Healthy watersheds are vital to SRP operations and Arizona communities. We are proud to sponsor forest restoration projects with the National Forest Foundation that protect our state’s precious water resources and support SRP’s long-term commitment to water sustainability.

—Kelly Barr, Chief Sustainability and Compliance Executive and Senior Director, Environmental Management, Salt River Project.
The reality is that these conditions are as much a part of living in Arizona as sunsets and saguaros. This year National Forests across the state face increased risk of fire due to a warm, dry winter. With rising environmental and financial stressors, there is one thing we CAN be sure of, now more than ever, public lands need an engaged citizenry to help improve the health and resiliency of the lands that provide basic necessities like clean air and water. At the National Forest Foundation, we strive to connect communities to these resources. And your support helps us achieve more on-the-ground restoration each year.

Here in Arizona, the National Forest Foundation is proud to partner with the Salt River Project (SRP) and other amazing organizations, businesses, municipalities, governments, and conservation organizations, and work with four nonprofits and four restoration contractors, completing $1 million in restoration work improving forest health conditions and protecting our water supplies.

Throughout the NAFF, the National Forest Foundation is uniquely positioned to complete projects in hard-to-access and steep areas that are inhabited by threatened or endangered species and/or do not have commercial value. By filling this distinctive ‘pre-commercial’ restoration niche, we fulfill a larger restoration purpose, leveraging project benefits across the landscape, and catalyzing further restoration.

We live in uncertain times in the West—wildfire and drought are an ever-increasing source of concern and consume more and more public funding each year.

**2017 Year in Review**

In 2017, the NAFF accomplished the following:

- Completed seven high-priority restoration projects,
- Fostered partnerships with 18 businesses, municipalities, governments, and conservation organizations,
- Worked with four nonprofits and four restoration contractors,
- Completed $1 million in restoration work improving forest health conditions and protecting our water supplies.

There are many pieces to the forest restoration puzzle in Arizona, just as there are many threats to our watersheds. In putting all the pieces together, the National Forest Foundation seeks to implement high-priority restoration projects across the five National Forests within the Salt and Verde River watersheds. With support from the Forest Service and partners, we complete projects that are part of larger forest restoration efforts, which allows us to open up more acres to restorative forest thinning and use of prescribed fire.
The NAFF provides a simple mechanism for large and small businesses, all sectors of government, conservation organizations and anyone interested in becoming involved; whether through donations, volunteerism, outreach or service. Every person, every penny, every moment, makes a difference and helps us get more work done on the ground. YOU can help improve forest health, minimize fire risk, decrease the amount of sediment moving into our streams and reservoirs, and get water back into a healthy, functioning system. YOU help protect the lifestyle we love in Arizona. And the reality is…We can’t do it without YOU.

What is at risk? Northern Arizona’s National Forests provide most of the water to the Salt and Verde Rivers. These ribbons of blue connect us all. Flowing from the high-elevation forests to the warm deserts below, this water becomes vital for millions of people in the Greater Phoenix Metro area. But our National Forests face unprecedented threats, including increased wildfire, toxic runoff and erosion—all of which impact downstream water quality and long-term water resilience.

In order to protect these vital water ways, the NAFF focuses on projects that fall into three main categories: 1) reducing wildfire risk, 2) minimizing erosion and sedimentation, and 3) improving the function of degraded streams, springs and wetlands. We work directly with the Forest Service, contractors and nonprofit conservation organizations to conduct hand thinning, mechanical thinning, and prescribed fire in overstocked forests, erosion control and drainage improvement on roads and trails, and restoration and improvement of wetlands, streams and springs.
The NAFF focuses on projects that fall into three main categories:

- Reducing wildfire risk.
- Minimizing erosion and sedimentation.
- Improving function of degraded streams, springs and wetlands.
Whether we live in a snowy mountain town or a sunny desert city, we are connected by water. A WATERSHED is any area of land that water flows across or through. Water in a watershed trickles and flows toward a common body of water, such as a stream, river, lake or reservoir. Watersheds can be big or small, but they usually have high points (like mountain tops or ridgelines) as their upper boundaries. Watersheds capture water from precipitation, usually as snowpack, eventually releasing it into streams and rivers or recharging groundwater supplies.

