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Gas Pains

Pennsylvania, reeling from a budget crisis, exploits—at any and all costs—what might be the largest U.S. natural gas deposit. The results could be disastrous.

By Ted Williams

Earth hadn't seen its first dinosaur when an enormous river system finished dumping its sediments over what is now Pennsylvania, West Virginia, southern New York State, western Maryland, and eastern Ohio. In the 350 million years or so that followed, other sediments piled up on the delta, sometimes to depths of 8,000 feet. As the river's organic leavings were compressed and heated, hydrocarbons proliferated. Today the 48,000-square-mile Marcellus shale formation contains one of the largest known gas deposits in the United States.

Measured in immediate dollars and without subtracting the real costs of extraction, the windfall is dazzling. A Penn State study that does exactly this predicts that Marcellus gas will inflate Pennsylvania's economy by at least $8 billion in just 2010. Farmers are now signing away mineral rights—for as much as $5,500 per acre, then getting royalties as high as 20 percent on the gas recovered.

That news would be better if Marcellus gas was recovered in a regulated, responsible fashion and with coordinated resource-agency oversight. After all, natural gas is the least polluting of all fossil fuels. It can even be rendered into cleaner-burning forms of gasoline and diesel fuel. And as a replacement for coal it has the potential to slow global warming because it releases only half as much carbon. But because the technology to extract the gas is younger than the 21st century, no one yet knows how to do it without simultaneously sacrificing the forests, waters, fish, and wildlife that, over time, are worth far more than any finite energy fix. That's why New York State has placed a moratorium on Marcellus drilling while it struggles to devise effective regulations.

And that's why some officials in Ohio, Maryland, and West Virginia are scrambling to get protections in place before the onslaught. So far they haven't had much success. In an effort invoking the image of Oliver Twist requesting seconds on gruel, West Virginia lawmakers twice tried to pass legislation requiring companies merely to alert property owners before they get permits to hack and gouge their land. Both times the gas lobby shouted it down. Such is its stranglehold on the political process.

Almost all the development has been in Pennsylvania, which squats on the main chunk of the deposit. One might suppose that Pennsylvania would proceed cautiously, with 4,600 miles of its streams already contaminated by abandoned mines to the point of becoming

lifeless acid seeps and having allowed the timber industry to denude the entire state a century ago. But no. The scene here resembles a wagon race of whooping, whip-flailing homesteaders. In 2008 Pennsylvania issued 476 Marcellus shale deposit drilling permits. In 2009 the figure was 1,984, and the industry expects to acquire 5,200 additional permits in 2010.

It's not just native ecosystems that are being violated, it's Pennsylvania's constitution, which states: "The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people." What most alarms and outrages fish and wildlife advocates is that the state's equally alarmed and outraged professional resource managers have been sidelined by big-money politics.

Pennsylvania's wildest woods and most pristine streams are managed by the Department of Conservation and Natural Resources (DCNR). This 2.3-million-acre state forest system is among the largest publicly owned pieces of real estate east of the Mississippi River, and it is almost unique among state holdings in that it has been certified as "sustainable" by the Forest Stewardship Council. But in many places the agency can't protect that sustainability because it doesn't control mineral rights. In an attempt to marginally protect these areas, the DCNR had been requiring gas companies to sign surface-use agreements. But last May the companies got a state court to end even this.

If the current orgy is allowed to continue and if it becomes a model for the other Marcellus states, vast swaths of the East's best forests will be fragmented, groundwater and surface water polluted, and fish and wildlife wiped out on a scale that would dwarf the recent tragedy seen in the gas fields of Wyoming, Colorado, and New Mexico.

On the frigid, gusty afternoon of January 27, pilot Joe Costa flew Phil Wallis, director of Audubon Pennsylvania; Nels Johnson, conservation program director for The Nature Conservancy in Pennsylvania; and me over well pads proliferating in but mostly around the Tioga and Loyalsock state forests in north-central Pennsylvania. The scene was heartbreaking, but these were just early strikes in a massive assault yet to be launched. New roads sliced through woods and fields. Some pads, sprouting white-and-orange towers, were in the process of being drilled. Others were ringed with hundreds of wheeled tanks, each the size of the aft section of a tractor-trailer truck and by which drill sites acquire fluid for "fracking."

