

MISHKOS KENOMAGWEN: THE TEACHINGS OF GRASS

I. INTRODUCTION

You can smell it before you see it, a sweetgrass meadow on a summer day. The scent flickers on the breeze, you sniff like a dog on a scent, and then it's gone, replaced by the boggy tang of wet ground. And then it's back, the sweet vanilla fragrance, beckoning.

II. LITERATURE REVIEW

Lena is not fooled easily, though. She wanders into the meadow with the certainty of her years, parting grasses with her slender form. A tiny, gray-haired elder, she is up to her waist in grass. She casts her gaze over all the other species and then makes a beeline to a patch that to the uninitiated looks like all the rest. She runs a ribbon of grass through the thumb and forefinger of her wrinkled brown hand. "See how glossy it is? It can hide from you among the others, but it wants to be found. That's why it shines like this." But she passes this patch by, letting it slide through her fingers. She obeys the teachings of her ancestors to never take the first plant that you see.

I follow behind her as her hands trail lovingly over the boneset and the goldenrod. She spies a gleam in the sward and her step quickens. "Ah, *Bozho*," she says. Hello. From the pocket of her old nylon jacket she takes her pouch, deerskin with a beaded red edge, and shakes a little tobacco into the palm of her hand. Eyes closed, murmuring, she raises a hand to the four directions and then scatters the tobacco to the ground. "You know this," she says, her eyebrows a question mark.

"To always leave a gift for the plants, to ask if we might take them? It would be rude not to ask first." Only then does she stoop and pinch off a grass stem at its base, careful not to disturb the roots. She parts the nearby clumps, finding another and another until she has gathered a thick sheaf of shining stems. A winding path marks her progress where the meadow canopy was opened by the trail of her passage.

She passes right by many dense patches, leaving them to sway in the breeze. "It's our way," she says, "to take only what we need. I've always been told that you never take more than half." Sometimes she doesn't take any at all, but just comes here to check on the meadow, to see how the plants are doing. "Our teachings," she says, "are very strong. They wouldn't get handed on if they weren't useful. The most important thing to remember is what my grandmother always said: 'If we use a plant respectfully it will stay with us and flourish. If we ignore it, it will go away. If you don't give it respect it will leave us.'" The plants themselves have shown us this—*mishkos kenomagwen*. As we leave the meadow for the path back through the woods, she twists a handful of timothy into a loose knot upon itself, beside the trail. "This tells other pickers that I've been here," she says, "so that they know not to take any more. This place always gives good sweetgrass since we tend to it right. But other places it's getting hard to find. I'm thinking that they might not be picking right. Some people, they're in a hurry and they pull up the whole plant. Even the roots come up. That's not the way I was taught."

I've been with pickers who did that, yanking up a handful that left a little bare spot in the turf and a fuzz of broken roots on the uprooted stems. They too made offerings of tobacco and took only half, and they assured me that their method of picking was the correct one. They were defensive about the charges that their harvesting was depleting sweetgrass. I asked Lena about it and she just shrugged.

III. HYPOTHESIS

In many places, sweetgrass is disappearing from its historic locales, so the basket makers had a request for the botanists: to see if the different ways of harvesting might be the cause of sweetgrass's leaving.

I want to help, but I'm a little wary. Sweetgrass is not an experimental unit for me; it's a gift. There is a barrier of language and meaning between science and traditional knowledge, different ways of knowing, different ways of communicating. I'm not sure I want to force the teachings of grass into the tight uniform of scientific thinking and technical writing that is required of the academy: Introduction, Literature Review, Hypothesis, Methods, Results, Discussion, Conclusions, Acknowledgments, References Cited. But I've been asked on behalf of sweetgrass, and I know my responsibility.

To be heard, you must speak the language of the one you want to listen. So, back at school, I proposed the idea as a thesis project to my graduate student Laurie. Not content with purely academic questions, she had been looking for a research project that would, as she said, "mean something to someone" instead of just sitting on the shelf.

