

# FRACKING: BOON OR BUST?

LESSONS FOR WOODLAND OWNERS  
FROM THE FRONTLINES OF AMERICA'S  
NATURAL GAS REVOLUTION

BY JOHN CAREY

**F**or Skip and Joyce Brownlee, the thumping was the first sign of dramatic change coming to their small corner of West Virginia. The retired police detective and his wife, a real estate broker, own 62 acres and a spacious modern cabin nestled in the steep forested hollows in Doddridge County. It's a quiet life, working on their certified Tree Farm, growing vegetables and hunting deer and turkey. "We moved here to be tucked away and left alone," says Skip.

But starting four years ago, their peace was shattered, first by the earth-thumping trucks of geologists searching for natural gas deposits, and then by the drilling companies

themselves. "We couldn't have anticipated it," Skip says. "It was one of those things that just kind of reared its head all of a sudden."

One hundred miles north in the West Virginia panhandle town of Colliers, the first indication of the impending transformation in Chris and Fred Welshans' world was a knock on their door. The brothers, who own and operate cemeteries, had spent decades turning an overgrown 30-acre woodland into a showpiece forest teeming with mighty oaks, poplars, ash, black cherry and other species. "We're very proud of our trees," says Chris. The brothers had even bought another 138 acres of woodlands and created a detailed



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management plan. But the man at the door wasn't interested in the trees. He wanted the Welshans to lease their mineral rights, opening up their land to natural gas drilling. "I said, 'I don't think we even own the mineral rights,'" Fred recalls. "No one around here ever thought of it."

The Brownlees, the Welshans and thousands of other American landowners can't avoid thinking about it anymore. They have been swept up in a new American energy revolution—the natural gas boom. A mile under the forests, farms and towns in huge chunks of West Virginia, Ohio, Pennsylvania and New York is a rock formation known

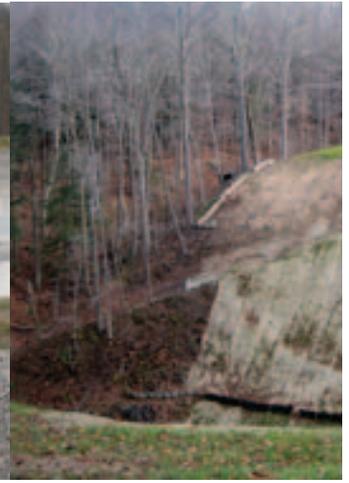
as the Marcellus shale. Geologists had long suspected that Marcellus shale harbored large quantities of natural gas. But it wasn't until recently that petroleum engineers figured out how to unlock the gas imprisoned in the rock. The trick is using a combination of horizontal drilling and a process called hydraulic fracturing, or fracking. A drill bores deep down and then sideways through the earth. Then water and chemicals are pumped at high pressure down the drill hole. That fractures the rock, allowing gas to bubble up through the well hole.

Similar shale formations are found everywhere from Texas to North Dakota to

Wells have been sprouting on private land across the nation as energy companies have learned how to extract vast reservoirs of natural gas held in rock formations underground. The key to this new American energy revolution is the technique of hydraulic fracturing, or fracking. The fracking boom holds both opportunities and dangers for woodland owners.



PHOTOS © JOHN CAREY



Among the woodland owners swept up in the new energy boom are Skip and Joyce Brownlee (left). The West Virginia couple had to scramble to buy back part of their property's mineral rights to gain some control over nearby gas operations. Chris Welshans (center) and his brother

Fred allowed drilling under their Tree Farm from a well a mile away and have no complaints.

But the brothers are relieved they turned down an offer to lease a pipeline right-of-way through their woodland.

The right-of-way now cuts a barren swath through a neighboring property (right).

California, and fracking for oil and gas is now big business in many states. But what's made the Marcellus shale especially productive is not only the huge amount of gas it contains, but also the natural fractures in the rocks that make the gas easily accessible. "When I started looking at it seven years ago, no one had any idea how successful gas production would be in the Marcellus shale," says Pennsylvania State University geology professor Terry Engelder. With production soaring, Pennsylvania is now challenging Louisiana as the second largest gas-producing state in the country, behind only Texas. If the region with the Marcellus shale were a country, it would be the third largest gas-producing nation in the world.

#### **POLARIZING DEBATE**

The boom has touched off a fierce controversy over the risks and benefits of fracking. "It has evolved into one of the most polarizing debates the U.S. has ever seen," says Engelder.

