

A man with a beard and glasses, wearing a green cap and a dark leather jacket, stands in a field of tall, golden-brown grass. He is holding a stalk of grass in his hands. The background is a vast field of similar grass under a soft, warm light.

The Green Grass of Home

The rush to save native prairie
and transform agriculture finds an
unlikely stalwart

by **Chris Lazzarino**

Photographs by Steve Puppe

We got it all wrong, so horribly wrong. Then again, so did everyone else on God's green earth who marched confidently out of the 19th century with steel plows and motorized tractors and endless stretches of lush grassland there for the taking.

The transformation took hold, to be sure. But not as anticipated.

Within a mere whisper of geological time, and even a tiny snippet on the timeline of human interaction with the land, the world's native, unspoiled grasslands have, in essence, disappeared. Native grasslands once spread across 40 percent of North America; now, according to a grasslands primer distributed by the University of Victoria Faculty of Law, 98 percent of tallgrass prairie east of the Missouri River is gone and California has a mere 1 percent of its grasslands remaining intact. According to Ducks Unlimited, more than 2 percent of the 298,000 acres of native prairie remaining in the eastern Dakotas was lost to agriculture from 2002 to 2005 alone.

Grasslands status updates by scientists and governmental and non-governmental agencies from all corners of the world report the same bleak findings: Various combinations of overgrazing, monoculture agriculture, urban expansion, degraded soils, fire suppression, forest and non-native plant encroachment, reckless recreation and mismanagement of water resources have withered the grasslands of India, Tibet, Mongolia, China, Africa, Russia and South America. The European Commission reports that from 1990 to 2003, Europe lost 12.8 percent of its grasslands, which are now among Europe's most-threatened ecosystems.

A hunt for solutions that might reverse grasslands' dismal fortunes is underway, and researchers at KU have thrust themselves into the fray by recently joining forces with colleagues at Kansas State University, The Land Institute in Salina and Konza Prairie Biological Station. As desperate battles tend to encourage, a most unlikely champion has emerged: a quiet, careful, curious and

passionate professor of law, John Head.

In 2012, Head published the book *Global Legal Regimes to Protect the World's Grasslands* (Carolina Academic Press). The abruptly straightforward title reflects Head's insistence on projecting his work as a close examination of the minutia of how national and international laws, treaties and institutions might help slow the loss of the world's grasslands. But, as is true of the author, the book is more fiercely passionate than might be judged by its cover.

Before any fight can be won, Head argues, there must first be agreement on a fundamental question: Do we care whether the grasslands survive?

"Tropical rainforests, coral reefs, panda bears, baby seals, all of these have kind of instant widespread public attention given to them, but in fact, the kinds of contributions that grasslands can make to the overall health of the planet are really quite substantial," says Head, Robert W. Wagstaff Distinguished Professor of Law. "As a biome, as a portion of the world's land cover, they're generally regarded as the least protected, as the least noticed. And of course they've been so severely degraded and largely destroyed around the world that that also contributes to public ignorance about their value and the tragedy of their disappearance."

Agriculture has been with us for at least 5,000 years, and the earliest crops were grains cultivated from grasses, directly comparable to what we now know as wheat, barley and rye. And yet as agriculture progressed for the next five millennia, huge swaths of spectacularly fertile land resisted humanity's best effort at conquest.

"Soil does form. It can renew itself. Doing so, however, takes the correct conditions. Grasslands offer those conditions—or, more precisely, grasslands can offer those conditions if the grasslands themselves are not degraded."

—Head, *The World's Grasslands*

Life = Sun + Soil

—John Head, *Global Legal Regimes to Protect the World's Grasslands*

In North America, these lands came to be known as "prairie," from the French word for "meadow." No English word could be adopted as a descriptor because no such vastness existed in what was then the English-speaking world. Like the Great Plains of North America, other temperate grasslands have similarly romantic names: the pampas of Argentina, the steppe of Russia, the veldt of South Africa. Tropical grasslands, too, have their own lovely descriptor: savanna.