NAFF projects protect watersheds, but what does that mean?
A healthy watershed provides a clean and consistent supply of water. Watershed health can be harmed by high-severity fires that create ash and debris, destabilize soils, and eliminate understory vegetation causing precipitation to runoff too quickly and carry ash and sediment downstream.

Watersheds may also be impaired by roads and trails that concentrate runoff, accelerate erosion and dump sediment, which make water muddy and murky. Wetlands are critical natural infrastructure, working like water filters by trapping sediment, storing water and releasing it consistently throughout the year.

By reducing fire risk, minimizing sedimentation, and restoring degraded wetlands and streams, the NAFF ensures that water resources are protected and can continue to provide long-term supplies far into the future.

In the Salt and Verde River watersheds, rain and snowmelt run from the high elevation forests—an area of over 13,000 square miles—and are stored in reservoirs that help sustain water demands in Phoenix-area cities. When watersheds are impacted by severe wildfire, increasing drought, or high erosion rates, water quality and sustainability are affected. Cumulatively, NAFF projects minimize fire risk, reduce erosion and sediment moving downstream, and put water back into a more natural and functioning stream or wetland system.

In the Salt and Verde River watersheds, rain and snowmelt run from the high elevation forests and are stored in reservoirs that help sustain water demands in Phoenix-area cities.
The National Forest Foundation has successfully implemented 15 high-priority watershed restoration projects since we launched the NAFF in 2015. NAFF projects have been completed across all five National Forests of northern Arizona, protecting tributaries of the Salt and Verde Rivers. The restoration accomplishments for 2015, 2016 and 2017 include:

- Over 10,000 acres of fuels reduction projects within ponderosa pine and pinyon-juniper forests on the Coconino, Kaibab and Prescott National Forests,
- Over 90 miles of erosion control and drainage improvement on roads and trails on the Coconino and Tonto National Forests, and
- Over 2,500 acres of stream and wetland protection on the Apache-Sitgreaves and Prescott National Forests.

Projects are strategically located to maximize benefits, leverage resources, and are integrated into priority Forest Service efforts—often at a landscape scale. With this approach, and with partner support, we achieve tremendous benefits.
Banfield and Snake Ridge Fire success story:

On May 1st, 2017, the Mogollon Rim District of the Coconino National Forest completed a NAFF project: a 3,550-acre prescribed burn known as the Jacks Canyon - Banfield Spring Forest Restoration Project and Prescribed Fire. The prescribed fire was strategically located to burn adjacent to the Pinnacle Peak 345-KV powerline that provides power to the greater Phoenix area and runs through the Forest.

Just a few weeks later on May 19th, the lightning-caused Snake Ridge Fire was detected adjacent to the Jacks Canyon - Banfield Spring Prescribed Fire Project. Forest managers allowed the Snake Ridge Fire to burn and managed the fire for multiple resource benefits, including:
- reducing fuels,
- protecting water supplies for downstream users,
- returning fire to the fire-adapted ecosystem, and
- protecting the valuable powerline infrastructure.

Because of the fire’s proximity to the transmission line, the U.S. Forest Service used the Jacks Canyon - Banfield Spring Prescribed Burn as a firebreak to prevent damage to critical utility infrastructure. The strategic location of the Jacks Canyon - Banfield Spring Fire allowed the Forest Service to contain the Snake Ridge wildfire, allowing it to burn freely without putting infrastructure resources at risk.

Between the Snake Ridge wildfire and the prescribed fire, 18,880 acres were treated with low-severity fire. These kinds of burns are important for reducing fuel loadings across the landscape, thus reducing the risk of an uncharacteristically high-severity fire. In addition to protecting our watershed, these fires protected the 345-KV Pinnacle Peak powerline, which ensured that our lights stayed on and the water kept flowing. Thanks to partners like the Salt River Project and many valley cities for helping achieve these goals through funding, implementation and collaborative coordination!

