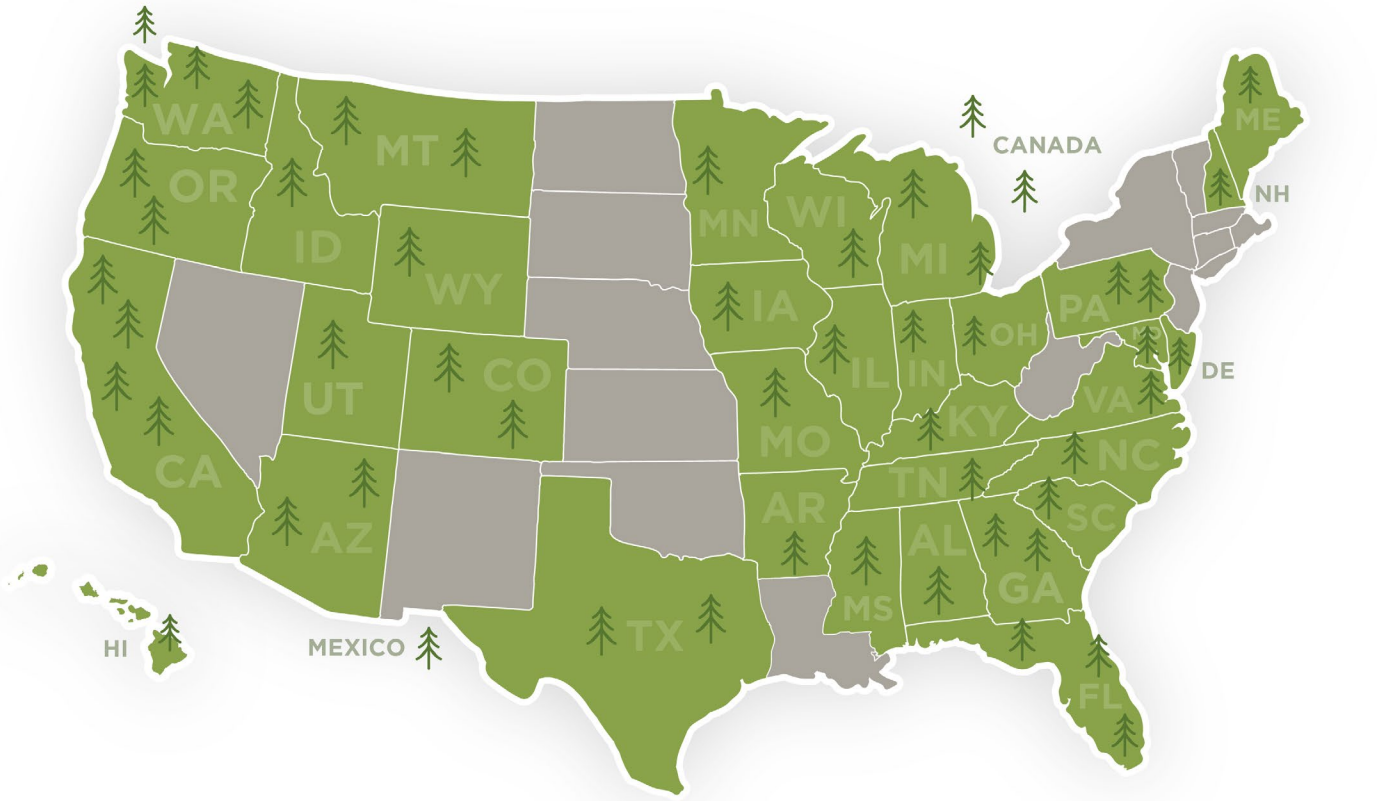
One Tree Planted partnership | Overview



ONETREEPLANTED

60,000 Planted per year	230,233 Planted so far

OFS began our partnership with One Tree Planted in January of 2020 in an effort to help reforest areas throughout the world. This partnership allows us to scale and have much more impact than we could create on our own. One Tree Planted gives us the opportunity to utilize their existing network of tree planting organizations and access to projects across the globe. It also allows us to plant enough trees to offset all of our Scope 1 and Scope 2 Greenhouse Gas emissions. These are emissions from all of our building electricity and natural gas usage as well as Styline transportation fuel usage and all of OFS company owned vehicles.

It is estimated that one tree growing through a lifespan of approximately 60 years will sequester approximately 1 metric ton of carbon dioxide. Our total scope 1 and scope 2 emissions in recent years is generally between 50 - 55 thousand metric tons annually. This is the basis for our goal of planting 60,000 trees per year. This essentially offsets our annual emissions over time. Another benefit of our partnership with One Tree Planted is that each planting is done in areas with active forest management. This helps to ensure that ongoing maintenance and monitoring is conducted and tree survival rates and lost tree replacements are prioritized.

Currently, planting trees is the number one climate change solution. Not only does this activity absorb harmful carbon from the atmosphere, it also helps clean the air we breathe of harmful pollutants, filter the water we drink and provide habitat to over 80% of the world's terrestrial biodiversity. Forests provide jobs to over 1.6 billion people, help prevent soil erosion, and provide key ingredients in 25% of all medicines.

Colorado Wolf Creek Reforestation Project

Project location: San Juan National Forest | Colorado

Project description: The San Juan National Forest contains a range of rich ecosystems, three wilderness areas, an abundance of wildlife, and many bodies of water. It covers over 1.8 million acres of land, a portion of which is accessed all year round by tourists and locals participating in outdoor recreational activities. In recent years, sections of this Forest have suffered from degradation due to the Spruce Beetle Infestation.

OFS Trees planted: 5,000 Engelmann Spruce

Ecological benefits: Insect infestations degrade land, and leave forests vulnerable to threats such as further invasive species, and fire. By planting trees our partners are working to repair the damage that has been done, and ensure that the overall health of the forest remains in tact.

Community benefits: This forest contains sensitive watersheds that serve as critical components in the health of an entire ecosystem. Planting these trees will restore the land, leading to improved soil quality.

Etoniah Creek State Forest Reforestation Project

Project location: Putnam County | Florida

Project description: The Etoniah Creek State Forest Longleaf Pine community is recognized as one of the most species-rich plant communities outside of the tropics. Re-establishing these stands on these flatwoods communities will benefit native wildlife, including threatened and endangered species.

OFS Trees planted: 5,000 Longleaf Pine

Ecological benefits: Reforesting the Etoniah Creek State Forest will benefit all area wildlife, including several listed species like the eastern indigo snake and gopher tortoise. The canopy closures from Longleaf Pine will also allow for native, endangered grasses and herbaceous plants to thrive, further increasing food and habitat biodiversity. Planting Longleaf Pine will improve the watershed in Etoniah Creek State forest to its' namesake creek, improving community access to clean water. This improvement will allow freshwater habitats to thrive, especially for local endangered aquatic life, such as the black creek crayfish.

Community benefits: Restoring this state forest will drive tourism to the region, as it provides rich hiking, nature study, photography and bird watching opportunities. The influx of tourism will create jobs in Florida to keep up with the increasing number of guests in the park. The surrounding communities will be able to enjoy the park once more.

Georgia Tree Establishment Program

Project location: North Georgia

Project description: Provide seedlings and technical support to landowners in north Georgia who are interested in tree planting.

OFS Trees planted: 8,750 Cherrybark Oak, Swamp Chestnut Oak, White Oak, Water Oak, Northern Red Oak, and Willow Oak

Ecological benefits: The objective is to encourage landowners to plant native, commercial oak trees to establish healthy, sustainable oak forests. These plantations should provide clean air, clean water, wildlife habitat, and forest products for future generations. This is an innovative project, as large-scale oak tree plantings are not common in Georgia. Hardwood establishment is more expensive and requires more intensive management than pine establishment. Landowners will be encouraged to diversify their plantation by planting a mixture of red oak and white oak species to benefit wildlife and forest health. This project will promote open-land plantings which created new forests, bottomland and riparian plantings to protect soil erosion and water quality, and larger plantings to maximize impact on the landscape.

Community benefits: Communities will benefit as these planting will help provide clean air, water, wildlife habitat, future forest products, and diversity to the landscape.

Wildcat Ridge Reforestation Project

Project location: Daniel Boone National Forest - London Ranger District | Kentucky

Project description: After coal mining was completed in Wildcat Branch in the 1980s, required reclamation activities included filling in all of the mine shafts and heavily compacting the disturbed area and converting it to grassland. Because of this soil compaction and vegetative competition from exotic species such as tall fescue and Russian Olive, natural regeneration of oak-hickory forest types is virtually nonexistent on the project site. With compacted soil, this site was in a state of arrested forest succession.

OFS Trees planted: 1,200 Upland Oak and Shortleaf Pine

Ecological benefits: Reforestation practices proven by the non-profit group Green Forests Work have helped restore thousands of acres of compacted mine sites to productive native forests. We partnered with them on this project called Wildcat Ridge. In the fall of 2018, this site began an extensive restoration process to re-establish healthy and productive forests on this formerly mined land by clearing non-native exotic shrubs, and ripping the compacted substrate, and planting native trees.

Community benefits: In March 2019, this reforestation project planted trees on about 32 acres of the Daniel Boone National Forest. Many volunteer groups helped plant trees with much success. The surrounding communities will be able to enjoy the park once more.

Mud Creek Floodplain Restoration Project

Project location: Mud Creek Floodplain | North Carolina

Project description: This is a large scale, holistic, restoration project focused on restoring and enhancing six different habitat types by **(1)** restoring natural hydrology; **(2)** restoring and enhancing habitat for breeding muskellunge, amphibians, reptiles, and birds; **(3)** restoring wetland habitat; **(4)** restoring native vegetation adapted to site conditions and focal habitat types; **(5)** improving water quality; and **(6)** reconnecting streams to their floodplains. At fully functioning condition, we expect this tract to provide stormwater treatment, flood abatement, successful spawning and rearing habitat for Muskellunge and other fishes, swamp forest-bog complex habitat for rare wetland species (and possible occupation by these species), grassland and pollinator habitat, and improvements to water quality in the French Broad River. We expect greater occupancy by and diversity of SGCN, at-risk, and threatened species, and Partners in Flight priority birds. Species and habitat monitoring by project partners will aid in determining if functional uplift has been obtained for the site.

