



2025 ANNUAL REPORT

Restoring healthy and productive forests
on formerly mined lands in Appalachia and beyond.

greenforestswork.org



GREEN FORESTS WORK

OUR MISSION

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

OUR 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 scrublands into native 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 over 7.5 million trees on nearly 15,000 acres.

OUR APPROACH

To mitigate the landscape impacts of conventional mine reclamation, various combinations of site preparation are used. The first step in reforestation is to control the established, unwanted vegetation that would out-compete or severely impact native tree survival and growth. Depending on the length of time since reclamation and vegetation present, different vegetative control techniques may be required. On some mined lands, many native species have established, and no treatment is necessary. On others, aggressive grasses and legumes may need to be treated with herbicides through a broadcast application of a non-selective herbicide. When much time has elapsed and large patches of invasive shrubs or exotic trees have established, removing the vegetation and seedbank entirely may be required. This is often accomplished by "scraping" off the brush, roots, and top few inches of soil, which contains a seedbank of unwanted species, into piles at the perimeter of the project area.

After unwanted vegetation is controlled, the compacted ground must be loosened to improve water infiltration and gas exchange. It also increases the ability of the seedlings' roots to extend through the soil. Ripping is conducted by pulling one or two three-foot ripping shank(s), fully immersed in the soil, behind a large bulldozer. The ripping creates a rough ground surface of loosened rocks and soil, which allows better absorption of precipitation, which reduces erosion and sedimentation to receiving streams, improving water quality.



A shortleaf pine (*Pinus echinata*) planted on a former coal mine site in Kentucky.

THE SHORT LEAF PINE INITIATIVE

Shortleaf pine forests were once abundant in the eastern United States. Over the past several decades, shortleaf pine forests have been declining due to pine beetle infestations, poor management, land-use changes and altered fire regimes. Many of the coal mines in Cumberland Plateau were shortleaf pine/upland oak stands prior to mining and it is our intention to bring back those lost forests. Over the last decade, Green Forests Work has planted hundreds of thousands of shortleaf pines in focal areas identified for the restoration of this forest type. Working with the National Fish and Wildlife Foundation, the Arbor Day Foundation, U.S. Forest Service, The Nature Conservancy and Suntory Global Spirits, thousands of acres have been restored.



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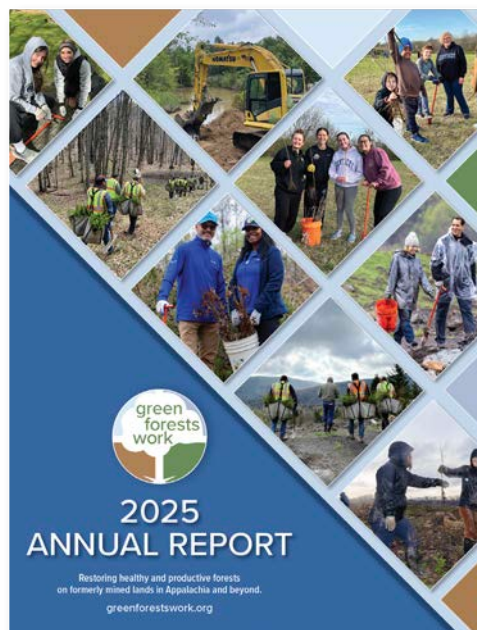
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VISIT OUR WEBSITE

Scan the QR code to access Green Forests Work's website. There, you can catch up on our newsletters, read more about our work, watch videos, and more.



ON THE COVER

Volunteers, corporate sponsors, and professional tree planters worked to restore native forests on former coal mines across the Appalachian region in 2025.

LETTER FROM THE PRESIDENT

Floods are a natural component of a river system. A floodplain is formed when water moves beyond the stream bank and into the adjacent upland. We normally expect streams to experience small floods once every few years and major floods every 50 to 100 years. Unfortunately, recent extreme flooding events appear to be happening more frequently and with more dire consequences across the globe. Warmer temperatures in the Gulf of Mexico have resulted in more water vapor accumulating in a warmer atmosphere. Because the warmer atmosphere can hold more water, the likelihood of heavy rainfall increases substantially. Excessive greenhouse gases, such as carbon dioxide (CO₂), released to the atmosphere through fossil fuel combustion trap heat and are responsible for the warmer global temperatures. Air quality standards proposed by the US Environmental Protection Agency (EPA) and others to greatly reduce CO₂ emissions have been steeped in controversy. Should they be?

In response to concerns over acid rain, National Ambient Air Quality Standards were established by EPA to drastically reduce sulfur dioxide (SO₂) and nitrous oxide (NOx) emissions from power plants, automobiles and other greenhouse gas producers. Since 1980 we have seen a drastic reduction in emissions of SO₂ and NOx in the eastern United States. As a result, we have seen dramatic reductions in the amount of sulfur and nitrogen in rainwater since 1984. In eastern Kentucky, where coal is still mined and burned for electricity generation, research at the University of Kentucky's Robinson Forest has documented a nearly 50% decrease in sulfur concentrations in stream water since the early 1980s, indicating a whole ecosystem response to regulations implemented through the Clean Air Act.

