

CUTTING IT DOWN TO SIZE

ARIZONA IS HOME TO THE LARGEST STAND OF PONDEROSA PINES IN THE WORLD. ITS SIZE IS IMPRESSIVE. ITS HEALTH IS NOT — THE WOODS ARE TOO DENSE. THUS, THE FOUR FOREST RESTORATION INITIATIVE, AN UNPRECEDENTED, AMBITIOUS AND CONTROVERSIAL EFFORT TO THIN AND RESTORE 2.4 MILLION ACRES ON FOUR NATIONAL FORESTS IN THE STATE. THE TIMELINE IS 20 YEARS. TIME WILL TELL.

BY TERRY GREENE STERLING
PHOTOGRAPHS BY TOM BEAN

A young ponderosa pine stands in front of recently harvested ponderosa logs along a Coconino National Forest road south of Flagstaff. The trees were cut down as part of a Four Forest Restoration Initiative task order.

On a May morning, Dick Fleishman angles a white SUV onto a road of gritty red cinder. On both sides of the road, ponderosa pine trees in various degrees of health quiver and moan in the wind.

We're motoring through the Coconino National Forest not far from Flagstaff. I'm in the front seat, scrawling notes as I get a crash course on forest restoration from Fleishman, the assistant team leader for the largest, most ambitious forest restoration effort in the United States.

It's called the Four Forest Restoration Initiative, known locally as 4FRI. It's an unprecedented, history-making, ambitious, optimistic, collaborative, controversial and utterly human effort to restore, in 20 years, 2.4 million acres of mostly struggling ponderosa pine stands on four national forests in Arizona — the Coconino, Tonto, Kaibab and Apache-Sitgreaves. The goal of the U.S. Forest Service is to restore the structure of unhealthy, unnaturally dense, drought-stressed forests to their original "pre-settlement" condition.

Pre-settlement forests existed before non-Native American settlers innocently and not-so-innocently damaged them in a variety of ways that included overgrazing, natural fire suppression and logging. To get an idea of what pre-settlement forests looked like, ecologists study historical photos, analyze the few untouched-by-settlers stands of ponderosas still existing in Arizona and assess the patterns of ponderosa stumps that were logged a century ago.

Forest restoration developed widespread public support after a series of savage fires wiped out huge sections of the state's beloved ponderosa pine belt, which stretches from the Grand Canyon south and east to the New Mexico border.

Proponents of 4FRI (pronounced "four fry") say returning Arizona's ponderosa pine forests to the closest semblance of their pre-settlement

configurations as quickly as possible will render them more resistant to epic wildfires and climate change. In 4FRI's restored forests, the thinking goes, biodiversity will increase, destructive flooding will diminish, life-giving watersheds of big cities will be protected, and the millions of visitors who ski, hike, bike, run, rappel, fish, swim, camp, picnic and chill out beneath the ponderosas will still have a place to go.

Much is at stake. If it succeeds, the 4FRI experiment will be an important national model for landscape-scale forest restoration. And forest restoration is key to combating climate change. One hundred ninety-five countries signed the 2015 Paris Agreement climate pact, which, among other things, encourages forest restoration. The reason: All forests, including the ponderosa stands in Arizona, store enormous amounts of carbon. Carbon turns into carbon dioxide — a greenhouse gas contributing to climate change — every time there's a forest fire. Carbon dioxide continues escaping into the atmosphere from dead trees long after the fire has ravaged the landscape.

Yet despite the urgency, 4FRI isn't proceeding apace.

This may explain why Annette Fredette, 4FRI's planning team leader, and Brienne Pettit, a public affairs specialist, bounce along in the back seat during Fleishman's tour, politely answering my questions with carefully chosen words.

Fleishman, 57, wears a navy-blue Forest Service baseball cap with the word "Fire" embossed in red on the front, along with a tan shirt, green khakis and hiking boots. He has a gray walrus mustache and a soul patch beneath his lower lip. Fleishman's father worked for the Forest Service, and Fleishman grew

up in the Phoenix area. He's friendly and patient and laughs easily. Only his chewed-to-the-nubs fingernails suggest he internalizes stress.

He wants to help preserve the ponderosa forests so they'll be around for his kids when they're his age.