These massive stretches of the earth's surface thrived for specific reasons. They did not need much rainfall, and in fact could flourish in semi-arid conditions. Whether sparked by lightning strikes or set by native hunters who knew tasty green sprouts soon to emerge from charred earth would attract their prey, fire destroyed only what could be seen above ground; below, the regeneration was as near to instantaneous and rigorous as can be found in wild flora. Soil churning by huge animals—in North America, the seemingly limitless bison herds—actually helped, rather than harmed.

Native grasslands' ultimate weapon of self-preservation, though, was their roots, which in certain soils can plunge to 15 feet below the surface, weaving into a subterranean web stronger than their mightiest foe, including human farmers. At the time of the Louisiana Purchase, the riches of the North American Great Plains could be exploited by bison hunts, but not the plow.



"For thousands of years plows had been made of wood, and even when they were given cast-iron edges, they could not penetrate the grasslands," wrote emeritus distinguished professor Don Worster in one of his classic books on environmental history, *The Grasslands in Time*. "They would break first. Their usable range was limited to exposed soils along the river bottoms or what had once been forest floor."

And then came John Deere and the appearance, in 1837, of his first steel plow. Even pulled by a draft animal, Deere's plow "could slice through the toughest sod and expose the deep, fertile soil to the air."

If it had not ultimately become so thoroughly destructive, the headlong rush into the Great Plains might be seen in some respects as comically inept. Early boosters of agricultural expansion into western lands made the ludicrous claim, in the words of Josiah Gregg, that "extreme cultivation of the earth might contribute to the multiplication of showers." Indeed, brief spans of unusually high precipitation

helped the notion that "rain follows the plow" take root. Railroad tracks and telegraph wires were also thought to induce rainfall in arid environments.

And then came harsh winters and dry summers—a perfectly natural state of affairs—which by the mid-1890s nearly emptied a 300-mile-wide stretch of the Great Plains from Canada to Texas. Of course the same cycles of boom and bust were soon to repeat themselves, ultimately collapsing into the catastrophic Dust Bowl of the 1930s. The destruction of middle America's splendid grasslands, Head says, was "absolutely breathtaking in its pace," a "very quick unzipping of the land."

"For a while, at least," Head says, "there was this mystique, an ideology, a goofiness that rain follows the plow. There was this idea that, well, it's by plowing that we somehow create more precipitation; we can change the climate in a good way by settling and tearing things up as quickly as possible. Well, yeah, climate changed as a consequence, but not in the way that people in their ignorance thought."

Lucia Orth, John Head and their dog, Loki, stroll through the prairie grasses planted around the pond near their home south of Lawrence. John grew up on a farm in northeastern Missouri, and Lucia spent much of her childhood visiting her grandmother's farm near her hometown of Hannibal, Mo.

Loki the lucky rescue dog emerges from his new pond, shaking and shimmering and splish-splashing water and good spirits in broad arcs. Lucia Orth, a novelist, teacher, attorney and wife of John Head, grimaces, but the high-energy hound is having way too much fun for his people to do anything but smile at his antics. As Lucia and John stroll down a path through tall native grasses that surround their pond, one of the first restoration projects on the property they bought a decade ago south of Lawrence, two foresters emerge from the woodlands behind their home and, leaning against pickup trucks, compare notes after their afternoon inspection.



“We might usefully regard the Earth’s soil, then, as an extremely thin ‘skin of life’ stretched over a dead rock. ... If it remains healthy, that ‘skin of life’ can create adequate food, feed, and fiber—and indeed, it can do so in luxurious abundance—for the benefit of all the creatures that live on it, including humans. Grasslands, perhaps more than any other type of biome or land-cover, help nurture the health of that “skin of life” by conserving the soil and allowing its regenerative powers to operate.”

—Head, *The World’s Grasslands*

Dave Bruton, district forester for the Kansas Forest Service, and Ryan Neises, watershed forester for Ecotone Forestry in Ottawa, are charting plans for Head’s next leap into returning his family’s land to as natural a state as possible.

“A lot of times, people view our woodlands as wasteland and don’t do the management that’s important to keep our woodlands healthy and diverse,” Bruton says. “It is good to have landowners who are interested and take the initiative. The thing that I get gratification from is that they’re not doing it, in most cases, for themselves. They’re doing it for future generations, for the overall good of the general population.”