The Clean Air Act worked for solving issues associated with acid rain. Power industries did what was needed to comply with emissions standards through changes in coal mining practices (shift to mining more low sulfur coal) and through implementation of new pollution control technologies such as scrubbers and catalytic reduction systems. New air quality standards aimed at reducing CO₂ emissions are often cited as a catalyst for the loss of jobs and economic opportunities. Looking backward, enactment of the Clean Air Act actually sparked economic growth through research and development of emission



GFW President Chris Barton stands amongst trees planted in 2004 on a riparian and stream restoration project in late October 2025, at Bernheim Forest, Kentucky.

reduction technologies. Likewise, research and development of new carbon capture and storage technologies have begun and will likely grow in the future but are slow to be widely adopted. Solutions for offsetting CO₂ emissions via injection of CO₂ in deep geologic strata or terrestrial sequestration in newly planted forests certainly help reduce our carbon footprint, but stricter standards are needed to curb emissions. Now is the time to revisit emission standards for CO₂. We must seek solutions for slowing, and reversing, the buildup of CO₂ in the atmosphere and associated rise of global temperatures to prevent future climate disasters.

With your help, we are doing our best to be a part of the solution. Planting trees provides many benefits to society, notwithstanding is clean air and carbon capture. We look forward to planting another million trees in 2026. Thank you for your support to help us restore forests and improve the quality of our planet.

Chris Barton, PhD

2025 YEAR IN REVIEW

This past year brought both challenges and successes for the Green Forests Work (GFW) team. We sadly lost our dear friend and colleague, Tiffany Heim, one of the 20 victims of the tornado that struck Somerset and London, Kentucky, in May. Tiffany had been with GFW for several years, greatly contributing to our volunteer and professional planting projects. Her enthusiasm for reforestation touched many lives, and she will be deeply missed.

The tornado also caused extensive damage to the forests within the Daniel Boone National Forest, affecting several of our previous reforestation projects. A white fringeless orchid restoration study, which had been planted just a week before the tornado, was directly in its path. Chris and May May had been caring for the orchids for months, and a significant amount of effort had been invested by the Office of Kentucky Nature Preserves and the U.S. Forest Service staff in preparing the plots for this critical study aimed at identifying the environmental conditions favorable for orchid restoration.

Another setback this spring was the federal funding freeze and subsequent clawbacks, which directly impacted GFW and many of our collaborators. Our longtime partner, the Arbor Day Foundation, faced a clawback of a \$75 million urban reforestation grant, affecting nonprofits and communities nationwide.

Despite these challenges and losses, 2025 marked another successful year for GFW's ecological restoration efforts. We concluded several large, multi-year projects in Kentucky, West Virginia, and Pennsylvania



Tiffany Heim clears felled trees to improve habitat for white fringeless orchids on a Kentucky Nature Preserve in 2017.

in partnership with the National Fish and Wildlife Foundation (NFWF), Suntory Global Spirits, and the Arbor Day Foundation. Over the past two years, these initiatives resulted in the planting of more than 540,000 trees and the distribution of over 2,000 pounds of native warm-season grasses and wildflower seeds across more than 700 acres. We planted over 125,000 trees and shrubs on nearly 300 acres as part of our ongoing restoration efforts in the New River Gorge National Park and Preserve, and the Monongahela National Forest, also in collaboration with NFWF, Komatsu, and other partners. Additionally, we hosted numerous volunteer tree plantings for K-12 students, colleges, universities, and corporate partners, and provided seedlings for several Arbor Day seedling giveaways. This spring, GFW's professionals and volunteers planted more than 820,000 trees and shrubs across

nearly 1,600 acres!

As we look toward 2026, GFW is planning to expand our reforestation efforts. We are creating a regional inventory to prioritize projects that support various conservation objectives. Currently, we are working on a large reforestation project at Tioga State Forest in Pennsylvania and have decommissioned 27 ponds on the Monongahela National Forest to reduce thermal pollution in cold-water streams. Additional restoration work is being planned for New River Gorge National Park.

We also aim to restore shortleaf pine-upland oak forests in the Cumberland Plateau of eastern Kentucky and Tennessee in partnership with organizations such as The Nature Conservancy and the Arbor Day Foundation.

As always, we are grateful to our partners, donors, volunteers, and supporters for making these efforts possible.

2025 BY THE NUMBERS

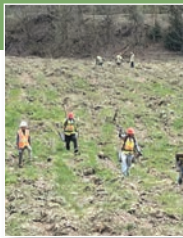
2025 highlights and numbers over the years.



TREES PLANTED

821,006

In 2025, Green Forests Work planted trees in Kentucky, West Virginia, Pennsylvania, Indiana, and Ohio.



ACRES PLANTED

1,573

Professional tree planters and volunteers planted 1,573 acres across the project sites.



VOLUNTEERS

1,957

Despite all types of weather conditions, 1,957 volunteers attended and participated in planting events.



VOLUNTEER EVENTS

35

In 2025, a record 35 volunteer tree planting events took place between the months of March and May.



VOLUNTEER HOURS

4,343

Volunteers spent over 4,300 hours participating in tree planting events.



