

## Forest Management

One day about forty years ago, thinning east of Snow Lake, I dropped a tree and was lopping it up when I came upon a little spotted owl sitting on one of its branches. I put it in another tree and went back to work. I've always wondered how it handled the trauma. Terrifying from the owl's perspective. Later that year, working on a relatively small logging operation high up in the back country of the Sangre de Cristos, I was sitting on a log with virgin spruce forest and a beautiful dusting of snow behind me, watching the dust and devastation of an ongoing clearcut in front. At the other end of the log an ermine was sitting, watching with me.

I grew up in the Southern California chaparral and Santa Ana winds. I have many years of experience logging and thinning in our Southwestern forests, as well as 16 years experience as a volunteer firefighter on a well respected rural department, where I spent many hundreds of hours a year building and maintaining equipment. I have a sawmill and I've small scale, non intrusively, salvage-logged several fires. My daughter and son-in-law are professional firefighters with the Forest Service who lost good friends on the Yarnell Hill Fire. I'm a mechanic, a machinist, a welder, a millwright, and a lot of other things. I've also been studying climate for many years. I know a bit about what I'm talking about.

For most of a century, Forest Service policy was to put out all the fires; completely ignoring the many warnings from people with a more farsighted knowledge of forest ecology. The current Forest Service policy of selective logging and subsequent thinning with no firebreaks is even worse.

Back in the '70s, when we thinned the Southwestern forests, I'd killed about a quarter million trees before I realized that we were doing way more harm than good. In the short term we were reducing fuel load and ladder fuel and speeding up growth, but we were setting up a disaster in the future. We let in the sun. If there's water, sunlight, and a bit of nutrient, something's gonna grow. In a natural forest, if seed drops are dense, competition for light forces vertical growth and trees grow straight and tall with no low branches. Until it eventually thins itself, doghair is quite vulnerable to fire and might have to start over many times, but when it finally gets a chance, it matures into a tall, fire resistant forest that can endure for many centuries. Selective logging and subsequent thinning lets the light in. Lacking competition for light, trees grow short and fat with lots of low branches and there's constant growth of new shrubs and trees at ground level, especially if cattle have taken the grass. A selectively logged and thinned forest will never grow into a tall, mature, fire resistant forest until it burns and starts over. It will always be vulnerable to stand replacement fire unless it is constantly thinned, and will never produce anything but extremely poor quality lumber full of knots with a very high volume of logging slash. It's most likely that it will end up as stand replacement burn scar.

Most types of forest are not steady state ecosystems. They have a distinct birth, life, and death, sometimes on a time scale of thousands of years. Inappropriate thinning of a young

forest is like feeding growth hormones and steroids to children to make them grow up faster. You don't get what you're hoping for.

Most forest is born the morning after a fire. In the past, the common course of a forest fire has been to crown during the afternoon and run on the ground in the night and morning. This resulted in a patchwork of clearings, varying in size from a few trees to thousands of acres, amidst a forest made much more resistant to fire.

Where the fire has crowned, the intense heat has sterilized the soil. Mother Nature doesn't start a new forest with trees. Over the next few decades a progression of life stabilizes the soil. Bacteria, wildflowers, weeds, grasses, shrubs, bushes, deciduous trees, and finally conifers. Under certain conditions grasses will dominate and meadows will form. Under most conditions, dependent on proximity to seed trees, soil moisture, and wind speed and direction, thickets of varying density eventually sprout and immediately begin to compete for light, water, and nutrients.

Thinning can be good for a forest, but not the way we're doing it now. Appropriate thinning is about taking out all the trees that have lost the light, but never let the light in. This frees up water and nutrients and covers the ground with a layer of mulch, which lessens forest flammability a bit and speeds up growth, shortening the age of vulnerability till they're tall enough to turn into a mature, fire resistant forest. Intensive thinning for fire control will be useful in places to protect communities and in some places it can help reestablish the forest mosaic if we can keep the cattle out and bring back the grass, but the goal is to protect as much doghair as we can.

