

People of the Prairie, People of the Fire

Twice over the past 20,000 years the Illinois landscape has been destroyed and rebuilt. In the first age the agent of change was ice, mounded into sheets and leveraged outward through a suite of periglacial processes from katabatic winds to ice-dam-breaching torrents. The ice obliterated everything, leaving as its legacy a geomorphic matrix of dunes, swales, moraines, loess, great lakes and landscape-dissecting streams. For the second, the agent was iron, forged into plows and then into rails. Coal replaced climate as a motive force, and people pushed aside the planetary rhythms of Milankovitch cycles and cosmogenic carbon cycles as a prime mover. They left behind a surveyed landscape of squared townships.

The first event worked through a geologic matrix; the second, a biological one; and they were equally thorough. All the state went under ice at least once. The last outpouring, the Wisconsin glaciation, pushed south from Lake Michigan and covered perhaps a third of it. The frontier of agricultural conversion put nearly all of the state to the plow, or where rocky moraines prevented it, to the hoofs of livestock. When it ended, only one-tenth of one percent of the precontact landscape remained more or less intact. Less than one acre out of a thousand held its founding character, and that acre was itself minced into a thousand, scattered pieces.

In both ice age and iron age, however, life revived after the extinction with fire as an informing presence – fire in the hands of people. The biological recolonization of the landscape after the ice had fire in its mix and expressed itself as oak savannas, tallgrass prairies, and grassy wetlands, stirred by routine burning. Fire was a universal catalyst; in particular, prairie and fire became ecological symbionts. The reconstruction of the second landscape has relied on industrial combustion, fueled by the fossil fallow of long-buried biomass.

But those intent on sparing, or actively restoring, the former landscape must appeal to open burning. A fire sublimated through a tractor does not yield the same effects as one let loose to free-burn through big bluestem. The regeneration of such settings is troubling – unstable and scattered, an inchoate genesis still in the making, its reliance on fire both essential and challenged.

The indigenes at the time of European contact, the Potawatomi, were known variously as the people of the place of the fire, or the keepers of the fire, because they maintained the great council fire around which the regional confederation of tribes gathered. But that fire did not stay within the council circle: it spread throughout the landscape, a constant among the diversity of grasses, trees, shrubs, ungulates, small mammals, birds, and insects that congregated in and around a dappled prairie. In time the Potawatomi became known equally as the people of the prairie since the one meant the other. Remove fire, and the prairie disappeared. Remove prairie, and free-ranging fire lost its habitat. Remove the keepers of the fire and both prairie and fire vanish into overgrown scrub, weedy lots, or feral flame.

Restoration is a slippery concept. In some places it means mostly finding ways to preserve and enhance relicts that have survived the battering. In other places it means an outright regeneration, or a reconversion of farmland to prairie. But at its core it involves sparing the pieces and saving the processes that connect them. In Illinois, once the prairie state, now a factory farm, prescribed burning is what connects those pieces, and prescribed burners are the agents that join them.

Kankakee Sands

The unity of the Kankakee sands region lies in one of those convulsive geologic aftershocks of glaciation. As the Wisconsin ice receded, it melted, and the meltwaters ponded behind berms of moraine or lobes of adjacent ice sheets. Eventually those dams themselves wasted away or were breached, and the impounded waters drained out. This often happened catastrophically in the

form of floods or, in local parlance, torrents. At Kankakee the outrush left a scoured landscape of sand dunes and wet swales and incised streams. It became an archipelago of soils and landforms whose connection looks back to events 17,000 years in the past.

Each site took on additional characteristics as the result of its recolonization and, during the second – the settlement - torrent, the ways in which it was farmed, drained, grazed, or subdivided. Historically the lowlands were marshy and grassy, and the uplands more forested. But extensive draining converted the swales into corn fields, while routine burning kept the uplands into a woody savanna – the largest remnant of extant oak savanna anywhere. Critically, while grazed, the uplands were not plowed: their soil structure remained intact. And, exceptionally, they continued to burn.

The great northward migration of African-Americans had an echo in a secondary outflow from Chicago, a city some found too alien and job-poor, into subdivided lots around Pembroke. There they settled down amid old habits, including casual fire, and an absence of government services, not least fire protection. The lack of trash collection, in particular, meant they burned refuse, and these fires frequently escaped to kindle the countryside. The surrounding sand ridges burned roughly every 1.5-2 years. An area of extreme economic poverty became, paradoxically, a place of exceptional biotic wealth.