OFS Trees planted: 5,000 Green Ash, Sycamore, River Birch, Swamp White Oak, American Elm, Black Gum, Silky Dogwood, Black Holly, Smooth Sumac, Silky Dogwood, Common Elderberry, Persimmon, Pawpaw, White Basswood, Black Cherry, American Hornbeam, Shingle Oak, Bitternut Hickory, Shagbark Hickory, and Mountain Silverbell

Ecological benefits: This project focuses on restoring the natural ecological function of a floodplain by reconnecting wet areas with riverine and tributary channels to reestablish hydrologic functions that have been significantly reduced over the past 100-years. Connectivity of the riverine and floodplain zones are beneficial for water quality by filtering stormwater containing both sediment-laden pollutants and by recharging ground water. Wet areas, saturated soils, early successional shrub areas, and wooded riparian corridors contribute to the overall structural complexity necessary for resilient and diverse biotic communities. Restoration and enhancement activities would include establishing and enhancing over 1 mile of riparian buffer along the French Broad River and Mud Creek. Key project objectives focusing on riparian habitat establishment, and reconnection of the river-floodplain interface will provide exceptional opportunity for uplift of aquatic, semi-aquatic, and terrestrial species and their habitats. This restoration project will benefit 12 federal and/or state listed aquatic species including Appalachian elktoe, Tennessee clubshell, Eastern hellbender, and French Broad crayfish by reducing sediment eroding from the tract and providing habitat for these species.

Community benefits: We expect this project to provide substantial community benefit through flood abatement, climate change mitigation, and recreational access, outreach, and educational opportunities. At the northeast corner of the site, a parking area has been designated on the restoration design plan. A raised 10 ft wide access path for all-weather access will be constructed along the east parcel boundary for vehicle, ATV, and maintenance access, and to help facilitate the extension of the Oklawaha Greenway through this tract. Pedestrian hiking trails are included for internal and river access at the site, which may be accessed from the parking area and from the designated access path. A primitive canoe camp and access area just north of the Mud Creek – French Broad River confluence is also designated on the project plans. Habitat restoration and species monitoring will be accomplished through several partnerships with universities, organizations, and agencies. Both UNC-Asheville and Western Carolina University (several classes) have visited the site with project partners and have expressed interest in incorporating this site into their ecological restoration course curriculum as a case study. Asheville Greenworks has expressed interest in using this site with interns and volunteers to engage youth in work experiences that emphasize the importance of caring for our natural environment. The site will serve as a demonstration project to others involved in stream and floodplain restoration and rare species recovery.

Yosemite Fire Restoration Project

Project location: Yosemite National Park | California

Project description: In 2018, the Ransome and Donahoe ranch properties, located adjacent to Yosemite National Park, were significantly burned by the Ferguson Fire. To restore this land, our partners have planted seedlings consisting of five species. This planting will provide a range of benefits to the variety of plant and animal life calling this area home. Additionally, it will positively impact nearby communities both culturally and environmentally.

OFS Trees planted: 5,000 Douglas Fir, Giant Sequoia, Ponderosa Pine, and two other species

Ecological benefits: The landscape was burned in high severity in 2018 due to the Ferguson Fire, and was in vital need of reforestation. Our partners have restored the area with climate resilient species as to prevent future threat of fire. Planting trees contributes to soil and water health, and promotes the growth of other plant species. The property features a ridge line that serves as a wildlife corridor between Yosemite National Park and Sierra National Forest. The site is frequented by many wildlife species, including bears, cougars, and deer to name a few. Restoring the area will ensure that these species will continue to use the land as a refuge, foraging ground, and corridor.

Community benefits: The planting location is well known in the community of Yosemite West, providing non-consumptive recreation and scenic values to locals. Restoring the Property and maintaining it will add value for the community in this regard. It will also provide protections from erosion-related problems such as landslides, earth flow, and flooding to the downhill community, and prevent risk of further fire.

Pine Island Reforestation Project

Project location: Pine Island Property, Lufkin | Texas

Project description: This Longleaf Pine planting project is being done to create quality wildlife habitat on the property know as Pine Island in Angelina County, Texas. One Tree Planted will support the planting of a portion of the 73,726 total number of trees scheduled to be planted during the 2020/21 planting season. The purpose of the project is to establish Longleaf Pines and maintain it for the long term as a native Longleaf stand to promote high quality wildlife habitat.

OFS Trees planted: 8,750 Longleaf Pine

Ecological benefits: The landowners will be releasing Wild Turkeys on the property, and restoring and managing for Longleaf will improve their native habitat.

Community benefits: Having well maintained longleaf habitat reduces wildfire risk and provides ecosystem benefits such as water filtration and carbon sequestration.

Orca Whale Project

Project location: 50+ Watersheds | California, Oregon, Washington, BC

Project description: The Endangered Southern Resident Orca have called the stretch of Pacific Ocean from Northern California to British Columbia home for millennia. Every year, as the Orca's migrate North to South and back again they rely on the West Coast Chinook salmon for food (nearly 80% of their diet). However, salmon stocks are diminishing due to loss of habitat and increasing pollution - ultimately impacting the Orca downstream. Planting trees along rivers and streams of the Pacific Northwest restores habitat for the endangered Orca. Trees help with water quality and therefore improve the health and quantity of salmon for the Orca to eat!

OFS Trees planted: 5,000 Grand Fir, Vine Maple, Bigleaf Maple, White Adler, Red Adler, Serviceberry, Pacific Madrone, Incense Cedar, Pacific Dogwood, Red Osier Dogwood, Hazelnut, Hawthorn, Oregon Ash, Western Crabapple, Indian Plum, Valley Ponderosa Pine, Black Cottonwood, Bitter Cherry, Choke Cherry, Douglas Fir, Oregon Oak, Cascara, Hookers Willow, Pacific Willow, Scouler's Willow, Sitka Willow, Blue Elderberry, Red Elderberry, Western Red Cedar, and Western Hemlock

Ecological benefits: Planting trees has a number of knock-on effects that benefit the salmon and, ultimately, the Orca.

1. Improved water quality: Trees planted along the banks of the river can help filter out toxins as water passes through the soil and into the rivers where the salmon spawn. This not only improves salmon survivability, but also improves the quality and quantity of food available to the Orca.

2. As the trees grow and their roots spread, the banks of the rivers solidify, protecting against erosion and keeping the river water clear of excessive sediment, which is necessary for the salmon to spawn.

3. Trees also help provide important nutrients for the young salmon as they grow. Leaves, needles, and woody debris falling into the river create habitat for insects the salmon eat, helping them fatten up for the long journey downstream to the Pacific Ocean.

4. As the trees mature and the forest canopy thickens it provides critical shade over salmon spawning grounds. Salmon eggs need to be kept cool, and without adequate shade from vegetation on the banks of the river water temperatures will rise, reducing the chances the eggs have to develop and hatch.

5. Even dying and fallen trees on the banks of the river benefit salmon. Branches and trees that fall into the water help to slow down the flow, making it easier for the salmon to lay their eggs without them getting immediately washed away. Planting trees today means the debris created in the future ensures the salmon have plenty of spots to lay their eggs.

Community benefits: Orcas are emblematic of the North-West and have significant meaning for the First Nations communities that have lived in this region. Making sure these creatures don't go extinct has a significant community impact.

The Keystone Tree Partnership

Project location: Specific locations of planting Riparian, Suburban, and Mine Land properties | Pennsylvania

Project description: For more than half a century, the Chesapeake Bay Foundation (CBF) has led a landmark effort to save the Chesapeake Bay—a national treasure that supports the health and well being of nearly 20 million people and 3,000 species of plants and animals. Nutrient and sediment pollution to the Bay has been reduced by one-third in recent years, according to independent analyses. Despite our significant progress, the Bay is still dangerously polluted. Pollution from agricultural fields and urban development runs off the land and into the water. Air pollution and chemical contamination remain formidable threats and climate change is exacerbating all of these challenges.

One of the most cost-effective ways to reduce pollution reaching the Bay is by planting trees. Trees filer and reduce polluted runoff and decrease greenhouse gases that cause climate change. When planted along waterways, the trees act as a buffer to pollution and provide a host of other stream benefits, including stabilizing banks, cooling water temperatures, flood mitigation, and improving habitat quality. Forested buffers play a critical role in supporting soil health alongside streams and adjacent lands. As a result, drinking water sources are cleansed, habitat for native brook trout and macro invertebrates is improved, farm productivity and herd health is increased, and property values are protected.

To increase the number of native trees and acres of forested buffers throughout the Bay watershed, CBF has committed to accelerating the pace of planting native trees, especially in Pennsylvania. Pennsylvania's Susquehanna River delivers half of the freshwater entering the Bay, and nearly half of the pollution. Prioritizing the restoration and preservation of trees alongside streams, streets, and other sensitive landscapes will have a profound impact on the health of local rivers, streams, and the Chesapeake Bay.

In April 2018, CBF launched the Keystone 10 Million Trees Partnership, a collaborative, multi-year effort to plant 10 million trees throughout Pennsylvania by the year 2025. The Partnership consists of national, regional, state, and local agencies, conservation organizations, outdoors enthusiasts, businesses, and citizens committed to improving Pennsylvania's communities, economy, and ecology. Our collective goal is to buffer approximately 6,250 miles of Pennsylvania streams within the Chesapeake Bay watershed, nearly equal to one-third of the state's impaired streams.

OFS Trees planted: In 2020, 8,750 native trees were planted, and in 2023, an additional 5,000 trees were added. (80+ native species)

Ecological benefits: Adding native trees to the Pennsylvania landscape will improve the Bay's water quality by stabilizing stream and river banks, filtering water flow from agricultural, urban, and abandoned mine land environments.

Community benefits: Adding native trees to the Pennsylvania landscape will boost the economy through trees' ability to reduce public health costs, crime, and engaging local industry such as nurseries, garden centers and like-minded industries.

East Tennessee Nursery Seedlings Project

Project location: East Tennessee Nursery, Delano | Tennessee

Project description: The goal of this partnership/project is to provide seedlings to Tennessee landowners for the purpose of reforestation of native species. The goal is to plant the right tree in the right place. Landowners work with Area Foresters to make the right species selection for the planting site. One Tree Planting is funding the opportunity to landowner to receive seedlings for reforestation project.

OFS Trees planted: 4,750 seedlings from 23 native species.

Ecological benefits: Seedlings that are grown at the East TN Nursery are Native species and are more diverse and more affordable than is typically found at local big box store. More trees planted is an ecological benefit to everyone.

Community benefits: It is proven that trees make people happier. The more trees an area has the more likely people are to get outside in there community.

Spruce Salvage Planting Project

Project location: Hiawatha National Forest | Michigan

Project description: The Hiawatha National Forest is unique in that it touches upon three of the Great Lakes. It is also home to several iconic lighthouses, which bring tourists into the forest every year. It contains beaches, rivers and streams that run through the forest for miles, and an abundance of wildlife. By planting seedlings within 260 acres of the Sault Ste Marie Ranger District, we will restore land degraded by insect infestations, protecting wildlife habitat, and contributing to overall forest health.

OFS Trees planted: 5,000 Eastern White Pine, Red Pine, Jack Pine, and Eastern Hemlock

Ecological benefits: Over the years this forest has suffered degradation due to Beech Bark Disease. Restoring degraded land is essential in helping a forest bounce back from such devastation. It also puts these areas at lower risk of future threat.