In addition to protecting our watershed, these prescribed fires protected the 345-KV Pinnacle Peak powerline, which ensured that our lights stayed on and the water kept flowing.
Through the NAFF, the National Forest Foundation implemented seven priority watershed restoration projects within the Salt and Verde River watersheds.

In 2017, more than $1,000,000 was invested to complete watershed projects across the Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto National Forests.
In 2017, the NAFF completed seven projects across five National Forests that reduced wildfire risk, minimized sedimentation and erosion into waterways and reservoirs, and improved and protected vital wetlands and meadow landscapes. Preliminary results show the following benefits:

- Removal of 185,000 trees on 823 acres through hand-thinning and mechanical treatments to reduce fire risk of overstocked forests,
- Reduction of fire risk by 27% across 3,500 acres through use of prescribed fire, and
- Reduction of sediment loading into streams and reservoirs by 17 tons through improved and enhanced drainage structures on 31 miles of roads and trails.

**Additional economic and social benefits:**
- Protection of trans-national communication infrastructure—providing internet and communication services to all of northern Arizona,
- Protection of 345-KV power transmission line—a major supplier to the greater Phoenix Metro area,
- Improved water quality in the Verde River system, including reduction in E. coli bacteria transmission,
- Improved habitat for threatened and endangered species like the Mexican Spotted Owl, Apache Trout, and New Mexico Jumping Mouse,
- Supported Arizona restoration economy by contracting with four regional contractors and four local nonprofits, and
- Added capacity to the Forest Service by helping to manage and implement landscape-scale restoration projects.
High-Severity Fire Risk Reduction Projects
include techniques such as forest thinning and prescribed fire treatments to reduce forest fuels. These treatments help restore the natural role that fire plays in the forest and prevent destructive high-severity fires. In 2017, the NAFF completed three fire risk reduction projects.

**The Upper Hell Canyon Forest and Watershed Health Project**
- Location: south side of Bill Williams Mountain, on the Kaibab National Forest.
- On-the-ground work: 200 acres of mechanical and hand-thinning work.
- Desired result: to improve forest and watershed health.
- Additional work completed: 81 acres were treated with hand-thinning techniques alone.
- Desired result: reduce ladder fuels to prevent crown fires, improve forest and watershed health.
- Additional benefits: protected communication and utility infrastructure located at the top of Bill Williams Mountain. Cumulatively, these projects complimented other commercial thinning projects occurring on adjacent acres.

**The Aspen Creek Watershed Health and Aspen Restoration Project**
- Location: southwest of the City of Prescott on the Prescott National Forest.
- On-the-ground work: 151 acres of hand-thinning work to reduce conifer tree density.
- Desired result: reduce conifer tree density to restore aspen and walnut stands.
- Desired result: reduced risk of high-severity fire for adjacent private properties in the Wildland Urban Interface.
- Additional benefits: improved watershed health for Verde River Watershed, which contributes to Phoenix Metro Area water supplies.

**The Jacks Canyon and Banfield Spring Forest Health Project**
- Location: along the Mogollon Rim on the Coconino National Forest.
- On-the-ground work: 3,500 acres of prescribed burning.
- Desired result: improved forest health and reduced risk of high-severity fire.
- Additional benefits: project part of larger forest restoration effort to treat 48,000 acres.
Erosion and Sediment Control Projects

are designed to drain water from the surfaces of roads and trails to help catch sediment before it reaches nearby streams and rivers. These projects improve water quality while repairing roads and trail infrastructure that provide recreation opportunities and access to public lands. In 2017, the NAFF completed two sediment reduction projects.

The West Pinto Trail Improvement Project

• Location: the Tonto National Forest.
• On-the-ground work: restored trail stability, improved safety and reduced erosion along a total of 26 miles of trail (41 miles in 2016 and 2017).
• Desired result: prevent erosion and sediment delivery to adjacent streams and the Salt River.
• Additional benefits: engaged youth with Arizona Conservation Corps, providing leadership skills, technical work experience, and building an understanding of pressing conservation issues.
• Initial results: reduced sedimentation into the nearby streams that enter the Salt River by up to 17 tons of sediment annually.
The Oak Creek Schnebly Hill Road Project

