

# Ecological Restoration: Making Space for the Wild

The theme for the 2010-2011 Paideia Text and Issues lecture series was “Transforming Service.” While most of the lectures focused on service to people, we wish to extend the idea of service to include stewardship of the ecological community that is our home.

Be forewarned: although we are both biologists, and despite the word “ecology” in the title, this is not a biology presentation. We have no data, graphs, or statistics. Instead we will focus on the ways in which this form of service both challenges and transforms us.

There are elements of restoration that make us uncomfortable. Hidden inside the word “restoration” are many decisions, decisions about what should be saved and what should be destroyed. We recall decisions with disastrous consequences in the history of conservation biology. We will reflect on our experiences with confronting these moral ambiguities.

Ecological restoration is transformative service. Restoration transforms the landscape. That is its intent. What we don’t often realize is that at the same time, restoration transforms us. It deepens our attention and develops our ecological imagination. We will describe some of the ways in which we have been transformed through our attention to the natural world.

Our presentation is part of Luther’s sesquicentennial celebration, and rightly so. Restoration is rooted in history:

to envision the future of Luther’s landscape, we need to understand its past. So let us begin by describing two parts of Luther’s landscape as they might have been 150 years ago, the oak woodlands and the floodplain.

## Transformation of the Luther College landscape

Imagine that you had been one of the first settlers to arrive in Decorah in the late 1840s, and you had gazed west from the bluff where Centennial Union now stands. What would you have seen? The broad valley where Bob Jewell now has pasture may have been a savanna—prairie with widely scattered bur oaks. A forest of elm, silver maple, hackberry, and cottonwood grew on the banks of the Upper Iowa River. The river’s flow changed slowly with the season. Prairies, wetlands, and forests absorbed the spring melt and summer rains, then released the water gradually.

On the other side of campus, looking east from what is now Olin, you would have also seen oak savanna. Higher on the ridge was an open woodland of white oak. The steeper hollows of Hickory Ridge Woods may have sheltered fire-sensitive species, such as basswood and red oak. Cedars grew slowly on the safety of rocky outcrops.

By the time that Jens Jensen arrived at Luther in 1909 to plan the new landscaping for the college’s fiftieth anniversary, these vistas had changed dramatically. On the flatter areas, the former savanna was destroyed. In its place farmers planted oats, wheat, barley and corn. The oaks in Hickory Ridge Woods had been felled for fence posts, fuel, and houses, but young oaks had sprung up to take their place. Beneath the trees, cattle grazed. Along the river, the forest had been cut to make way for pasture and fields.

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Beth Lynch is an ecologist who thinks about how and why plant communities change over long periods of time.

by  
**ERIC  
BAACK**

by  
**BETH  
LYNCH**

Her current research is directed at understanding pre-historic fire regimes in pine and oak ecosystems of northwestern Wisconsin. Her undergraduate study was at Trent University and her PhD study was at the University of Minnesota.



Oneota Valley and the Upper Iowa River, from the location of Main, n.d. (perhaps as early as 1903)

LUTHER COLLEGE ARCHIVES

The river was also changed. When prairies grew along its tributaries, the grasses slowed the rain before it reached the soil, and the deep roots allowed the water to seep in. With prairies replaced by crops, more of the water ran across the surface instead of soaking in. As a result of these transformations the Upper Iowa rose higher in the spring. In the fall, it dropped lower without the steady trickle of water released from prairies and wetlands.

At the time of Luther's centennial in 1961, the scenery was similar to that seen by Jens Jensen fifty years earlier. Field and pasture still came to the river's edge. Cows still grazed in the open woods. But the cattle and plow were taking their toll on the land, leaving eroded gullies on the hillsides. More changes were coming.