Fracking—from "hydrofracturing"—is a process developed by Halliburton in which a mixture of water, sand, surfactants (to keep the sand in suspension), acids, formaldehyde, petroleum compounds, and herbicides (to kill pump-clogging algae in wastewater ponds) is blasted into the shale, breaking it apart. The sand, forced into the fissures, props them open. A single frack job can require five million gallons of water. Aquatic life is at risk

when gas companies dewater streams for fracking and when they store or dispose of used frack water. Not only is the industry allowed to protect the chemical composition of frack water as a trade secret, but under what's called the "Halliburton Loophole," fracking is exempt from Safe Drinking Water Act regulations. This was a 2005 gift from then vice president Dick Cheney to the company he used to run.

Something like three-quarters of the frack water stays in the earth, but that which flows back has acquired additional toxins such as salts, xylene, benzene, ethyl benzene, toluene, heavy metals, and naturally occurring radioactive material usually consisting of radium isotopes—bone-seeking carcinogens. Because fracking takes place far below aquifers, groundwater contamination can be prevented by sealing drilling shafts, but the shafts aren't always properly sealed. For example, in Dimock Township, Pennsylvania, 63 wells drilled by Texas-based Cabot Oil & Gas in nine square miles have polluted groundwater and caused private wells to explode, 15 families allege in a lawsuit. Last November the state Department of Environmental Protection (DEP) fined Cabot $120,000 and ordered it to provide permanent water supplies to affected families.

In 2008 used frack water gushing from overwhelmed sewage-treatment plants grossly polluted the Monongahela River in southwest Pennsylvania and northern West Virginia—home to a rich diversity of aquatic life, including endangered mussels, and the drinking water supply for 350,000 people. For a time the river wasn't even fit for industrial use. U.S. Steel actually had to cease production at its Pittsburgh coke plant. And last September used frack water leaking from an old coal mine where it was being stored was largely responsible for virtually extinguishing 161 aquatic species from 38 miles of Dunkard Creek in West Virginia and Pennsylvania. Victims included 18 fish species and 16 mussel species, two of which are candidates for protection under the Endangered Species Act.

We flew over world-famous trout streams—including many of the nation's last refuges of the troubled eastern brook trout—some of which had already been damaged during dewatering for fresh frack water, polluted by used frack water, and compromised by sediment runoff from roads and well pads. At least as vulnerable as trout are amphibians, such as hellbenders, and invertebrates that fuel aquatic ecosystems. Legal water withdrawals are themselves a major concern, and not all withdrawals are legal. Since June 2008 eight gas companies have paid a total of about $2 million to settle charges of illegal withdrawals from Pennsylvania streams.

While the ulcers we saw from the air were appallingly ugly, the best parts of the state were still intact. On all compass points the vast, diverse hardwood forest stretched largely undefiled to the horizon. We found this revelation at once encouraging and frightening—encouraging because we could see there was still time to get Marcellus gas extraction right, frightening because of what will be lost if Pennsylvania doesn't radically alter course. "As we're advancing renewable energies in this country, we're losing sight of what it really costs," said Wallis. "If we're not careful, we're going to do exactly what we started doing in the 1950s. Today we call it sprawl. What's going on here is energy sprawl. The real issue is fragmentation."

Opening the forest canopy with roads and well pads can attract nest parasites (cowbirds) and nest predators such as skunks, raccoons, squirrels, crows, and blue jays. Audubon Pennsylvania is especially worried about scarlet tanagers and wood thrushes, which it classifies as "responsibility species," meaning the state produces a significant percentage of the world's population (about 17 percent for scarlet tanagers and 12 percent for wood thrushes). Other species in grave peril from Marcellus drilling are the veery, Swainson's thrush, hermit thrush, brown creeper, blue-headed vireo, winter wren, and the following warblers: black-and-white, blackburnian, black-throated blue, black-throated green, Canada, hooded, Kentucky, and ovenbird. In fact, some ornithologists believe that large tracts of contiguous forest like the ones in Pennsylvania provide the source populations for all the fragmented habitats where birds are seen but where their nests fail.

Nels Johnson added this: "Even three years ago energy wasn't on our list as a major challenge. Now it is—not just gas, not just wind, not just access roads, not just biomass, not just transmission lines. It's the cumulative impact of all this development. And there's no cross-talking between the agencies involved. No one is paying attention to the big picture."

On the ground I inspected Marcellus well sites with Bruce Snyder, a trained forester and project inspector for Texas-based Range Resources. He checks for threats to the environment, and if a planned road or well pad looks like it might compromise a wetland, for instance, he'll get company engineers to move it. With us were Sarah Sargent, one of Audubon Pennsylvania's Important Bird Area coordinators; Charles Schwarz, forester for the Northcentral Pennsylvania Conservancy; Wallis; and Johnson. These and other environmentalists tell me that Range is making a genuine effort to minimize environmental damage.

