

CONTINENTAL DIVIDE 2024





GREEN FORESTS WORK'S MISSION

Green Forests Work's (GFW) mission is to re-establish healthy and productive forests on formerly mined lands in Appalachia.

VISION

GFW's vision is to create a renewable and sustainable multi-use resource that will provide economic opportunities while enhancing the local and global environment by converting reclaimed, non-native grasslands and scrub lands into healthy, productive forestland.

Our reforestation projects provide jobs for equipment operators, nursery workers, and tree planters, and improve the environment by eradicating exotic species and restoring ecosystem services. With the help of our partners and volunteers, this vision is quickly becoming a reality.

Since 2009, we have planted nearly seven million trees on more than 12,000 acres.

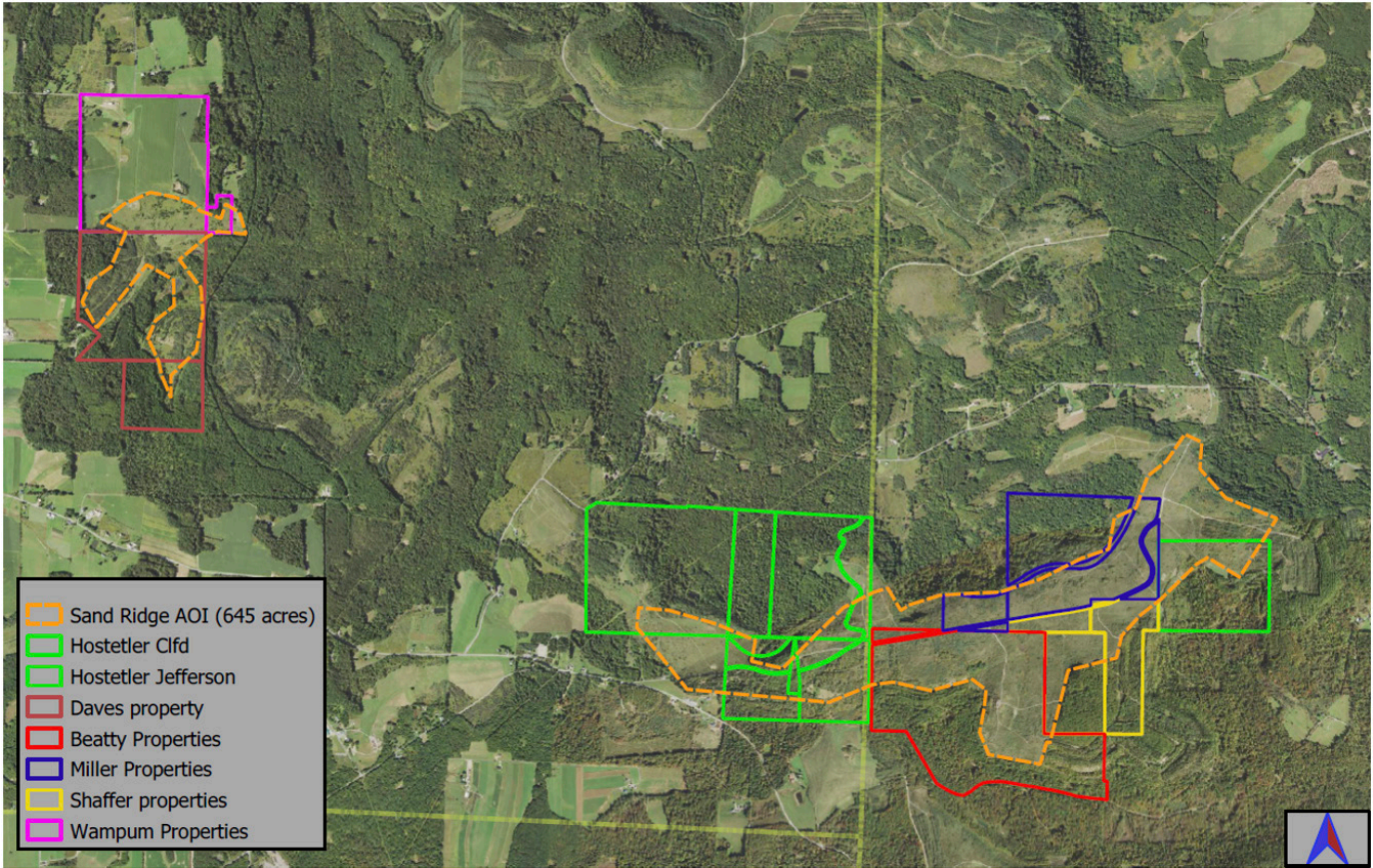
ACKNOWLEDGEMENTS

This report highlights the Continental Divide project undertaken in 2024 in Pennsylvania. We at Green Forests Work are so grateful to all our donors for supporting this important work. The financial and in-kind support from the PA Game Commission, National Fish and Wildlife Foundation, The Nature Conservancy, Chesapeake Bay Foundation, private donors, and AM Logging has been instrumental in allowing GFW and our partners to take on additional projects and plant a greater number of trees on more acres, resulting in larger restoration outcomes.

We could not have carried out this work without our numerous partners and supporters. We would especially like to thank our newest employee Eric Oliver (formerly PA Department of Environmental Protection) for facilitating this year's large mined land restoration project on private lands as well as 5 volunteer tree planting events; The Nature Conservancy for funding and red spruce donation to our mined land project; Dave Saville of Appalachian Forest Restoration LLC for growing and delivering over 96,000 red spruce seedlings for our PA projects; Chesapeake Bay Foundation for funding; One Tree Planted for supporting the large mined land project; the Appalachian Regional Reforestation Initiative; the American Chestnut Foundation and the Arbor Day Foundation for providing American chestnut seedlings; Pennsylvania Environmental Council, Richard King Mellon Foundation, and GFW donors and supporters who provided technical and financial assistance that made these projects possible; and all the volunteers that gave their time and energy planting trees in contribution to this important work. We would also like to thank Napieralski Forestry Enterprise and their professional tree planting crew.