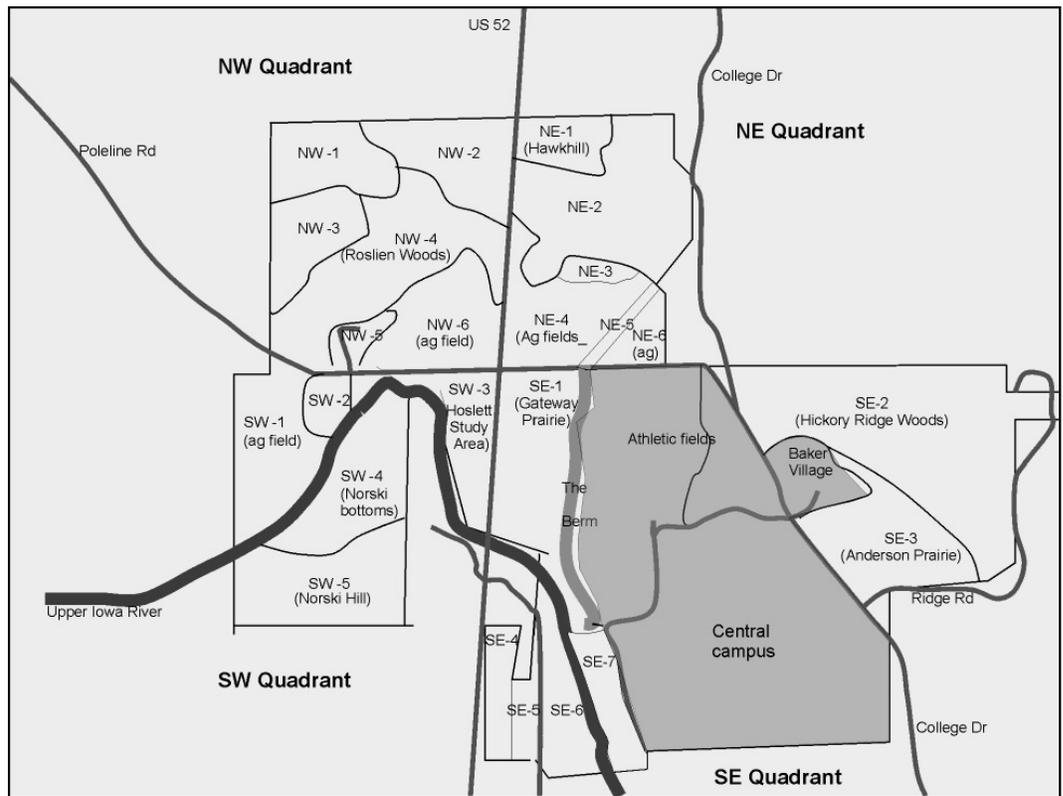
Between 1960 and 1985, Luther College ceased farming. While fields in the floodplain continued to be leased to neighboring farmers, the hillsides were now without grazing for the first time in a century. With neither cattle nor fire, elm, walnut, and hackberry began to fill in the spaces between the oaks. Birds carried in the seeds of exotic species—European buckthorn, honeysuckle, Japanese barberry. These new species began to colonize the understory of the forest.

The college became concerned about erosion of its lands. Cattle were removed from the hillside across the river, and the college planted tens of thousands of trees in what we now know as Roslien Woods. Rich Tenneson enrolled the corn field along the edge of Hickory Ridge Woods in the Conservation Reserve Program and planted prairie grasses. Luther College had begun to restore its landscape.

The campus expanded towards the river with construction of the Regents Center. To protect the new gym, a levee was built along lower campus using soil from the floodplain. Pioneer tree species such as box elder and cottonwood became established near the river.

And so we come to today's landscape. Remnants of the past forest still grow in Hickory Ridge Woods. The white and bur oaks have been joined by other species that, unlike the oaks, are tolerant of shade. The future belongs to these new species. The old trees of the woods today are the last generation of oaks that this forest will produce.

In many places, the river is once more screened by floodplain forest, but it is not the same forest. It lacks the bur oaks, elms, and hackberries that would have been present in 1850.