IV. METHODS

Laurie was eager to begin, but she hadn't met Sweetgrass before. "It's the grass that will teach you," I advised, "so you have to get to know it." I took her out to our restored sweetgrass meadows and it was love at first sniff. It didn't take her long to recognize Sweetgrass after that. It was as if the plant wanted her to find it.

Together we designed experiments to compare the effects of the two harvesting methods the basket makers had explained. Laurie's education so far was full of the scientific method, but I wanted her to live out a slightly different style of research. To me, an experiment is a kind of conversation with plants: I have a question for them, but since we don't speak the same language, I can't ask them directly and they won't answer verbally. But plants can be eloquent in their physical responses and behaviors. Plants answer questions by the way they live, by their responses to change; you just need to learn how to ask. I smile when I hear my colleagues say "I discovered X." That's kind of like Columbus claiming to have discovered America. It was here all along, it's just that he didn't know it. Experiments are not about discovery but about listening and translating the knowledge of other beings.

My colleagues might scoff at the notion of basket makers as scientists, but when Lena and her daughters take 50 percent of the sweetgrass, observe the result, evaluate their findings, and then create management guidelines from them, that sounds a lot like experimental science to me. Generations of data collection and validation through time builds up to well-tested theories.

At my university, as at many others, graduate students must present their thesis ideas to a faculty committee. Laurie did a wonderful job of outlining the proposed experiment, ably describing multiple study sites, the many replicates, and intensive sampling techniques. But when she was through speaking there was an uneasy silence in the conference room. One professor shuffled through the proposal pages and pushed them aside dismissively. "I don't see anything new here for science," he said. "There's not even a theoretical framework."

A theory, to scientists, means something rather different from its popular use, which suggests something speculative or untested. A scientific theory is a cohesive body of knowledge, an explanation that is consistent among a range of cases and can allow you to predict what might happen in unknown situations. Like this one. Our research was most definitely grounded in theory—Lena's, primarily—in the traditional ecological knowledge of indigenous peoples: If we use a plant respectfully, it will flourish. If we ignore it, it will go away. This is a theory generated from millennia of observations of plant response to harvest, subject to peer review by generations of practitioners, from basket makers to herbalists. Despite the weight of this truth, the committee could only struggle not to roll their eyes.

The dean looked over the glasses that had slid down his nose, fixing Laurie with a pointed stare and directing a sidelong glance toward me. "Anyone knows that harvesting a plant will damage the population. You're wasting your time. And I'm afraid I don't find this whole traditional knowledge thing very convincing." Like the former schoolteacher she was, Laurie was unfailingly calm and gracious as she explained further, but her eyes were steely.

Later, though, they were filled with tears. Mine, too. In the early

years, no matter how carefully you prepared, this was nearly a rite of passage for women scientists—the condescension, the verbal smack-down from academic authorities, especially if you had the audacity to ground your work in the observations of old women who had probably not finished high school, and talked to plants to boot.

Getting scientists to consider the validity of indigenous knowledge is like swimming upstream in cold, cold water. They've been so conditioned to be skeptical of even the hardest of hard data that bending their minds toward theories that are verified without the expected graphs or equations is tough. Couple that with the unblinking assumption that science has cornered the market on truth and there's not much room for discussion.

Undeterred, we carried on. The basket makers had given us the prerequisites of the scientific method: observation, pattern, and a testable hypothesis. That sounded like science to me. So we began by setting up experimental plots in the meadows to ask the plants the question "Do these two different harvest methods contribute to decline?" And then we tried to detect their answer. We chose dense sweetgrass stands where the population had been restored rather than compromising native stands where pickers were active.

With incredible patience, Laurie did a census of the sweetgrass population in every plot to obtain precise measures of population density prior to harvest. She even marked individual stems of grass with colored plastic ties to keep track of them. When all had been tallied, she then began the harvest.