Community benefits: Three of the Great Lakes meet the borders of this forest. It also contains streams and rivers that run for miles. Planting trees will assist in conserving the health of these vital water sources. Healthy watersheds are essential in protecting the overall health of a forest.

Coconino Post-Fire Community-Based Reforestation Project

Project location: Coconino National Forest - Flagstaff Ranger District | Arizona

Project description: During the past 30 years, 15 high severity, stand-replacing wildfires have impacted the Flagstaff Ranger District of the Coconino National Forest. Unfortunately, extremely low natural regeneration has occurred across the 6,100 acre post-burn areas, leaving fire-scars (large deforested zones) for decades. This negatively impacts fauna that depend on the forest, such as the endangered spotted owl, and results in loss of carbon sequestration due to post-fire carbon loss from soils. Reforestation will increase ecosystem productivity and reduce soil temperatures, thereby leading to gains in carbon sequestration. We propose a new strategy for improving reforestation efforts in the Coconino National Forest. This includes partnering with researchers at locally situated Northern Arizona University to grow trees, manage plantings, and involve both college interns and local K-12 schools in reforestation efforts. The voters in Flagstaff recently passed a $10 million bond to increase forest health, which indicates that our community is interested in participating in restoration activities. We propose to involve our community in a "Reforestation Learning Laboratory" by planting trees, which will in turn foster support for National Forest projects in the future. The NAU Restoration Team will plant trees, using professional staff who have planted over 500,000 trees, in addition to an intern program that will train interns in all aspects of reforestation. The intern program will contribute to a much-needed career pipeline from the University directly to the Forest Service.

OFS Trees planted: 5,000 Ponderosa Pine, Limber Pine, Douglas Fir, and White Fir

Ecological benefits: Supporting habitat restoration for fauna that resides in the forest such as the endangered spotted owl.

Community benefits: In the first three years of our partnership with the Coconino National Forest, we have planted trees across 1,200 acres of the Coconino National Forest. Given our higher than predicted rate of survivorship in 2018, we modified our prescription from 170 trees per acre to 100-reforesting 500 acres in 2019 instead of the 300 we accomplished in 2018. Many of these trees were grown by staff at NAU-50,000 each year and were ready to plant by early July-successfully timed to coincide with the southwestern monsoon. The majority or our planting begins in mid-July and carries through into mid-September depending on each year's monsoonal pattern. Then in late August through October is our school program. Over the last two years we have involved over 1,200 middle and high school children, and over 5,000 volunteer hours. In 2019 we added in-class & field-based curriculum to our planting effort with the school children. We worked with local teachers to create this new component and look to expand upon these efforts in 2021. The Coconino NF will provide funds to NAU for project preparation and administration. In addition, the Coconino will also provide the tree shelters to protect the seedlings after planting. The Forest and District is highly supportive of this partnership as it will have the benefit of hiring local nurseries and crews which helps to build local capacity for reforestation efforts, supports the local economy, increases the capacity of the district staff to carry out forest restoration projects, and further engages the local community and schools through volunteer events and educational field trips. We are seeking to fund both seedlings and planting costs.

TLA Longleaf Restoration Project

Project location: Covington and Escambia Counties | Alabama

OFS Trees planted: 5,000 Longleaf Pine

Project description: The overall goal of this project is to restore the Longleaf Pine ecosystem to grow timber products and improve wildlife habitat. Two tracts will be planted in the 2021/22 planting season. Both are cutover forestlands that will be converted to longleaf pine habitat Containerized longleaf seedlings will be planted in January 2022.

Ecological benefits: Reduced risk of wildfire and protection of water quality. Promotes restorative management practices.

Salmon River & Red River RD Spring Planting Project

Project location: Nez Perce Clearwater National Forest | Idaho

Project description: This project is for the scheduled spring planting in several timber sale regeneration harvest areas on the South Zone (SZ) of the Nez Perce-Clearwater National Forest. The total of 813 acres is more than our normal planting -the SZ averages approximately 500 acres/year. Of the 813 acres, stewardship project planting will be conducted on 127 acres. Another 176 acres will be planted in a fuels reduction project area.

OFS Trees planted: 5,000 Western Larch, Engelmann Spruce, Douglas Fir, Western White Pine, and Ponderosa Pine

Ecological benefits: Planting focuses on watershed restoration and fire-resistant species (Ponderosa Pine, Douglas Fir, Western Larch) being reestablished. In addition, more shade-tolerant species adapted to moister areas (Engelmann Spruce and Western White Pine) will be planted on the moister sites.

Community benefits: This project will benefit the overall environment with the area, work to protect the scenic and ecological quality of the forest, which will ultimately allow visitors to appreciate and make use of this land for years to come.

Creek Fire Restoration Project

Project location: Shaver Lake | California

Project description: Post-fire reforestation of Edison Forestry land surrounding Shaver Lake. 3,000-acres burned in the 2020 Creek Fire. Planting will be done by professional commercial tree planting crews in accordance with industry best management practices. Crews consisting of twelve planters and a foreman will use hoedads to strike the earth, open a wedge, plant the tree, and tamp/backfill. This is the most efficient and least carbon intensive form of reforestation. Eliminating equipment ensures minimal impact on the land. This planting will consist of seedlings planted over the course of five years. The multi-year approach allows for modifications in timing, densities, species, distribution, and methodology to ensure the greater success each subsequent year.

OFS Trees planted: 2,011 Ponderosa Pine, Douglas Fir, and Incense Cedar

Ecological benefits: Reforestation will provide the following benefits: **(1)** Retention of soils/reduced erosion. The soil surrounding Shaver Lake has the potential to increase sedimentation in the lake leading to loss of aquatic life. The loss and stress of aquatic life compromises the food source for species adjacent habitats, compromises recreational activity (a catalyst for regional economic development), and impacts long term stability; **(2)** Preventing type conversion. Type conversion occurs when chaparral and shrubs replace historically established conifers. The result of which is loss of habitat and significant changes to Fire frequency, intensity, and behavior. Forests have the ability to naturally regenerate except in conditions where fire intensity and severity compromise the seedbed. This occurs when temperatures exceed temperatures that allow for and promote sprouting. The increase of a few degrees can be the difference between regeneration and sterilization. Chaparral have greater seed count at greater depths with greater longevity. The loss of soil retention leads to runoff that exposed non-conifer species. The only true remedy for this is reforestation. Type conversion is the equivalent to habitat loss. Most species that currently exist and will return from existing forests will be unable to survive. This occurs for flora and fauna; **(3)** Greater carbon sequestration potential. Reforestation will directly lead to greater carbon storage. This is due largely to the greater above and below ground carbon of the relatively quick growing conifers. Soil carbon sequestration also increases notably as canopies better prevent solarization of the soil and allow for a greater accumulation of carbon through organic decomposition. The carbon, water, nutrient, and nitrogen cycles are improved leading to increased ecosystem services; **(4)** As the trees mature and the forest canopy thickens it provides critical shade over salmon spawning grounds. Salmon eggs need to be kept cool, and without adequate shade from vegetation on the banks of the river water temperatures will rise, reducing the chances the eggs have to develop and hatch.; **(5)** Even dying and fallen trees on the banks of the river benefit salmon. Branches and trees that fall into the water help to slow down the flow, making it easier for the salmon to lay their eggs without them getting immediately washed away. Planting trees today means the debris created in the future ensures the salmon have plenty of spots to lay their eggs.

Community benefits: Loss of soil retention reduces the efficiency of its power generation, essentially to the rural Sierra Nevada Mountain communities through reduction in water quality. Increased maintenance or potential shutdowns due to complications with water beyond the correct conditions may lead to increases in operational costs having a potential economic impact on the service area. Recreation is an essential economic driver for the area. Loss of the Forest compromises water conditions crucial for sustainable fishing and detrimental to esthetics for those seeking vacation. Reforestation has a tangible impact through inspiring the community. Crews and labor will act as a minor, yet important, economic contribution to the local economy through lodging and dinning.

Living Lands & Water Project

Project location: Trees have been planted in hundreds of different communities across the Midwest | Illinois, Wisconsin, Iowa, Ohio, Missouri, Kentucky, Indiana, Tennessee, and Minnesota.

Project description: The Million Trees Project began in 2007 with a goal of planting 1 million native hardwood trees. In 2013 OTP broke ground on the Million Trees Project Nursery in Davenport, Iowa, a site dedicated to growing saplings from acorns and to educating visitors and volunteers about the importance of native trees. We reached our million tree goal in 2016 and began our 2021 season with a total of 1,457,611 trees planted. In 2021, OTP plans to distribute 100,000 trees, including Bur Oak, Red Oak, Swamp White Oak, Shagbark Hickory, and Shellbark Hickory. We intentionally only plant mast producing trees so that wildlife have access to nuts and fruits as a viable food source. Trees are planted in communities to reduce the impacts of climate change, increase biodiversity, reduce erosion, and provide shade to river systems to help reduce algae blooms and eutrophication. Beginning in February and throughout the months of March and April, we work with schools and community volunteers to wrap the bare root trees and coordinate tree orders through an online reservation system. Over time we have developed a wide ranging network of schools, NGOs, businesses, city and county park districts, and individuals who help us distribute and plant the saplings, with an estimated 90% survival rate. The trees are distributed across the Midwest either at events or to a local coordinator. Participants receive their tree saplings along with a planting and care guide. While many trees are planted in homeowner yards or on their farms, thousands of trees are also planted during special projects. For example, last year in Cedar Rapids, Iowa, LL&W worked with the city and the parks district to plant trees in sites severely damaged by the Derecho storm.

OFS Trees planted: 5,000 Bur Oak, Swamp White Oak, Red Oak, Shagbark Hickory, and Shellbark Hickory

Ecological benefits: Increased biodiversity, habitat and food for native wildlife, carbon sequestration (we estimate that the Million Trees Project has sequestered 13,402,302 pounds of CO2 since the project began), and root systems that act as filters and protect against erosion.

Community benefits: Beautification of communities, education about native trees and benefits of tree-planting easy access to participation in the project, thousands of volunteers assist each year, and increasing community investment in planting and caring for native trees.

Roy Creek Kirtland Warbler Project

Project location: Huron-Manistee National Forest | Michigan

Project description: This project involves habitat restoration for the Kirtland's Warbler (KW).

OFS Trees planted: 2,800 Jack Pine

Ecological benefits: The lower peninsula of Michigan is one of the prime areas for KW breeding habitat. This project will help restore that habitat.

Community benefits: Benefits for local communities and bird watchers who receive great pleasure in interacting with the wildlife in the Huron-Manistee National Forest.

Chippewa National Forest Project

Project location: Chippewa National Forest | Minnesota

Project description: This project covers multiple sites across the Chippewa National Forest. The reasons for sites needing restoration vary, but include wind events that blow standing trees down, insect and disease where trees are salvaged or harvested for sanitation reasons to limit losses and/or curtail the spread of a forest health vector, enhancement plantings to improve forest stand resilience to climate change, water quality, wildlife habitat improvement, or at the request of the Leech Lake Band of Ojibwa for cultural reasons.