UNDER 25

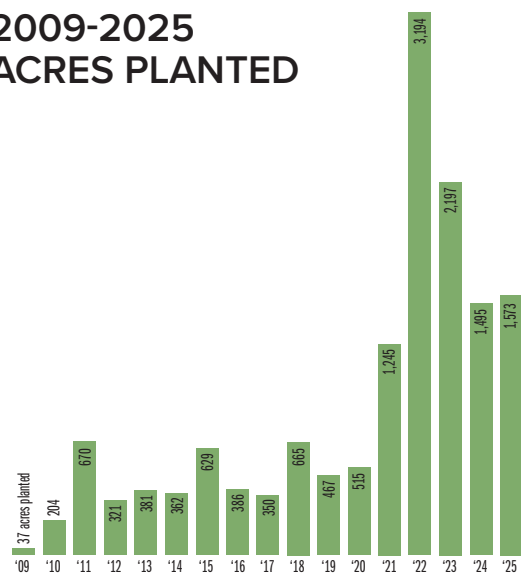
620

Participants under the age of 25 supported tree planting efforts at 2025 volunteer tree planting events.

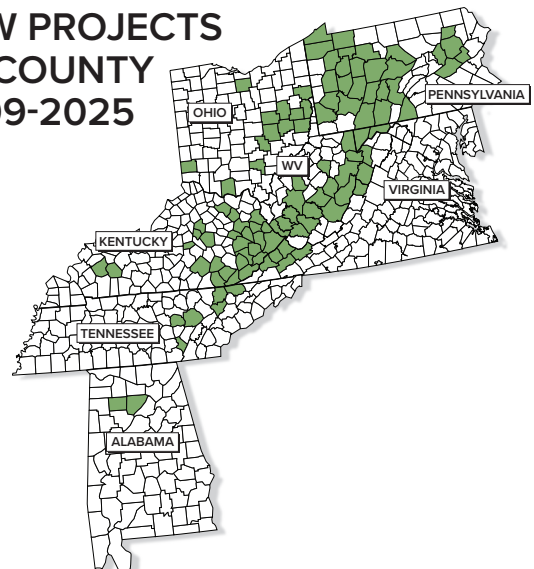
2009-2025 TREES PLANTED



2009-2025 ACRES PLANTED



GFW PROJECTS BY COUNTY 2009-2025



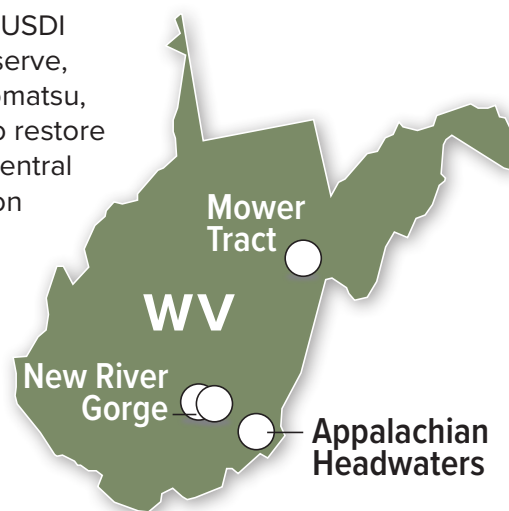


Planters walk to an area in the Monongahela National Forest to complete an underplanting of red spruce seedlings.

WEST VIRGINIA PROJECTS

GFW, USDA Forest Service – Monongahela National Forest, USDI National Park Service – New River Gorge National Park and Preserve, National Fish and Wildlife Foundation, Arbor Day Foundation, Komatsu, The Nature Conservancy and other partners initiated a project to restore native forests on lands disturbed by surface coal mining in the Central Appalachian Region. This collaborative, science-based restoration project aims to address priority goals associated with both the Central Appalachian Spruce Restoration Initiative and the White Oak Initiative. The project includes reclaimed mine tracts in West Virginia in the Monongahela National Forest (MNF) and in the New River Gorge National Park (NRG). A holistic suite of restoration activities including invasive plant control, soil decompaction, and planting of native trees and shrubs were proposed for 50 acres in the MNF and 224 acres in the NRG.

In the project areas, vernal wetlands were created and native pollinator seed was sown. The work has restored habitat for neotropical migratory songbirds, Northern flying squirrel, native brook trout, ruffed grouse and numerous species that inhabit wetlands. In addition, restoration activities will ultimately improve watershed conditions by providing thermal protection for headwater streams, preventing erosion and subsequent stream sedimentation. Through this project, over 340,000 seedlings were planted on 544 acres and 600 pounds of native seed were spread across the project areas. In addition, numerous wetlands were created and miles of headwater streams were protected through the underplanting of conifers that provide wildlife habitat and shade.



MOWER TRACT RESTORATION 2023-2025

The Mower Tract, which encompasses 40,000 acres, was acquired from the Mower Land and Lumber Company in the early 1980s. Located on Cheat Mountain, with an elevation of 4,848 feet, it spans Randolph and Pocahontas Counties in West Virginia.

The Mower Tract and nearby high-elevation areas were once dominated by old-growth red spruce and red spruce-northern hardwood forests. However, industrial logging in the late 19th and early 20th centuries reduced the red spruce ecosystem by about 90%. Clear-cutting led to unnaturally hot wildfires that destroyed red spruce seeds, transforming these areas into even-aged, hardwood-dominated forests. Additionally, extensive logging contributed to regional flooding and significantly influenced the creation of the Monongahela National Forest (MNF).

Coal mining, along with logging, severely limited the re-establishment of red spruce communities in West Virginia. In the Mower Tract, about 2,000 acres were surface mined. Reclamation laws required mining companies to restore the site to a similar contour and control erosion, which they did by compacting soils and planting non-native trees and grasses. Consequently, the area became non-native conifer plantations and pastureland for over 30 years, preventing native species from recolonizing due to compacted soils and thick grass cover.