On the one hand, the flood of cheap natural gas has unquestionably been a major economic boon. Companies like Dow Chemical are investing billions of dollars on new facilities in the United States to take advantage of inexpensive gas, creating jobs and homegrown wealth. Meanwhile, the money from gas production is revitalizing countless communities and towns. Colliers, W.V., had fallen on hard times after the declines of the steel industry and coal mining, for instance. But now its economy is thriving. "The younger generation now has a reason to stay," says Fred Welshans. "The ripple effect has been phenomenal." And of course, cash is flowing into the pockets of wood-

land and farm owners, easing worries about paying the taxes or maintaining the land for future generations. "It's like finding gold on your property," says New York natural resources attorney David J. Colligan.

On the other hand, the fracking boom comes with horror stories of contaminated drinking water, polluted streams and chronic health problems. "There are some serious, serious issues with air and water quality," says Ben M. Stout III, a professor of biology at Wheeling Jesuit University in Wheeling, W.V., who has documented threats to drinking water from fracking waste. In Doddridge County, crane operator Wayne Woods and his wife Christina started a county watershed association to monitor drilling operations. They've discovered spills and stream contamination, and helped force the drilling companies to fix damage they caused to the roads.

"Whenever there's a boom or a rush, it's not going to work out well—it never has," warns Woods. "It's not being regulated properly."

In addition to the impact on private woodlands, hundreds of acres of state forests are being cleared for well sites, roads and pipelines. And even when everything goes perfectly, the roads are clogged with hundreds of water trucks supplying fracking water for the drilling operations. "When they put a well in, it's like Sherman's march to the sea," says attorney Colligan. "Figure on a year of ridiculous imposition."

Because of the concerns, New York state has a moratorium in place on fracking, and anti-fracking activists have been able to ban the practice in several towns across the country. Yet no one really knows how worrisome the long-term risks are, and how they stack up against the benefits.



So when the gas company comes knocking on the door, what's a landowner to do?

**GAINING CONTROL**

For Skip and Joyce Brownlee, the first sobering realization was learning how little control they had. Like many landowners, they owned just

the land's surface, not the resources underground—the mineral rights. As a result, any gas drillers who did own the mineral rights could put a well just about anywhere on the Brownlees' property—and the couple would get zilch from it. In fact, that's what happened to a neighbor. "The last thing we wanted was a well site in our front yard," says Skip.

From the Surface Owners' Rights Organization, the Brownlees learned they could regain control if they were able to snare just a portion of their mineral rights. So they traced the history of the mineral rights, which had originally been bought in the late 1800s, and were able to buy one-quarter of the rights back from an attorney who had inherited them from her parents.

But that didn't necessarily mean the Brownlees could keep the frackers away. Once drillers own the mineral rights to enough adjacent properties, they can legally force other owners to sell. In Doddridge

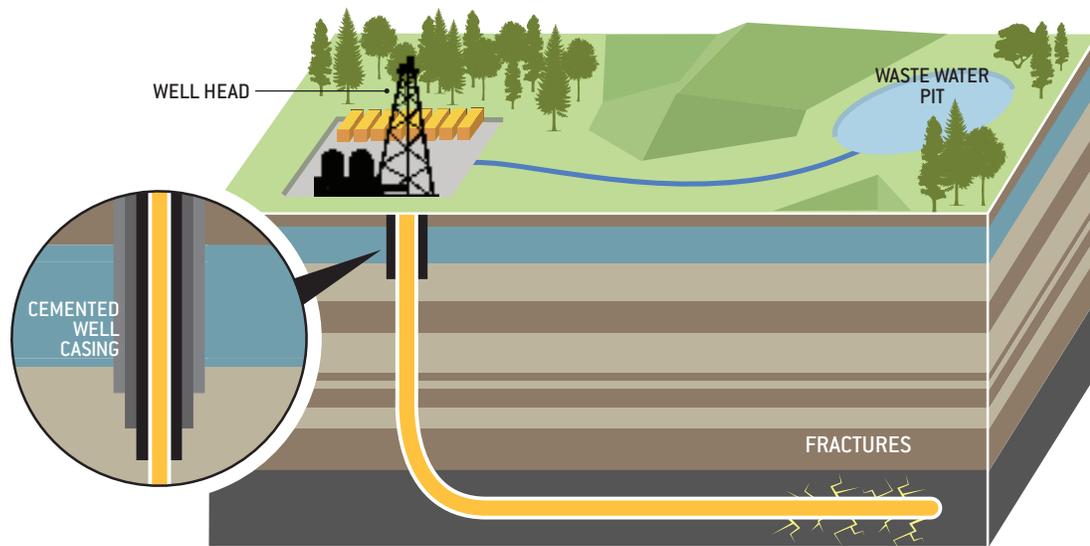
County, wells were already springing up like kudzu, and wide swaths of forest were being cleared for gas pipeline right-of-ways running up and down the steep slopes. "Had we said 'no, we're not going to sign a lease,' they could have taken us to court and have our rights sold," Skip explains.