OFS Trees planted: 5,000 Red Pine, Jack Pine, White Pine, White Spruce, Tamarack, Bur Oak, Red Oak, and White Oak

Ecological benefits: Restoration of these pine stands is critical to wildlife that depend on them. Large red and white pines on the Chippewa National Forest also make excellent eagle nesting sites. The Chippewa supports one of the highest breeding densities of American bald eagles in the continental United States. People often make a special trip to the Chippewa to observe bald eagles. Restoring pine stands will ensure that bald eagles continue to have nesting habitat on the Chippewa into the future.

Community benefits: Restoration of these pine stands is critical to wildlife that depend on them, recreationists that enjoy them, and a timber industry that creates hundreds of local jobs. The Ojibwa community living on the Leech Lake Reservation also has a bond to these forests.

George Washington North Zone Project

Project location: George Washington and Jefferson National Forest - Lee Ranger District, North River Ranger District | Virginia

Project description: The Shortleaf Pine restoration project of FY2022 will cover approximately 75 acres (at 750 trees/acre) across the North Zone of the George Washington/Jefferson National Forest.

OFS Trees planted: 5,000 Shortleaf Pine

Ecological benefits: Shortleaf Pine is of particular interest because seedlings and saplings can re-sprout after a fire, which provides them competitive advantages over other species in future climates. Being associated with fire-maintained, open-canopy ecosystems, the presence of Shortleaf Pine has historically had a positive impact on populations of federally endangered red-cockaded woodpecker (Picoides borealis).

Community benefits: With an abundance of ecological, economic, and cultural benefits, forestry professionals realized the importance of establishing a formal conservation plan focused on regenerating and managing viable populations of Shortleaf Pine.

Spokane River Restoration Community Plantings Project

Project location: Thompson Creek/Newman Lake, Hangman Creek Hein property, Marshall Creek, Davis Property | Washington

Project description: The Lands Council works to protect the forests, water, and wildlife of the Inland Northwest. We do this in part by planting thousands of trees annually. Over the past 38 years, The Lands Council has planted over 100,000 native trees and shrubs along riparian areas in and around Spokane with the help of thousands of generous community volunteers. These trees reduce erosion, lower stream temperatures, and keep toxins from entering our waterways - protecting our entire watershed. Over the next 3 years, The Lands Council will be planting three large restoration sites with tens of thousands of native trees. Our three sites are Thompson Creek/ Newman Lake; Hangman Creek; and Marshall Creek (details attached). We would like to partner with One Tree Planted to plant these sites with One Tree Planted trees. With OTP support, we will purchase seedlings from our local distributors that sell native bare-root stock. With the help of volunteers and our partners, we will pot these seedlings to help them establish, filling our nurseries trees. The trees will be stored, maintained, watered and cared for at our two nurseries until they are ready to be outplanted at our three sites over the next 3 years. The trees will be planted at community volunteer tree planting events like Reforest Spokane Day, and at school field science plantings. OTP will be recognized and promoted as a sponsor of the trees at our planting events.

OFS Trees planted: 5,000 Quaking Aspen, Black Cottonwood, Coyote Willow, Pacific Willow, Drummond Willow, Douglas Spiraea, Golden Currant, Black Hawthorn, Red Osier Dogwood, Woods Rose, Pacific Ninebark, Mock Orange, Snowberry, Serviceberry, and Chokecherry

Ecological benefits: The Lands Council proposes to reduce the level of impairment at these sites by planting hundreds of native trees and shrubs. The intrinsic beauty of the natural riparian ecosystem will elevate the aesthetic value of the properties. Restored riparian habitats provide excellent wildlife viewing opportunities for the public, as well as an opportunity for environmental education and demonstration of ecological principles for the volunteers implementing the restoration. Enhancing riparian ecological factors on these sites will stabilize streambanks, improve water quality, build connections to habitat corridors, and feed downstream reaches with native source material to areas otherwise exposed to urban disturbance and agricultural impacts.

The type of restoration to be conducted focuses on the recovery of ecosystem health and integrity, and the return of a degraded ecosystem to its former state. Restoring riparian vegetative communities will greatly improve watershed health. Riparian buffers will filter pollutants, sediments, and pathogens and aid in reducing elevated stream temperatures. As the trees mature, age, and eventually die, they become valuable riparian habitat components as potential large woody debris in streams for added habitat and complexity. On a larger scale, restoring riparian communities and increasing connectivity between these communities will improve water quality and restore the overall integrity of the riparian corridor.

Community benefits: Riparian restoration activities will be carried out by groups of students and community members. These volunteers will be educated on the Greater Spokane River watershed and its water quality issues, the importance of native vs. non-native vegetation, and the function of riparian buffers in correcting water quality problems in the watershed. They will also be trained on-site on safety and proper planting methods. Coming together to achieve a shared goal builds community and strengthens social bonds. Throughout the years, The Lands Council has hosted hundreds of community tree planting events. Volunteers consistently leave in high spirits. They experience pride and gratitude after connecting with nature and each other by getting their hands dirty in the soil. A shared sense of community investment brings people together and draws awareness to their local environment. The opportunity to gather and plant a tree that will benefit the whole neighborhood is powerful...especially in a post-COVID world of isolation and social distance.

Chequamegon-Nicolet National Forest Reforestation Project

Project location: Chequamegon-Nicolet National Forest, Washburn and Great Divide | Wisconsin

Project description: Tree seedlings to be planted on 575 acres across three ranger districts on the CNNF in the spring of 2022.

OFS Trees planted: 5,000 Pinus Resinosa, Pinus Strobus, Pinus Banksiana, Tsuga Canadensis, and Larix Laracina

Ecological benefits: Reforestation of National Forest lands after severe wind events and timber harvest is an important activity that serves to maintain a healthy and productive National Forest for the present and future.

Community benefits: Reforestation helps to maintain and enhance watershed function and improve wildlife habitat for tourist attraction. The surrounding communities depend on these forest for several outdoor activities such as hiking and gathering forests products.

Hell Canyon Salvage Timber Sale Planting Project

Project location: Medicine Bow-Routt National Forest - Brush Creek/Hayden Ranger District | Wyoming

Project description: The 2021 Hell Canyon Salvage Sale Planting will plant 215 acres of the best growing sites for lodgepole on the Medicine Bow-Routt National Forest. In the late 2000's the Forest was severely hit by mountain pine beetle, causing mortality of 70-90% of lodgepole on the forest, and more so in the area being planted in. Hell Canyon area was salvage logged in 2017-2019 and in post-harvest monitoring it has been determined that regeneration is now favoring subalpine fir. We're working to regenerate Lodgepole in an area that has historically been a high-productivity site for Lodgepole Pine. The stands being planted were site prepped for planting in 2019 and are planned to be planted in spring 2021.

OFS Trees planted: 5,000 Lodgepole Pine

Ecological benefits: The District has a history of tree planting, but none has occurred in the last several years. The forest has relied heavily on excellent natural regeneration prior to the mountain pine beetle epidemic and the last planting was in 2012. The area being planted in 2021 has low cone serotiny and loss of seed viability. We're hoping to start a planting program with this project in 2021 and continue to plant in mountain pine beetle affected areas into the foreseeable future. The mountain pine beetle mortality forest-wide has created a large need for salvage logging to reforest stands, and to promote reforestation to quickly reestablish forest cover to improve watershed health, visual quality, endangered, threatened, and sensitive plant and species habitats. Prioritized planting in recently salvaged areas will provide this necessary "stand reset" and stabilize areas hardest hit by catastrophic stand replacing disturbance.

Community benefits: Community benefits will include improved watershed quality, scenic enhancements to the area and increased overall health of the region.

Green Bay Replanting Project

Project location: Wye Mountain | Arkansas

Project description: Containerized, native Shortleaf Pine seedlings will be planted on an 8 foot by 10 foot spacing, yielding 454 seedlings per acre (1,121 per Ha). This property serves as a restoration demonstration site for us and our state and federal partners.

OFS Trees planted: 5,000 Shortleaf Pine

Ecological benefits: Urbanization is threatening in-tact forested landscapes critical to the protection of the drinking water source for a half-million people. This tract was clearcut by a timber company, and was acquired by Central Arkansas Water, which will conduct an ecological restoration at the site, replanting the native Shortleaf Pine. Central Arkansas Water (the largest municipal supplier of water in the state), has a history of watershed protection efforts. In 2007, their Board adopted the Lake Maumelle Watershed Management Plan which birthed the Watershed Protection division of the utility. To-date, the utility has protected more than 12,200 acres of land in the watershed and with this project, will have planted more than 136,000 trees in reforestation efforts. The tract contains portions of Reece Creek, one of the main tributaries to Lake Maumelle. Native Shortleaf Pine trees will increase forest resiliency to climate change. The tract also boasts sweeping views of Lake Maumelle, which increased the threat of future development. CAW is pioneering new models to deliver protection at scale, like issuing the world's first certified Green Bond to protect forests for water quality, the proceeds of which purchased this property.

Community benefits: Safe, affordable, reliable drinking water for over 500,000 residents and increased acreage of public lands 10 miles from Little Rock. This project will increase protected forested buffer areas along Reece Creek and create a forest filter for water quality protection and enhancement. It will increase the useable life of Lake Maumelle as a drinking water source for current residents and future generations.

Moonlight Fire Area Restoration Project

Project location: North Central Plumas County (Moonlight Fire, Walker Fire, & Dixie Fire Footprint) | California

Project description: The Moonlight Fire Area Restoration Project is restoring approximately 12,703 acres in the Moonlight Fire area and is located on National Forest System lands on the Plumas National Forest (PNF), Mt. Hough Ranger District. In 2007, the Moonlight Fire burned 65,000 acres of the Plumas National Forest, 37,000 of which burned at stand-replacing high severity converting forests dominated by long-lived conifers to shrublands dominated by montane chaparral species. The Moonlight Fire Area Restoration Project will complete watershed and forest health restoration activities in areas where the high severity fire occurred. Some of the Moonlight Fire Area reburned in the 2019 Walker Fire and the 2021 Dixie Fire which has added restoration units that are immediate priorities.

OFS Trees planted: 5,000 Ponderosa Pine, Jeffery Pine, Sugar Pine, Incense Cedar, and Douglas Fir

Ecological benefits: This forest fire restoration project will produce ecological benefits that include reforestation for biodiversity and habitat restoration, erosion control, and carbon sequestration for climate stabilization.

Community benefits: This project will benefit the local community by creating jobs and restoring the health of the watershed and landscape.

