

A photograph of a forest fire. The scene is dominated by tall, dark tree trunks in the foreground and middle ground, with bright orange and yellow flames and smoke rising from the forest floor. The background is filled with a dense canopy of trees, some of which are also illuminated by the fire. The overall atmosphere is one of intense heat and destruction. A semi-transparent red rectangular box is overlaid on the right side of the image, containing the title and author information in white text.

PLAYING WITH FIRE

YEARS OF POOR PUBLIC FOREST
MANAGEMENT HAS CREATED THE PERFECT
STORM FOR WILDFIRES. PRESCRIBED BURNING
AND OTHER FAMILIAR TECHNIQUES COULD GO
A LONG WAY TO SOLVING THE PROBLEM.

BY BOB WILLIAMS

As foresters and landowners in the forestry community, we are well aware of the impact of fires on our landscapes. Many of us use fire to provide conservation stewardship to forest ecosystems.

As we saw with the historical wildfire events across the United States in 2020, a seemingly annual event, at least out west, society needs to assess the way it lives with fire as opposed to continuing the long-term war on fire.

Some insist that climate change causes these catastrophic wildfires with little consideration given to the long-term neglect of our public forests and the conditions that neglect has caused to our forests.

People must understand and accept that fire in the forest is as natural as rain or sunshine. But the concern is how we need fires to behave in the forest.

Fire has helped forests evolve for thousands of years. Many people remain under the illusion that before European settlement, forests in North America were carpets of pristine old-growth forests. Nothing could be further from the truth. Most forests were occupied and managed by Native Americans. Their primary tools were managed fires and natural lightning fires.

To what ends did American Indians use fire? To any that could serve their purposes. They used fire as a technology to harden spear points, fire pottery, chip stone, light dwellings, and cook. They used it on the landscape in ways both tiny and huge. With torches, they could clean ground to better collect acorns and chestnuts; they smoked bear and raccoons out of dens; they attacked enemy encampments; they cleared trails; they stimulated edible tubers (such as camas); they pruned and promoted berry patches; they fired dense woods to create accessible firewood.

As Stephen A. Pyne chronicled in his 2009 book *America's Fires: A Historical Context for Policy and Practice*, they fished at night with torches. By burning around wetlands, they encouraged habitat favorable to ducks and muskrats. By selective firing in sedge and shrubs, they promoted thatch and twigs suitable for baskets. With smoke, they could attract deer and elk driven mad by flies. By burning, they kept lands around settlements and houses open, which prevented ambush by foes or predators and shielded them from wildfire. A land unburnt was a land uncared for – an uninhabitable land.

The most spectacular use, Pyne wrote, involved fire hunting. The ecology behind it involves both a push and a pull. By setting fires and letting them run with winds, hunters could drive animals into sites for harvesting. Those burns, in turn, freshened browse and grass that, when greened, attracted more game animals and allowed more specialized hunting. Done properly, the fire hunt was indefinitely renewable.

There were patterns to the practice. A simple way to imagine the outcome is to think of lines of fire and fields of fire – “lines” referring to routes of travel, and “fields,” to those sites where burning promoted foraging, hunting, and fishing. Thus, people burned along corridors of seasonal movement, they burned both deliberately and accidentally, and as they moved through the landscape, they burned the same patches, each in its proper season.

Typically, sites in a condition to burn were set ablaze: they



Salvage work following the King Fire, which destroyed 97,717 acres on private lands and the Eldorado National Forest in California in 2014. The fire cost \$117 million to suppress.



A prescribed burn on private pine barrens in New Jersey.

were burned early, often, and lightly. But people did not always return with exact regularity, and fires did not always stay in place. In this way the burning varied, year to year. Besides, a good deal of fire “littering” occurred—fires left on the land in normal years burned themselves out, but in droughty years they could bolt across the scene. How these general patterns expressed themselves varied with the particular biota and setting in which they occurred. Common techniques applied in tall-grass prairie could result, for example, in different outcomes when used in boreal forest.

Since human fire interacted with everything in the landscape, as the landscape and its species changed, so did fire. Of particular interest is the disposition of animals that competed with fire for fine fuels, like grasses and shrubs. In the post-Pleistocene era, the extinction of large mammals led to two opposing outcomes. In fire-prone places, their disappearance allowed fuels to build up, thus furthering humanity’s firepower. But in fire-intolerant places, the loss of animals that had kept a landscape open might make fire more difficult: it might cause the tree canopy to close in and shut down the conditions for fire. In America, both trends happened until Europeans introduced domestic animals – horses, cattle, sheep, goats, and swine – that reversed the process.

Let’s not suggest we can go back to the methods that Native Americans used to sustain their forested lands to begin to address our concerns, but we can learn much from them. Mitigating the damages resulting from uncontrolled massive

wildfire is going to take many years and complex solutions. We didn’t get here overnight but rather after decades of poor land management decisions, policies, and government regulation.

In large part, the argument now rages between those that simply blame climate change and continue to call for a hands-off preservation land use policy and those that claim slogans such as “Log It or Lose It” solutions.

Neither proposal will work. It’s going to take an integrated approach that looks back at the natural historical role of fire and integrate that with some of the promising research and science developed by some of our best forest scientists.

It appears clear to many that the past forty years of a hands-off preservationist policy that discourages active conservation stewardship on the land has led to forests overstocking themselves resulting in an unnatural buildup of fire fuels in both quantity and structure. This has resulted in increased size and intensity of forest fires. Politicians have accepted the premise of Mother Nature knowing best and have adapted a leave-it-alone approach. This thinking has resulted in disastrous results.

Additionally, we have permitted the construction of homes, businesses, and infrastructure in fire-prone landscapes that exacerbate the overall fire problem.