Eric Oliver conducts a field trip of the site to students from Indiana Univeristy of PA who are in Dr. Michael Tyree's Forest Restoration class.



Continental Divide Project area 2024 and 2025 total project work areas as planned



ECOLOGICAL BENEFITS

MINED LAND RESTORATION PROJECTS

The reforestation of surface mined lands provides innumerable benefits including control of unwanted vegetation, creation of young forest habitat in the short-term, and the eventual creation of mature forest habitat and reduction of forest fragmentation in the long-term. With wildlife always in mind, our projects increase plant community diversity, provide multi-seasonal nectar sources for pollinators, and improve wildlife habitat, often for targeted sensitive species.

Two of our planting contracts and 5 volunteer tree planting events were held on mined lands that required site decompaction. Ripping the compacted land immediately creates a rough ground surface and exposes large rocks, creating microsites that will provide cover for insects, small mammals, reptiles, and amphibians. The bare soil is quickly colonized by many native species of wildflowers which provide nectar and pollen for pollinating insects. In the short-term, the young forest that is created will benefit American Woodcock, ruffed grouse, wild turkey, Golden-winged



Site preparation is conducted using a Komatsu 155 with dual ripping shanks.

Warblers, and other species that rely upon young forest habitat. As the planted seedlings grow, the project areas become patches of young forest habitat that many songbirds, game birds, reptiles, and large and small mammals rely on for foraging and breeding. As the forests mature over time and biodiversity increases through the process of succession, different



Aerial view of the site in July 2024 showing the native forbs and grasses that have returned after removal of invasives and site preparation. Also note the invasive shrubs remaining in the unplanted area.

species will benefit, including those that prefer larger tracts of unbroken forest. Canopy cover of stream waters will maintain cooler waters needed for trout fisheries.

Once the forest matures, exfoliating bark from spruce, pines, oaks, cherry, and snags will provide roost sites suitable for several bat species including the endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), which has been recently listed as endangered. Mature forest will benefit numerous large mammals, including bobcats and black bears. Acorns from mature oaks will feed white-tailed deer, wild turkey, ruffed grouse, and a variety of small mammals that reside in the area.