- Location: the Coconino National Forest.
- On-the-ground work: repairing drainage on Schnebly Hill Road, a popular recreational destination for hikers, mountain bikers and hearty jeep adventurers.
- Desired results: minimize erosion and trap sediment before reaching tributary streams that connect to Oak Creek.
- Additional benefits: reduction in transport of E.coli into Oak Creek; protected important communications infrastructure operated by CenturyLink, which supported the project.
- Initial results: reduced sedimentation into Oak Creek by an estimated 14 tons annually.
Stream and Meadow Restoration Projects

help protect some of the most critical areas in a watershed. Stream banks and corridors, also known as riparian areas, and meadows have unique vegetation that regulate stream flow by soaking up and storing water and then releasing it steadily over time. This helps prevent flooding and erosion during spring runoff and storm events. Restoration and protection of meadows, wetlands and grasslands can help replenish water in natural hydrologic systems and recharge groundwater systems. In 2017, the NAFF completed two wetland and grassland projects.

The Chino Valley Grassland Restoration and Erosion Control Project

- On-the-ground work: hand thinned encroaching juniper stands from grassland habitat on 350 acres.
- Desired results: restored natural hydrology of area, improved grassland health, re-introduction of prescribed fire.
- Additional benefits: improved pronghorn habitat and habitat connectivity.
The Black River Headwaters Wetland Protection Project

- Location: the Apache-Sitgreaves National Forest, approximately 20 miles southwest of Alpine, AZ.
- On-the-ground work: installed exclosures around important wetlands and streams in high-elevation meadows.
- Desired results: reduced trampling and grazing in wetland areas, reduced sedimentation in wetlands and creeks, restored riparian vegetation and improved water quality in Wildcat, Boggy and Center Fire Creeks.
- Additional benefits: improved Apache Trout habitat in the Black River Watershed; improved habitat for New Mexico Jumping Mouse, a sensitive species.
- Future work: additional planting of willows in 2018 will further support the recovery of critical meadow and wetland habitat.

By minimizing sedimentation, and restoring degraded wetlands and streams, the NAFF ensures that water resources are protected and can continue to provide long-term supplies far into the future.
Volunteer and Partner Collaborative Events in 2017

Arnett Canyon Invasive Species Removal Project

On Earth Day weekend as part of the Final Four Organizing Team’s sustainability efforts, the National Forest Foundation and an amazing group of partners including Tonto National Forest, Arizona Wilderness Society, Friends of the Tonto, Arizona State University, Bonneville Environmental Foundation, The Final Four Local Organizing Committee and Salt River Project all worked together to support removal of invasive species in Arnett Canyon, a tributary of Queen Creek near Phoenix, Arizona. The team toiled to remove invasive tamarisk—a prolific phreatophyte that out-competes native vegetation, especially in regulated stream systems and in hot, dry climates. The effort helped restore the primitive nature of Arnett Canyon, and allows the reestablishment of endangered, threatened and rare native fish. Through this effort, volunteers worked on over a half mile of drainage, cutting away tamarisk, and hauling away the residual limbs.

“We set out to ‘Leave a Legacy’ through the power of sports. Water availability is the biggest risk we face in the Phoenix area. By working to improve, protect and preserve our watersheds, we are ensuring that Phoenix can continue to thrive. The partnership between the NAFF and the Final Four is a slam dunk.”

—Colin Tetreault, chair of the 2017 Final Four sustainability committee.
Red Flat Meadow Restoration Project

On a breezy, cool day in late October, 2017, the National Forest Foundation and Friends of the Verde River hosted volunteers and an Arizona Conservation Corp crew to complete the finishing touches on the NAFF’s Red Flat Meadow Restoration Project. Earlier project elements included fencing, thinning encroaching juniper trees, and reseeding the meadow to encourage the return of native grasses. Red Flat Meadow is located about ten miles east of the old mining town of Jerome. The Prescott National Forest identified the erosion control measures on Red Flats Meadow as a priority for restoring meadow vegetation and slowing erosion of the stream channel, which flows right into the Verde River. The National Forest Foundation has been working to address these issues since 2016.

