



# LET'S TALK TREATMENT

Forestry Division

## Thinning can be shocking – but why is it necessary?

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Forestry work is complex and often looks rough. It raises a fair question: Why meddle at all? Aren't forests fine on their own? But the forests we're inherited are the result of centuries of management – and mismanagement. It's our task now to restore them.

Dr. Tom Swetnam can recall sledding in the Jemez Mountains when he was just a kid. In the 1960s and '70s, he'd cruise on an inner tube down open slopes from Jemez Springs to Valles Caldera, braking and weaving to dodge clusters of ponderosa pine.

Now, when he drives that same road, the prospects for sledding look very different.

"You can't even see those slopes today, they're so grown in," he said.

**It's a common belief that a dense forest is a healthy forest – and if that were the case, New Mexico's forests might be the poster child for tree health.**

However, the inverse is true. In our dry forest environments, trees need space to thrive. In 2026, the trees growing in New Mexico's overstocked forests are chronically stressed in their competition for water, soil nutrients and sunlight.

New Mexico's climate has long seen shifts from dry to wet and back again. But a megadrought that began in 2000 – the most severe since year 800 – has amplified trees' competition for precious water in the arid Southwest. Rapid warming compounds the drought, which is [not predicted to ease up](#).

All this stress renders forests particularly vulnerable to additional looming threats: wildfire and insect outbreaks.

Swetnam has spent the last 45 years as a tree-ring researcher with University of Arizona. In his life and work, he's seen a particular kind of story emerge from the tree

rings he's pored over for decades. At the turn of the 20<sup>th</sup> century, when a livestock grazing boom, then a timber boom, then fire exclusion by federal agencies became the order of the day, forests surged, infilling scores more trees per acre and crowding the landscape.

"Absolutely no doubt, there's a giant pulse of regeneration," he said. It may sound like a boon – but simultaneously, "Tree ring growth declines precipitously in the late 20th century. Drought is affecting them, but it's also competition – we see that in the data."

Swetnam's research shows that lightning-caused fires and insect outbreaks have worked for hundreds of years as a natural treatment to check forest density. But with stands that are now overgrown and drought-stressed, these events are now devastating.



In 2025, [tree mortality tripled from 2024](#) with over 200,000 acres impacted by beetle kill.

Increasingly catastrophic wildfires burn out entire landscapes, forcing a near-total ecosystem change, or "type conversion," from ponderosa pine forest to oak shrubland, for example. Swetnam calls the Jemez Mountains the "poster child for type conversion." He estimates [20 to 30% of the forest has flipped](#) in the past 25 years.

"Now that's shocking. And those forests are probably not coming back – not without some very severe interventions and stopping climate change."

## FOREST FOR THE TREES

It's a counterintuitive notion, that too many trees might be a bad thing. But high stand density brings side effects.

In the Southwest's arid watersheds, overly dense forests take water out of soil and streams. Tree canopies can shade the ground and retain snowpack – but when too dense, tree canopies trap snow up high, where as much as [90% can sublimate](#), or turn from ice to water vapor, without ever reaching the ground.

Trees help retain soil, but conversely, too many trees without enough grasses can compound erosion because trees' deep root systems are not as good at holding soil in place as nearby grasses' shallow root systems.

"I think it's an undeniable reality that we have to cut trees down to help these ecosystems work the way they evolved to work," said Mary Stuever, Cimarron District Forester. "We need to recognize that humans have had a huge impact on forest health and that we have a responsibility as stewards going forward."

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Stuever has worked in the Southwest for 44 years. She's seen time and again that forest treatments are a proven way to reduce tree stress and wildfire risk and return forests to a more balanced state.

Treatments can take different forms. From hand-thinning to machine thinning to broadcast burns, prescriptions are tailored to suit different landscapes, forest types and land management goals.

Beyond forest health itself, stands can be thinned to support elk grazing or kept dense for elk calving. If a potential project site is surrounded by acres of overgrowth, creating a fuel break might be a good idea. If the landscape is more open, keeping a piñon stand dense could support pinyon jays.

The work is complex and nuanced, with no one-size-fits-all prescription.