So the Brownlees leased their rights. "I'm against the fracking," says Joyce. "I'm against what it's doing to the streams, how it's disrupting the bear, the deer, the other wildlife. But we really had no choice."

What they could do was negotiate the best possible deal. The Brownlees knew that some neighbors had been shafted. When the boom started, the gas companies "were trying to lease at \$5 to \$10 per acre—and believe it or not some people signed up," says Skip. The true market value was at least hundreds of dollars per acre, rising to thousands of dollars in some areas of the Marcellus. First, the Brownlees made sure they got the market price. Then they also had their water tested, putting the gas company on the hook to fix any future contamination problems. "If you have a polluted well, your property is essentially worthless," says Skip. Finally, the company agreed not to put a well anywhere on the Brownlees' land. Any drilling had to be done far underground horizontally from wells outside the property.

So far, not bad. The Brownlees' monthly royalty check is tiny, far less than the \$3,000 to \$5,000 per month some neighbors are getting. The couple worries about spills in local streams and trucks roaring down the

A simplified view of fracking: Drillers bore a hole (yellow) several thousand feet below the ground until it reaches gas-bearing shale layers (gray). At this point, the hole is extended horizontally. Bore holes are typically lined with three layers of cement (inset) in the aquifer layer (blue) to protect water supplies. A pressurized mix of water and chemicals is pumped down the hole, fracturing the shale and allowing the trapped gas to move up the hole to the well head, where it is captured.



# ADVICE FOR WOODLAND OWNERS



Here are tips from the experts for when the gas drillers show up in your community:

## Find out who owns the mineral rights for your property

Many forestland owners don't own the rights to what's beneath the surface. Without owning rights, you can't prevent drilling on your property and you're not entitled to any payments. In that case, it may be possible to track down the owners and buy some rights back, as Skip and Joyce Brownlee did in West Virginia. You might also be able to cut a deal for some compensation anyway, since gas companies are learning that a little extra money may dampen local opposition.

## Get expert help

Some landowners have signed leases too hastily, getting just a few dollars per acre (and 12.5 percent royalties on any gas produced) when the market rate is as much as \$3,000 per acre with 18 percent royalties. So as a first step landowners "should hire a good specialist in oil and gas leasing," says Michael J. Burns, program resource manager for the Family Forest program at the American Forest Foundation. Asking neighbors can be a good way to identify the most reputable attorneys. Some landowners are also banding together in coalitions to negotiate collectively. But don't get too greedy. If you hold out for too much, then the gas company may choose to lease elsewhere, leaving you with nothing. That's already happened to some landowners.

## Carefully weigh alternatives

No matter how much money energy companies offer, you may decide that your land has greater value for you (for its timber, wildlife, hunting or just plain tranquility) if it's protected from drilling. On a practical level, well sites (especially for oil drilling) may eat up so many acres of trees that a small woodland may no longer be economically viable for timber if leased.

## Test drinking water wells before drilling starts and require periodic retesting afterward

In almost all cases where contaminated wells have been found, the industry

claims that the problems existed before drilling started, says New York attorney David J. Colligan. That's why baseline testing is crucial. Leases should require that, should contamination occur, gas companies must fix the problem or supply equivalent amounts of clean, safe water.

## Negotiate a custom lease

Don't just sign a standard lease; make sure it meets the needs of your property. You might designate some areas off-limits to well sites, or require that the company build or maintain an access road, or at the very least, require that drillers put fences and gates back up.

## Don't spend the money before you have it

Even after you sign a lease, the gas company typically has up to three months to decide whether to accept the deal. Waiting until the check is in hand seems like common sense. Yet every community tells stories of landowners who rushed to buy new trucks or other goodies, only to have the gas companies pull out before handing over any cash.

## Require sufficient advance warning of any operations

Trees felled to clear a well site or pipeline right-of-way may have no value if cut by energy company crews instead of professional loggers. So make sure you have plenty of time to arrange for your own logging of those areas and consult with a professional forester, who can put you in touch with loggers who know how to harvest sustainably.

## Monitor drilling operations and hold the companies responsible

Don't assume that everything is going smoothly. Wells and pipelines leak. Containment ponds overflow. Accidents and mistakes happen. Whether it's you, a local watershed association, community activists, university researchers or state environmental watchdogs, someone must be watching for spills and other problems—and companies must be forced to improve their operations and methods when they fall short.