Volunteers finalized the erosion control work by placing the branches of the recently cut juniper trees into the stream channel to catch and hold sediment in place.
In addition to project implementation, the NAFF allocates funds for monitoring the impacts of the completed restoration projects. Different monitoring techniques are used to measure the variety of benefits of each project. To measure the benefits of forest restoration treatments, the NAFF is working with a nonprofit partner to look at the effects of treatments on fire-severity risk. To track the benefits of erosion projects, we are working with the Forest Service to model effects and ground-truth longevity of erosion control structures using photo points and trail assessments. For meadow and wetland protection, we will be using meadow health assessment tools.

In 2017, we implemented monitoring activities for the 2016 Clint’s Well and Stoneman Lake Forest Restoration Project on the Coconino National Forest and the McCracken Woodland Health and Habitat Improvement Project on the Kaibab National Forest to evaluate the benefits of minimizing fire risk through prescribed fire and mechanical treatments, respectively. By comparing forest characteristics before and after treatment, we can demonstrate that the forest treatments reduced high-severity fire risk.

**Clint’s Well and Stoneman Lake Forest Restoration**
- Result 1: Canopy cover reduced by 12%.
- Result 2: Canopy bulk density reduced by 20% across the project area.

**McCracken Woodland Health and Habitat Improvement Project**
- Result 1: Canopy cover reduced by 31%.
- Result 2: Canopy bulk density reduced by 29% across the project area.

Prescribed fire and thinning treatments create a measurable reduction in two key variables that control fire behavior: canopy cover and fuel loading. Canopy cover is measured as the percentage of ground covered by the branches and leaves of trees. Canopy bulk density is an estimate of the amount of fuel in a forest canopy, which is a variable that controls the spread of fire through the forest and the intensity of the fire as it burns.
In order to measure the watershed benefits from erosion control and sediment reduction projects, we evaluate the amount of silt, sand and debris that remain on the land as opposed to entering our rivers and streams. Actual measurements of the sediment that is prevented from reaching streams and rivers are costly and difficult to obtain. However, these benefits can be estimated using science-based models.

Oak Creek Schnebly Hill Road Project
- Result 1: Estimated reduction of sediment into Oak Creek by 14 tons per year.
- Result 2: Photo monitoring will continue to assess seven representative sites along Schnebly Hill Road.
- Result 3: Using information collected through photo points, WEPP models will be run again to establish a final estimate of sediment reduction benefits.

The West Pinto Trail Improvement Project
- Result 1: Estimated reduction of sediment into West Pinto Creek, and subsequently Roosevelt Lake, by 17 tons per year.
- Result 2: Trail conditions will be re-evaluated in the spring of 2019 to assess structural integrity of drainage features.
- Result 3: Using information collected through trail assessments, WEPP models will be run again to establish a final estimate of sediment reduction benefits.

Meadow and wetland health monitoring for the Black River and Red Flats project is ongoing and will be reported after an additional year of field data is collected.

WEPP Modeling Erosion Control
The Water Erosion Prediction Project Model (WEPP) incorporates existing information about project site (soil type, slope, trail/road characteristics) and precipitation data to simulate the process of water running off of a trail or road and then estimates the amount of sediment that water is carrying with it. By comparing models that use before-project conditions and after-project conditions, it is possible to estimate the amount of sediment reduction generated by our erosion control projects.

We used the WEPP model to estimate and monitor sediment reduction benefits for the Oak Creek-Schnebly Hill Road Erosion Control and West Pinto Creek Trail Erosion projects.
The NAFF aims to complete six projects within the Salt and Verde River watersheds.

- Reduce high-severity fire risk on an additional 350 acres of over-stocked forests.
- Improve an additional 20 miles of fire-impacted trails.
- Restore spring function, replenish an estimated 20 million gallons of water, and revegetate almost 2 miles of stream bank habitat with over 4,000 native plants and trees.
Fire Risk Reduction Projects

The Twin Springs Fuels Reduction Project, located on Bill Williams Mountain on the Kaibab National Forest, will improve forest health and reduce the risk of uncharacteristic fire on approximately 150 acres of overgrown ponderosa pine and juniper forests in the Upper Hell Canyon Watershed. This project is a continuation of forest restoration work within a larger area to restore forests, protect watershed function, and reduce high-severity fire risk throughout the Bill Williams Mountain Restoration Project area that covers more than 15,000 acres, located near the City of Williams.