TOP TO BOTTOM: Raemy Winton, a member of a monitoring crew, measures a small ponderosa pine during a pre-thinning project on the Coconino National Forest. Winton's colleague Krystal Burchinal records data during the same project. Pine needles, cones and branches accumulate beneath mature ponderosas south of Flagstaff.

RIGHT: Arizona's ponderosa pine belt, seen here from Bill Williams Mountain south of Williams, stretches from the Grand Canyon to New Mexico.



“This is my life,” he tells me, gesturing at the forest. “This is my kids’ life. If we don’t take care of this, there will be nothing left for them.”

Nobody involved in Arizona forest restoration wants another 2011 Wallow Fire, which burned half a million acres and whose atom-bomb-like flames left charred, outgassing tree skeletons in their wake in some areas.

We climb out of the SUV. On one side of the road, there’s a dense stand of ponderosas that, until today, would have appeared perfectly natural and normal to me. But Fleishman calls it an “unhealthy monoculture,” meaning there is just one tree species, ponderosa, growing here. The forest here is overpopulated with small and medium-sized trees, all competing for the same precious groundwater in nutrient-starved soil. There’s little plant life, or understory, beneath the trees — just dead pine needles. It’s another Wallow Fire waiting to happen.

On the other side of the road, widely separated ponderosa pines have enough groundwater and nutrient-rich soil to thrive.

Fleishman says, “This is what it was like [before settlement].”

This bit of forest was mechanically thinned and underwent a subsequent prescribed burn, a scientifically

designed, intentionally ignited restorative fire meant to imitate fires that occurred cyclically in pre-settlement days.

While thinning and burning are big-step forest restoration techniques, there’s more to it. Targeted, fine-tuned restoration includes re-establishing native plants; restoring springs, streams, grasslands and other habitats; and retiring destructive, erosion-prone dirt roads created by loggers and recreationists.

Back in the SUV, we crawl along until we reach an area that’s in the midst of mechanical thinning. This is what’s known in 4FRI nomenclature as a task order, a tract of land that the Forest Service contracts out for thinning.

We don hard hats. We race up a hill. We view, from a safe distance, a feller buncher at work.

A feller buncher resembles a mechanical *Tyrannosaurus rex*. It’s operated by a human being in a well-protected cab. It can fell a tree in a few seconds, during which its saw whines piercingly like a jet engine while dislodged rocks from the forest floor shoot hither and thither. It holds newly cut, quaking ponderosas in the air like prey before dropping them in piles.

Keeper trees are often marked in Forest Service paint, which costs \$40

per gallon and contains special tracking chemicals. I touch one keeper. The bark is rutted and rough to the touch and smells like butterscotch. Thanks to restoration, the tree will likely be strong enough to weather naturally occurring bark beetles.

I wonder how long this tree will live. According to Wally Covington, the director of the Ecological Restoration Institute at Northern Arizona University in Flagstaff, the oldest recorded age for a ponderosa in Arizona is about 1,200 years. The oldest recorded age for a ponderosa in the Flagstaff area is about 700 years.

Later, we picnic beneath a survivor ponderosa in a different task order. Nearby, we see large mounds of brown “slash” — mostly branches removed from felled trees as they’re transformed into logs awaiting transportation out of the forest. This is the KA task order, which the Forest Service entrusted to the most controversial 4FRI contractor, Good Earth Power AZ LLC. In 2013, the company signed on to thin 300,000 acres in 10 years.

After our picnic, we run into Andy Cuevas, who is 52 and the logging supervisor for a subcontractor Good Earth Power AZ hired to conduct its on-site forest operations. Cuevas apologizes about the delays at the KA

task order. He promises the mounds of slash will be removed from the forest, in accordance with the contract. He acknowledges work is behind schedule.

A local woman stops her truck when she sees us. She’s just read in the Flagstaff newspaper, the *Arizona Daily Sun*, that some truckers say they haven’t been paid by Good Earth Power AZ.

In Williams, we cruise by the site where Good Earth Power AZ plans to build and operate a lumber mill.

On the way back to Flagstaff, I notice that a bit of snow caps Humphreys Peak. This signals a wet year. I wonder if the weather will buy some ponderosas a bit of time before the next epic fire everyone fears.