Longleaf Restoration Project

Project location: The historic range of Longleaf Pine | Southern Mississippi

Project description: Restore Longleaf Pine on private lands through plantings, prescribed fire and other management treatments within priority areas in Mississippi, benefiting gopher tortoise, northern bobwhite and Bachman's sparrow. Project will help address long-term prescribed fire capacity issues as well as provide financial assistance to landowners and contractors offset some of the costs associated with managing fire-maintained habitats, resulting in improved management Longleaf Pine forests. This proposal will establish 320 acres of longleaf pine, and educate landowners with outreach programs. It also will expand the existing Fire on the Forty Program by improving fire culture while increasing prescribed fire on the landscape. Proposed outcomes of these projects will significantly contribute to America's Longleaf goals by increasing, maintaining, and enhancing Longleaf Pine in MS.

OFS Trees planted: 5,000 Longleaf Pine

Ecological benefits: Partners will organize gopher tortoise surveys in key conservation areas to assess progress. Partial match may include management activities on a priority gopher tortoise conservation site in Southeast MS. Prior management of this site has shown a significant increase in gopher tortoise recruitment; some of the highest reported in MS. Since MS is host to the threatened gopher tortoise, black pinesnake, and other priority wildlife and plant species dependent on fire-maintained ecosystems, a primary objective for South MS is to improve prescribed burning capacity and long-term prescribed fire sustainability. South MS contains more than 3 million acres of pine forests.

Additionally, in cooperation with the respective species recovery leads, the USFWS Mississippi Migratory Bird and Ecological Field Office will continue to promote and look for opportunities to coordinate and facilitate research and monitoring projects targeted at furthering our understanding of species-habitat relationships and their response to management activities.

Community benefits: Mississippi contains one of the highest poverty rates in the United States with nearly 20% of MS residents falling within the poverty range (U.S. Census Bureau). We also report having one of the lowest safety scores in the nation. Conservation projects and outdoor recreation opportunities could markedly support America the Beautiful environmental equity and inclusion principles throughout the state.

Shingle Fire Restoration Project

Project location: Dixie National Forest, Kane County Intermountain | Utah

Project description: The objective of this project is to re-establish fire tolerant species to provide forest cover on approximately 250 acres within the Shingle fire footprint. This project will plant Ponderosa Pine seedlings.

OFS Trees planted: 5,000 Ponderosa Pine.

Ecological benefits: The project will restore forest and enhance recreational experiences. This will be sixth year of planting in the 8,284 acre Shingle fire of 2012. The Shingle Fire area is predominately ponderosa pine. Many different species of wildlife can be found in the area including elk, mule deer, pronghorn antelope, and Northern Goshawk. Ponderosa Pine is an important species of tree for these wildlife.

Community benefits: The Shingle Fire occurred in Mill Canyon and the surrounding areas; this is a very important high recreational area for local people. There are many OHV trails that run through the area and it's a very popular spot for dispersed camping.

Tornado Restoration & Bingham Longleaf Reforestation Project

Project location: The Davy Crockett Ranger District, Angelina County, Houston | Texas

Project description: The Davy Crockett Ranger District is proposing to restore 200 acres within compartment 34, to increase forest health, maintain biodiversity, and restore the Red-cockaded woodpecker (RCW) habitat, which is a Threatened and Endangered Species (TES). Restoration within the 2019 tornado path will involve planting containerized Shortleaf Pine in areas where pine regeneration is not occurring and within areas that favor Shortleaf Pine over other tree species.

OFS Trees planted: 5,000 Shortleaf Pine and Longleaf Pine

Ecological benefits: Regenerating this location will also help with watershed restoration. This area was in a Loblolly Pine stand that had a recent regeneration cut as well as site preparation for planting 62 acres of containerized Longleaf Pine seedlings in Compartment 73. Replanting the area with Longleaf Pine will help restore this area back to its historic Longleaf ecosystem, which also supports RCW Habitat.

Community benefits: The U.S. Forest Service manages approximately 675,000 acres of public land in Texas. This land is divided into four National Forests in east Texas and the Caddo-Lyndon B. Johnson National Grasslands in northeast Texas. These public lands are administered under multiple-use management to protect and obtain the greatest benefit from all forest resources: recreation, range, fish and wildlife, soil and water and minerals.

Maine Reforestation Project

Project location: Sites that have been impacted by intense logging activities combined to heavy moose grazing and grass invasion, and that will not regenerate by themselves in medium term (10 years). Those sites are located in timberlands located in Maine that have been recently bought by Solifor | Maine

Project description: The purpose of the project is to restore healthy forests ecosystems, which will provide habitat for wildlife and will contribute, at the landscape scale, to the increase of the presence of forest species that have been negatively impacted by the intense harvest that occurred in the region in the past century. Seedlings will be planted uniformly with a density of 2250 trees per acre with 1320 OTP-funded trees per hectare. Seedlings will be more spaced if natural trees are already on the site.

OFS Trees planted: 5,000 White Spruce, Larch, Red Pine, and White Pine

Ecological benefits: That project will restore forests in sites that were forested before, and that won't regenerate by themselves at medium term. Therefore, the project will contribute to provide habitat to species that occupy forest instead of open areas, for shelter or alimentation use, like moose, deer, bears, foxes, hares, grouses and many other mammals, birds and insects. Moreover, the project will contribute to increase, at the landscape level, the proportion of forest species that were negatively impacted by the heavy harvest of the last century, like pine and spruce, thus helping those species to remain in the landscape in the next decennies, and even to spread. It will contribute to the ecosystem resistance and resilience against insects, especially the spruce budworm. It will also contribute to the capture of carbon through trees and, therefore, to the fight against climate change.

Community benefits: This project will create and help to maintain jobs in Northeast Canada and in US. In Canada, it will contribute to maintain a dozen good quality jobs in a small community that live mostly from the forest sector, in addition to contribute to the improvement of a forestland that is owned by more than 700,000 Quebecers. In the US, it will provide seasonal jobs to approximatively ten planters, plus the companies in charge of the site preparation. It will help to keep a small US customs and border patrol lodge open. It will also provide long term jobs to the American foresters that will be mandated to follow and monitor the plantations and for a future harvesting.

Monarch Butterfly Project

Project location: Cerro del Cacique, Zitacuaro, Michoacan | Mexico

Project description: For this project we will take advantage of our great relationship with the local communities; their knowledge of the area, planting practices and willingness to combat deforestation.

OFS Trees planted: 5,000 Oyamel and Smooth-bark Mexican Pine

Ecological benefits: The degradation of the area is hard to notice from an outsider's perspective, because the canopy appears fine; tall and healthy looking trees extend all over the skirts of the mountain in which we are planting. But a closer looks reveals the problem; the Abies religiosa (Oyamel), nesting site of the monarch butterfly, only appears in small numbers (which is a problem considering this site is a historically kwon home of the species) and is being displaced further up the mountain (1 meter every year). The reduction and displacement are being caused by two main factors: overexploitation and climate change. The first one finds its origin in a familiar place: human need for development. The wood of the Abies religiosa is used to make the boards of train tracks, during the establishment of the Mexican railroad system in the state of Michoacán some of the local people took advantage of this fact to establish logging and manufacturing sites in which the boards where made, severely affecting the Oyamel population and displacing it from its original place. When it comes to the affectation caused by climate change, the reason is very simple; the Abies religiosa has a hard time in temperatures above 25 degrees Celsius, and with the continuous increments of average temperatures due to climate change, the Oyamel has had to retreat further up the mountains in search of colder conditions. The ecological benefits we are looking for involve the recuperation of the local ecosystem; planting Abies religiosa in efforts to recover its home, which in consequence will help preserve the monarch butterfly's home, and in an interesting and very important fact, this efforts will also help in the conservation of water; spring water is found across the region and its mountains. Recently, one of the nearby mountains lost its vegetative cover due to deforestation and of the 5 springs that it had, only one is left. The lifespan of the Abies religiosa is of around 300 years, with every tree we plant, but most importantly with every tree we make sure survives (by monitoring and working side by side with the local people) we look to add 300 years of ecosystemic services to the region.

Community benefits: The communities that inhabit this region (mainly being the indigenous community of San Juan Zitacuaro, the indigenous community of Nicolás Romero, and the indigenous community of El Aguacate) depend on the wellbeing of the ecosystem for two main reasons: keep the ecotourism and protect their water resources. The ecotourism is a big way in which the communities get their income; by being a known nesting site for the monarch butterfly it receives visitors from all over the country and other parts of the world, and if the habitat of the monarch gets displaced (or even worse disappears) so will the visitors that travel to witness the beautiful natural occurrence. The communities 'water resources are tightly connected to the vegetative cover of the area, springs are found over the region and are the main source of water for the communities, the springs need the vegetative cover to remain healthy and reload. One of the neighboring mountains lost its vegetation and with it went its spring (Cerro Pelon only keeps one of the 5 springs it had). By planting the right species in the right time, and ensuring they survive we help to keep the communities to keep one of their sources of income and, more importantly, safeguard their water.

Bullseye Ferry Planting Project

Project location: Bullseye Ferry Preserve along the Indian River | Delaware

Project description: This planting project is to be completed on a natural preserve in Bullseye Ferry. The land, which has been taken out of agricultural production, is in need of a high quality tree planting project for soil stabilization, natural beauty, carbon sequestration, and more. Native tree planting, planted plantation style with tree shelters to allow for maintenance to maximize tree seedling success. OTP planted 300 trees per acre. This preserve is projected to be opened to the public in the future. The surrounding forest and planting site is inland dune and ridge forest, and one of Delaware's rare woodland/forest communities. These communities inhabit rarer species such as Shortleaf Pine and Blackjack Oak, in addition to other more common species such as White Oak, Southern Red Oak, Post Oak, Chestnut Oak, Persimmon etc.

OFS Trees planted: 5,000 Shortleaf Pine, Post Oak, Chestnut Oak, Blackjack Oak, White Oak, Southern Red Oak, Persimmon, Black Oak, and Pignut Hickory

Ecological benefits: The planting at Bullseye will reduce nutrient runoff into the Indian River and will increase carbon sequestration. Numerous wildlife utilizing the surrounding forests will benefit from additional forested habitat. The site being restored houses an inland dune; inland dune and ridge forests are a habitat of conservation concern in Delaware. We are doing our part to restore these threatened habitats.

Community benefits: The community will benefit from increased forested habitat. This area will be opened to the public in the future as a nature preserve to recreate in. Opportunity for a planting event in the spring 2023.

Resilience Planting Project

Project location: Flathead National Forest - Swan Lake Ranger District and Tally Lake Ranger District | Montana

Project description: The project aims to plant Western Larch, Ponderosa Pine and White Pine throughout the "island Unit" of the Swan Lake Ranger District and the Griffin Creek area of the Tally Lake District. These three species are the most long-lived, disease, fire and insect resistant species we have on the Flathead National Forest.