*Luther College central campus and surrounding natural areas. Hickory Ridge Woods at far right, the river corridor below Main (SE-7), Hawkhill (NE-1), and Norski (SW-5).*

ERIC BAACK

Elsewhere, invasive grasses form a dense sod.

We can guess how our landscape will change over the next fifty or one hundred years if we do not intervene. On the hillsides, the mature oaks and shagbark hickories will grow old and die. No saplings will replace them. Shade tolerant species such as hackberry, cherry, and elm will become more common, but invasive shrubs will continue to increase at an even greater rate, taking over more of the forest floor.

Along the river, too, invasive species will become more common. European buckthorn will increasingly dominate the forest, while garlic mustard will carpet the floor. Sunny spots will support mounds of Japanese knotweed, a vigorous invasive plant species transported here from upstream during the last flood.

In both communities, the ecological changes that began 150 years ago will continue to transform the landscape. The human tendency is to see the landscape as static and unchanging. But we know that this landscape is on a trajectory towards continued change. In the face of this, even if we take no action, there will still be dramatic changes for years to come.

And so we ask, should Luther College do anything to restore the floodplain, or to keep bur and white oaks on our hillsides? Yes, the college should. The diversity of ecological communities is essential for teaching and research. The abundant acorns are a critical food source for turkeys, squirrels, and blue jays. Without the oaks and the web of life that they sustain, our lives will be poorer. If we do not restore, we will lose much of what we value and need.

The health of the Upper Iowa River and the Mississippi depends in part on the floodplain. The Emergency Watershed

Protection program (EWP) aims to protect watersheds from flooding and erosion. In October, Luther College committed to protect part of its floodplain under this program. The college will restore natural vegetation on 49 acres currently used for crops (“SW-1”, “SW-4”, and “SE-7” on map).

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*How can we presume to make decisions for ecosystems? It is clear that we must, but equally clear that we must do so with humility.*

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The goals of the EWP make some steps clear: levees will need to be breached to allow flood waters to spread over the floodplain. Crop fields will be planted to forest or prairie. This sounds easy, but some difficult questions remain. For example, when we plant a forest in a floodplain, what tree species should we use? How much herbicide will be necessary to ensure that the trees will be able to grow past the weeds? Making these decisions can make us uncomfortable. Yet, we know we must do something and so we forge ahead with some unease and a lot of humility.

### **Moral ambiguity and discomfort with restoration**

#### *Setting goals*

**[Beth]** One of the most difficult aspects of ecological “restoration” is setting goals—that is, what do we want this place to look like in the future, and what tools will we use to get there? As a first year graduate student I had a strong interest in agroecology and ethnobotany. I spent a summer in Costa Rica studying these topics with other graduate students and faculty. We visited agricultural research stations, farm cooperatives, subsistence farms, biological field stations, indigenous communities, and ecological reserves.

I realized that summer that, as interested as I was in the people and their livelihoods, I didn’t want to be in a position of advising them. I was more interested in learning from their experiences and didn’t think that as an ecologist I’d ever have anything to add to what they had already learned through experience and tradition. They were the ones working the land. I didn’t want to be a gringo scientist delivering recommendations about how to sustain agroecosystems. Besides, problems with land use would be solved not by ecologists telling people how to best grow coffee to reduce erosion, but by changes in economics and politics. As an ecologist, I decided to retreat to a position of trying to understand ecology for its own sake.

But here I am, placed once more in a position of guiding decisions, and still troubled. How can we presume to make decisions for ecosystems? It is clear that we must, but equally clear that we must do so with humility. As ecologists, we start by consulting the ecosystem. We try to understand its history and the range of conditions that it experienced prior to our recent intervention. It is human society, not the ecosystem or the ecologist, who will set goals, but ultimately what is possible depends on the ecosystem. For this reason, we start by looking and asking.



BETH LYNCH

*Algific talus slope at Luther College located on north-facing slope above the Upper Iowa River.*

Our knowledge is incomplete; the fact that there are large gaps in our knowledge about present ecosystems does not make it easy to set goals. Also, it has become abundantly clear that there is no “original” state to which an ecosystem can be restored. Given the ever changing scene, why should we choose 1850 as a goal for restoration?