Today that miscellany of missed places constitutes an atoll of natural areas, some 32,000 acres in all, allocated among 33 designated sites, hopefully labeled the Greater Kankakee Sands Ecosystem. The archipelago includes Goose Lake Prairie State Natural Area, Des Plaines Conservation Area, Midewin National Tallgrass Prairie, Wilmington Shrub Prairie Nature Preserve, Laughton Preserve, Mazonia-Braidwood State Fish and Wildlife Area, Iroquois Woods Nature Preserve, Mskoda Land and Water Reserve, Sweet Fern Savanna Land and Water Reserve, Kankakee Sands Restoration Project, Willow Slough Fish and Wildlife Area, and with those sites a roll call of Illinois conservation organizations that ranges from national agencies to state and county bureaus to NGOs; the U.S. Forest Service, the Fish and Wildlife Service, the Illinois Department of Natural Resources, The Nature Conservancy.

In all this - remnants scattered like lithic flakes, restoration projects sprouting from corn stubble, a variety of institutions as diverse and dispersed as their biotic relicts - Kankakee is a cameo of the Illinois conundrum. No single site, institution, or vision contains it all or organizes the pieces. There is no commanding height; not topographically, not institutionally, not intellectually. A federal presence is muted, quarantined amid checkerboard hills in the far south. There is no domineering private landowner - no Weyerhaeuser, no Ted Turner – to deform the space-time of land use. There is no counterforce to challenge the industrial plow. What the pieces and players share is a variously defined commitment to nature protection. They are, like the Potawatomi, peoples of the prairie, which means they are also peoples of fire.

They differ in goals. Some believe that the task demands a way to connect the fragments into a whole, at least conceptually; they seek out corridors to join the parts, or ideas to help identify which pieces should be protected in what order. Others believe that salvation depends on size. Unless the protected areas are large, unless they contain within themselves all the required parts, the whole cannot hope to survive against relentlessly fragmenting forces of regional or continental scope, not to mention globalization. Yet the practical scale of either strategy is so small that the atolls they oversee may both be drowned in the rising sea of a modern economy. Chicago adds more rambling exurbs yearly than the state does protected preserves. Farmland converts to city, not nature.

Each site resembles a miniature, the ecological equivalent of a ship in a bottle. Its minuscule scale allows for some processes to persist, and for the abolition of known destructive practices. But they struggle to become a whole; the separate parts cannot absorb the roaming elk and bison (and successor cattle), or their predators, that helped define the historic scene. Their collective

fauna is one that travels by air, and that is also tiny; the faunal diversity consists of birds and especially invertebrates.

This can cause troubles, however, because insects can be highly specific in their preferred habitats, and they can attract partisans that consider butterflies and leafcutters in old-growth prairie as the counterpart to spotted owls in the old-growth forests of the Pacific Northwest. The species triumphs over the habitat. In order to accommodate, even small plots might have to partition into micromanaged patches; a landscape that boasted white deer and wolves must shrivel to one for beetles and the regal fritillary. This matters because some management practices cannot be indefinitely shrunk, any more than Newtonian physics can scale evenly from quasar to atom. A butterfly and a bison demand different minimums of place.

So, too, does fire. In a miniature landscape it acts more like a blowtorch than a free-ranging wind. It behaves like an implement of horticulture, a clipper or hoe, no longer feeding itself as it propagates but consuming what it is served. The patches resemble cages in an open-air zoo, or to mix in a more benign metaphor, like rooms in a hospice. The ecology of a candle bears little kinship with that of a prairie aflame. No one knows the scaling laws for fire ecology that might join the nano-niches of a prairie refugia to a boreal crown fire; they only know they must have fire.

This, however, is the second element the system shares: a commitment to burning. Fire does nothing here it does not do elsewhere; it just seems more prominent because it is indispensable and the small scale of the operation makes it undeniable.

The remnants survived because they were burned. If flame leaves, woody plants will quickly swarm over and smother prairie and savanna. A handful of years is sufficient to let invasive shrubs and trees establish themselves to the point that fire alone can no longer knock them back. Like a boa constrictor steadily tightening its coil whenever its victim breathes out, the woods crush the grasses and forbs when the pause between fires lasts too long.