As to climate change, forests should be a big part of the solution. They should serve as carbon sinks that help remove CO₂ from the atmosphere. Instead, they are at risk of becoming a source of carbon release from both the smoke from active fires and the release of carbon from dead, rotting trees left behind.



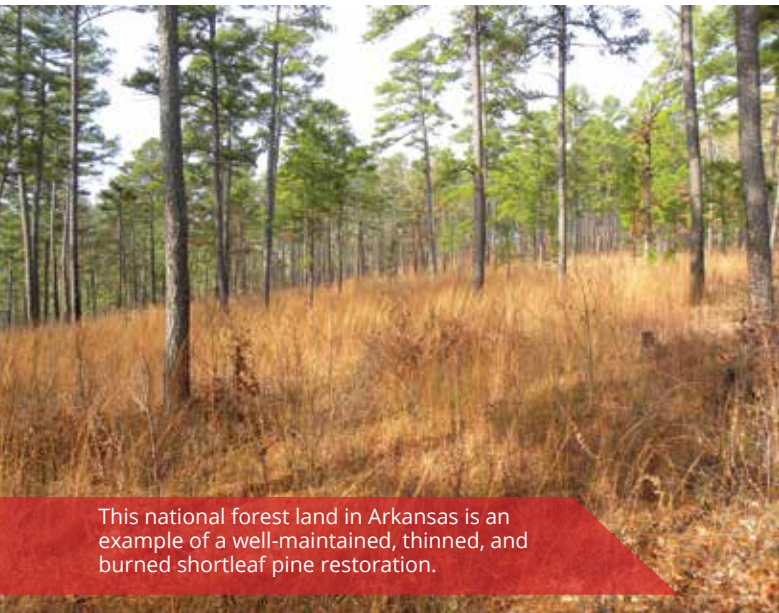
A thinned and burned longleaf pine restoration in Georgia.

Even more concerning is the release of carbon from some forests supported by organic soils – carbon stored for thousands of years in those soils.

The continued benign neglect of a large portion of our public and private forest lands will lead to larger and more intense fires. Not only does this neglect contribute to the wildfire crisis there is also a direct link to the loss of many plant and animal species. Biodiversity decline is worsened with this hands-off



Prescribed burning is an effective management tool and helps with wildfire prevention.
Photo: Getty Images



This national forest land in Arkansas is an example of a well-maintained, thinned, and burned shortleaf pine restoration.

policy. Species loss in most public lands is not from development or land conversions -- it is a result of failed land management policies and the lack of fire.

Forest science has provided us the technology to begin to address these wildfire concerns. There is no magic bullet or one size fits all, but there is plenty of evidence to provide the needed conservation stewardship for the greatest diversity of species. An integrated approach of prescribed fire and forest management by tree removal methods is badly needed and critical to success. This approach will reduce forest densities, re-arrange fuel structures, and volume while restoring optimum biodiversity habitat structure and diversity.

Here in southern New Jersey, we use fire to reduce concerns for wildfire while also sustaining the ecological integrity of forests. However, both here and in many of our forests throughout America, the forest is too overgrown to apply prescribed fire and tree removal is required.

In many areas, we cannot burn our way out of the crisis. We must integrate planned tree and timber harvesting. Of course, harvesting trees is the activity that caused many special interests to block forest management by any means politically and socially. This stalemate has resulted in a dramatic decline in active forest management on most public lands over the last fifty-plus years.

The good news is we have many excellent examples of integrated burning and thinning that have resulted in restored forest ecosystems that are aesthetically beautiful, more resilient to fire and insects, and more biologically diverse than the neglected lands nearby. One can visit the beautiful restoration of Ponderosa pine systems in Arizona, Oregon, and Washington, the stunning conifer forests in the mountains of California, the majestic longleaf pine forests of Florida and Georgia, and the restored pitch and shortleaf pine forests of the Pinelands National Reserve in southern New Jersey – it's all there for people to see for themselves.

Unfortunately, the work done on those fronts is only a drop in the bucket compared to the long list of concerns that must be addressed across the country.

The use of fire has its limitations, which is why mechanical removal and treatment of trees remain essential tools. Many areas are too close to homes or infrastructure and the smoke becomes a problem. Getting the right weather conditions to allow for the intentional setting of fire is challenging. There are also ecological concerns at times. Allowing a fire to destroy a seed bank or burn into the turf can have devastating impacts on some

ecosystems. The bottom line is that this is all complex. But we need to get on with what we know works.

Forest management often requires an understanding of the fire ecology of those lands. It's not possible technically, phys-

ically, and economically to manage all of our conserved forest lands. Thus, Mother Nature will continue to be a partner in our forest management strategies.

We can collaborate with nature in a way that protects our needs from the forest as well as our towns, villages, and recreational uses. We can manage our forest on a landscape level to better direct how wildfires behave and what they do or don't impact. We must learn how to live with fire as the Native Americans did for thousands of years. The Native Americans clearly understood they were an integral part of the forest system, not invaders. We too must begin to understand we have influenced the forest and we too are part of the forest system – not invaders. We need to sustain each other.

None of this will be easy. Much of the restoration work requires the removal of small-diameter trees with no markets for this wood. Our new vision for forest and fire policy will need to consider the economic and tax policies that can make the needed work economically feasible. Using wood fiber for renewable energy might be one of the key players in the needed forest restoration and management program. Biomass, small-diameter timber, pulpwood, and wood chips all will play a role.

Here in southern New Jersey between the great cities of New York and Philadelphia, we have a fire culture on the land. Family forest landowners along with state fire wardens burn forests annually without concern or problem. It can and should be done elsewhere. 🌿

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