This little slice of country heaven, 2 miles south of the Clinton Lake dam, is nestled in a rural neighborhood known as Pleasant Valley. After purchasing the home and 38 acres of hillside woodland, Head and his wife convinced the owner of the flatter pasture land across North 900 Road to sell them her 52 acres.

Working closely with Jim Weaver, district manager for the Douglas County Conservation District Office, Head immediately set about returning the land to something resembling a native prairie. The land had not seen row crops for decades, so its terracing was crumbling, and brome grass, which was still being cut for hay, was competing with cedar, locust and hedge for dominance.

The terraces were removed, as were the invasive plant species, which were replaced with a five-species mixture of native prairie grasses that can still be hayed but are perennials that need no fertilizing, irrigation or seeding. Head also had engineers create a network of “micro-wetlands” that catch and hold rain and encourage amphibians and birds to restore natural cycles of life on the property.

“It’s like anything else,” Weaver says. “Every little bit helps. I think that when other people see that project out there, they may want to emulate something like that on their own place.”

John Head grew up on a farm in rural northeastern Missouri, attended Mizzou

and in 1975 accepted a Marshall Scholarship to attend Oxford University, where he earned an English law degree and discovered an unexpected interest in pursuing international law and a career outside the United States. He first returned for law school at the University of Virginia, then spent three grueling years immersed in international law while working in Washington, D.C., for a New York City firm.

He and Lucia in 1983 made their first trip to Asia, and he accepted a job based in Manila for the Asian Development Bank.

“My wife and I were both eager for adventure,” Head says. “We wanted more exposure to life overseas. It was partly appealing to us because it was so exotic and unknown.”

Head spent five years in that assignment, traveling throughout southern and eastern Asia to work as a lawyer for development projects to build hospitals, schools, roads, power grids and irrigation works. He spent two years with the International Monetary Fund in Washington, D.C., and in 1990 he turned his career toward academia at KU Law, where he has established himself as a prolific writer, researcher and teacher of international economic and environmental law, international institutions and comparative law. He recently published a book in another area of interest, Chinese law and history, written in collaboration with former graduate student Xing Lijuan, SJD’12, now assistant professor at City University of Hong Kong School of Law.

“His passion and his belief in his work makes me feel it is really a thing worth our labor and worth our attention,” Xing, who contributed research on Chinese laws and programs to Head’s grasslands book, says from her office in Hong Kong. “I think he is very gentle, and he is always very generous and open-minded. He seeks every opportunity to incorporate some things different from traditional perspectives.”

Xing notes that long before Head turned his attention to researching and writing about international grassland protections,

his fondness for the natural world was evident—namely in the potted plants that blossomed in his fourth-floor Green Hall office, where large windows offer a sunny view of the Hill.

“There was a long period of time whenever I went into his office, it was like he was working in a forest,” she recalls with a soft laugh. “He really enjoyed that, and I thought, ‘This is fantastic.’”

On a Friday morning in mid-October, a vanload of KU faculty trucked west to Salina. A consortium dedicated to a reinvention of human interaction with the prairie was about to be born.

Hosting the event was The Land Institute, a non-profit organization dedicated to transforming agriculture from annual crops sowed in monoculture expanses of otherwise barren land into a system of perennial grains grown in polyculture mixtures, mimicking the best traits of natural grasslands. Founded in 1976 by MacArthur “Genius Grant” winner Wes Jackson, g’60, and encouraged over the years by many of the region’s foremost thinkers, researchers and artists, including Worster, recently retired from a long career at KU, and photographer Terry Evans, f’68, Land Institute researchers had in 2012 decided to rein in some of their nationally distributed research collaborations and instead work more closely with natural and social scientists at KU and K-State, where the range of available expertise far surpassed that of the Land Institute’s focus on plant genetics.