The natural gas boom has touched off a fierce debate in this country. Proponents point to the economic boost gas development provides to rural communities.

Opponents cite health, environmental and aesthetic problems from drilling and pipelines (above). Everyone agrees, though, that property owners need to be educated and vigilant to protect themselves, their families and their land.

winding rural roads. But their 62-acre Tree Farm is still an oasis of quiet, and a haven for trees and wildlife. “It has certainly changed, but I enjoy our home and our woods,” says Skip. “The fracking has not deterred me at all from wanting to stay here.”

#### DIVERSIFYING YOUR INCOME STREAM

The Brownlees may have been reluctant to allow gas drilling under their property, but other landowners have embraced the new opportunity—with caution. Susan Benedict and her family own a 2,000-acre certified Tree Farm and hunting camp in Snow Shoe, Pennsylvania. It’s a beautiful property with a pristine trout stream and pond, well-maintained forest (with some of the best hemlocks in the region), wetlands and even some big sandstone outcrops where Native Americans once gathered to hunt. It’s also no stranger to energy development. The geologists’ thumper trucks first came back in the 1970s, searching for oil, and a successful well was drilled on state forest land right next to the Benedicts’ property. “Our family was all for it,” recalls Benedict. “We were thinking, hey, we’ll get some money.”

The money didn’t come then. The oil company needed three producing wells for a viable operation, and the next two came up dry. But subsequent surveys showed that the prospects for gas development were good. In 2006, agents for Chesapeake Energy approached the family, offering to lease the mineral rights for the full 2,000 acres for five years at about \$125 per acre. The family agreed. Susan Benedict had vivid memories of the huge 25-acre clearing for the original 1970s gas well, with all of the vegetation burned brown from the brine that had been sprayed around. And she knew that the more recent gas development had a much smaller, cleaner footprint. “That had a big impact on why I can accept gas money now,” she explains. “Natural gas development practices have greatly improved since 1970 and continue to do so.”

Nothing happened during the five years of the lease. But in 2012, a new company wanted to lease the property. By then, the immense value of the underground gas was far better known. “We thought we might get \$2,500 per acre—and we got



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about one-third of that, because the price of gas was down and we are not in one of the ‘sweet spots,’” she says. They also leased a chunk of property to a wind farm developer who wanted to explore the potential for a cluster of wind turbines.

The actual drilling hasn’t started yet. While Susan worries about spills on the surface that might damage the stream, she believes that leasing the mineral rights was crucial in helping the family hold on to and maintain the property for generations to come. “So far, it’s all been good for us,” she says. “The problem with owning a property of this size is that it takes a lot of money. Selling timber alone is not going to handle all that, so diversifying your income stream is pretty important.”

#### NOT AS BAD AS THE COYOTES

Up in West Virginia near the Pennsylvania border, Chris and Fred Welshans were also intimately familiar with the benefits and risks of energy development. Their beautiful 30-acre woodland in Colliers, which they painstakingly had cleared of grapevines and other invasive species, was once a coal strip-mine. Fred vividly remembers growing up in the 1960s, when “everyone’s house smelled like gas. Our grandmother’s house was horrid. You could smell it coming up from the coal mines.” Chris can point to a crack he fixed in the wall of a building he owns, the result of years of being shaken by coal mining operations. Plus, “whole towns around here were built on oil,” he says.

Leasing the mineral rights to their family’s 2,000-acre certified Tree Farm in Pennsylvania has enabled Susan and Leroy Benedict (above) to invest in their property and help ensure it will stay in the family for generations to come. But Susan worries about spills damaging the pristine trout stream and pond.



The right-of-way behind the Welshans' West Virginia Tree Farm is lined with trees left to rot when the land was cleared for the gas pipeline without using sustainable harvesting practices (above). "This is one of the saddest things I've ever seen," Chris says. "Had I not been educated, this could be my property."

So when the knock came on the door from the representative of Great Lakes Energy, the Welshans figured gas drilling might actually usher in a cleaner, better chapter in the area's long saga of natural resource extraction. They quickly found that, although the mineral rights to their property had been leased back in 1876, the lease was 'only' 100 years long, so the rights had reverted back to them as landowners. "If you don't own your mineral rights, you are screwed," says Fred.

Fred and Chris didn't sign the offered lease right away. "We started researching," says Chris. "You err on the side of caution first." The brothers found an attorney to look over the contract. This was in 2006, before Marcellus shale development had really begun. The attorney explained that the offer—\$70 per acre up front plus 12.5 percent royalties on gas produced for a five-year lease with an option to renew—was the going rate. The Welshans signed.