"You wouldn't do the same thing on every landscape, every time," Stuever said. "That's where forestry is both an art and a science."

Stuever focuses on connecting projects to key buffer areas or landscape-scale goals to stretch work further. She works with landowners to fit their hopes to the reality of the forest type.



Matthew Silva is one such landowner. He's treated his family's forested land in the Zuni Mountains for over 20 years. When he started, the forest was "terribly overstocked," he said, with as many as 6,000 trees in an acre.

Every year, he tackled between 30 and 80 acres. Every year, he saw dry stream beds refill with water. Birds would flock to the newly treated forest the very next day. The balanced ecosystem on his property supported the Zuni blue head sucker, an endangered fish.

His work also helped defend his home during the [2025 Merrill Fire](#). The fire had burned through 50 acres in two hours, but when it reached a fuel break near Silva's property, flame lengths died down to a crawl.



To this day, he feels his property is well-positioned against wildfire. "The reason it doesn't make me nervous is we have fuel breaks along our property," he said.

Swetnam recalls a similar event during the [2021 Cerro Pelado Fire](#). From his back porch, he watched the black smoke plume rise from the Jemez Mountains. The fast-moving crown fire was descending on Sierra de los Pinos when suddenly, the smoke turned pure white.

"The fire front hit a treated area and dropped to the ground," he recalled. "That fuel break probably saved a couple hundred homes."

"I think people are starting to see dense ponderosa forest as the risk that it is," he added.

Before



After

Southern Gila

Tom Ziegler, Forestry Division

## 'IT LOOKS PRETTY ROUGH'

In the end, treating our forests reinvigorates them and insulates them – and our communities – against the worst of wildfire.

The road to getting there, though, can be bumpy. When a project first wraps, “It looks pretty rough,” said Lawrence Crane, Bernalillo District Forester. Brush piles, small stumps, a carpet of wood chips or tree limbs: Treatments often make a forest look worse before they look better. Brush piles take years to dry out before they can safely be burned.

Treatments can be shocking, especially when residents are accustomed to the way their nearby stands look. Forests have grown in over centuries, while treatments happen in mere days. There is understandable concern for how this impacts wildlife or soils.

Agencies implementing projects often desire both public trust and patience but haven't always earned it – whether cutting too many large diameter trees or not communicating throughout the process. Community members aren't wrong for questioning the efficacy of treatments.

“But if they don't do this thinning work, it's all gonna burn,” Swetnam said. “I think overall, if the price we have to pay is treatments that cost more than they return in timber, so be it. It's time to invest in these forests.”

Still, it's understandable to be sentimental. Why not let nature do its thing? After all, America's landmark Wilderness Act of 1964 hails a utopian vision of nature as being “untrammelled by man.”

But nature has long been trammled by man – often beneficially for the humans who dwell in them. The semi-open canopies Swetnam sledged through in his youth

were the inheritance of millennia of Tribal land stewardship.

Most of the villages in Jemez were built in ponderosa forest, which low-severity fire burned every five to 10 years. Tree-ring research shows that around ancestral Pueblo villages, low-intensity fires burned very infrequently or not at all. People gathered all the woody fuels for heating, cooking, and building roofs.

A few miles beyond villages, fires burned more often – every two to three years – as Tribes used fire for hunting or to cull overgrowth. When Europeans first encountered the savannah-like forests in the West, they thought they'd found a naturally occurring Eden without fully understanding what they were seeing: responsible forest management.

“That's the fundamental lesson,” Swetnam offered. “If you live in the forest, you should manage it and live with fire and use fire. Because if you keep fire out, and you don't cut any trees, you're gonna have a problem. These people who lived here for centuries, they lived sustainably.”

## TREATMENT TYPES

**Hand thinning** removes smaller diameter trees and ladder fuels from dense stands and is useful on tricky slopes or small footprints

**Mechanical thinning** uses heavy equipment to reduce densities on a larger footprint, creating forest openings and fuel breaks on a larger scale

**Mastication** uses a machine to chew up small trees and ground fuels and spread them across the forest floor, returning woody material and nutrients back the soil

**Pile burning** gathers slash, branches and small diameter trees into, you guessed it, piles, which dry over 2-3 years before being burned

**Prescribed thinning** uses low-intensity fire to burn out fine fuels like accumulated leaf litter and small seedlings to keep forests from overgrowing

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# WHAT IS HEALTHY FOREST?