In 2010, the U.S. Forest Service partnered with GFW and several other organizations to carry out a range of restoration activities. These activities include removing non-native species, adding organic matter, decompacting soil, reforesting mined land, and creating wetlands. The short-term goal is to establish early successional habitats, while the long-term aim is to develop a forest consisting of at least 30% red spruce. Additional benefits of these efforts include improved water quality, enhanced wildlife habitats, and increased ecosystem services, such as carbon sequestration. So far, over 900,000 seedlings have been planted across more than 1,700 acres at the Mower Tract in the MNF (see Table 1).



A red spruce seedling planted at the Mower Tract in 2025.

Table 1. Yearly summary of restoration activities.

¹ In addition to the 192 ripped acres, 8 acres of nonripped slopes were planted.

² In addition to the 171 ripped acres, 18 acres of land ripped in the past project years were planted.

³ Each eliminated pond retained a wetland feature.

⁴ There is overlap in the species planted each year. Across all years, a total of 60 different species have been planted.

Year	Area (ac)	Wetlands Created	Trees\Shrubs Planted	Species Planted	Volunteers Engaged
2011	90	135	22,550	12	60
2013-14	105	75	28,485	8	117
2015	116	279	46,937	11	49
2016	65	100	35,436	22	90
2017	95	318	76,782	32	90
2018	200	175	93,308	35	14
2019	58	192	51,108	23	85
2020	200 ¹	84	92,318	21	0
2021	184	108	119,718	32	20
2022	189 ²	180	117,452	31	0
2023	160	60	105,215	20	0
2024	65	18 ³	102,343	19	30
2025	13	22 ³	34,087	19	7
TOTAL	1,540	1,746	925,739	60 total⁴	562

MINE POND DECOMMISSIONING

The Mower Tract has over one hundred abandoned sediment ponds that were not removed from the site during reclamation because they were established before SMCRA, and they offer little ecological value today.

Before mining, natural vegetation helped filter rainwater into above ground streams flowing into the Shavers Fork of the Cheat River. After mining, soil compaction caused water to flow rapidly across the surface, filling the ponds and elevating incoming water temperatures. This contributed to thermal pollution harmful to cold-water aquatic life, such as native brook trout.

In 2023, we began a project to convert these ponds into small wetland complexes. An area of approximately 60 acres was converted to wetland complexes on the Mower Tract and wetland trees and shrubs were planted.



One of the completed decommissioned ponds prior to planting.

TREE PLANTING AND SEEDING 2024-2025

In the fall of 2023, an excavator moved earth, decompacted edges of ponds, built porous “weep berms” that release water slowly to downgradient forests, and extended soil area for planting with wetland shrubs and trees. In 2024, GFW and partners planted 100,754 trees and wetland shrubs of 18 native species on 28 acres of decommissioned mine ponds enhanced to wetland complexes, as well as 36 acres of supplemental plantings in other restoration areas. Before the planting, 100 lbs of native wildflower, legume, and grass seed was spread over the 23 acres of the wetland complexes. Seed species included: rice cut grass, rattlesnake grass, foul managrass, beggar tick, deertongue, partridge pea, blue vervain, brown eyed Susan, boneset, arrowleaf tearthumb, great blue lobelia, mud plantain, big bluestem, and Indian grass.

Over a 3 month period in the fall of 2024, 22 additional ponds were decommissioned and prepped for planting. In 2025, GFW and partners planted 33,985 trees and wetland shrubs of 19 native species on 13 acres of the decommissioned mine ponds. During the planting, 90 lbs of native wildflower, legume, and grass seed was spread over the 13 acres of wetland complexes.



Planters make their way across the prepped area and plant red spruce seedlings

NEW RIVER GORGE RESTORATION 2023-2025

WAR RIDGE 2024

The War Ridge site, located on Backus Mountain in Fayette County, West Virginia, was acquired by the National Park Service (NPS) in 2003. It comprises four small areas that were surface mined for coal in the late 1980s to early 1990s, connected by haul roads. The vegetation mainly included native shrubs, herbaceous species, and moss, with minimal non-native invasive species present. The long-term goal is to restore the areas to an upland oak-hickory forest.

Due to soil compaction from mining reclamation, few native trees were established, with surviving species like tulip poplar (*Liriodendron tulipifera*) and red maple (*Acer rubrum*) exhibiting stunted growth. White pine (*Pinus strobus*) was planted during reclamation and can also be found on-site. Since reclamation, several wetlands have developed naturally.

Site prep took place from mid-February through mid-March 2024 and 21,050 trees were planted



An excavator spreads woody debris at the War Ridge site during site preparation in February and March 2024.

across 30 acres on March 26. Four small wetlands were created and 15 pounds of wetland seed was broadcast at the site.