Not only do ecosystems change continually as they adjust to disturbances such as fire or as they track changes in climate, but humans have been manipulating North American ecosystems for thousands of years. Indigenous peoples planted hickories and Kentucky coffee trees. They set fire to the woods and prairies. Given the difficulty in identifying the “natural state” of any ecosystems, *how* do we choose one to restore to?

**[Eric]** Knowledge of past decisions does not make this any easier: think of kudzu or Asian lady beetles, both intentionally introduced, the first to control erosion, the second to control aphids. Neither one makes the list of good ideas in ecology. I want to focus on one attempt at restoration that has reshaped our floodplain: reed canary grass. Back in the 1940s, cattle were trampling stream banks, and few grasses could withstand their hooves. Farmers and the Soil Conservation Service searched for a plant that could hold soil in place. They planted reed canary grass, selecting the most productive strains from the US, Europe, and Asia. The restoration worked almost exactly as hoped: it provided forage for cattle, and helped to prevent erosion.

However, seventy years later, we can see the problems with this decision. Reed canary grass did not remain in pastures but began to spread in the floodplain, crowding out other wetland plants. Once established it is exceedingly difficult to remove. It forms very poor habitat for amphibians and waterfowl. Planting reed canary grass met the goals of the 1930s but made it far more difficult for us to meet other goals today.

As we set goals for restoration at Luther, how can we avoid making mistakes? We probably cannot. But we can adopt a key idea from Aldo Leopold: “If the biota, in the course of aeons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts? To keep every cog and wheel is the first precaution of intelligent tinkering.”

We should make an effort to keep as many of the parts as we can. If we do this, then maybe we can keep open possibilities for the future. What are the cogs and wheels that we must keep?

Most of us think of species when we consider parts, but we have also lost ecological communities and processes, which are just as important.

Several species are absent from our landscape in eastern Iowa, including passenger pigeons, elk, bison, bear, and wolves. These species played key roles in the landscape. For example, the bison changed the way that fire moved across a prairie: areas that had been grazed recently did not burn, creating a patchwork of burned and unburned areas.

In place of these missing species, other species have become more common than ever before: deer, robins, and crows, for example.

We have retained some of the ecological communities here at Luther. We have a patch or two of white oak forest, and a nice red oak forest on the slope at Norski. Nearby, we have a small algific talus slope—a community that occurs nowhere else in the world outside of the Driftless Area. We have lost others: bur oak savannas once dominated our landscape, and thickets of oak grubs and hazelnut were common: both are almost entirely gone. Two communities that remain, oak-hickory woodland and floodplain forest, are dramatically altered.

Moreover, we are missing ecological processes that were once key parts of the landscape. Wildfires do not burn through our woodlands and prairies. Floods, though still present, are altered in essential ways. The Upper Iowa still floods, but with a much faster rise and swifter fall than in the past, and with a much heavier load of sediment and nutrients. Fires and floods are destructive, but their destruction has been a part of this landscape for millennia.

Some of these missing parts cannot be replaced. For now, we cannot bring back elk, bison, or wolves. We will never bring back passenger pigeons. The Upper Iowa has cut a deep channel into the floodplain, cutting it off from its floodplain except in extreme events. Our goals must be constrained by these realities.

Other lost parts we might be able to replace. We have begun to open up oak woodlands. Some wildlife species that were missing for a time have returned. Along the Upper Iowa River, beaver, otters, and bald eagles are seen again. Prairie grasses grow once more. And we have re-introduced fire—in a limited way. Now, we burn in the early spring when we can burn safely, rather than in the summer and fall when fires were probably frequent in the past. Our limited burning probably acts in some of the same ways as late-season fires did, but not in all ways.