Because they visualize clearcut as massive devastation, environmentalists have put a stop to most clearcut, when small, contour related strip clearcut done with a combination of logging and fire where new forest is much closer to nature than selective logging. The logging boom is over. We've taken almost all of the world's forests. It will be centuries before we have anything but tree farms pumping out pulpwood and extremely poor quality lumber. If we drop the timber yield by about 70%, small scale salvage logging done with unobtrusive methods would be much healthier for the forest than cutting new timber. We can't let mindless capitalism drive the final destruction of our forests. Steel and stone and a lot of other materials are much stronger, more durable, and fire resistant building materials. Don't build with wood. We need to find other jobs for most of the logging industry. This is essential if we're to let Mother Nature regrow the forests.

First came massive clearcut along with sheep and cattle. Next came fire suppression, then selective logging and thinning. Now comes climate change on an inter-glacial scale. For many decades, all species over almost all of the planet have been moving uphill and towards the poles as the climate warms. Atmospheric and oceanic warming are expanding the Hadley Cell, driving the deserts toward the poles. Here in the southwest, contrary to the conventional forecast of drought, we are likely to be cyclically south of the desert zone and will be warmer and periodically wetter. This does not bode well for the mixed conifer forests, as they are completely dependent on a shaded snowpack to make it through the spring winds.

It will take centuries for our forests to regrow if we let them and they won't be like they were. We need to change the focus of our efforts from controlling nature to helping

nature. The challenge is how to reintroduce fire into a forest that is totally altered and has lost its ability to live with fire. The only way for a forest to mature into a steady state, fire resistant forest is to let the doghair fight it out for the light. A young natural forest is extremely vulnerable to crown fire until it matures, but a thinned forest after thirty years or so of new growth is even worse, and has no chance of ever becoming a tall, mature, fire resistant forest. Most of the big fires in the American Southwest have been in forests that had been selectively logged and thinned thirty to fifty years previous. Most of them have been overgrazed. Most of them have been subject to excessive fire suppression. Mother Nature uses fire for fire control; we need to learn to better manage fire in order to help with the burn.

This brings us to the A10 Warthog. Most fires should be allowed to burn, but it would be very helpful if we could steer them, and in the drought years it's best to put them out before they get away. In the early days of aerial firefighting, Forest Service Fire and Aviation tried to put out fires with slurry with almost no success. The air tanker fleet can't fly in wind, cannot maneuver at all, and their drop speed is about two acres a second. They missed far more than they hit. They quickly gave up and now they just mist the crown to slow it down and give the ground crews more time to build line. It usually helps, but it's sometimes just for show and a paycheck or dropped on a small fire that's already fully controlled by the time they get there because someone on the ground panicked. They've developed a mindset that a fire can't be extinguished with a plane.

The A10 Warthog is specifically designed to hit spot ground targets, and it's extremely accurate. An A10 could fly up a canyon on a windy day, coat a smoldering snag with a thousand gallons of heavy wet rain, turn around and knock it down with a two ton ball of snot, and do it for cheap. We have hundreds of them sitting around doing nothing, and there are plenty of Hog pilots who would love to fly. A10s are a fun plane.

A major impediment to bringing fire back to the forest is urban interface. It's a problem that's not going to go away anytime soon. The Forest Service is trying to hand structural protection over to the insurance industry. It's a good idea, but there's literally no equipment designed specifically for protecting structures at the urban interface, and there's not nearly enough community planning and liaison with the construction industry. A few months after the Cedar Fire [280,000 acres; 2,232 structures], I spent most of a day touring the southern edge of the burn scar with a friend who was one of San Diego County's fire chiefs. I spent most of the next day touring the east side. Most of the fire was chaparral. When the Santa Ana winds blow, a chaparral fire cannot and should not be fought at all. It was born to burn and it will. If it doesn't burn this year, it will just burn hotter the next time it finds a spark and some wind. There were around 700 engines on that fire; almost all of them protecting structures with equipment designed for fire fighting. The fire equipment industry is pumping out a lot of bright and shiny and very expensive Rube Goldberg crap that's fundamentally obsolete because it's all designed for fire fighting instead of fire management and protecting structures. Until we build a better way to protect people's homes from wildfire, there's no political way to stop excessive fire suppression.

In the Fireline section at <http://bobstockdale.me> there's a lot more about forest management and firefighting, and a business proposal for equipment specifically designed for the urban interface.