Also spurring the coalition was a recent donation to the Land Institute of rich farmland north of Lawrence by Jim Haines, retired CEO of Westar Energy, and his wife, Cindy. The initial 65-acre gift, including a home built in the 1880s, will by January include 240 acres, with 100 acres of cropland now under perennial brome pasture. Once the site has been outfitted with lab equipment and baseline data gathered on fields before any research commences, it is anticipated that the farm will offer KU faculty and graduate students

hands-on work within the consortium’s shared mission.

“We’re calling it the ‘living lab,’” says Chris Brown, KU professor of environmental studies. “If you can’t show your students how they can take what they learn and actually see changes in the landscape around them, how can you expect them to go out and change the world?”

KU faculty attending the October meeting in Salina were drawn from such diverse departments as environmental studies, geography, sociology, history, the Spencer Museum of Art, ecology and evolutionary biology, anthropology, and, of course, law.

John Head had collaborated with Wes Jackson for years, including arranging meetings with Land Institute researchers and representatives from the World Bank, and dedicated his grasslands book to Jackson, among others. Though he has, without doubt, earned his place at the table, Head still treads softly when surrounded by researchers who lead the scientific inquiries into refitting modern prairie ecosystems.

“He’s constantly commenting on how he’s just figuring this out and has the least to offer of anyone,” says ecologist Tim Crews, the Land Institute’s director of research, “and yet he obviously has a lot to offer. I credit John with seeing a gap in policy and legal analysis, and his attention

to it has been brilliant. I had not thought about a lot of the issues he’s raised in his book, and continues to raise. I’m just thrilled he’s a part of this group.”

The Land Institute recently debuted a perennial grain that is a close relative to wheat, dubbed Kernza. Its flour has been used by beer masters at Boulevard and Free State breweries and bread makers at Wheatfields Bakery, and it is being grown on 100 acres in Minnesota to test its commercial possibilities.

Ultimately, though, the work of creating a perennial grain crop that replicates natural prairie—grown in polyculture acreage, with minimal need for human intervention for pest control or fertilization—will likely require decades of intense research. Recent research has begun exploring, with modern genetic tools, microbial interaction in the rooting zones of prairie ecosystems, a complexity that Crews describes as “off the charts, an absolute Library of Congress of ecological information.”

The first steps, including Kernza, are now coming to fruition, though Crews labels this stage as “training wheels.” Ultimately, he says, “you can think of a gradual curve starting today and 100, 150 years from now, the full-on turnover of the next agricultural revolution has happened. And 30 or 40 years from now, we’re going to be somewhere in between.”

Why care about the next generation of

agriculture technology? Why care about the prairie?

“We’re becoming bankrupt,” Crews says. “We have a yield ceiling. We have degrading soils. We have genetically engineered crops that are no longer working because the herbicides have been overcome by the weeds. Now we’re looking at prairie and going, wow, it maintains about the same level of productivity as a wheat crop here in Kansas with no inputs whatsoever. It doesn’t need herbicides and it doesn’t need to be resowed. Basically, it just grows itself.”

Jim Weaver, the county conservationist who helped Head restore his land to native grasses, says he holds in his imagination the scene from “Dances With Wolves” when Kevin Costner’s character roams the prairie, holding his arms out above the tallgrass, “just enjoying the countryside. To me, the opportunity to maintain some of that natural area, knowing that it can still be done and that we can preserve it for our kids and their kids to see, just feels good.”

Head cautions that a solution to prairie restoration and a reformation of agriculture must take both short- and long-term perspectives. The immediate needs of feeding a hungry and growing world can’t be “shouldered to one side by long-term perspectives. There has to be a juggling act. Had our immediate predecessors not been so successful at plowing up the prairies, there might not be this confluence of short-term and long-term, but right now we’ve got them both. And it is right now, in the next 20 years, 40 years, 60 years I guess at the outside, that there has to be this balanced solution.”

Success is far from certain.

“There might be some hope on the horizon,” Head says, in reference to younger generations who are showing themselves to be faithful to needs of the lands they’ll inherit. “That’s a silver lining in a dark cloud. Maybe we have a rising tide of appreciation and enthusiasm.”

And this time, perhaps we’ll get it right, wonderfully, eternally right. 🌾