HYLTON STRIP 2024

The Hylton Strip tract is located on Highland Mountain in Fayette County, WV and was acquired by the NPS in 1988. Mature hardwood forests surround the site, and a steep slope on the western edge leads down to the New River. The site was surface mined for coal prior to the adoption of the Surface Mining Control and Reclamation Act of 1977. The area consists of two

large, flat sections and tiered benches that were regraded to fill highwalls. A ditch line was created on the downslope border of the site to help catch runoff and sediment. Two streams cross through the site. One of these streams went underground through a culvert. The other stream floods a portion of the site, creating a wetland habitat. Though the site was revegetated with non-native grasses and shrubs, some slopes had natural regeneration of trees including tulip poplar, black locust (*Robinia pseudoacacia*), and red maple. However, the benches and the understory of the slopes had a dense cover of invasive species including multiflora rose, autumn olive, sericea lespedeza (*Lespedeza cuneata*), wineberry (*Rubus phoenicolasius*), and Paulownia tree (*Paulownia tomentosa*).

Restoration of an upland oak-hickory forest type as well as the erasure of man-made structures were the goals of this site.

Site prep was completed in mid-March 2024, and from March 27-30, 76,850 trees were planted across 107 acres. Furthermore, 350 pounds of dryland seed and five pounds of wetland seed were broadcast at the site.



Planters at Hylton Strip where more than 76,000 seedlings were planted in March of 2024.



Wetland created at the Terry Top project site in April 2025.

TERRY TOP 2025

The Terry Top site, located in Fayette County, West Virginia, featured a small, flat-topped area with old haul roads extending north and south along the steep walls. The haul roads were filled with invasive plants, including autumn olive, stilt grass, lespedeza, multiflora rose, and bittersweet. In the central area, additional invasive species were found including Paulownia and tree of heaven. There were two dense stands of Virginia pine trees, while red maple and tulip poplar dominated other patches of forest at the site.

Due to the flat and compacted old haul roads, water accumulated in certain areas, resulting in

non-functional wetlands. To address this issue, unwanted vegetation was cleared away, and the wet areas were improved by creating depressional wetlands. Rocks and woody debris were added to these depressions to provide habitat for amphibians and insects.

Site prep and ripping were completed in late March 2025. Professional tree planters planted 25,935 trees across 43 acres on March 17 and April 2. Additionally, 155 pounds of dryland seed was spread. 43 wetlands were also created and 25 pounds of wetland seed was broadcast at the project site.

PIKE POND 2025

Located in Raleigh County, West Virginia, Pike Pond was not a coal mine; instead, the site was mined for soil and rock to aid in the construction of a nearby bridge, the Glade Creek Bridge. Other building materials, such as concrete and wood, were also stored here.

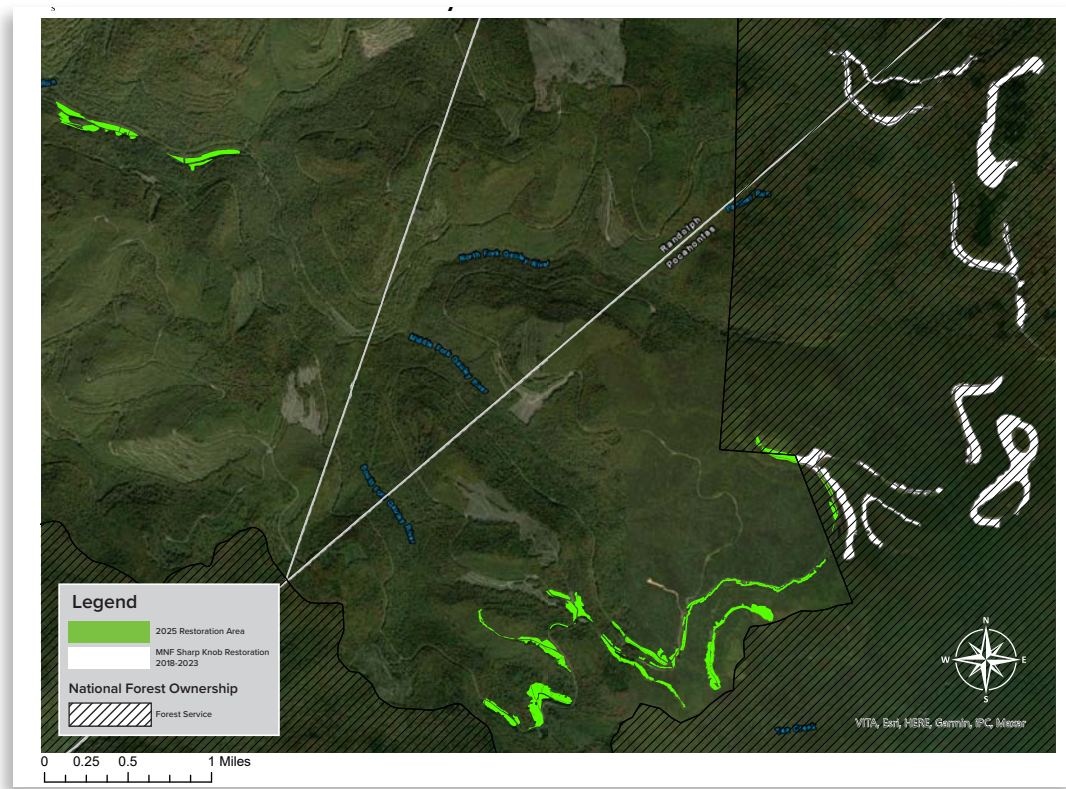
The site was filled with invasive shrubs and trees, such as autumn olive, Japanese knotweed, multiflora rose, and Paulownia. Additionally, there were stunted white pines, cherry trees, black locusts, and tulip poplar saplings. *Sericea lespedeza*, an invasive herbaceous plant, had a strong presence on the site, but there were also areas of bare soil.