Making an effort to keep all of the pieces places some limits upon our actions: we should not turn all of the landscape into one type of ecological community, no matter how much we might like it. In Hickory Ridge Woods, there are areas with bur oaks with spreading branches. These trees grew when what is now forest was savanna: perhaps we should restore these areas by removing fire-intolerant species and returning fire. In other corners, we find large basswood trees and red oaks

that have re-sprouted from cut stumps; both are species that do not survive fire. Their presence on the landscape tells us that Hickory Ridge Woods has long been a mosaic of different habitats. Keeping the pieces implies that we should pay attention to the red oaks and basswoods and not seek to turn all of the forest into a savanna or oak woodland.

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Keeping the pieces also directs our attention to things that we might otherwise ignore. Thickets were not viewed highly by pioneers, dense with scrubby oaks and hazels. Odds are good that if we succeed in restoring thickets to our landscape, many folks will find them ugly. Likewise, if we aim to keep the pieces, we should not seek to have grass running to the river's edge, at least not everywhere. Even if Jens Jensen admired the open view, we should seek to have some diverse floodplain forest as well. If we aim to keep all of the pieces, then our aesthetic sense can be checked by ecological reality.

Some pieces are easier to retrieve than others. For example, planting prairie grasses on former farm fields has returned many native plant species and created beautiful views around campus. But, it will take longer for the native insects to return, and perhaps even longer for the fungal species of the planted prairies to resemble a native tallgrass prairie.

Other pieces will be hard won, requiring not only fire, but perhaps also chain saws, herbicides, or earth moving equipment. If we wish to have maple-basswood forest we think we must remove the invasive species that seem to be taking over. If we wish to have oak savanna and white oak woodland, we think we need to remove the cedars, hackberries, and walnuts now growing amidst the oaks. But, this kind of heavy-handed management worries us. We've seen humans make things worse so often that we hesitate. Restoration will require both humility and boldness.

### **Violence of restoration**

**[Beth]** Another moral difficulty with ecological restoration is that it involves destruction and violence. My colleagues have cut down dozens of cedars and black walnut trees in Hickory Ridge Woods in the name of restoration. By April of every year, I talk obsessively of slaughtering garlic mustard. Passers-by on trails through our city parks cast accusatory glances my way as I rip the plants from the soil by their roots and hang their carcasses in the crotches of trees to wilt. Worse yet, I spray toxic chemicals from a backpack tank to kill larger patches. Later in the summer I switch to cutting and poisoning European buckthorn and non-native honeysuckles.

Even the deer in my woods get no sympathy from me. As we lock eyes, I hope for cold winters with deep snow, though in the absence of serious predators it hardly matters. Lately I've begun to wonder if I have an obligation to take up deer

hunting to protect the forest. This kind of killing and poisoning could be considered offensive. We have a visceral reaction to the destruction of living things: a pile of slash looks much the same whether it is a from logging or from a woodland restoration. Cutting down trees and killing animals have got us into big trouble before. Because of this, we are pushed to think hard about why we engage in these acts of violence again in the name of ecological restoration.

When humans attempt to restore the processes that once shaped our landscape—floods and fires and predators—violence may be inevitable. I think we are starting to be able to live with this. It is not so long ago that ecologists successfully convinced policy makers that fire is an important component of many ecosystems. They argued that the elimination of wild fires would create new problems and was, in any case, probably not possible. In general, policy makers and the public seem to now accept this premise (at least for remote wilderness areas) despite the lingering image of Smokey Bear signs along roads in National Forests. We work with fire, allowing some fires to burn. In other places, the risks of a catastrophic wild fire are too high, and here thinning and smaller prescribed fires are used instead.

Perhaps killing in the name of restoration is not so far from allowing fires and floods to occur for the same purpose. The well-being of the mountain may require something to hunt the deer, something to eat an invasive species. We may not be willing to bring back wolves, or introduce an insect pest to feed on the invasive plant; the risks may be too high. Instead, we act as the predator, hunting the deer or pulling up the weeds. Fire has become more accepted; maybe we are nearing a similar change in attitudes about managing invasive plants and exploding deer populations.