**“Healthy forest” looks different across different types**, from mountaintop spruce-fir down to riverside bosque.

## **Subalpine spruce-fir (8,000-10,000 feet)**

These forests are used to being dense. Thinning is usually not beneficial. With too little tree density, these shallow-rooted trees are vulnerable to the alpine winds that turn high-elevation slopes into a game of pick-up sticks.

Because these forests are dense, fires in these forests typically burn through a whole stand. At lower elevations, aspens recolonize the area first, then conifers slowly creep back in. Near the timberline, hundreds of years may pass before conifers replace alpine meadows. When you’re out hiking, think: Anytime you’re standing in an aspen grove, you’re standing in some type of disturbance.

## **Wet mixed conifer (6,000 – 10,000 feet)**

This type is often characterized by the presence of aspen and absence of ponderosas. Fire behavior oscillates between stand-replacing events and low-intensity surface fires. These forests play an outsized role in water supply, from storing snowpack to holding wet meadows.

## **Dry mixed conifer (6,000 – 9,500 feet)**

This transition zone between spruce-fir and ponderosa pine is perhaps most impacted by the legacy of fire exclusion. Frequent fire, large pines and grassy openings characterize this type. Without regular fires, shade-tolerant trees like firs come to dominate the understory. Over time, they grow layers of limbs that are easy ladder fuels for fire to climb up to the canopy.

## **Ponderosa pine (6,300 – 9,500 feet)**

Perhaps because Flagstaff, the hub of Southwest forestry research, is surrounded by ponderosa forest, this type has been researched most, Stuever noted. “This has been the area where our treatments are generally most effective at changing fire behavior.”

These forests benefit from thinning to break up tree density. Foresters aim to mimic the natural clumps of trees that support grassy openings, which helps low-intensity fire burn through and clear out overgrowth from coming back up.

Ponderosa pines are built for fire: Their thick bark and high branches evolved precisely to withstand flames. Anytime you see a stand of ponderosas with blackened bark, don’t fret: That’s just how they like it.

## **Bonus: Oak (6,500–8,000 feet)**

Some dry mixed conifer and ponderosa stands support more oak than others, which changes those stands’ fire behavior. Thinning too aggressively forests that have an oak understory can trigger a burst of oak regrowth, which can raise fire risk.

“I call it the ‘Fantasia’ species,” Stuever grinned. “You know, every time Mickey Mouse would break the broom, it would become two more brooms.”

Reducing oak requires persistence. It may also push that stand outside its natural range of variation. If it wants to be oak, maybe it’s best left as oak.

## **Piñon-juniper (5,000–9,000 feet)**

These are by far the least researched forest type, Stuever noted. However, this area has been a choice zone for human habitation for thousands of years, beloved for its climate, fragrant, dense firewood, and rich nuts.

These forests are also particularly diverse. A bird cruising overhead might fly through dense piñon-juniper, sagebrush, grassland and back again in one area.

Treatments here are site-specific. For example, the broader landscape lacks sagebrush, thinning some trees to introduce brush may be beneficial.

“This carpet of trees across the landscape is probably not the healthiest version of what our PJ landscape should look like,” Stuever said. “We should be seeing a lot of diversity.”

## **Bosque (up to 6,500 feet)**

Down in New Mexico’s riverside woodlands, cottonwood forests have long missed a different disturbance: floods.

Water infrastructure like dams installed in the 1900s seriously altered rivers’ behavior. Along the Rio Grande, no longer did spring snowpack runoff induce floods across a meandering, shifting river. Instead, the river was channelized and managed for consistent flow throughout the year. This has curbed the growth of generations of new cottonwoods.

Invasive species like salt cedar and Russian olive were introduced to stabilize the river’s banks. These nonnatives use more water than their native counterparts and create higher fire risk that riparian forests aren’t used to seeing, like in the [2025 Desert Willow Complex Fire](#).