OFS Trees planted: 5,000 Ponderosa Pine, Western Larch, and Western White Pine

Ecological benefits: The objective of the planting is to increase long-term resilience to wildfire, insects, and diseases in harvested units. The sites are understocked with poor representation of species that are resilient to perturbations. There are not enough healthy seed trees of desirable species to regenerate the sites naturally. The three species of trees are the most long-lived, disease, fire and insect resistant species we have on the Flathead National Forest.

Community benefits: The Flathead National Forest is 2.4 million acres of lakes galore, rugged wilderness, wild rivers, over 2,000 miles of trail, campgrounds, ski areas, and year-round beauty. This forest is a premiere natural landscape of the American West.

Wolf Creek Riparian Reforestation Project

Project location: Clary Boulee McDonald Nature Preserve, Liberty Township, Seneca County | Ohio

Project description: The 160-acre property was acquired by Black Swamp Conservancy in 2021, to create a nature preserve to protect existing habitat along Wolf Creek and to restore adjacent agricultural fields to native habitat. About one-third of the site contains natural habitat, including secondary growth woods and around 25 acres of high- quality mature riparian woods that contain 10.5 acres of forested/shrub wetland. The restoration area is 100 acres of agricultural field, 35 acres of which lie in the floodplain of Wolf Creek. The site is on the periphery of the area historically known as the Great Black Swamp, and has undergone the drainage practices common throughout the region. Subsurface drainage tile, ditching, vegetation clearing, and the loss of natural topography from years of plowing have resulted in nutrient enrichment, excessive sedimentation, and habitat loss in the watershed of Wolf Creek. The objectives of this restoration project include nutrient and sediment reduction and habitat improvements in this watershed. These goals will be reached through removal and daylighting of drainage tile on site, creation of 45 acres of wetlands (including emergent, scrub-shrub and forested wetlands), restoration and construction of oxbows in the floodplain of the creek, and conversion of 50 acres of agricultural land to riparian woods and native meadow habitat. The reforestation of the agricultural fields is the focus of our request from One Tree Planted. To restore wetlands, floodplain connectivity, and floodplain oxbows on this large site requires detailed engineering and design work, plus a large amount of earth moving. The bulk of our current restoration budget is taken up by those components, leaving too small of a planting budget to reforest more than about 30 acres. With One Tree Planted's funds, we will be able reforest 14 more acres of the agricultural fields at a density of 350 trees per acre.

OFS Trees planted: 5,000 Eastern Redbud, White Oak, Red Oak, Post Oak, Sugar Maple, Shagbark Hickory, Shellbark Hickory, Black Walnut, Black Gum, American Sycamore, Swamp White Oak, Bur Oak, Pin Oak, Silky Dogwood, Gray Dogwood, and Black Cherry

Ecological benefits: The Wolf Creek Riparian Reforestation and Floodplain Restoration will convert 100 acres of high intensity row crops into a natural mosaic of native floodplain, riparian and associated upland habitats. The site lies in the agriculturally dominated rural landscape of the Western Lake Erie Basin. Creating 100 acres of habitat in an important watershed of this region will yield numerous ecological benefits. The restoration area lies alongside 60 acres of existing habitat, including mature riparian forest that contains high quality forested wetlands. The reforestation areas will about the existing riparian forest, creating a buffer between adjacent agricultural lands and creating a larger, contiguous patch of habitat. Wolf Creek runs through the middle of the property, so our restoration along both sides will create a large patch of habitat accessible to the many wildlife species that rely on riparian corridors. Restoring wetlands and oxbows in the floodplain, and planting trees along the banks will improve aquatic habitat in Wolf Creek by cleaning runoff and providing shade. This will lead to better habitat for fish species. The wetland and floodplain restoration and the plans to capture field tile outflow from neighboring farms and flow it through the oxbow and wetland features will reduce nutrient and sediment pollution, improving water quality downstream, for humans as well as aquatic species. The hydrologic improvements to the site will affect waters from an approximately 120 square mile watershed that drains to this property. The wildlife species that will benefit from creating 100 more acres of habitat in a critical watershed are too numerous to list. Our past projects like this have shown an immediate increase in frogs, wetland birds and dragonflies, to name just a few.

Community benefits: Seneca County, Ohio, is dominated by privately owned agricultural lands. The County only has 11 public parks, totaling 738 acres, plus 2 state nature preserves containing 175 acres. The 160-acre property where this restoration project is taking place will be donated to Seneca County Parks after the restoration, and it will be named the Clary Boulee McDonald Nature Preserve. This will increase the publicly accessible natural areas in the County by about 20%. By contributing to more reforestation on this site, OTP will improve this site for future passive recreation by the 55,000 county residents. The reforestation of these former agricultural fields, as well as the wetland and floodplain restorations, will contribute to water quality improvements that will benefit the downstream communities. Additionally, the Conservancy will host at least 2 volunteer tree planting days. We will recruit volunteers from nearby Heidelberg University, as well as other youth and community groups. The volunteers, particularly the students, will learn about the natural communities of northwest Ohio, the importance of healthy watersheds, and habitat restoration.

Chesapeake Bay Clean Water Project

Project location: Kaminski Site, Shriver Site, Beachy Site, Stevens Site, Antietam National Battlefield Site, Ridenour Swamp Site, Taylor Site, Dahbura Site | Maryland

Project description: This project seeks to improve the water quality of the main stem of the Chesapeake Bay by reducing non-point source pollution, namely inputs of nitrogen, phosphorus, and suspended solids. To achieve this goal, we are requesting funding to re-establish native forests on 89.7 acres of private and public land in Garrett, Allegany, and Washington Counties, Maryland, including 24.6 acres of new riparian buffer and 19.9 acres of formerly mined lands. This project will utilize the reforestation methods and strategies identified by the Maryland Department of Natural Resources (DNR) Forest Service, and will be executed in close coordination with DNR Forest Service field staff based in all three counties. To maximize the success of our reforestation efforts, this proposal requests funding for site preparation and two years of planting maintenance to be completed in coordination with the DNR Forest Service. Project funds will be used to secure a private contractor to reforest sites located on 8 properties across Garrett, Allegany, and Washington Counties according to shovel-ready planting plans that have been developed by the DNR Forest Service.

OFS Trees planted: 5,000 trees

Ecological benefits: This project aims to address the levels of nitrogen, phosphorus, and sediment which exist in the Chesapeake Bay through the reforestation of sites located across western Maryland. The planting of 24.6 acres of new riparian buffer will be of paramount importance to addressing several major conservation efforts, including improving the water quality of the local watersheds, erosion control, flood mitigation and storm water management, carbon sequestration, and young forest habitat restoration. The young forest habitat restoration is especially important for promoting population rebounds of vulnerable and threatened species such as the Golden-winged and Cerulean warblers. This project will support existing efforts by Antietam National Battlefield to address water quality issues present in Antietam Creek. The surface waters of Antietam Creek are generally characterized as being of good quality, although the area is showing some impacts from human activities. Primarily agricultural, wooded, or rural residential land users surround the creek and its tributaries within the battlefield; however, upstream municipalities and the neighboring town of Sharpsburg may also impact the quality of the park's water resources. These are problems that affect many natural areas in the face of intensive agricultural practices and increasing development. Park resource managers have identified specific threats to the quality of Antietam's surface and groundwater resources, including agricultural runoff or nutrients and erosion into park surface waters possibly causing eutrophication or sedimentation and storm water runoff from the streets of Sharpsburg. The National Park Service joined the Chesapeake Bay Program in 1994 with a commitment to aid in the creation of streamside riparian buffer zones. The creation of 14.5 acres of new riparian buffer through these plantings will bolster the Park Service's efforts in this area and improve the water quality of Antietam Creek. The plantings will contribute towards Maryland's goal for no net loss of forests, and Maryland Stream ReLeaf prioritization in floodplains and headwaters. This project will also address the 2014 Bay Agreement goals of promoting abundant life, clean water, increasingly engaged communities, and climate change resiliency in the Chesapeake Bay watershed through the establishment of young forest habitat in western Maryland in tandem with our proposed radio broadcast, social media, and in-person outreach. Specifically, this project supports the long-term goal of 70% riparian forest

Community benefits: There will be 4 private landowners participating in the project. Each of these landowners will benefit from the increased ecological and recreational value that the reforestation projects will bring to their properties. The location of the plantings on the Antietam National Battlefield and within the Ridenour Swamp Wildlife Management area will mean that the public will have the opportunity to benefit from the added aesthetic and ecological values of those plantings.

The Merrimack River Watershed Project

Project location: The Merrimack River Watershed | New Hampshire.

Project description: 12 miles of protective riparian buffers will be restored at critical water bodies across an estimated six priority HUC12 sub-watersheds. An average buffer of 300ft (width) across 12 linear miles (length) will result in approximately 436 acres of direct forest enhancements. A robust suite of ecological restoration techniques will improve riparian forest function and make it more climate-adaptive. 4 representative sites will be selected as demonstration sites to teach landowners about the process (and long-term maintenance needs) of Resilient Riparian Forest Management. Depending on the needs of each site, practices include: **1)** use of local, native nursery stock for tree-planting, and **2)** multi-age tree installation (ranging from 2+0 seedling to 1.5" caliper). Additional restoration practices to complement tree-planting may include the following at bordering forests needing restoration: **3)** opening of regeneration gaps to favor large tree growth, **4)** practices to control invasive species, **5)** recommendations for forest infrastructure improvements that adapt to extreme rain events including appropriately-sized and designed roads, culverts, bridges, forestry layouts, erosion controls.