Snyder took us first to Lycoming Township, farm country with cattle-dotted valleys and open, rolling hills. The well pad here was just a flat area of perhaps three acres and, in the middle, a metal shaft sprouting nine red wheels the size and shape of car steering wheels, all enclosed in a green metal cage 12 feet on a side. The land had been in hay, so at the property owner's request Range had restored it to hay. This was a vertical well, but the industry now has the technology to send shafts down 8,000 feet and then out horizontally through the shale for almost a mile. This way more gas can be recovered and multiple wells can be drilled from a single pad.

Horizontal drilling can, but often does not, reduce the industry's footprint. So far the 12 largest gas companies operating in Pennsylvania have leased 4.8 million acres, and while they talk about one well pad per square mile (a requirement on DCNR forests), the literature they provide to shareholders suggests that on private land there may be as many as nine.

“What you’ve done here is great,” Wallis told Snyder. “And this is the perfect place for a gas well. But we’re running out of places like this.” Snyder agreed, pointing at a distant, wooded plateau where Range would develop its next leases.

Project inspectors like Snyder can’t begin to do the state’s work for it, but their role is all the more important now that the DEP has implemented “fast-track permitting.” On March 18, 2009—at the bidding of industry lobbyists and with no public hearings or even notice—the DEP proclaimed that henceforth gas permits would no longer be processed by county conservation districts, the agency’s eyes and ears on the ground and whose employees are most familiar with local land and water features. Instead the job would be handled by a few deskbound agency bureaucrats in distant offices.

“DEP is barely looking at the application forms,” says Matt Royer, staff attorney for the Chesapeake Bay Foundation. “It just makes sure they’re signed. And it has written a ‘model plan,’ apparently so operators can fill in the blanks.” Royer and leaders from 35 other environmental groups, including Audubon, the Sierra Club, Trout Unlimited, Earthjustice, and American Rivers, maintain that fast-track permitting is illegal under the Clean Water Act because it denies the public the opportunity to comment on pollution discharge applications and precludes meaningful agency review.

Last October, after the Chesapeake Bay Foundation appealed permits at three Marcellus sites, the DEP finally scrutinized them, then promptly revoked all three, citing “numerous technical deficiencies discovered after our approval of the permits.” Royer says that small victory was soured by the knowledge of how many more permits with “numerous technical deficiencies” are out there and will go out there, rubber-stamped by the agency.

From the hayfield site Snyder led our party deep into the forested hills of Cummings Township to a well that Range had just fracked. DEP’s strict water-treatment requirements have motivated Range and other companies to use their frack flowback over again, but regulations about how that flowback is stored and handled are all but nonexistent. Deb Nardone of Pennsylvania Trout (a Trout Unlimited chapter) applauds this trend toward recycling, but points out that when frack water gets recycled it picks up more pollutants. “One of our biggest concerns is that the industry is now storing flowback in open plastic-lined impoundments,” she says. “We saw an incident in Clearfield County where liners were leaking, contaminating the soil and seeping into two good brook-trout streams.”

Range hadn’t yet restored its Cummings Township well site, so the wound appeared far more grievous than the one we’d seen on the hayfield. About 75 empty frack tanks had been hauled out. The remaining 125 were lined up along the widened dirt road. As with almost all Marcellus pads, this one was slightly under five acres. In enforcing the federal Clean Water Act, the Commonwealth of Pennsylvania has exempted gas and oil operations with footprints of less than five acres from sediment and erosion regulations. But a single pad requires access roads wide enough to admit drilling equipment and frack trucks, and pads can be clustered.

Where the DCNR does control mineral rights, a 1955 law requires that revenue from gas leasing go to conservation, parks, recreation, and flood control. But last year the legislature approved Governor Ed Rendell's request to raid that dedicated money and dump it into the general fund at a time when the agency is critically understaffed and underfunded. Already about 700,000 acres of DCNR-managed forestland has been leased for gas extraction.

Taxpayers hire DCNR professionals to determine which parts of their state forestland can safely be developed by the oil and gas industry. But in 2008, dazzled by potential windfalls, the legislature forced a state forest garage sale in which leases on 74,000 acres were sold off for a quick $166 million.

On March 27, 2009—a week before he resigned—then DCNR secretary Michael DiBerardinis wrote Governor Rendell as follows: "Wholesale leasing . . . would scar the economic, scenic, ecological, and recreational values of the forest—especially the most wild and remote areas of our state in the Pennsylvania Wilds. Your years of work and investments in rural economic revitalization through outdoor experiences in the Pennsylvania Wilds could be erased."