Here in Decorah, we have learned that the blackened earth from a prairie burn is a sign of abundant wildflowers to come. The time from fire to flower is sufficiently short that we see the connection. It will be harder for us to accept other forms of destruction as the price to be paid for beauty and diversity. Given our past, skepticism may be warranted. If skepticism leads us to carefully study the results of our actions, then it will serve us well. We are, after all, still learning how to use fire, and to play predator. We'll make mistakes: we'd best pay attention to them.

### Transformation through restoration

**[Beth]** To make wise decisions in our efforts to protect and restore ecological communities we need to be attentive to our natural surroundings. This means taking the time to explore, to get to know what other species live here, to observe their habits, and to notice when something appears to be out of the ordinary. This practice of attention to the natural world

is transformative. It pulls us beyond the physical limits of our bodies, beyond the confusion of human relationships and social mores, out into the world of damp soil, chilly breezes, muddy rivers, lichens on tree bark, and kettles of turkey vultures soaring on a warm updraft. This attention to the world beyond fills us with wonder, love, and sorrow.

As I think about becoming an ecologist I can see it might have started with being attentive to the names of things. As a kid in elementary school I was eager to learn the trees and stones, and was eager to learn which plants I could eat and which kinds of trees made the best heat for our wood stove.

When I was in my late twenties in graduate school I took a friend on her first canoe trip. We enjoyed hiking and cooking together, and I figured she'd enjoy the Boundary Waters too. She was a terrible paddling partner. She spent the whole time gazing through her binoculars and exclaiming in delight at the warblers flitting around us. We didn't make it very far

on that trip, but she opened up a whole new layer of the world to me. I had never noticed warblers before that trip. Now, the warblers are welcome companions each spring when I head out to the woods to see what is happening. Some years I see very few and I worry.

The work of recognizing and naming is not a trivial pursuit. In order to distinguish between the beaked hazel and American hazel (both of which grow here, but one is much more rare)

one must look closely at the young twigs for the presence of hairs. If you are lucky, you'll find the nuts before the squirrels do, and notice the long snout of the beaked hazel. Students in Bio 151 learn to recognize the trees of Hickory Ridge Woods by seeing subtle differences in the shape and color of the buds, or the stoutness of the twigs. Until that week in the fall, many students never knew these trees or noticed that the shagbark hickories are more common on the ridge tops and bitternut hickories more abundant in the ravines. Naming is the first step in noticing. This work of seeing and naming connects us to the land, and so we are transformed.

Once we take note, we are prepared to start seeing patterns in nature. Humans excel at this, and questions like, "where will I find morels?" "where should I set up a deer stand?" and "why are there no trees here?" are all questions about patterns. As an ecologist, I walk through the world observing patterns, asking questions, and making up explanations for their existence. Squirrel corn is very rare in Iowa, but its sister species, Dutchman's breeches is very common. I have only seen squirrel corn in old forests with rich soils and little signs of disturbance. "Ah," I say to myself, "perhaps land use history is the key factor here. I will only see squirrel corn in old forests that have experienced minimal grazing by livestock." This is how my mind works as I walk through the woods.



*Garlic mustard patch in Spilde Woods at Luther College.*

BETHLYNCH

Where it gets interesting is when the expected pattern goes awry. I am delighted to find a favorite plant from northern Minnesota tucked into a hillside in central Iowa, and distraught when I spot a garlic mustard plant at Malanaphy Spring. Noticing patterns and deviations from the expected drive us to dig deeper. We look for causes and revise our explanations. This kind of thinking is part of the work of stewardship. It helps us to formulate goals and to assess the consequences of our efforts.

