco
 - 1.6 million dollars awarded to federal land managers
 - Monongahela National Forest and Shenandoah National Park each received \$800K
 - Funding became available for spending in 2017
 - The Lower Williams Terrestrial Liming project is an approved USFS Region 9 Stewardship Project
 - \$150,000 was made available for project implementation through retained receipts from the sale of commercial timber
 - The Monongahela NF provided salary dollars for soils staff oversight and contracting administration. These dollars are not accounted for in overall costs.

Project Cost

- USFS Helicopter End Product Contract = \$643,375.00
- Limestone Sand and #3 Gravel (for road repair) = \$90,000
- Typar and black plastic = \$15,000
- Cost of construction and maintenance crew = \$40,000
 - Limestone sand staging, keeping roads open, and restoration
- Monitoring Agreement with West Virginia University = \$79,000
- Filming crew = \$2,500
- Monitoring equipment = \$1,125

Total Estimated Cost of Project for 777 acres of soil quality improvement = \$871,000

The Limestone Sand

Appalachian Aggregates Mill Point, WV Haul distance to project location 57 miles



ASHHTO #9
3-5 tons per acre

Limestone Stock Piles

- Strategic locations throughout project area
- Typar separates lime from landing
- Black plastic is used to cover limestone sand to protect it from precipitation



Delivered in Custom Made Buckets

Buckets carried approximately 9,000 pounds per lift.

2 buckets worked in tandem

Suspended 150 feet from Vertol

The Vertol

- Lift capacity – 1,400 lbs
- 2 pilots
- 1 service landing
- 1 fueling landing
- Ground team to monitor application and turns
- Team of mechanics



Lift Off...Operating Conditions

- Weather and ceiling limitations
- Stockpiles preloaded for weekend operations
- 2 operators on the deck to maneuver buckets and 1 steer skid operator to load buckets
- Turn times ranged from 3 minutes to 5 minutes
- Limestone sand delivery ranged from 90 seconds to 2 minutes
- Average lift 9, 000-10, 000 pounds



Implementation Monitoring



Laid out 10 pans in a known area of application with in unit – random spacing

Most important for pans to be stable and collect the dropping sands



Collected Pans



Weighing Sands

Collected pans combined the mass and did the area calculation

Let's watch it again...