Nevertheless, last January and despite the concerns of Acting Secretary John Quigley, Rendell unloaded an additional 32,000 acres of forestland leases for $128 million. Then in February he released his 2010–2011 budget, which locks in cuts to DCNR funds of 18 percent and to DEP funds of 26 percent (for a total of $321 million slashed from conservation). At the same time the budget calls for yet another forest sell-off of unspecified acreage designed to net $180 million. The state has become a hunger-crazed beast, feeding on its own flesh.

Rendell has ordered that public inquiries about Marcellus gas be filtered through press flacks, but a DCNR staffer I'll call "Mort" told me this: "Our heads are in the right place. There's no one in the agency on the wrong side of this. But the financial needs of the state are blinding the governor, the legislature, and the public. When we got painted as a revenue producer it changed the whole picture. We hold Pennsylvania's waters and woods in trust for the future; they belong to the public, but they're being cashed in. It's as if you had a tree that produced wonderful plums, and you chopped it down for firewood. Tourism is our second-biggest industry [after agriculture]. Even if all you cared about was money, you'd object to cashing in sustainability."

Particularly frustrating to Mort's cash-strapped agency and the DEP is the fact that of the 15 major gas-producing states, Pennsylvania is the only one that doesn't have a severance tax. The word severance derives from a private entity "severing" from the earth a publicly owned resource for its own profit, and thereby destroying other publicly owned resources like fish and wildlife. In Pennsylvania the gas industry has fought proposals for a severance tax viciously and successfully. Yet it pays severance taxes in other states.

It's not as if the industry can't afford to modestly compensate the people of Pennsylvania for all the renewable and nonrenewable assets it takes from them. For example, the resource-advocacy group PennFuture reports that one of the largest Marcellus lease holders, Chesapeake Energy, recently gave its CEO a $75 million bonus and purchased his art collection for $12.1 million. And Exxon/Mobil has found $41 billion to buy out XTO, a company heavily invested in Pennsylvania's Marcellus gas.

Governor Rendell has waxed hot and cold on a severance tax. For a while in 2009 he allowed that he wanted one; the House even passed it as part of the budget. But when irate industry lobbyists descended on him he flip-flopped. Basically, that killed the tax in the Senate. Now, under increasing public criticism, Rendell again says he wants a severance tax.

The tragedy under way in Pennsylvania is the result of professional resource managers being forced by the governor and legislature to do what they know from their training is wrong. "New York State's moratorium on Marcellus drilling has given it a wonderful bargaining position with industry," Mort told me. "We need a moratorium on forestland to get us a similar bargaining position. That's the only way we can regain professional control of drilling."

Why the stark contrast between the two states? For one thing, New York has much less experience with gas extraction and therefore fewer agency personnel to potentially regulate it. For another, unlike Pennsylvania, New York has a state version of the National Environmental Policy Act. Therefore, it can undertake extensive environmental review. Eighteen years ago it hatched a generic environmental impact statement for oil and gas development, but that document was written before Marcellus gas extraction was possible. So the state Department of Environmental Conservation is in the process of producing a supplemental environmental impact statement, the draft of which it released for public comment last September.

So deficient is the draft that it drew sharp criticism even from the laconic U.S. Environmental Protection Agency. The EPA says the draft ignores or glosses over: cumulative impacts, threats to the Catskill reservoirs that supply nine million people in and around New York City with untreated drinking water, maintenance of wastewater pits, threats to air quality, health risks of frack-water flowback, impacts on aquatic ecosystems from water withdrawals, and dangers to Important Bird Areas, which sustain all the forest-interior birds threatened by ongoing fragmentation in Pennsylvania.

Michael Burger, Audubon New York's director of conservation and science, warns that just in his state the Marcellus deposit underlies 40 Important Bird Areas and some of the best unfragmented forestland left. He has urged the New York Department of Environmental Conservation to place these and other priority habitats off-limits to drilling.

"We have relatively intact forests in many parts of the southern tier which still provide high-quality breeding habitat for neotropical migrants," declares Burger. "Losing those to

habitat fragmentation could impact regional or even continental populations. The draft EIS has elicited a huge outpouring of criticism. Many organizations are requesting that the department just withdraw it and start over. The gas isn't going anywhere. It's worth taking a little time to figure out how to get this gas out in a way that protects the environment as much as possible."

WHAT YOU CAN DO

To follow Marcellus gas development and learn how to help control it, go to these websites: PennFUTURE, ConserveLand.org, Pinchot Institute for Conservation, and Penn State College of Agricultural Science's Cooperative Extension.