CHAPTER TWO: THE CONTRACT MYSTERY

THE 4FRI STAKEHOLDER GROUP is a counterintuitive mix of Republicans, Democrats, independents and libertarians; loggers and environmentalists; local, state and federal officials; and water managers, industry representatives, academics, ecologists, hunters and scientists who set aside their extreme differences to come together on 4FRI.

Their collaboration is emblematic

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of 21st century approaches to environmental stewardship. Diverse stakeholders, many believe, come up with more creative and considered solutions to pressing environmental issues.

The stakeholders collaborated on an environmental impact statement, required by the National Environmental Policy Act, that analyzed about 1 million acres on the Coconino and Kaibab national forests on the west side of the 4FRI footprint. Ultimately, nearly 600,000 of those acres got the green light for restoration. (Stakeholders now are collaborating on the second environmental impact statement, which spans another 1.1 million acres on the Coconino, Tonto and Apache-Sitgreaves national forests.)

The agreed-upon goal was to first focus on restoring the west side of 4FRI, in the hope that infrastructure, such as sawmills, would follow. But in order to

build infrastructure on the west side, the thinking went, the lion’s share of the work — 300,000 acres — would go to one contractor. It was sort of a “too big to fail” mindset, the idea being that a company harvesting 300,000 acres would have the funds and motivation to build and attract infrastructure.

The Forest Service, everyone agreed, wouldn’t pay the contractor; instead, the contractor would pay the Forest Service via a formula that considered value of lumber harvested versus cost of clearing slash and other biomass. Exactly how much the Forest Service would get would be calculated for each task order.

Other contractors could also work on smaller 4FRI efforts, everyone agreed. As of this writing, a total of 11 contractors have worked on 4FRI task orders, according to Forest Service records. From 2011 to late 2015, the For-



JUNE 5, 2012: Photographer Tom Bean documented the effects of forest thinning on a ponderosa pine forest along Lake Mary Road near Flagstaff. This photo shows the forest before thinning began.



JULY 21, 2014: Two years after thinning, the overpopulation of ponderosas has been addressed. With the trees more sparse, the forest’s understory — the plant life beneath the trees — can grow.



APRIL 26, 2015: Bean made this photo about a week after a prescribed burn. Because the ponderosas have ample space between them, fire can be beneficial, rather than destructive, to the forest.



JULY 9, 2015: Three years after thinning began, and two and a half months after the prescribed burn, the forest appears to be thriving as an approximation of its “pre-settlement” condition.

est Service spent about \$120 million on 4FRI, but that included planning, monitoring, thinning, burning and targeted restoration efforts. Good Earth Power AZ has thus far paid the Forest Service \$107,416 for tree harvesting.

Stakeholders have no say over what companies the Forest Service chooses to contract with. Many were surprised in 2012, when the Forest Service awarded the big 300,000-acre, 10-year 4FRI contract to Pioneer Forest Products — a company that employed a retired Forest Service staffer.

Charges of incompetence and/or cronyism on the part of the Forest Service soon followed. The environmentally focused publication *High Country News* questioned why the Forest Service had rejected a bidder that had widespread stakeholder support and offered to pay the Forest Service more for the wood.

In an email, Roberta Buskirk, who worked on the contract and is the director of acquisition management for the Southwestern Region of the Forest Service, based in Albuquerque, New Mexico, maintains the Forest Service conducted impartial, thorough, multi-level due diligence. The agency, she

writes, “looked at all factors, not just price, in making the selection.” The Forest Service “determined Pioneer’s proposed price to be the most reasonable of the proposals, the most likely to be successful, and therefore, in the Government’s best interests.”

A year after it signed the contract, Pioneer cried uncle. It couldn’t get financing for the project.

That year, 2013, Pioneer was purchased by Good Earth Power AZ. The company’s CEO, Jason Rosamond, claimed ties to an Omani investor and global sustainability projects. The company had no forestry experience in the United States.

The Forest Service permitted Good Earth Power AZ to take over the former Pioneer contract in 2013, prompting more public criticism. Buskirk explains in her email that Good Earth Power AZ was allowed to take over the contract because it was in the government’s best interests.