One long-term goal of our projects is to reduce forest fragmentation and increase the extent of contiguous forest to benefit Neotropical songbirds such as Cerulean warblers, Scarlet tanagers, Ovenbirds, and other forest interior dependent species. Cerulean warbler populations have declined by 3.02% per year from 1966-2012 based on estimates from the North American Breeding Bird Survey. Cerulean warbler is considered a Bird of Conservation Concern by the US Fish and Wildlife Service and is a Species of Greatest Conservation Need in the Wildlife Action Plans of 22 states. Reforestation of surface mined lands is a long-term approach to benefit Cerulean warbler and other forest interior dependent bird populations by increasing the extent of contiguous



Prior to work beginning, the site was thick with autumn olive, honeysuckle and Japanese knotweed.

Table 1. Trees Planted in Pennsylvania

Year	Number of Trees	Area
2020	77,450	28.5 hectares (71.3 acres)
2021	210,980	157.6 hectares (394 acres)
2022	344,167	335.1 hectares (829.5 acres)
2023	353,200	425.5 hectares (1,051 acres)
2024	359,755	344 hectares (850 acres)
TOTAL	1,345,552	1,291 hectares (3,196 acres)

tracts of forest. Surface mine reforestation benefits numerous other terrestrial and aquatic wildlife populations, potentially including other listed species and species of concern.

GFW mined land reforestation projects also have the potential to immediately improve downstream water quality. Loosening the compacted soils increases infiltration rates, buffering storm events, decreasing runoff, and potentially mitigating flash flooding. As the trees grow, reforestation of upland sites influences water quality and quantity by sheltering ephemeral streams and buffering water release from sites. Water quantity contributed to downstream waters is reduced through increased evapotranspiration as the trees mature, which can reduce loading of sediment, metals, and salts (when present), further improving water chemistry. Certain trees also have the ability to accumulate metals in their tissues, which may reduce inputs to the watershed over time. The thermal protection and reduced sedimentation provided by forest cover reduces heating of downstream waters which increases water's capacity to hold dissolved oxygen, benefiting aquatic life.

Ecosystem services provided by forests include improved water quality, improved air quality through increased capture of airborne particulates, climate change mitigation through increased carbon accumulation, creation of soils that cycle nutrients, and improved wildlife habitat. Furthermore, people living near green spaces have better sleep and lower incidence of depression and anxiety, which improves mental health and consequently, physical health.

RED SPRUCE RESTORATION

On this project, 13,600 red spruce were in the species mix, which complements the efforts of GFW, ARRI, and the Central Appalachian Spruce Restoration Initiative to restore a corridor of red spruce influenced forests extending from West Virginia into Pennsylvania. This work benefits imperiled wildlife such as the Northern Flying Squirrel, which requires red spruce forests for foraging and shelter. Conifers provide year-round thermal protection of surface waters and benefit additional species, such as Pine Warblers.

COMMUNITY BENEFITS

GFW's projects provide employment for equipment operators, seed collectors, nursery workers, and tree planters. Since many tree planting crews consist of migrant workers, these projects stimulate local economies by bringing work into the region, benefitting retail, transportation, hospitality, service, and other secondary industries. Some of our contracted large equipment operators were formerly employed by mining companies, and now their skills are being utilized for restoration of mined lands. The healthy and productive native forests that are restored will provide sustainable economic development and opportunities for entrepreneurship through future management actions, recreation, and harvesting of timber and non-timber forest products. The vast majority of our Pennsylvania projects are located on land that is open to the public, so visitors will benefit from improved wildlife habitat when hunting, fishing, hiking, bird watching, and pursuing other recreation opportunities.



Planters from Napieralski Forestry preparing to plant the trees.



Left: Aerial view taken in July 2024. Right: Planters dip seedling roots in a mixture of peat moss and water crystals to keep them moist during the planting process.

PLANTING LOCATION

Jefferson (2025) and Clearfield Counties (2024 and 2025), Pennsylvania

GPS COORDINATES

N 40°55'7.052", W 78°47'20.903"

MOWING & INVASIVE CONTROL DATES

10/9/2024 - 11/15/2024

RIPPING DATES

01/31/2024 - 03/01/2024

PLANTING DATES

4/5/2024 - 4/13/2024

TREES PLANTED

132,310

ACRES REFORESTED

137

SPECIES PLANTED

Red Spruce, White Spruce, White Pine, Balsam Fir, Virginia Pine, Northern Red Oak, White Oak, Black Cherry, Chestnut Oak, Tulip Poplar, Quaking Aspen, Big Tooth Aspen, Black Locust, Sugar Maple, American Beech, Red Bud, Sycamore, Persimmon, American Crabapple, Silky Dogwood, Black Chokeberry, Am. Hazelnut, Black Gum, Wild Plum, Am. Chestnut