Five years later, the lease was renewed by Chesapeake Energy, which had bought Great Lakes Energy. By then, the vast potential of the Marcellus shale was clear. When the Welshans signed a new lease with Chesapeake for their 30-acre parcel, they got much better terms—\$3,000 per acre with 18 percent royalties. And when the gas company representative found out that the land was a certified Tree Farm, he added a clause that prevented Chesapeake from putting a well site on the land. "You can walk the property all you want, but you can never see that it is fracked at all," says Chris. All the action—

horizontal drilling from a well a mile away—is taking place a mile underground.

Like the Brownlees, the Welshans (and other property owners in Colliers) had their groundwater wells tested so that any future contamination problems could be pinned on the company—even though they get their drinking water from a municipal system that draws from the nearby Ohio River, and even though the Welshans believe groundwater contamination from drilling is unlikely. The fracking occurs thousands of feet below the water table, Chris points out, and drillers carefully line the borehole with a triple layer casing as they drill through the water table.

For Chris, "the worst thing I can say about fracking is the humming from the machines for three months," he says. Adds Fred: "Not as bad as the coyotes."

While the Welshans have no complaints about the drillers, they warn other landowners to be wary of pipeline companies seeking to lease land for right-of-ways. Putting in a pipeline requires cutting a 150-wide swath that must be kept clear of vegetation in perpetuity. "People don't realize that when you sign over a right-of-way, the lease uses terms like 'permanent' and 'forever,'" says Chris. "Essentially, you're not leasing the land, you're selling it." You can't build on it or even grow most crops, since hitting the buried pipeline with a plow or backhoe can be a fatal disaster. You can't even drive vehicles or equipment over the line without first putting down a pad.

One pipeline company pushed the Welshans to sign a lease for a right-of-way across their Tree Farm, offering as much as \$14,000. The Welshans declined. They figured the timber on that swath alone was worth at least six times more than that. "When you put your blood, sweat and tears into something, you're not going to just give it away," says Chris.

So the company bought a right-of-way on the adjacent property. But what angered Chris the most is that, in clearing the land for the right-of-way, the pipeline company didn't cut the trees using good logging practices. As a result, the mills won't accept the trees, so the big logs are just piled up on the sides of the clearing to rot, he says. "It takes the Lord 70 years to grow trees, and only one day with a machine run by someone who

doesn't understand how to harvest sustainably to destroy them," he says, pointing to the logs. "This is one of the saddest things I've ever seen. Had I not been educated, this could be my property."

Thanks to their caution, the Welshans believe they've made the most of the fracking opportunity. Their Tree Farm is untouched, and their lease money is safely stashed in the bank. "This is a blessing, a once-in-a-lifetime thing," says Fred. "You have to be responsible and look at it as a gift."

Other landowners, like Wayne and Christina Woods on their 64 acres in Doddridge County, have made other choices. They are refusing to sell their mineral rights at all for fear that their woods, streams and wells will be harmed. "Nothing's free," says Woods. "Yes, a number of people are becoming fairly wealthy. But I put a lot of work into this house, and it's going to be just a pile of wood if the water's not good."

The dilemma all these landowners face is that it's still difficult to know what the best choice really is. "This whole thing is going fast and is kind of scary," says Wheeling Jesuit University's Stout. On even such basic

questions as what chemicals are found in waste fracking water, "people want to know and they can't really find out," he says.

Yet people can't put the natural gas genie back in the bottle. Fracking is here. For many landowners, it's already happening on neighboring state lands and private properties. It comes with huge economic benefits for America. Yet like every past energy boom, it also carries environmental risks. So when the gas company comes knocking on the door, woodland owners need to educate themselves and make the best decisions for their own circumstances.

Those who have been through the process, such as Susan Benedict, say the most important thing is to be cautious (for more tips, see "Advice for Woodland Owners" on page 14). "You don't want to leave money on the table," advises Benedict. "But if someone is pushing you for what looks like a deal that's too good to be true, you need to wait."

*Freelance writer and forestry school graduate John Carey was recently offered a gas lease on family property he owns in northern Michigan. For both environmental and financial reasons, he declined.*

Fracking is occurring in places as disparate as California, New York, Texas and North Dakota (below). Both the pace of development and the unknowns about the process and the impacts worry many people. "This whole thing is going fast and is kind of scary," says Ben M. Stout III, a professor of biology at Wheeling Jesuit University in West Virginia. On questions such as what chemicals are in waste fracking water, "people want to know and they can't really find out," he says.



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