“In order to make that determination,” she writes, “the Contracting Officer assessed whether or not the new company was sufficiently sound, both financially and technically, and had

the skill sets required to successfully perform the existing contract.”

As of this writing, more than two years after it took on the job, Good Earth Power AZ has treated 6,513 acres out of 300,000. But according to the contract, Good Earth Power AZ itself is only required to thin 15,000 acres in 10 years. The remaining 95 percent of the 300,000 acres can be completed by subcontractors.

“Currently the contractor is fulfilling the terms and conditions of the contract,” Buskirk writes. The Forest Service monitors each task order. If a task order isn’t completed on time or appropriately, “the contracting officer would follow the process required under the Federal Acquisition Regulations, which could include a Notice of Non-Compliance, or a Show Cause Letter/Cure Notice, leading to a Termination for Default if necessary,” she says.

“The contract is, if anything, too liberal for Good Earth Power,” says Todd Schulke, a 4FRI stakeholder and co-founder of the Center for Biological Diversity, an environmental group based in Tucson. Schulke, who has worked on forest restoration for years, says the Forest Service made two bad mistakes

by first selecting Pioneer and then selecting Good Earth Power AZ.

This is what’s at stake, he says: the forests, the communities in the forests and public goodwill.

“If 4FRI fails,” he says, “it will be hard to start up something like this again in Arizona, but as importantly, it’s going to be really hard to convince people in other places that this kind of landscape-scale approach works.”

CHAPTER THREE: SURVIVING THE FIRE

ONCE AGAIN, I’m bouncing down a dirt road in a Forest Service vehicle, only this time it’s late August and I’m in the Apache-Sitgreaves National Forests, on the east side of the 4FRI footprint. Next to me in the back seat is Sue Sitko, the Northern Arizona conservation manager

for The Nature Conservancy and a co-chair of the 4FRI stakeholders group. In front, Ed Collins, the district ranger for the Lakeside Ranger District of Apache-Sitgreaves, drives. Photographer Tom Bean sits in the other front seat, scoping out possible sites for photos.

Collins has worked for the

Forest Service for 44 years; he’s been the district’s ranger for 27. He’s got a head of thick white hair and jogs three times weekly. Sitko is a slender mountain biker and has a prodigious knowledge of forest flora and fauna.

Both Collins and Sitko were deeply involved in the first effort at landscape-style forest restoration, which began in Eastern Arizona’s Apache-Sitgreaves National Forests. It was called the White Mountain Stewardship Project, and it lasted from 2004 to 2014. Unlike the main 4FRI contract, this project called for thinning 5,000 acres each year and paying loggers a sum derived from a complicated tonnage formula. The project surpassed its contracted goal and re-established timber-harvesting and wood-processing infrastructure in traditional Eastern Arizona logging communities.

“We’ve been doing this for years, so we can see we are on the right track,” Sitko says.

At the historic Los Burros Campground, we see pre-settlement pines — tall, stately dowagers with rough yellow bark and hardy, slightly downturned limbs. They’re spaced comfortably



CLOCKWISE FROM FAR LEFT: Felled ponderosa pines are piled amid preserved trees, marked with orange paint, in the Coconino National Forest. Stacked ponderosa logs wait to be sold near Howard Tank south of Flagstaff. Ponderosa logs from a task order being managed by Good Earth Power AZ southeast of Williams are loaded onto a truck. At the same task order, a feller buncher makes quick work of ponderosas in the dense forest.





apart in a meadow carpeted with native grasses. Collins figures this area likely was never logged.

A few miles later, we view a restored stand of ponderosas that withstood the 2014 San Juan Fire. The fire swept through the trees, but they survived beautifully. I touch the fire-scarred trunk of one ponderosa. The fire burned off its lower branches, but the higher canopy of branches is rich and green. The tree presides over a healthy and vibrant understory of native grasses, flowers and bushes. A warbler sings.

On the other side of the road, just a few feet away, the same fire killed every tree when it roared through. This area had not been restored. Thousands of greenhouse-gas-oozing, charred tree skeletons bear witness.

Now that the White Mountain Stewardship Project is over and the focus of 4FRI is mostly centered, for the first decade, on the west side, the Forest Service does its best to keep the existing industry on this east side alive.

