Healthy Forests, Healthy Watersheds

By our partners at the Verde River Basin Partnership and Salt River Project

Wildfire is a part of nature. It plays a crucial role within ecosystems by serving as an agent of renewal and change. But not all fires nourish an ecosystem; some are catastrophic. Over the last decade, Arizona has experienced an explosion of catastrophic wildfires in our forests. These fires have devastated millions of forested acres, destroyed hundreds of homes, and have taken the lives of residents and firefighters. Those are merely the short-term effects.

Arizona is fortunate to have some of the most significant and beautiful National Forests in the United States. They provide a variety of recreation opportunities for Arizonans, habitat for wildlife, and are important to Arizona’s tourism-based economy.

These forests also provide much of our surface and groundwater supplies, since more precipitation falls in the forested, high elevations of Arizona, than in the lowlands. In fact, National Forests in Northern and Central Arizona contribute most of the water flowing in the Salt and Verde Rivers, which provides vital surface water supply downstream to many people in the greater Phoenix metropolitan area.

Many of Northern and Central Arizona’s forests received their designation as National Forests before 1910, so watersheds could be preserved for current and future generations. The hydrological functions of healthy forested watersheds include absorbing rainfall and snowmelt, slowing storm runoff, recharging aquifers, sustaining stream flows, and filtering pollutants from the air and runoff before they enter streams, creeks, and rivers. Essentially, this water provides for life – terrestrial, avian, and aquatic.

For over 150 years, people throughout the Western U.S. have been significantly altering the forest landscape through logging, livestock grazing, and fire suppression. The forests today are very different than those in earlier times. In most of Arizona’s ponderosa pine forests, where there once were 20 to 60 ponderosa pines per acre, there now grows a crowded 500-1000. While ponderosa pine tree density has increased, there has been a decrease in biodiversity.
– both in flora and fauna. The variety and abundance of plants of the understory, as well as other tree species, has diminished.

These consequences of unhealthy forests are certainly great losses, but these conditions set the stage for the potential consequence that is the most alarming - catastrophic wildfires, which afterwards, have their own set of devastating and longer-lasting effects.

Forests with the types of tree densities we have now are not resilient to catastrophic wildfires. The density provides ready fuel for fires to become very hot and fast moving; they quickly climb to the tree canopies, often destroying most everything in their path. By contrast, in forests with healthy tree densities, the fires move slower and often do not reach tree canopies in most areas. These “normal” fires consume combustible forest fuels near the ground and keep young pines and seedlings in check. Catastrophic fires don't give the forests the immediate benefits that low-intensity ground fires do.

Low-intensity fires increase nutrient availability in the soil, which helps with plant regrowth. Although the relationship between fire and soil nutrients is complex because of many factors, in general, greater nutrient losses occur with higher fire intensity.

Catastrophic fires can increase the displacement and loss of wildlife and the period for wildlife re-colonization for some species. Additionally, hot-burning fires often create hydrophobic (water-repellant) soils, which shed water quickly, carrying large quantities of ash and debris into waterways. Besides altering the landscape, this has a substantial effect on hydrological processes within the burned areas and often beyond.

The reduction of vegetation cover caused by wildfire can lead to significant flooding, soil erosion, sedimentation in streams, pollution from chemicals that are no longer filtered by vegetation, and changes in stream water temperature. All of these effects can have harmful, even deadly, impacts on aquatic life, and other wildlife that depend on aquatic life as a food source.

Downstream in the Salt and Verde River Watersheds, these changes in hydrological processes can create significant problems for municipal water supplies. These problems can include damage to infrastructure, increased sedimentation in reservoirs, which results in
lower storage capacities, and increased organic matter and debris in the water, which increases the need for treatment. All of these effects raise the cost of supplying water.

Millions of people within Salt River Project’s water service territory in the Phoenix metropolitan area receive water from the Salt and Verde River Watersheds. Salt River Project (SRP) was established in 1903 as the nation’s first multipurpose reclamation project – providing both electricity and water - authorized under the National Reclamation Act. SRP, as well as many other entities, recognize the importance of healthy forests to Phoenix area communities and beyond.

They are participating in two projects to create a healthy watershed. One is the Four Forest Restoration Initiative, a long-term effort by approximately 30 stakeholders to restore forest ecosystems on a landscape scale within four National Forests - Coconino, Kaibab, Apache-Sitgreaves, and Tonto. The other is the Northern Arizona Forest Fund (NAFF), a partnership between SRP and National Forest Foundation (a 501(c)3 non-profit), in collaboration with the U.S. Forest Service. NAFF provides an opportunity for both businesses and residents of Arizona to invest in healthy lands and watersheds through restoration projects.

These types of projects focus on forest restoration, which is a multifaceted approach to restoring forest health. For example, NAFF integrates forest thinning and prescribed burning, stream and wetland restoration, sediment and erosion management, with habitat improvement and re-vegetation projects.

It’s not just businesses and non-profits that are focusing on forest restoration, so are academic institutions like Northern Arizona University (NAU). NAU’s Ecological Restoration Institute works to help land management agencies and communities by providing comprehensive focused studies, monitoring and evaluation research, and technical support. This research is key to understanding how restoration efforts are working in detail, if there are any unexpected results, and where improvements can be made.

While many organizations such as these are working to improve our forests, more can be done. Do we envision a future with healthy rivers, creeks, and streams providing habitat for abundant wildlife? Do we want thriving communities where we can enjoy the wonders of nature and have a vital, stable economy?

Supporting ways to restore health to our magnificent National Forests is a crucial step in achieving that future. Implementation of projects and research, combined with regional cooperation, will help us understand the complex ways that healthy forests provide for healthy water resources.

To learn about Salt River Project’s forest restoration efforts, please visit http://www.srpnet.com/water/forest/default.aspx. To read more about the Verde River Watershed, please visit the Verde River Basin Partnership’s website at www.vrbp.org.