OFS Trees planted: 2,989

Ecological benefits: The Merrimack River Watershed totals 2.1 million acres, is the fourth largest watershed in New England, and is split almost evenly between New Hampshire (54%) and Massachusetts (46%). The watershed is experiencing rapid development and fragmentation of its heavily forested rural, suburban and exurban areas. The 2020 MA State Forest Action Plan (MA Plan) points out that MA is the 3rd most densely populated state in the country and the 11th most forested state by percent forestland, and loses 13.5 acres of forest per day to development. This is echoed in the 2010 NH State Forest Action Plan (NH Plan)- NH is the 2nd most forested state and is on track to lose 5% of its forests between 2010 and 2025. The Merrimack River Watershed is identified as a priority landscape due to its role in producing clean water and the importance of protecting its forests from harm (NH Plan p.49) and because of its vulnerability to forest conversion (MA Plan p.175). The rapid loss and fragmentation illuminates 3 priority issues, all heavily embedded throughout both state's Plans, that our project will tackle: **1)** Protect water resources through targeted forestry and restoration best practices. Our project will develop a replicable model to triage, plan, implement and maintain riparian buffer restoration with high-precision identification of project sites in land-base zones immediately adjacent to rivers, lakes and ponds that provide source water. Functional riparian forests are critical to water quality protection, especially to stabilize banks and minimize soil erosion, protect from sedimentation, nutrient and other nonpoint source pollutant loading, moderate streamflows, and cool water temperatures. Sites selected will represent an assortment of these different threats to water resource protection, to demonstrate actionable, cost-effective solutions on the ground. Projects from Year 1 will be highlighted in workshops during Years 2 and 3. Tree-planting will follow US Forest Service tree-planting guidance and will source from the NH State Nursery and a MA DCR- approved nursery, both of whom source native species from local seed, and can provide cost-effective rates for this project due to our partnership with both state agencies. Both planting plans and long-term maintenance plans will be developed for each site; **2)** Improve resilience of forests to adapt to stressors and maintain forest ecosystem health and vitality. This project works to overcome the parcelization and fragmentation of forestland to improve function of critical riparian areas with forestry and restoration techniques that enhance resilience. This will improve the riparian forests capacity to bounce back from the increase in climate change-induced stressors of extreme precipitation and storms, flooding, drought, and the changes in soil moisture and temperature fluctuations that is increasing tree mortality. We draw guidance from the MA Plan, which draws heavily from the 2018 MA State Hazard Mitigation and Climate Adaptation Plan. We also draw specific watershed forestry guidance from the Northern Institute of Applied Climate Sciences and the UNH Forest Resilience Tool. Four project sites are already selected and 'shovel-ready'. Selected for demonstration purposes, they vary in their degradations, including- rampant invasive species, soil erosion from clear-cutting to the water's edge, agricultural areas with no buffer at all and livestock access right down to the river, and overstocked single species/single aged forest; **3)** Increase landowner knowledge and connection to the land. As forests are increasingly fragmented, parcels are trending smaller. This means there are more private small parcel landowners who need education and engagement. This project builds off the success of engaging the increasing number of private landowners with Forest Management Plans and stewardship training and resources already underway by state agencies. It will tie together work at the individual parcel-scale to the landscape-scale, increasing the contiguity and resilience of riparian forests.

50 Million Tree Program

Project location: Various locations across Ontario | Canada

Project description: This program plants and tracks millions of trees each year in Ontario on more than 500 sites annually and in collaboration with more than 80 planting partners. The program ensures that the right trees are planted in the right place, at the right time to maximize ecological benefits. We offer a comprehensive approach to planting by overseeing the entire process from seed to tree to survival. We and our on-the-ground partner network work together with the local landowners providing technical expertise, resources and training to ensure the long-term survival of trees and healthy planting sites. The trees selected for our tree planting programs are source-identified stock; species, stock type, and site preparation that are all customized to the project's scope and goals. We source trees from our robust network of local tree nurseries that grow from local seeds. This greatly improves survival, optimizes carbon sequestration, and ensures that new forests continue to provide benefits for generations to come. Our partners are required to complete survival assessments in the 1st, 2nd and 5th year growing seasons. Over the 2nd and 5th year growing season, Partners work directly with landowners to adapt their tending regime and implement maintenance based on results of the assessment, which are conducted during this timeframe. This information is used to compile a complete record for a planting project that can be referred to as needed. All tree planting project information, from seed to 5th year monitoring, is entered directly into our web-based tree planting tracking system. We provides resources, including protocols, Standard Operating Procedures, best management practices, the importance of monitoring, forest health, forest management and stewardship activities to Partners. These resources ensure Partners and landowners steward new forests through successful planting, establishment and tree maintenance. Beyond the fifth year growing season, landowners are encouraged to reach out to us if their planting partner directly regarding their trees.

OFS Trees planted: 4,000 Eastern White Pine, White Spruce, Red Pine, Norway Spruce, Eastern White Cedar, Red Oak, Tamarack, Silver Maple, European Larch, and Bur Oak

Ecological benefits: Increasing forest cover is critical to ensuring healthy forests for our future, as well as their associated values. Trees and forests sequester harmful emissions, reduce flooding and provide a cooling effect for our cities and towns. Trees are climate warriors, absorbing carbon dioxide from the atmosphere, storing it as carbon, and releasing oxygen for us to breathe. Trees clean the water we drink and when planted along waterways and areas with poor soil conditions, trees can be a form of erosion control. Tree planting creates forests and connects fragmented forests which will support wildlife habitat and maintain local plant and animal biodiversity. Tree planting is used to secure the health of our existing forests, establish new forests, connect forests, and improve the overall resilience of our landscapes.

Community benefits: Trees and forests are integral components of healthy ecosystems that support healthy communities. They provide places in the community for outdoor recreation with biking and hiking trails, opportunities for neighborhood gatherings in our green spaces, and places to play in our local parks. Our own mental and physical health and well-being are intricately interconnected with the health of our natural environment. Not only do green spaces encourage us to get outside and get active, but being around trees has proven to improve our mood, memory, and cognition. Forests and green spaces have also been linked to a significant decline in stress, improved rehabilitation, faster hospital recovery rates, and a decrease in the severity of symptoms in attention deficit disorders. By highlighting the links between human health and the health of rural and urban forests, Forests Ontario's tree planting initiatives will stimulate collaborative action to significantly enhance and restore forest cover across Canada.

Sheridan Fire Reforestation Project

Project location: Camp Wood - Chino Valley Ranger District, Prescott National Forest | Arizona

Project description: The Sheridan Fire burned 21,482 acres in 2019 in the Camp Wood area of the Prescott National Forest. The majority of the fire burned through Pinyon-Juniper evergreen shrub and chaparral vegetation types, however about 3,500 acres burned through ponderosa pine forests on the east side of the fire. The project will be the first planting on the Prescott National Forest in 10 years and will start with an initial planting in 2023 of 100 acres. A total of 30,000 trees will be planted within the Stringtown Wash watershed which is identified as a priority watershed on the Prescott National Forest.

OFS Trees planted: 5,000 Ponderosa Pine

Ecological benefits: These Ponderosa Pine ecosystems were burned at high severity and the fire was standing replacing. This area is a transitional pine ecosystem and with limited seed sources available, it is expected that the area will convert to a chaparral ecosystem for the next 100+ years. The Camp Wood area of the Prescott National Forest is a beautiful, shaded Ponderosa Pine forest and is a popular recreation area for the people of Prescott, Chino Valley and Phoenix. The area is home to elk, mule deer, and wild turkey and is a habitat for the Northern Goshawk, which is a species of concern in the USDA Forest Service Region 3.

Community benefits: The Camp Wood area of the Prescott National Forest is a beautiful, shaded ponderosa pine forest and is a popular recreation area for the people of Prescott, Chino Valley and Phoenix. The area is home to elk, mule deer, and wild turkey and is a habitat for the Northern Goshawk, which is a species of concern in the USDA Forest Service.

Blackwater River State Forest Reforestation Project

Project location: Blackwater River State Forest, Santa Rosa and Okaloosa Counties | Florida

Project description: This planting is part of an ongoing project to restore Longleaf Pine forests in Blackwater River State Forest. Approximately 100 acres in this proposal are portions of stands that were previously planted with Longleaf Pine; due to low survival in these areas replanting is required. The remaining acres are stands that were recently clearcut to remove planted, off-site, sand pine. Prior to planting, all sites will receive site preparation treatments using a combination of herbicides, drum roller chopping, and prescribed fire. Planting density will be 726 trees per acre to produce high quality timber and good needle cast for prescribed burning.

OFS Trees planted: 5,000 Longleaf Pine.

Ecological benefits: The project areas include sandhill and upland pine community types. The presence of large sand pine in these areas has limited the use of prescribed fire due to the highly flammable nature of sand pine. These areas must either be burned at such low intensity that burns are ineffective, or they can burn so intense that the health of the forest is diminished. Restoring Longleaf Pine will allow us to establish an effective prescribed fire regime to increase and maintain biodiversity. It will also reduce the risk of catastrophic wildfires by reducing fuel loads. Longleaf Pine ecosystems are incredibly biodiverse including many pyrogenic plant and animal species, such as wiregrass, gopher tortoise, bobwhite quail, and wild turkey.

Regreening Greater Sudbury Project

Project location: Greater Sudbury | Canada

Project description: The Regreening Program has operated since 1978 in the Greater Sudbury Area, restoring forest cover in the community after damages endured through primitive industrial practices like logging and mining. The selected landscape suffered unchecked erosion leaving the reaming soils acidic and metal contaminated. Through soil amendments, acidity is reduced, nutrients are replenished and a nurse crop of grasses is established before the seedlings are planted to ensure their survival.

OFS Trees planted: 1,000 Green Adler, Jack Pine, White Pine, and White Spruce

Ecological benefits: Afforestation efforts in Sudbury have been underway since 1978 to treat soils, and revegetate affected lands. This has re-built the forests of Sudbury with over 10 million tree and shrub seedlings planted and over 3,400 hectares of damaged land manually treated with soil amendments. Many bird and animal species have increased their numbers, returning to the Sudbury landscape as habitat has been re-established and is recovering to a preindustrial state. In particular, that of the Eastern Whip-poor-will, a threatened species in Canada, has benefited greatly from reforestation efforts. Much of the local area now offers the ideal habitat for this species - a combination of mixed woodland for nesting and open areas for feeding.

Another threatened species, the Wood Thrush, is also making an appearance in areas that have been re-greened, along with the Canada warbler and Eastern Wood-pewee, considered of special concern in Canada. The tree species planted are native to this region and seeds collected are from local sources or seed zones in anticipation of climate change to support future forest resilience.

Community benefits: Once dubbed a 'moonscape', Sudbury has made a remarkable transformation and is now a leader in what can be achieved if a community (citizens, businesses, government, academia, community groups) pulls resources together and take action. Since the Regreening Program began, over 10 million tree and shrub seedlings have been planted throughout the industrially impacted Greater Sudbury area, contributing to carbon sequestration, wildlife habitat creation, biodiversity, human health and well-being, and community pride.

The Regreening Program provides over 20 temporary employment opportunities to qualified individuals in diverse and inclusive work environments. The regreening experience provides valuable hands-on training following best practices in natural restoration. Individuals also have the possibility of employment within the project which would strengthen the local economy, while minimizing negative impacts on the environment.

Gunnison Spruce Beetle Tree Planting Project

Project location: Grand Mesa, Uncompahgre and Gunnison National Forests - Gunnison Ranger District | Colorado

Project description: Since 2010, southwestern Colorado has been affected by a severe spruce bark beetle epidemic which has killed nearly 100% of the Engelmann Spruce trees across greater than 500,000 acres (200,000 acres on the Gunnison Ranger District alone). This outbreak has affected a variety of wildlife species, recreation opportunities, and local scenic beauty.

In order to combat this outbreak, the Gunnison Ranger District has implemented salvage sales to remove fuels and hazard trees in affected areas. The planned tree planting will focus on areas where beetles decimated forests, and there is currently little to no existing regeneration or seed sources available for natural forest recovery. New trees will provide cover and habitat for Canada lynx and other wildlife species which have been impacted by the severe mortality. Further, planting in decimated areas will speed forest recovery, enhance scenic quality and improve recreation opportunities over time.