On the way back to Pinetop-Lakeside, we run into a logger working on a task order. There's a pile of dry-branch slash behind his massive truck, which holds a forest-harvesting machine. Someone's stolen his fuel, he says. And this matters: There's a tight profit margin for solitary loggers, and stolen fuel can make a big difference on the bottom line. But he's determined to make a living as a logger until he can no longer do it. He loves the life. "It's just me," he says, "and the trees."

Before dropping us off in Pinetop-Lakeside, Collins steers through the yard of a wood-pellet manufacturing plant, an example of forest restoration industry. The pellets, made from slash and small trees that would not be otherwise usable, fuel heating stoves. Rows and rows of stacked white plastic

bags stuffed with pellets sit in the yard, ready for shipment.

Sitko ticks off a partial list of products made from the forest restoration wood: boards, pallets, molding for cabinets, door frames, plywood, posts and poles, animal bedding, highway guardrails, furniture, biomass for power generators.

The key, always, is to have a steady supply of product. So, it's frustrating when 4FRI's main wood producer, Good Earth Power AZ, seems far behind. But Sitko reserves judgment.

A few hours later, Bean and I visit a sixth-generation area logger, Allen Reidhead, at his family's sawmill near Snowflake. With his father, Steve, and two younger brothers, Allen worked on the White Mountain Stewardship Project. They converted profits into infrastructure. Among other things, they own five feller bunchers, four skidders, two processors, three log loaders and 20 trucks. The equipment in their sawmill is designed to process smaller trees instead of the big, fat old-growth trees that were harvested in the area decades ago.

The Reidhead sawmill is conveniently located next to the Novo BioPower plant, a partner in the sawmill. The plant burns biomass such as slash and sawdust to feed a generator that provides renewable power to Salt River Project and Arizona Public Service Co.

Allen Reidhead is 39 years old and wears a hard hat, a navy-blue golf shirt, jeans and hiking boots. He chooses his words carefully. Eastern Arizona loggers have long wondered why 4FRI was launched on the west side, with no infrastructure, instead of on the east side, where infrastructure and an experienced local workforce already exist. Reidhead says the goal of struggling Eastern Arizona loggers is to keep their businesses alive until the second 4FRI chunk gets the environmental impact statement, which will greenlight ramped-up forest restoration in their area.

Making a profit, Reidhead says, is "all about volume." To keep its business going, the sawmill eradicates juniper trees for private landowners and the Forest Service, and thins any available Forest Service task orders that are unrelated to Good Earth Power AZ.

CLOCKWISE FROM TOP: A March 2015 managed fire smolders in the Coconino National Forest southeast of Flagstaff. A member of a U.S. Forest Service crew uses a drip torch to spread the Springs Fire, which was started by lightning but became another managed burn, south of Williams in August 2015. Forest Service firefighter Marcos Roybal monitors the Springs Fire as it slowly advances along the forest floor. A ponderosa pine seedling burns during the Springs Fire.



In the sawmill yard, hundreds of moist, freshly sliced ponderosa boards cool the hot summer air, infusing it with a thick pine scent. The boards are neatly bundled and stacked for shipment to markets in Texas, Colorado, California and Mexico.

Nothing, Reidhead says, goes to waste.

CHAPTER FOUR: "IT'S NOT EASY"

IN OCTOBER, two months after my visit to the Reidhead sawmill, I'm standing in a muddy lot in Williams. Next to me is Jason Rosamond, the CEO of Good Earth Power AZ, and his wife, Maya Minkova, the company's vice

president. The mill here belongs to their company, and Rosamond says it will be up and running soon. Several men in hard hats are working on equipment near a portable generator imprinted with the logo of United Rentals.

The biggest challenge is biomass, Rosamond says. His contract calls for moving a total of 17 million tons out of the forest, he figures — 8 million tons of biomass and 9 million tons of logs. But as you process the logs, you get even more biomass. "We have to find every single possible market imaginable for biomass," he says.

Right now, he's got buyers for 102 daily loads of biomass, and that's enough to thin 32,000 acres a year, he says. He's got a team in Phoenix, he says, that sells biomass and lumber for him.