The plots were subject to one of the two harvest methods the basket makers had described. Laurie took half of the stems in each plot, pinching them off one by one carefully at the base in some plots and yanking up a tuft and leaving a small ragged gap in the sod in others. Experiments must have controls, of course, so she left an equal number of plots alone and did not harvest them at all. Pink flagging festooned the meadows to mark her study areas.

One day in the field we sat in the sun and talked about whether the method really duplicated the traditional harvest. "I know that it

doesn't," she said, "because I'm not replicating the relationship. I don't speak to the plants or make an offering." She had wrestled with this but settled on excluding it: "I honor that traditional relationship, but I couldn't ever do it as part of an experiment. It wouldn't be right on any level—to add a variable that I don't understand and that science can't even attempt to measure. And besides, I'm not qualified to speak to sweetgrass." Later, she admitted that it was hard to stay neutral in her research and avoid affection for the plants; after so many days among them, learning and listening, neutrality proved impossible. Eventually she was just careful to show them all her mindful respect, making her care a constant as well, so that she would not sway the results one way or the other. The sweetgrass she harvested was counted, weighed, and given away to basket makers.

Every few months, Laurie counted and marked all the grass in her plots: dead shoots, living ones, and brand-new shoots just pushing up from the ground. She charted the birth, the death, and the reproduction of all her grass stems. When the next July rolled around she harvested once more, just as women were doing in the native stands. For two years she harvested and measured the response of the grass along with a team of student interns. It was a little tough at first to recruit student helpers given that their task would be watching grass grow.

v. RESULTS

Laurie observed carefully and filled her notebook with measurements, charting the vigor of each plot. She worried a little when the control plots were looking a little sickly. She was relying on these controls, the unharvested patches, to be the reference point for comparing the effects of harvesting in the other plots. We hoped they would perk up when spring came.

By the second year, Laurie was expecting her first child. The grass grew and grew, as did her belly. Bending and stooping became a little more difficult, to say nothing of lying in the grass to read plant tags. But she was faithful to her plants, sitting in the dirt among them, counting and marking. She said the quiet of fieldwork, the calm of sitting in a

flower-strewn meadow with the smell of sweetgrass all around, was a good beginning for a baby. I think she was right.

As the summer wore on, it became a race to finish the research before the baby was born. Just weeks away from delivery, it became a team effort. When Laurie was done with a plot, she would call out for her field crew to help hoist her to her feet. This too was a rite of passage for women field biologists.

As her baby grew, Laurie came to believe with increasing conviction in the knowledge of her basket-making mentors, recognizing, as Western science often does not, the quality of observations from the women who had long had close relationships with plants and their habitats. They shared many of their teachings with her, and they knit many baby hats.

Baby Celia was born in the early fall, and a braid of sweetgrass was hung over her crib. While Celia slept nearby, Laurie put her data on the computer and began to make the comparisons between the harvesting methods. From the twist ties on every stem, Laurie could chart the births and deaths in the sample plots. Some plots were full of new young shoots that signaled a thriving population, and some were not.

Her statistical analyses were all sound and thorough, but she hardly needed graphs to tell the story. From across the field you could see the difference: some plots gleamed shiny golden green and some were dull and brown. The committee's criticism hovered in her mind: "Anyone knows that harvesting a plant will damage the population."

The surprise was that the failing plots were not the harvested ones, as predicted, but the unharvested controls. The sweetgrass that had not been picked or disturbed in any way was choked with dead stems while the harvested plots were thriving. Even though half of all stems had been harvested each year, they quickly grew back, completely replacing everything that had been gathered, in fact producing more shoots than were present before harvest. Picking sweetgrass seemed to actually stimulate growth. In the first year's harvest, the plants that grew the very best were the ones that had been yanked up in a handful. But, whether it was pinched singly or pulled in a clump, the end

result was nearly the same: it didn't seem to matter how the grass was harvested, only that it was.

