

THE ART & MACHINERY OF WOODLAND RESTORATION

Halfway up a steep Montana hillside, the bottom of a freshly cut Douglas Fir rises several feet into the air. The tree sways slightly, hanging by a cable from a briefcase-sized steel device called a carriage. The cable snakes through the carriage and stretches several hundred feet up the hill to a spool atop an odd-looking machine. Suddenly, the spool begins to reel in the carriage, which glides uphill suspended like a gondola from a slightly higher cable. The carriage pulls the tree, and the tree's tip leaves a faint trail on the forest floor.

That trail, which will be unnoticeable after the next rain, is helping Matt Arno to make his mark.

Arno's company, Woodland Restoration, Inc., specializes in thinning sites like this one next to Rock Creek, a blue ribbon trout stream in the Sapphire Mountains. The site illustrates one of Arno's guiding principles: to make forests more fire resistant without destroying their beauty.

"With traditional logging," he explains, "you can run into three potential problems: scarring the ground; scarring the 'leave' trees (those left standing); and winding up with all the healthiest trees removed."

The first problem can be especially acute around the Inland West, where the land public and private alike is mountainous. So Arno gets thinning help from other forest practitioners like Dyrk Krueger, who built and operates the ingenious cabled contraption that's pulling in trees at the Rock Creek site.

Cross an excavator with a small radio tower and a pair of giant fishing reels, and you'll get something close to Krueger's machine, which he calls an excaliner. On a typical thinning job, crewmembers first run a "skyline," or guide cable, from the excaliner to a leave tree down the hillside. The cable is then pulled taut by a motorized spool until it rises to 10 feet or so above the work area. Next, a "main line," which snakes through the gondola-like carriage, gets wrapped around the bottom of the felled tree. Finally, a second motorized spool reels in the main line, which lifts the tree bottom and then pulls the carriage, which in turn pulls the half-suspended tree up the hill.

"That way," Arno points out, "almost all the tree's weight is off the ground." As a result, landowners avoid the telltale claw marks of a typical mountainside commercial cut.

What's more, the excaliner runs on bulldozer-style tracks, so Krueger can maneuver it into almost any terrain without having to punch in a road. And its double-cable system allows the machine to pull trees up -or down- slopes as steep as double black diamond ski runs.

But doesn't a big machine on tracks create its own problems? Not necessarily, says Krueger. "People used to take one look at a big unit like this and assume it was going to

disturb the surface. But we've learned how to avoid those kinds of problems-ground disturbance, compaction, residual tree damage, things like that."

Matt Arno seconds that statement, adding that a big advantage of Krueger's machine is Krueger himself. "Guys like Dyrk are conscientious and highly trained," he says. "They do a high quality job so the land doesn't look like it's been logged."

Arno's fascination with forestland might just be genetic. His father, Steve Arno, is an acclaimed researcher in forest ecology and fire ecology and is known for books like *Flames in our Forest* and *Northwest Trees*. Matt is a forestry graduate of the University of Montana, as is his brother Nathan, who owns his own forest restoration company, Firewise Forest Landscaping; the brothers often work together and pool their resources.

His background and training have led Matt Arno to view forestland in a scientific and historical context-not simply as trees to be thinned or sold, but as part of an ecosystem. That philosophy has won him business from both private landowners and the Forest Service. It's also attracted the attention of several members of the Sierra Club, which sponsored a tour of an excaliner worksite at the 2003 session of the Western Governor's Association in Missoula, Montana.

Standing at a privately owned site that his company worked on last year, Arno expands on his viewpoint. Ideally, he says, restoring a forest involves returning it to its condition before fire suppression became the law of the land. "In the low elevation forests of the Inland West," he explains, "the natural state is low-intensity fires in cycles of 15 or so years. The brush and small trees burn away, and the bigger, healthy trees survive."

Arno's dog, Kootenai, yelps for permission to jump from the bed of his master's diesel pickup (forest green, of course). Matt shushes him, then waves to the nearby hillside. Because of fire suppression, he continues, we've missed five or six fire cycles-and produced a landscape of scraggly, fire-prone trees.

Case in point: this part of the Rattlesnake Valley, about 50 miles northwest of the Rock Creek site. When Arno started the job, this hill was overrun by Douglas Fir and stunted Ponderosa fighting each other for water and sunlight. "We like to leave healthy trees, but if there simply aren't any healthy trees, we leave a few bare spots-better than weak trees that are going to blow over."

Later, a mile to the west, Arno stops his truck and walks down a ridgeline. "Now here we had good stuff to start with," he says with a smile, gesturing to a beautiful, open southern slope of 60- and 70-foot Ponderosa. On this slope, too, it's impossible to tell that several truckloads of trees had been removed less than a year ago.

Arno sees his job as helping landowners to recreate the naturally fire resistant, pre-Smokey Bear state of things. Of course he also takes into account his clients' other priorities, which usually include some combination of privacy, aesthetics, and wildlife protection.

But restoring a forested slope involves more than using the excavator. Arno tries to use low-impact techniques from start to finish, whatever the tools involved. A small detail: he uses removable plastic ribbons to mark the leave trees, instead of spray paint. And when his crewmembers cut trees on a hillside, they take care to fell them into a kind of herringbone pattern, so they can be moved into narrow corridors and then up (or down) the slope- without scarring the leave trees in the process.

Arno's outfit also treated a hillside of Douglas Fir on the shadier, northern side of this same ridge. No damaged trees. No damaged ground. "It still looks like a forest," says Arno. "But the crowns of the trees won't ignite each other; if a big fire comes through, it'll get knocked down to the ground, where it's lots easier to deal with."

His words are given added weight by a heavy layer of wildfire smoke that's settled over the Rattlesnake Valley this afternoon. As he speaks, 300,000 acres of decidedly unthinned forest are burning throughout Montana.

Surveying the hazy hills, Arno recalls that his business saw an increase in calls after the notorious fires of 2000. If the war-zone look of the air today is any indication, 2003 will end as another hot year for Woodland Restoration.