The site also contained a 1.25-acre pond with a failing dam. Since the pond lacked ecological value, natural resource managers at New River Gorge National Park preferred draining it to establish a shrubby wetland habitat.

Site prep began in early February and was completed in early April 2025. Planters planted 7,368 trees and spread 40 pounds of dryland seeds across 10 acres on March 18 and April 2. Two wetlands and one wetland complex, which includes a stream and several interconnected pools, were created, and 15 pounds of wetland seed was spread.



Creating a stream channel at the location of the former pond dam.



Map showing 2025 project locations (in green) and previous reforestation project (in white) near the intersection of Randolph, Webster, and Pocahontas Counties in West Virginia.

STATE, PRIVATE, TRIBAL INITIATIVE 2025

This project was a collaborative effort by GFW, Weyerhaeuser, USDA Forest Service – State, Private and Tribal Forestry, USDA Forest Service – Monongahela National Forest, the Arbor Day Foundation and others to restore red spruce forest types and their associated habitat on Weyerhaeuser property that is adjacent to the Monongahela National Forest in West Virginia.

The project, near the intersection of Randolph, Pocahontas, and Webster counties, aims to restore a declining forest type, improve air and water quality, enhance forest resiliency, and increase the sites' productivity for wildlife.

Site preparation activities began in December of 2024 with non-native tree and shrub removal and deep ripping to reduce soil compaction. During the spring of 2025, 86,330 seedlings of 36 native species were planted across a 112-acre restoration area, within the focal areas of the Central Appalachian Habitat Stewardship program and the Central Appalachian Spruce Restoration Initiative. In addition to the trees and shrubs, 105 pounds of wildflower and pollinator seed were spread in wet areas and along roadsides in the project area to increase biodiversity.

Although we exceeded our planting goal of 84,000 seedlings with extra trees that were

not needed on another nearby project on the Monongahela National Forest, our final acreage was less than what we had proposed. This was due in part to areas that were not planted such as roads and riparian buffers and patches within our initial mapped area that we felt were recovering nicely on their own and needed no intervention. We have funding remaining for approximately 50-acres of additional reforestation and will work with the landowner to determine if additional sites are available.



Project partners walk through one of the reforestation areas prior to site preparation on September 18, 2024.



A planting crew planted 79,157 trees, broadcast 225 pounds of dryland seed and 15 pounds of wetland seed near Lewisburg, WV.

APPALACHIAN HEADWATERS & LEWISBURG

Rich Hollow Farm, near Lewisburg, WV, was purchased by Appalachian Headwaters in February 2025. Most of the property is a mature oak-hickory forest that spreads up a mountain. However, the base of the property was largely cleared of trees in favor of grass cover for cattle to graze. The cattle pasture was a thin strip of flat land that serpentine around the foothills and extended partially up the hillsides. Unlike the flat land that was regularly grazed, the hillsides contained multiflora rose and honeysuckle (*Lonicera spp.*), growing thicker further up the hill and invading the forest's understory. A 1-acre pond with eroding banks provided water for the cattle.

In early March, GFW began efforts to restore native forest on the former pasture. Unwanted vegetation was removed with bulldozers, which also decompacted the soil. The steep hillsides were cross-ripped diagonally to create a diamond pattern, helping to prevent erosion from heavy rains. In some places, rocky soil prevented dozer operation. The area was then planted and seeded with native grasses and wildflowers.

The land at the hill's base lacked invasive species and needed only cross-ripping. With a lush grass cover already present, the area was planted solely with native seedlings.

The final prescription targeted a section

extending into the mountainside along a drainage area, where an ephemeral stream flows before vanishing underground. Due to the narrowness of the site, bulldozers couldn't work without disturbing the stream, so the area was planted at double the density with species suited for wet soils.

During the project, two other areas were also enhanced. At the crest of the tallest hill, a half-acre patch was scraped of unwanted vegetation but was not ripped. Rather than planting it with trees, native grass and wildflower seeds were broadcast to create a pollinator garden and reserve the area for viewing the landscape. An excavator was used to create gentle slopes to grade the steep, eroding banks of the old cattle pond, and woody debris was placed in the pond for turtles to use as sunbasking spots. A grass and pollinator mix of wetland

species was broadcast around the pond, and one side was planted with species adapted to wet soils.

Site preparation was completed in early April on a total project area of 96.25 acres. Between March 31 and April 2, a planting crew planted 79,157 trees and broadcast 225 pounds of dryland seed and 15 pounds of wetland seed. Furthermore, 1,200 trees were planted by students from the University of North Carolina at Chapel Hill as part of a research project. In total, 80,357 trees were planted for the project.



Students from UNC Chapel Hill planted 1,200 trees as part of a research project in March of 2025.

WEST VIRGINIA VOLUNTEER PLANTING EVENTS



Komatsu volunteers planted 1,390 seedlings across 2.5 acres at the New River Gorge site on April 22, Earth Day, 2025.



Volunteers from Chicago planted 102 trees and shrubs in two wetland areas at the Mower Tract in the Monogahela National Forest in June 2025.