Laurie's graduate committee had dismissed this possibility from the outset. They had been taught that harvesting causes decline. And yet the grasses themselves unequivocally argued the opposite point. After the grilling Laurie received over her research proposal, you might imagine she was dreading the thesis defense. But she had one thing skeptical scientists value most: data. While Celia slept in her proud father's arms, Laurie presented her graphs and tables to demonstrate that sweetgrass flourishes when it's harvested and declines when it is not. The doubting dean was silent. The basket makers smiled.

VI. DISCUSSION

We are all the product of our worldviews—even scientists who claim pure objectivity. Their predictions for sweetgrass were consistent with their Western science worldview, which sets human beings outside of "nature" and judges their interactions with other species as largely negative. They had been schooled that the best way to protect a dwindling species was to leave it alone and keep people away. But the grassy meadows tell us that for sweetgrass, human beings are part of the system, a vital part. Laurie's findings might have been surprising to academic ecologists but were consistent with the theory voiced by our ancestors. "If we use a plant respectfully it will stay with us and flourish. If we ignore it, it will go away."

"Your experiment seems to demonstrate a significant effect," said the dean. "But how do you explain it? Are you implying that the grass that was unharvested had its feelings hurt by being ignored? What is the mechanism responsible for this?"

Laurie admitted that the scientific literature held no explanations for the relationship between basket makers and sweetgrass since such questions were not generally deemed worthy of scientific attention. She turned to studies of how grasses respond to other factors, such as fire or grazing. She discovered that the stimulated growth she had observed was well known to range scientists. After all, grasses are beautifully

adapted to disturbance—it's why we plant lawns. When we mow them they multiply. Grasses carry their growing points just beneath the soil surface so that when their leaves are lost to a mower, a grazing animal, or a fire, they quickly recover.

She explained how harvesting thinned the population, allowing the remaining shoots to respond to the extra space and light by reproducing quickly. Even the pulling method was beneficial. The underground stem that connects the shoots is dotted with buds. When it's gently tugged, the stem breaks and all those buds produce thrifty young shoots to fill the gap.

Many grasses undergo a physiological change known as compensatory growth in which the plant compensates for loss of foliage by quickly growing more. It seems counterintuitive, but when a herd of buffalo grazes down a sward of fresh grass, it actually grows faster in response. This helps the plant recover, but also invites the buffalo back for dinner later in the season. It's even been discovered that there is an enzyme in the saliva of grazing buffalo that actually stimulates grass growth. To say nothing of the fertilizer produced by a passing herd. Grass gives to buffalo and buffalo give to grass.

The system is well balanced, but only if the herd uses the grass respectfully. Free-range buffalo graze and move on, not returning to the same place for many months. Thus they obey the rule of not taking more than half, of not overgrazing. Why shouldn't it also be true for people and sweetgrass? We are no more than the buffalo and no less, governed by the same natural laws.

With a long, long history of cultural use, sweetgrass has apparently become dependent on humans to create the "disturbance" that stimulates its compensatory growth. Humans participate in a symbiosis in which sweetgrass provides its fragrant blades to the people and people, by harvesting, create the conditions for sweetgrass to flourish.

It's intriguing to wonder whether the regional decline in sweetgrass might be due not to overharvesting but rather to underharvesting. Laurie and I pored over the map of historical locations for sweetgrass created by a former student, Daniela Shebitz. There were blue dots

where sweetgrass used to be found but has since disappeared. Red dots marked the few places where sweetgrass was reported historically and where it is still thriving. These red dots are not randomly scattered. They are clustered around Native communities, particularly those known for their sweetgrass basketry. Sweetgrass thrives where it is used and disappears elsewhere.