Beyond naming and puzzling over patterns, we train our minds to anticipate connections among species. As I walk through Hickory Ridge Woods, I note that the invasive honeysuckle thickets may threaten the reproductive success of songbirds. I know of a study which demonstrated that the architecture of honeysuckle shrubs makes it easier for predators to reach the nests of birds. What about the deer? I notice where they bed down for the night. While show shoeing through the woods this December I noticed that each deer bed had above it a juniper branch. The presence of the branch retains nighttime radiation, keeping the deer just a bit warmer than if it had been sleeping in a more open spot. As I wander around in winter I notice what the deer eat: not the invasive honeysuckle and barberry. No, they like the native trees, oaks and basswood. How will this transform the forest in years to come?

Biologist Aldo Leopold also grew into contemplating such connections. He was way ahead of the times in the 1920s when he recognized the role of predators in ecosystems of the southwest. As an employee of the USFS he shot one of the last wolves in the region and later, in an essay from the *Sand County Almanac*, described the event and his personal transformation:

In those days we had never heard of passing up chance to kill a wolf. In a second we were pumping lead into the pack, but with more excitement than accuracy: how to aim a steep downhill shot is always confusing. When our rifles were empty, the old wolf was down, and a pup was dragging a leg into impassable slide-rocks.

We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes—something known only to her and the mountain. I was young then, and full of trigger-itch; I thought that because fewer wolves meant more deer, that no wolves would mean hunters' paradise. But after seeing the green fire die, I sensed that neither the wolf nor the mountain agreed with such a view.

In the essay he goes on to describe the many places where he had observed the destruction of vegetation resulting from high deer populations. He imagined, "just as deer live in mortal fear of wolves, so does a mountain live in mortal fear of its deer."

Ecologists are still learning to "think like a mountain," but we know a lot more now that we did in 1930 when wildlife

biologists were busy extirpating wolves. The reintroduction of wolves to Yellowstone National Park in the late-1990s has led to all kinds of unintended consequences, many of them quite welcome in an ecosystem that suffered overgrazing from large elk herds. The willow thickets along streams in subalpine meadows have grown back because the elk now keep to the safety of the woods. Aspen and cottonwood are now growing back in places where only a few old trees remained. Populations of coyotes and foxes are down, and their prey populations are up.

A painful side effect of being attentive to our surroundings is that we notice when things go wrong. This fall, Dean Bill Craft joined the first year students for a morning of buckthorn slaying. He reported that after spending a morning searching out buckthorns in Hickory Ridge Woods, he saw them everywhere around Decorah. The wounds in the landscape were suddenly visible to him.

From 1997 to 2001 I lived in Dubuque, and there I witnessed something I had never seen before. In two natural areas that we frequented, garlic mustard populations increased from a handful of plants to dense monocultures in the span of just four years. Before my eyes, mature hardwood forests with lush carpets of spring wildflowers (some of them quite rare in Iowa) were taken over by millions of garlic mustard plants. By the time I realized what was happening, the transformation of these rich woodlands into garlic mustard jungles was well underway. Helplessly watching the loss of these jewels from the already ecologically depauperate landscape of Iowa, I felt a deep sense of sadness, loss, and guilt. If only I had done something.... Then, we moved to Decorah, and the first thing that I noticed was that there were very few areas that had garlic mustard. What a relief! And, then I started to spot a plant here, and another plant there. The invasion had begun, but it was a few years behind. This time I took action, spurred by my imagination of what would happen if I did nothing.

[Eric] I have not witnessed the loss of wild things that I've loved: rather, it is the imagination of that possibility that has moved me to act. In the summer at the end of my first year in Iowa, a student and I were looking for plants at Bixby Preserve, near Strawberry Point. Bixby is one of the most diverse spots in northeast Iowa—federally endangered monks hood grows there, along with nineteen other plants that are rare in Iowa. As we studied the bark of the yellow birch and admired the golden saxifrage blooming at the mouth of the ice cave, a familiar plant stopped me in my tracks. I couldn't believe that garlic mustard was growing on these hillsides. Something had to be done: Iowa could not afford to lose the tiny patches of wildness that remain—or more accurately, I could not afford to lose them. Restoration became an imperative.