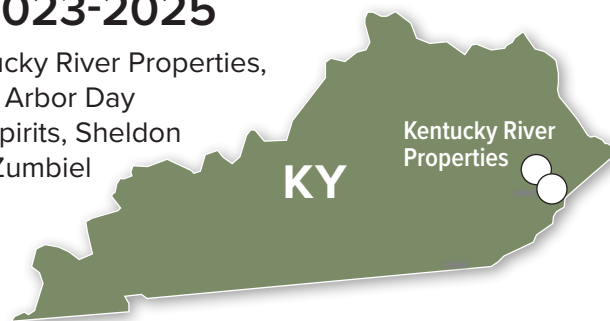


Brad Brandt and Brie Frickenstein Kramel of the Arbor Day Foundation plant at the Mower Tract on October 6, 2025.

KENTUCKY PROJECTS

KENTUCKY RIVER PROPERTIES 2023-2025

This project was a collaborative effort by GFW, Kentucky River Properties, LLC (KRP), the National Fish and Wildlife Foundation, the Arbor Day Foundation, the University of Kentucky, Suntory Global Spirits, Sheldon and Audrey Katz Foundation, The Nature Conservancy, Zumbiel Packaging, Acciona Energy, and Appalachian Regional Reforestation Initiative to restore shortleaf pine-upland oak forest types and their associated habitat on former surface mines in eastern Kentucky.



The project on KRP properties, located in parts of Letcher and Knott Counties, Kentucky, aims to restore a declining forest type (i.e., shortleaf pine-upland oak woodland), improve air and water quality, enhance forest resiliency, and increase the sites' productivity for wildlife. Over the duration of the project, professional planters and volunteers planted 278,628 trees on 404 acres and spread 2,010 lbs of seed across the sites, all of which are within the freshwater and terrestrial focal area of the Cumberland Plateau Stewardship program boundary.

In the fall of 2023, GFW and KRP identified the initial project site in Knott County, Kentucky, consisting of 8 tracts dispersed along a main road. Small bulldozers were used to remove non-native, undesirable groundcovers and unwanted woody vegetation in the reforestation areas and project perimeters. The goal was to eliminate unwanted vegetation and the top layers of soil, which contain the seed bank, primarily made up of non-native, species.

After the vegetation removal was completed, a large bulldozer was used to loosen the soil that had become overly compacted during the mining reclamation process. The soil decompaction was achieved by pulling the ripping shanks, which were fully immersed in the ground, behind each track of the bulldozer (see sidebar page 16). Vegetation

removal and cross-ripping were conducted over a total of approximately 152 acres.

Site preparation was completed in early January 2024, followed by the planting of 92,260 tree and shrub seedlings in early February. The seedlings included 19 species and were planted across approximately 137 acres.

Additionally, 760 lbs of native warm-season grasses and wildflower seeds were broadcast to support the establishment of native herbaceous species. In total, 152 acres of surface-mined land were treated and planted, aiming to restore a shortleaf pine-upland oak forest. KRP will conduct long-term monitoring and implement management activities, including herbicide applications and prescribed burning, as needed.

In the fall of 2024, three additional legacy coal



Sowing seed in the project area to increase plant biodiversity and attract pollinators.



Planters set off to plant trees at the Carbon Glow site in Letcher County, in late February 2025.

mine sites were identified for 2025 plantings. Each site had similar vegetation and land history characteristics as the 2024 Knott County site. As such, similar site preparation techniques were performed. The first site was a 71 acre tract of land owned by KRP located near the community of Carbon Glow in Letcher County, Kentucky. The second site was a 59 acre tract of land owned by the Bates family, which is also situated near Carbon Glow in Letcher County, Kentucky. The third site was 122 acres of land owned by KRP located near the community of Littcarr in Knott County, Kentucky.

From February to April 2025, 252 acres at the three sites were planted with 176,368 trees, representing 18 different species.. Additionally, 1,250 pounds of native grass and pollinator seeds were broadcast to enhance the local ecosystem.

Ultimately, the projects restored upland oak/shortleaf pine forests on four sites in two counties which is highly relevant to stewardship and conservation goals for the region. The project exceeded its goals by planting 278,628 trees on 404 acres. The 2,010 pounds of native seeds that were spread will attract pollinators and other wildlife while the planted trees grow. The projects also provided a platform for 282 volunteers to participate in improving the local environment through tree planting.

WHAT IS CROSS-RIPPING?

Cross-ripping is a technique that loosens soil to create a better rooting medium for trees. This process allows tree roots to extend in multiple directions and enhances the hydrology of the site. By loosening the soil, infiltration rates increase, enabling precipitation to be absorbed and released more slowly.

When land is ripped, it immediately creates a rough surface and exposes large rocks, which form microsites that provide cover for insects, small mammals, reptiles, and amphibians. Some



exposed soil results from temporary clearing and cross-ripping, which reduces competition from herbaceous plants and allows newly planted seedlings to become established. However, this

bare soil is quickly colonized by native plant species, leading to increased species richness and initiating the natural succession process.

The exposed soil also allows additional woody plants to establish themselves, including many native trees and shrubs that are not part of the original species prescription.

Many of our projects show a surge of native flowering herbaceous species after ripping, which benefits pollinators such as butterflies, moths, and bees.

KENTUCKY VOLUNTEER PLANTING EVENTS



Students, staff, and faculty from Asbury University, local residents, school children, and members from the Laudato Si Commission planted trees on the campus of Asbury on March 27, 2025.