Questions of scale do not, however, abolish all principles of fire ecology, and one is that organisms do not adapt to fire in the abstract but to a fire's regime. You can lose a site as surely by burning badly as by not burning at all. The bouquet of sites around Kankakee argues for a bouquet of burns; and in the absence of particulars, a useful rule of thumb is a 3-year rotation, which approximates the core cycle of post-fire recovery and, at Kankakee, will accommodate almost all species if a site is large enough relative to the organism's demands. Still, the threat of too little probably trumps the threat of too much. The premier relicts like those around Pembroke burned almost annually, or no longer than biennially; they burned as frequently, that is, as fuel existed to carry the flames.

Another principle is that fire is *biotechnology*. Its flames do more than act as a fiery brushcutter; beyond merely mowing and mechanically rearranging, they transmute; they chemically change the biomass they consume, as grazers do. Nothing else provides their range of ecological services. Moreover, add to the roster of precepts that fire is an interactive technology as well. Fire's effects rarely result from fire alone, but from the cascade of interplays it sets in motion, among them grazing and browsing, both gone from the Kankakee complex except at the level of insects. That is why mowing or planting or shunting fuels around cannot substitute. You can't replace clipping for burning as you can an electric bulb for a candle.

All this argues for prudence, which here means perpetuating the regime that kept the sites intact. To the uninitiated the precautionary principle might seem to argue for the opposite: they might invoke it to halt burning until a full-spectrum ecology can be worked out. But of course a complete ecology will never be known, and while species-partisan Neros and academic researchers fiddle, Rome won't burn, with disastrous results.

From the grand perspective of fire's recession and recovery across the American continent, the kindlings around Kankakee seem quaint, a daub of mom-and-pop stores amid an economy of big-

box retailers and multinationals. This is boutique burning, almost a farmer's market of handcraft fires. California's Cedar fire burned an order of magnitude more acres in one savage surge than the Greater Kankakee has under its collective protection.

But such metrics miss the point: it is not the number of scorched acres but the richness of their impact that matters. Acre for acre, probably more comes out of the Illinois burning than from all the firing of southern loblolly pine plantations and of generic western wildlands. Here, fire is the critical catalyst, without which the land cannot be defibrillated back to integral prairie and healthy savanna. Fire alone can't make that restoration work, but nothing done without fire can succeed.

Nachusa Grasslands

The Kankakee complex is a strategy of small parts in search of a larger context. Its conceptual counterpart is a large preserve that might contain the varied habitats of interest within its own borders. In Illinois its prime expression is the Nachusa Grasslands managed by The Nature Conservancy. But Nachusa is becoming large (in relative terms) not because it has preserved an ancient landscape but because it is rebuilding one.

Its core is a small ripple of rocky hills that escaped the plow and hence retained some native species. In 1986 TNC purchased 400 acres. But around that biotic reef lay a platted sea of row-cropped maize. Over the course of 20 years the preserve has expanded to 3,000 acres, of which 2,200 have been restored, all purchased from willing sellers at market prices. Those acres must be brought into the system through a laborious process of restoration. By 2009 some 93 projects, ranging from two to 60 acres each, had expanded the dominion of prairie. Half the labor has come from volunteers.

It isn't enough to leave the acquired land to nature's touch: it will grow to weeds. Instead prairie must be cultivated with even more tending than commercial crops; and there is little natural about the boundaries, which must follow the square-surveyed townships of settlement and the economic rhythms of commercial agriculture. Until they have the wherewithal to begin the conversion, managers lease out the land for corn. Meanwhile, stewards gather seeds from existing prairie.

They begin actual restoration – or more accurately, a reconstruction – by harvesting the corn, burning the stubble, and sowing a heavy mix of native seed, as much as 55 lbs/acre of 150-200 species. The next year, assorted plants will have rooted, along with a street-gang of weeds. Some weeds matter, and are clipped and individually herbicided; others will succumb as the indigenes thrive. What matters is removing the nasty species and stimulating the desired ones, especially the grasses like little bluestem, since they will carry fire over the plot, and fire is what sparks the system to life.

The overseers burn as often and intensely as possible. Where desired plants flourish, they may overseed with more, and where some seem lacking, they may try again, and let nature determine the suitability of niches. Meanwhile, they burn. By the third year of tedious culling, a raw matrix of prairie grows on the site. When they determine the mix is more or less right, managers can begin backing off annual burns and feel their way toward a suitable cycle. Fall-spring burns for 2007-08 racked up 1,200 acres, including some burned for neighboring parks; in 2008-09 that number reached 1,900. Those fires spread across the surveyed borders and suture the larger quilt of patches together. In this way the restoration reverses the frontier inscribed under the parameters of the Northwest Ordinance of 1787; and with so much work done by volunteers, the process resembles a kind of reverse homesteading.