The ability to imagine is another key transformation emerging from caring for the land. We walk through the woods compulsively imagining the future. We imagine futures of despair, but we also imagine futures of hope, otherwise why bother do anything? In one corner of campus, at the base of Hawk Hill, is a forest that I've begun to call Mirkwood. Until this fall, very few folks went there. To reach it, you walk past Lindeman pond, along the cross country trail, cross Pole Line Rd and walk along the corn field where the city may build

the athletic complex. Past the abandoned prairie full of wild parsnip, you'll find it—an ecological disaster. Dense buckthorn shades the forest floor, where almost nothing grows—except for some garlic mustard. Here and there, you find an old bur oak, or shagbark hickory.

It is a challenge to imagine this buckthorn-choked forest as anything else. The history of restoration prods us to try. Eighty years of prairie restoration at the University of Wisconsin have taught us that degraded prairies can flower again once fire is returned. We've learned that wetlands can revive when the drain tiles are broken. Often our restorations are imperfect copies—but they still testify that beauty and diversity can return. I take hope, stand in a clearing at the top of Hawkhill, and imagine looking down on a forest of white oaks and shagbark hickories.

**[Beth]** As important as imagining the future is our ability to imagine the past. Every landscape has been shaped by a long history; what we see today is a legacy of that past. If you are attentive, you can see clues to the past all around. Walking through the western part of Hickory Ridge Woods you can reconstruct the transformation from open bur oak and hickory woodland into the modern forest oak, walnut, red elm, and hackberry. It took 150 years, but the evidence is still there: the wide spreading crowns of the oaks, the young elm and hackberry making their way into the canopy, the dying cedars that were the original invaders of the woodland.

On the other side of Highway 52, the north-facing slope has one of the largest basswood tree trunks I have ever seen. Actually, it's a double trunk, evidence that before this gigantic tree there was another enormous basswood tree that produced the sprouts that grew into the tree that I see today. This tree grows right along the fence line and for this reason was spared the ax when the land was cleared decades ago. There are other signs that this place has a long history as a rich forest, including wildflowers that thrive in protected sites like this. Blue cohosh and squirrel corn tell us the long past of this forest, even though most of the trees there today are still quite young.

I look for these clues of the past partly because it entertains me on my wanderings. But, there is another reason. This is how I consult the place when thinking about restoration

goals. It is silly to put a prairie where there was once forest, or a wetland on an abandoned river terrace. If you do this you end up fighting against the soils, the seed bank, the legacy. A restoration attempt is more likely to meet with success if you aim for something within the range of what has been there before.

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*In restoring, we work to create spaces for the wild—and in the process we create a home for ourselves in this landscape.*

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**[Eric]** For Beth, this attention has always been a part of life. I, on the other hand, could live largely within my own thoughts. Attention has been a practice to develop. Studying field biology required me to attend to the living things outside of my head. Over the years, I've become better at seeing.

As a child of the West, I'm accustomed to wildness on the scale of oceans and mountain ranges. Coming to Iowa, I knew that I needed to seek it out in the little patches where it persists. I spent my first year visiting the natural areas in northeast Iowa: noting the Dutchman's breeches on the limestone ridge at Lionberger Preserve, watching the sandhill cranes at Cardinal Marsh, delighting in the Jack in the Pulpits and anemones at Malanaphy Springs, and savoring the solitude of the cliffs of the Bluffton fir preserve.

The love that grows out of attention lies at the heart of restoration. We restore out of love for what is wild—for what is not fully under our control, and does not exist solely for our use. We restore in order that the world may retain some of its dazzling variety. We restore here in northeast Iowa so that there may be a little bit more of the wild in our daily lives, and more still in the lives of those who will follow. We restore out of gratitude for the return of bald eagles and river otters.

We restore, in part, to restore ourselves. Hope is essential, and ecologists do not find it easily. Restoration ecology is an ongoing enactment of hope. In restoring, we work to create spaces for the wild—and in the process we create a home for ourselves in this landscape.

*Agora*