The Aspen Creek Watershed Restoration Project, located near the Town of Prescott on the Prescott National Forest, in its second year will reduce fuel loads and restore two aspen stands on 152 acres in the Prescott National Forest. Reducing fuel loads in these overgrown forests reduces fire risk and protects a critical watershed for the City of Prescott and the Upper Verde watershed.

Erosion and Sediment Control Projects

The Sierra Ancha Trails Erosion Control and Drainage Improvement Project, located on the Tonto National Forest, is designed to rehabilitate over 46 miles of trails damaged by the Juniper Fire in May and June 2016 and thereby restore ecosystems in several creeks that flow directly into the Salt River and/or Roosevelt Lake.

The National Forest Foundation is uniquely positioned to complete projects in hard to access areas, catalyzing further restoration and leveraging project benefits across the landscape.
Springs, wetlands and meadows are the living, breathing centers of our forests. Although small in scale, these special places serve as filters to clean water, as sponges to hold water, and as sieves to prevent sediment moving downstream. Restoration of degraded areas has infinite benefit both onsite and far downstream.
addressing forest health across northern Arizona requires many diverse strategies: thinning trees in areas that are overgrown, using prescribed fires to remove undergrowth and ground fuels, minimizing erosion and sediment into our streams and reservoirs, and also planting trees in areas already affected by wildfire.

Though it can be counterintuitive—thinning trees in one area and planting trees in another—is truly the most comprehensive approach to addressing landscape-scale forest health issues, especially when wildfires are burning increasing numbers of acres at an unprecedented intensity.

In 2017, through its tree-planting program and tremendous support from the Salt River Project, the National Forest Foundation implemented three strategic tree-planting projects in northern Arizona, addressing impacts from the Shultz Fire on the Coconino NF, the Wallow Fire on the Apache-Sitgreaves NF, and the Warm Fire on the Kaibab NF. An additional project was implemented on the Apache-Sitgreaves NF to proactively protect a unique aspen forest community. Through both protection and direct planting measures, the National Forest Foundation planted almost 300,000 trees.

In 2018, the NAFF will pair up with SRP’s Trees for Change program to help support riparian re-vegetation along the Black River in the Salt River Watershed.

Tree planting by the National Forest Foundation is an ongoing and long-term effort to reforest important forest habitats that have been affected by natural occurrences like wildfire, insects and disease. By restoring forest cover, we’re stabilizing forest soils, reducing erosion, and reducing the risk of severe flooding in downstream communities. Reforestation also expands wildlife habitat, increases snowpack retention, fights climate change, and improves experiences for forest visitors.
Experience it for yourself!

Take a Hike!
NAFF projects have improved over 45 miles of trails in the Salt River watershed. Many of these trails are less than an hour-and-a-half drive from Phoenix. Take your friends and family out for a hike and tell us what you think of the repaired trails!

Ride in Style!
Check out the great work for yourself! Take a Pink Jeep tour ride up Schnebly Hill Road and learn about the watershed, Arizona history and the geology of the Sedona Red Rocks area. And through Pink Jeep’s contribution program, YOU can be a part of the watershed solution!

Get on the Ground!
If you like to get your hands dirty, let us know you want to volunteer! We will send you opportunities for amazing volunteer adventures during the upcoming field season. Plant trees, sow seeds, build rock structures to slow water down, muck around a spring... all things fun and productive on our beautiful National Forests.
Looking forward, the NAFF will continue to seek opportunities to highlight the success of its projects and to connect Arizonans with their watersheds. Through educational videos, public presentations and public outreach events, the NAFF celebrates its successes with its funding partners, creating a positive, vibrant image that will continue to attract other cities, counties, business and individuals to support this effort.

The NAFF’s current strategic partners include:

The NAFF thanks USDA and SRP for supplying the bulk of the photography for this report.