The contrast is not only with Kankakee but with such long-standing prairie sites as Konza (in the Flint Hills of Kansas), gazetted in 1982 as a Long-Term Ecological Reserve. Konza is the classic model of nature protection and its servant science: it was a preserved landscape (and hence "natural") that kept prairie continuously under a regimen of burning, and later grazing. Nachusa is a reconstructed landscape, resuscitated out of corn stubble and ragweed. As it

challenges Konza in size, however, it may also challenge Konza's embodied conceptions of what constitutes prairie and what deserves sustained research, and perhaps may come to merit LTER standing as well.

The fire story at Nachusa is simple enough to state. Fire initiates the conversion, and once it has worked that alchemy repeated burning perpetuates the revived biota. Restoring prairie has meant restoring fire: this much is unexceptional, however quirky the process might appear to deep ecologists intrinsically wary of Roundup and flame. Rather, Nachusa's natural character resides in its present expression, not its history – or as William James famously described Pragmatism, “By their fruits ye shall know them, not by their roots.”

Yet there is a second narrative of fire restoration at work as well, in which fire is returned not only to the land but to the hand. The reconstruction of Nachusa reinstates fire to ordinary people. The volunteers who do much of the hard work of gathering and disseminating seeds, clearing invasive shrubs and weeding new acres, also do the burning. As much as reinstating big bluestem and lady fern, Nachusa has returned the torch to folk practitioners, the kind of fire wielders who sustained the prairie peninsula through millennia. The people of the new prairie have become people of the new fire.

This is a story easily lost among the attention paid to the traditional big-hitters of fire management, and it counters two trends. One is the grand narrative of Earthly fire by which industrial combustion has replaced open burning through technological substitution and outright suppression. This is why there is no fire on the still-farmed lands around Nachusa, why cooling towers from a nuclear-power plant loom over the northern horizon from the rebuilt barn that constitutes preserve headquarters, and why quads and tractors rather than draft animals fill the sheds. Against that tide Nachusa is putting fire back on the land.

The other trend is the systematic stripping of fire from the hands of the folk. The simplistic yet orthodox narrative for justifying the restoration of fire on public wildlands is that nature had set fires and misguided public agencies extinguished them, and the outcome is the shamble of present-day fire regimes. Such a narrative implies that restoration means no longer suppressing nature's fires. It means that people have to quit interfering with nature's logic. Nature will then begin deleveraging the landscape into its proper state.

Yet the record for virtually every landscape is that people had set most of history's fires, and this leads to the conclusion that the missing fires – those that have disappeared over the past century - are the result of people no longer acting as we have acted throughout our existence as a species. Less and less burning got done because there were fewer and fewer burners to do it.

To be sure, not all of that erstwhile burning was prudent or systematic; much was abusive and promiscuous, and not a little was simple fire littering. But in shutting down the excesses, fire became, in effect, a government monopoly, something so seemingly arcane and technical and intrinsically dangerous that ordinary citizens could not be trusted with its stewardship. In this narrative, restoration means getting people to burn again. What Nachusa adds is the return of the torch to private citizens, not solely to agents of government.

Recession and Restoration

The ice age receded, across a span of 10,000 years, with a succession of geologic spasms like the Kankakee torrent. The recolonization of that evacuated landscape by life took several millennia, and after the climatic maximum of the Hypsithermal, humanity helped stabilize its dimensions and the resulting pastiche of prairie and savanna by regular firing.

The iron age ended with the bleeding soils from a thousand thousand cuts and with a slow smothering beneath a blanket of domesticated flora. Its regeneration will take centuries, if not longer, quarter section by quarter section, township by township, and it will act out against a fast-

morphing climate, likely the byproduct of an industrial burning run amok. But it will happen at the hands of a humanity wielding fire.

This is not the kind of creation story or heroic narrative that American environmentalism has traditionally thrived on. But it is what must happen if nature's economy is to continue to produce the goods and services we want. It's a story in which the Hippocratic injunction to first do no harm means you may harm if you don't first do. And it's a story in which the people who want prairie must also become a people who want fire.

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