OFS Trees planted: 5,000 Engelmann Spruce

Ecological benefits: New trees will provide cover and habitat for Canada lynx and other wildlife species which have been impacted by the severe mortality. Further, planting in decimated areas will speed forest recovery, enhance scenic quality and improve recreation opportunities over time.

Community benefits: Gunnison National Forest provides 3000 miles of trails with scenic views that bring travelers to the community as well as provide endless entertainment for locals. Hunting, fishing, camping, hiking, and day-use recreation are all ways of benefit for local communities. Restoring the forest to provide habitat for wildlife will only increase the authenticity of these experiences and bring people back for years to come.

Andrew Pickens Reforestation Project

Project location: Andrew Pickens Ranger District | South Carolina

Project description: This project will restore native species on sites that were occupied by Loblolly Pine on the Andrew Pickens Ranger District. An oak and hickory component is provided by advance regeneration. Shortleaf Pine, Pitch Pine and Table Mountain Pine are being restored mainly by planting.

OFS Trees planted: 5,000 Shortleaf Pine, Pitch Pine, and Table Mountain Pine

Ecological benefits: Wildlife habitat restoration

Community benefits: Maintaining the land to ensure that it can be appreciated, accessible and healthy for years to come.

Appalachia Mine Site Rehabilitation & Restoration Project

Project location: Bucks, Clarion, Forest, Jefferson, Venango, and Wyoming counties | Pennsylvania

Project description: The majority of our reforestation sites, thus far, have been unproductive reclaimed mined lands that are not able to advance through natural succession due to heavy compaction. Through our PA partnership, invasive species are removed, the land is de-compacted, and then we plant a diversity of native trees at a rate of 1730 or more per hectare. If survival is very low due to drought or other natural causes, we will replant projects the following year.

Increasingly over the last few years, we have also been supporting more non- mined projects. These projects on PA State Game Lands (SGLs) have varying percentages of forest cover, but the forest has been disturbed or degraded by exotic/invasive insect or plant invasion, storm blow-downs, or is threatened by hemlock wooly adelgid invasion detected in the county. Most of these SGL plantings are in riparian areas adjacent to quality streams that support life requiring cold water, which depends on tree canopy shading. Underplanting the hemlock canopy in advance of loss due to the hemlock wooly adelgid, planting after heavy loss due to storm blowdown, and planting after invasive species removal and treatment protects water resources and the wildlife that inhabit them, prevents invasive plants from quickly taking over the openings, and ultimately increases the resiliency of the forest ecosystem. Trees also uptake water and prevent flash-flooding, add stability to stream banks and organic material to stream habitat, and provide habitat to a host of native wildlife.

OFS Trees planted: 5,000 White Pine, White Spruce, Red Spruce, Balsam Fir, American Hazelnut, Quaking Aspen, American Beech, Yellow Poplar, Northern Red Oak, Serviceberry, Spicebush, Winterberry Holly, Witchhazel, Yellow Birch, White Oak, Black Cherry, Chestnut Oak, Flowering Dogwood, American Crab Apple, Wild Plum, Shagbark Hickory, Silky Dogwood, Gray Dogwood, Hop-Hornbeam, Sugar Maple, Red Maple, Red Bud, Black Gum, Virginia Pine, Red Pine, Eastern Hemlock, Basswood, Elderberry, Scarlet Oak, and Silver Maple

Ecological benefits: Reforestation of surface mined lands provides numerous 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. Additional benefits of these reforestation projects include increased biodiversity, multi-seasonal nectar sources for pollinators, and improved wildlife habitat for targeted species. 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, wild turkey, and other species that rely upon young forest habitat for foraging and breeding, such as Golden-winged Warblers. As the planted seedlings grow, this project will create a patch 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 species will benefit including those that benefit from larger tracts of unbroken forest. Acorns from mature oaks will also be beneficial for white-tailed deer, wild turkey, ruffed grouse, and a variety of small mammals that reside in the area.

One long-term goal of this project 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. The species was petitioned for listing as threatened under the Endangered Species Act, but were not warranted for listing in 2006. 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 tracts of forest. However, surface mine reforestation will also benefit numerous other terrestrial and aquatic wildlife populations, potentially including other listed species and species of concern. Once the forest matures, exfoliating bark from oaks, cherry, and pines and snags will provide roost sites suitable for several bat species including the endangered *(Continued on next page)*

(Continued from previous page) Indiana bat (Myotis sodalis) and northern long-eared bat (Myotis septentrionalis), which has been recently listed as threatened. It is also anticipated that the forest will benefit numerous large mammals, including bobcats and black bears. The project area adjoins a large block of intact forest that runs in SW-NE direction, and includes one of the public Game Lands. It is likely that reforestation efforts on other mined areas in this vicinity will continue in future years to further increase forest cover and connectivity. Our planting partners have been working to create a corridor of red spruce influenced forests along the Allegheny Front, extending from West Virginia into Pennsylvania. This project will supplement that effort and is intended to restore habitat for the endangered Northern Flying Squirrel, which requires red spruce forests for foraging and shelter. The planted conifers will provide year-round thermal protection of surface waters and benefit additional species, such as Pine Warblers. 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. Prior to the industrial logging era of the late 1800s and early 1900s, red spruce influenced forests were much more prevalent in the Alleghenies. Widespread clearcutting and wildfires removed the red spruce forests, which were eventually replaced with hardwood forests and the tracts of red spruce that remained were highly fragmented. Our planting partners have been working to create a corridor of red spruce influenced forests along the Allegheny Front, extending from West Virginia into Pennsylvania. This project will supplement that effort and is intended to restore habitat for the endangered Northern Flying Squirrel, which requires red spruce forests for foraging and shelter. However, red spruce influenced forests provide habitat for many other threatened and imperiled species.

Approximately 20% red spruce and 21% white spruce will be planted for these projects, and are intended to benefit Northern Flying Squirrels by improving their current habitat and by creating future habitat. The planted spruce, white pine, and balsam fir will also provide year-round thermal protection of surface waters and benefit additional species such as deer, turkey, and many other species. 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.

All of these benefits are relevant to under-planting forested areas that have been disturbed or degraded. These projects on PA State Game Lands (SGLs) have varying percentages of forest cover, but the forest has been disturbed or degraded by exotic/invasive insect or plant invasion, storm blow-downs, or is threatened by hemlock wooly adelgid invasion detected in the county. Most of these SGL plantings are in riparian areas adjacent to quality streams that support life requiring cold water, which depends on tree canopy shading. Underplanting the hemlock canopy in advance of loss due to the adelgid, planting after heavy loss due to storm blowdown, and planting after invasive species removal and treatment protects water resources and the wildlife that inhabit them, prevents invasive plants from quickly taking over the openings, and ultimately increases the resiliency of the forest ecosystem. Trees also uptake water and prevent flash-flooding, add stability to stream banks and organic material to stream habitat, and provide habitat to a host of native wildlife.

Community benefits: Our projects provide direct employment for seed collectors, equipment operators, 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. 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. An additional benefit of these projects is the restoration of ecosystem services, which helps all of society. Ecosystem services provided by forests include improved water quality, improved air quality through increased deposition of airborne particulates, and climate change mitigation through increased carbon accumulation.

Our mined land reforestation projects and projects in degraded riparian areas have the potential to improve downstream water quality. Reforestation of upland sites influences water quality and quantity by sheltering ephemeral streams and buffering water release from sites through increased infiltration and reduced surface runoff, potentially reducing flash flooding. Water quantity contributed to downstream waters is also reduced through increased evapotranspiration as the forests mature, which can reduce loading of sediment, metals, and salts (when present), improving water chemistry. Certain trees also have the ability to accumulate metals in their tissues, which may reduce inputs to the watershed over time as the forest matures.

Mauna Kea Restoration Project

Project location: Mauna Kea | Hawaii

Project description: The goal of this partnership/project is to accelerate forest recovery that will effectively mitigate threats of wildfire and alien weeds, and secure suitable recovery habitat for endangered birds, the Hawaiian Hoary Bat, and dozens of plants and invertebrates.

OFS Trees planted: 5,000 Māmane, Koa, Woodland mirror plant, Hawaiian Goosefoot, Mountain sandalwood

Ecological benefits:

1. Increase ecosystem diversity and provide habitat for numerous native species
2. Fire risks will diminish as the forest canopy closes and grass densities decline due to increased shading
3. Reduced invasive species cover
4. Enhanced water supply and reduced erosion

Elmo Fire Restoration Project

Project location: Elmo | Montana

Project description: The goal of this partnership/project is to provide fire restoration to privately owned Flathead Ridge Ranch.

OFS Trees planted: 5,000 Douglas Fir, Western Larch, and Ponderosa Pine

Ecological benefits:

1. Restoration of native range for Whitetail and Mule Deer, as well as Elk, turkeys, Grouse, Wolves, Coyotes, and Mountain Lions.
2. Protection of the Ronan Cr. watershed

Bolt Creek Fire Restoration Project

Project location: Skykomish | Washington

Project description: The goal of this partnership/project is to provide fire restoration to tribal lands.

OFS Trees planted: 5,000 Douglas Fir, Western Red Cedar, Western Hemlock

Ecological and Community benefits:

1. Keep soil in place and protect from erosion on steep ground
2. Protect the ecosystem from being overtaken by invasive species
3. Restore wildlife habitat
4. Restore tribal land

Family Forest Restoration Project

Project location: Oregon

Project description: The goal of this partnership/project is to restore private land that was previously clear-cut, Repair damage caused by irresponsible management of resources, and protect local riparian area.

OFS Trees planted: 5,000 Douglas-fir, Grand Fir, Ponderosa Pine, Incense Cedar, Western Red Cedar, Sugar Pine, Sitka Spruce, Giant Sequoia, and Redwood

Ecological benefits:

1. Restoring wildlife habitat
2. Increased carbon sequestration
3. Improved water quality and soil stabilization

Mangrove Restoration Project

Project location: Florida

Project description: The goal of this partnership/project is to enhance a weakened ecosystem, promote riparian restoration, improve soil stability and erosion control, and provide youth engagement and education.

OFS Trees planted: 233 Red Mangrove and Black Mangrove

Ecological and Community benefits:

1. Flooding, shoreline erosion, and extreme weather mitigation
2. Combat stormwater pollution
3. Creation of living classroom for youth education

Longleaf Restoration of At-Risk Landscapes Project

Project location: Georgia

Project description: The goal of this partnership/project is to engage landowners to better manage high-priority sites, promote prescribed fire, provide habitat for at-risk wildlife, and reestore Longleaf Pine stands in South Georgia

OFS Trees planted: 5,000 Longleaf Pine

Ecological and Community benefits:

1. Improving and managing habitat for the gopher tortoise
2. Improving habitat for red-cockaded woodpeckers, bobwhite quail, and other species
3. Create financial opportunities for local landowners