Suntory Global Spirits volunteers and students from the University of Kentucky planted at the KRP site on April 10, 2025.

PENNSYLVANIA PROJECTS

2025 STATE GAME LANDS

Many Pennsylvania (PA) State Game Lands (SGLs) are biologically diverse landscapes with several forest types, such as northern hardwoods and eastern hemlock forests. Streams and riparian areas crisscross the SGLs, contributing to essential watersheds that lead to large rivers such as the Clarion and Allegheny. When areas become degraded or are threatened by beech bark disease, leaf disease, infestations of hemlock woolly adelgid, emerald ash borer, spongy moth, and a variety of invasive plants, we collaborate with the PA Game Commission to address these issues. These threats are concerning because they can significantly alter wildlife habitat in both terrestrial and aquatic ecosystems.

The primary objective of these projects is to increase, retain, or restore the conifer component of PA's forests, often in the face of hemlock woolly adelgid (HWA) invasion. Conifer underplantings aim to ensure a long-term native conifer presence to mitigate the loss of eastern hemlock to HWA and maintain forest diversity and shade in riparian areas. Increasing species diversity primarily through planting red spruce, white spruce, white pine, and balsam fir is an important goal. Enhancing terrestrial and aquatic habitats is of utmost importance in these project areas, while also expanding suitable habitat for species of greatest conservation need.

These forest stands and riparian areas provide



habitat for birds such as ruffed grouse, black-throated green warbler, Louisiana waterthrush, and scarlet tanager. These waterways also support breeding populations of native brook trout and wild brown trout, making conifer canopy cover vital for maintaining cool water conditions. Conifer underplantings aim to ensure a long-term native conifer presence and maintain forest diversity and cover to mitigate current canopy losses.

Site preparation includes treatments such as herbicides and mechanical cutting efforts to control invasive glossy buckthorn and other invasive plants, as well as hack-and-squirt or stem injection herbicide treatments to remove undesirable midstory and understory growth, which compete for sunlight. Less commonly, we will plant project areas that have been timber harvested and are not regenerating well, or areas where tree felling into streams has taken place to support stream habitat and provide erosion control.

The long-term goals of these projects are to diversify vertical forest structure, reestablish healthy conifers in the canopy to suppress invasive vegetation and provide riparian thermal cover, contribute to forest and watershed health and resilience, and provide habitat benefits for wildlife.

In 2025, nine projects on eight State Game Lands were planted, primarily located in the Northwest Region of the Pennsylvania Game Commission. These projects were spread across Clarion, Forest, Crawford, Erie, Jefferson, Venango, Warren, and Centre counties. A total of 186,200 tree seedlings were planted on 590.5 acres. Since 2015, GFW and the Pennsylvania Game Commission have successfully planted over 1,230,000 native tree seedlings across nearly 3,200 acres of degraded land.



Professional planters establish native conifers in canopy gaps.

PENNSYLVANIA VOLUNTEER EVENTS

2025 Pennsylvania Volunteer Events

Event	Date	Acres	Trees	Volunteers
Murraysville Area Watershed	4/7/25	1	50	9
MCWA/PO Jr. High	4/11/25	2	2,200	128
MCWA/PSU EMS	4/12/25	3	3,400	43
Factoryville Sportsmans	4/13-14/25	2	520	7
Reed's Run	4/15/25	3	2,300	59
Fort Roberdeau	4/16/25	1	325	39
Northern Blair Rec Center	4/18/25	1	150	19
Moraine State Park	5/8/25	2	700	8
Prince Gallitzin State Park	5/9/25	1	250	6
PSU Climate Symposium	5/18/25	1	720	8



Top right: MCWA and Phillipsburg Osceola Middle school tree planting on April 11, 2025. Above left: MCWA and PSU College of Earth and Mineral Science planting on April 12, 2025. Above right: Fort Roberdeau Tyrone NHS planting on April 16, 2025.

9/11 MEMORIAL AT FLIGHT 93

A ceremony for the 24th observance of the 9/11 attacks on our nation took place at the Flight 93 National Memorial in Shanksville, Pennsylvania on September 11, 2025. The ceremony honored the 40 passengers and crew members who lost their lives on Flight 93.

During the event, the names of the 40 passengers and crew were read aloud by Scott Eggerud (OSMRE - ret.) and friends and family members of the victims, followed by the ringing of the Bells of Remembrance, by Michael French of GFW and Reclamation Specialist Chet Edwards (OSMRE - ret.). The ceremony included a moment of remembrance and a wreath-laying, with thousands of students participating virtually through the "Teach to Remember 9/11" initiative.

GFW and OSMRE have partnered with the National Park Service and Friends of Flight 93 National Memorial to create a "living memorial" by planting over 150,000 native trees on nearly 200 acres of reclaimed land that was once a surface coal mine.



Chet Edwards - OSMRE (ret.), Tom Shope - Acting Deputy Director of OSMRE, Scott Eggerud OSMRE (ret.), and Michael French (GFW) at the Bells of Remembrance.

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Appalachian Regional Commission
Appalachian Regional Reforestation Initiative
Conservation Legacy – Appalachian Conservation Corps
Lexington-Fayette Urban County Government
Kentucky Department for Natural Resources
Kentucky Department of Fish and Wildlife Resources
Kentucky Division of Forestry
Kentucky Division of Mine Reclamation and Enforcement
Office of Kentucky Nature Preserves
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