PROJECT DETAILS

This restoration project was given its name because it straddles two watersheds — the Chesapeake Bay Watershed and the Ohio River watershed. The 300 mined acres are owned by several landowners and the project will be completed in two phases: phase one 137 acres in 2024 and phase two 100-150 acres in 2025. The site was previously overgrown with autumn olive, invasive honeysuckle, and Japanese knotweed. AM Logging of Spring Mills, PA, and Smerkar Services from Shipperville, PA removed the invasive species and treated the acres planned to be reforested in 2024 with herbicide. Fremer Reclamation, Inc. of Brockway, PA ripped the site using a Komatsu 155 dozer with double-ripping shanks. Napieralski Forestry Services planted 132,310 seedlings in early April, with 24 native tree species. Funding for this project was provided by The National Fish and Wildlife Foundation, The Nature Conservancy, One Tree Planted, and GFW.

Once the planting is complete, one of the landowners wishes to enter their property into a permanent conservation easement to preserve the crucial wildlife habitat that exists and is being restored. This easement will conserve nearly 300 acres.

The landowners are environmental stewards and have been involved in project planning from the very beginning, from surveying the land, to species selection, to being present while the planting contractors planted the trees. One of the two landowners owns the company AM Logging and did most of the site preparation with his own equipment and time. Some of the work that AM Logging did went toward a match for funding this project.



Aerial view taken in July 2024.

The two landowners of the 2024 phase share their perspectives:

“My family purchased this land 20 years ago for its recreational value. We sat by and felt nearly helpless as we watched our losing battle with the invasive plants. Enter Green Forests Work, and with our personal contributions, we see what may have taken a century be reduced to a few decades. That is, returning our mined lands into a productive forest. A forest that provides wildlife habitat, cleaner air and water, and one that will mature to allow harvested products for the enjoyment of future generations.”

**Wes Miller, Land Owner
& owner of AM Logging**

“I’m filled with gratitude for the work of Eric Oliver and Tom Clark in reaching out to neighboring landowners and expanding the scope of this project, now at six times the acreage that would have included my land alone. I’m so appreciative of their hard work, and of everyone involved, in developing a plan that provides for both the needs of the landowners and for the stewardship of the land. This spring I had the privilege of seeing the trees being planted. I stood there watching, and thinking, “I’ve been waiting fifty years for this,” my heart overflowing with joy. I loved meeting the planting crew and Nato, their leader, and hearing him speak about their dedication to reforestation and the satisfaction it has brought to their lives. Another sense of connection was formed. I’m in awe. As an environmentalist, I realize that this project will help to improve water quality from the Gulf of Mexico to the Chesapeake Bay, since the divide between the Ohio Basin and Chesapeake watersheds crosses directly through the property.

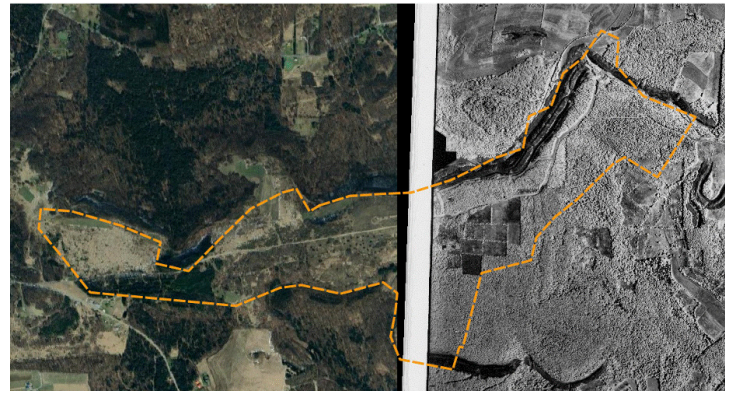
But the best part of all of this project is the impact it’s had on my son. Throughout the project he’s spoken about his growing enjoyment and appreciation for the woods, eager for upcoming visits and making comments like “I wonder what interesting things about nature we will learn from Eric today!” I asked him what he would like me to say in this statement, and he said, “I’m just feeling so grateful. I hope in the future it will be a great habitat for many critters, not just the birds and the animals but the bees and butterflies and other insects too.” This project is hope for the future. Thank you.”