Science and traditional knowledge may ask different questions and speak different languages, but they may converge when both truly listen to the plants. To relate the story the ancestors told us to the academics in the room, however, we needed to use scientific explanations expressed in the language of mechanism and objectification: "If we remove 50 percent of the plant biomass, the stems are released from resource competition. The stimulus of compensatory growth causes an increase in population density and plant vigor. In the absence of disturbance, resource depletion and competition result in a loss of vigor and increased mortality."

The scientists gave Laurie a warm round of applause. She had spoken their language and made a convincing case for the stimulatory effect of harvesters, indeed for the reciprocity between harvesters and sweetgrass. One even retracted his initial criticism that this research would "add nothing new to science." The basket makers who sat at the table simply nodded their heads in agreement. Wasn't this just as the elders have said?

The question was, how do we show respect? Sweetgrass told us the answer as we experimented: sustainable harvesting can be the way we treat a plant with respect, by respectfully receiving its gift.

Perhaps it is no coincidence that it is Sweetgrass that reveals this story. *Wiingaashk* was the first to be planted by Skywoman on the back of Turtle Island. The grass gives its fragrant self to us and we receive it with gratitude. In return, through the very act of accepting the gift, the pickers open some space, let the light come in, and with a gentle tug bestir the dormant buds that make new grass. Reciprocity is a matter of keeping the gift in motion through self-perpetuating cycles of giving and receiving.

Our elders taught that the relationship between plants and humans must be one of balance. People can take too much and exceed the capacity of the plants to share again. That's the voice of hard experience that resonates in the teachings of "never take more than half." And yet, they also teach that we can take too little. If we allow traditions to die, relationships to fade, the land will suffer. These laws are the product of hard experience, of past mistakes. And not all plants are the same; each has its own way of regenerating. Some, unlike sweetgrass, are easily harmed by harvest. Lena would say that the key is to know them well enough to respect the difference.

VII. CONCLUSIONS

With their tobacco and their thanks, our people say to the Sweetgrass, "I need you." By its renewal after picking, the grass says to the people, "I need you, too."

Mishkos kenomagwen. Isn't this the lesson of grass? Through reciprocity the gift is replenished. All of our flourishing is mutual.

VIII. ACKNOWLEDGMENTS

In a field of tall grass, with only the wind for company, there is a language that transcends the differences between scientific and traditional understandings, the data or the prayer. The wind moves through and carries the grass song. It sounds to me like *mishhhhhkos*, over and over again on ripples of moving grass. After all it has taught us, I want to say thank you.

IX. REFERENCES CITED

Wiingaashk, Buffalo, Lena, the Ancestors.

MAPLE NATION: A CITIZENSHIP GUIDE

There's just one gas station in my community. It's right there at the stop-light, also the only one. You get the picture. I'm sure that it has an official name, but we just call it the Pompey Mall. Coffee, milk, ice, dog food, you can get most anything essential to life at the mall. Duct tape to hold things together and wd-40 to get them apart. There are tins of last year's maple syrup, which I pass up, since I'm on my way to the sugar house where new syrup awaits. The clientele runs largely to pickup trucks and now and then a Prius. There aren't any snowmobiles revving at the pumps today, because the snow is just about gone.

Since it's the only place to fuel up, the lines are often long and today people stand outside in the spring sunshine, leaning against the cars, waiting their turn. Conversation, like the shelves inside, tends toward essentials—the price of gas, how the sap is running, who's got their taxes done. Sugaring season and tax season overlap around here.

"Between the price of gas and the tax man, I'm just about bled dry," Kerm gripes as he replaces the nozzle and wipes his hands on greasy Carhartts. "Now they want to raise taxes for a windmill down to the school? All on account of global warming. Not on my dime." One of our town officials is ahead of me in line. She's an ample woman, a former social studies teacher at the school, and does not hesitate to wag a finger in the banter. She probably had Kerm in class. "You don't like it? Don't complain if you're not there. Show up to a damn meeting."

There's still snow under the trees, a bright blanket beneath the gray trunks and the blush of reddening maple buds. Last night, a tiny