Rosamond is in his 40s and has a neatly trimmed brown beard that's turning gray. He wears wraparound shades, a blue-checked shirt, jeans and sneakers. He speaks rapidly.

"Our contract," he says, "is to clear 300,000 acres in 10 years, and that's what we gotta do, whatever it takes."

I ask to see his 4FRI contract, but he says his Omani investor would not approve.

He met the Omani investor in London, where he lived and worked, he says. He also met Minkova in London. She worked for the Shell oil and gas company. They were married two years ago in Croatia. Rosamond's father was employed by Raytheon, and Rosamond grew up abroad. He speaks several languages, and so does Minkova, who was

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ing, especially when you are building the entire supply chain."

"It's not easy," Minkova says. "People want us to cut [trees] as fast as we can, and we'd love to do that as well, but you can't just cut as fast as you can and pile it on the ground, you know."

She is in her early 30s, with long brown hair. She's small and slender, and wears a "Love Trees" T-shirt, cuffed jeans and Nikes.

Rosamond claims Good Earth Power AZ has ramped up. He says the company now has a mill in Heber and the soon-to-be mill in Williams, and a trucking fleet, and third-party truckers, and a bunch of equipment out in the forest, and "now we're gonna start employing people to operationalize everything."

I ask Rosamond why he doesn't ask the Omanis to send more money.

"We don't need any more money," he says. "We've just bought equipment, as I just said. We've got enough to do 24,000 acres [annually]." He says he's got a brand-new forest operations team in place, and he's optimistic. To complete the contract on time, he would have to accelerate in 2016 to 46,000 acres per year. He seems confident he can do it.

To prove his point, he drives through the KA task order, the same deserted task order I visited with Fleishman. Now, a growling mechanical monster chews up slash, spitting it into waiting trucks, which will take it to Phoenix, where it will become mulch.

Later, we jump out of the SUV and into a truck, and after navigating a primitive road, we jump out again and hightail it through the forest in search of a new feller buncher. One month ago, Rosamond had two feller bunchers. Now, he says, he has six.

The feller buncher whines and whistles and spits out rocks, and I don't have a hard hat, so I take cover behind a

pine tree. A squirrel darts in front of us.

After a few minutes, we race back to the truck because Rosamond is late for another meeting. Before we say goodbye, Rosamond says: "Do you ever watch those Guinness commercials? 'Good things come to those that wait.'"

"You know, it takes time to build up industry," he says. "So, come back and check us out in a quarter. That's what I recommend doing."

So I do check back. In an upbeat January 2016 newsletter, Good Earth Power AZ reports it has invested \$23.4 million into 4FRI and is preparing to spend another \$100 million on the project. The company says it has entered into an agreement with International Forest Products (IFP) to sell its lumber, a move it dubs a "game changer" because IFP provides an "assured market for every piece of lumber that comes out of the forests." Restoration, the newsletter notes, must be profitable to succeed.

After my meeting with Rosamond and Minkova, I'm on Interstate 17, heading home to Phoenix. A few miles south of Flagstaff, I gaze out the window at an overcrowded, sickly ponderosa forest. Ponderosas have likely graced this hillside for thousands of years, but it took little more than a century for humans to wreak havoc on the species in Arizona.

In the course of visiting the fragile ponderosa forests, I realize, I've joined all the conservatives, liberals, loggers, environmentalists and disparate others who feel a keen sense of urgency over their well-being. These men and women deeply want 4FRI to overcome its problems and succeed. But they also recognize the landscape-scale restoration initiative is a hopeful, flawed, utterly human undertaking. [▲▲▲](#)

To learn more about the Four Forest Restoration Initiative, visit www.4fri.org.

Young ponderosa pines mingle with established trees along a Coconino National Forest road southeast of Sedona. Four Forest Restoration Initiative stakeholders hope to make forests like this one the norm in Arizona.

born in Bulgaria but grew up in Africa.

We're in their SUV, headed out to the forest. I bring up the criticisms of Good Earth Power AZ aired in media reports — slow progress, truckers complaining about not getting paid, rosy prognostications leading to disappointments.

The project has been "a lot more work than we ever imagined it to be," Rosamond says. "You wake up every day to unbelievable challenges you have to fix. Coordinating an entire supply chain from start to finish is certainly challeng-