Vivienne Shaffer, Landowner

HISTORICAL IMAGERY



1939 NHAIP imagery showing the project site prior to any mining activity.



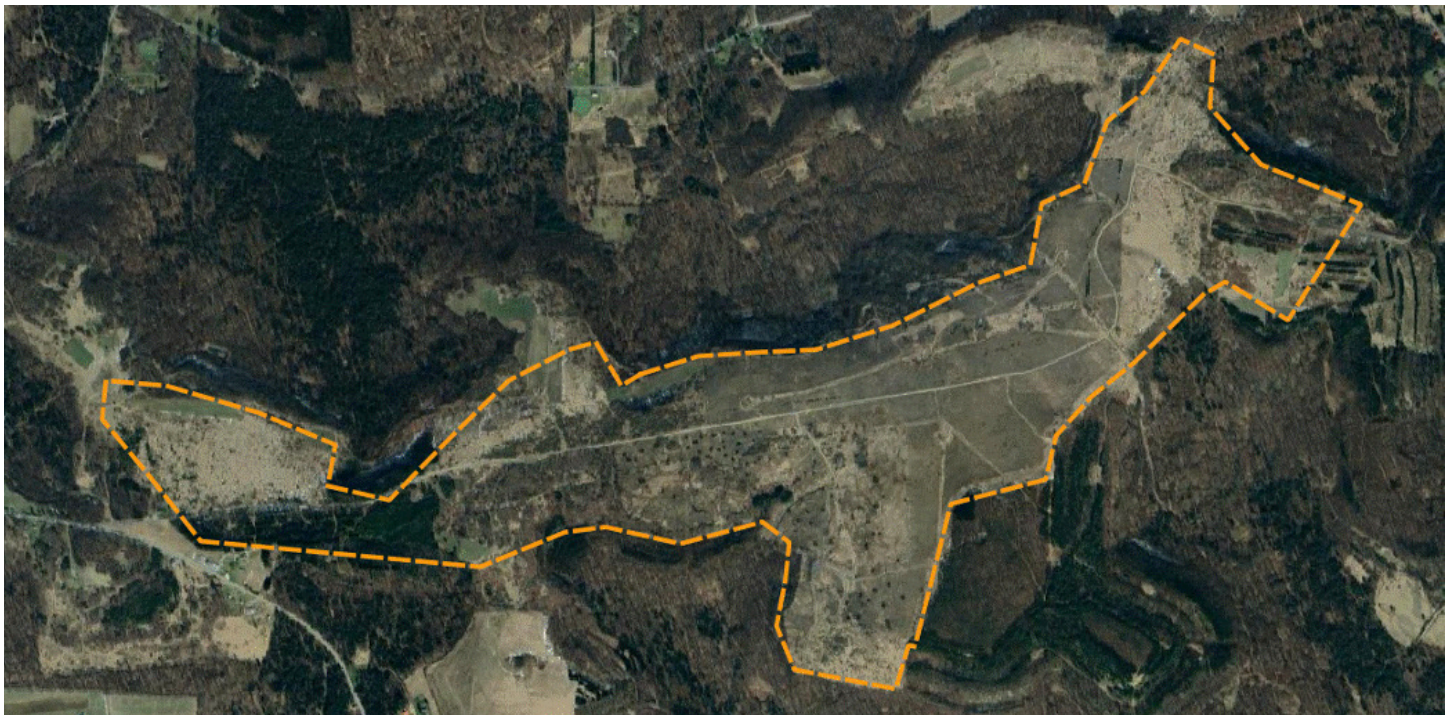
1951 NHAIP imagery showing surface mine activity starting on the northern portion of the project site.



1961 imagery showing mining extents.



1981 imagery with mining at its largest extent.



2024 imagery just after site preparation was completed.

PARTNERS

National Fish and Wildlife Foundation
The Nature Conservancy
Appalachian Regional Reforestation Initiative
Central Appalachian Spruce Restoration Initiative
Dr. Richard and Catherine Rudolph
One Tree Planted
A.M. Logging
American Chestnut Foundation
Pennsylvania Environmental Council
Richard King Mellon Foundation
Arbor Day Foundation
Chesapeake Bay Foundation Keystone
10 Million Trees Program



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