Lessons Learned in Protecting and Restoring Biodiversity

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Conservation in Action

Edited by

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Cambridge Scholars Publishing

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CONTENTS

PREFACE

We have everything we need to begin solving this crisis, with the exception of the will to act. But in America, our will to take action is itself a renewable resource. (Al Gore 2002)

Each part of this essay collection begins with an action word for a reason. Essays reveal why and how citizens, educators, scientists, practitioners, and policymakers solved many "crisis" issues at the local, state, and national levels. Their words underscore that conservation work is not done alone but rather via networks and partnerships across jurisdictional lines in unique agreements with new tools and rulemaking. What continues to limit action appears to be public understanding and support. It is the reader's responsibility to build on what we learned and move the public to become stewards of the land. No one does conservation work alone.

Protecting Nature: Since the 1970s, our natural heritage has been protected by law, preserves, inventory mapping and research. That accumulated natural history knowledge is now threatened by climate change. Nature-based solutions are being sought worldwide. However, once biodiversity is diminished, ecosystem services are compromised, and species are lost, will we have the know-how to restore nature? Survival depends on it. Human and natural environments are forever connected.

Connecting Plants and Animals: Plants and wildlife have always needed one another to survive. Plant and wildlife sciences connect in the science of ecology, which guides decision-making and research about their futures. These linkages are not always well understood or supported by the public or legislators. Action can be slow, and species become extinct. Now and then, one person ensures a species' safe passage. Often, it takes a community or act of Congress.

Restoring Native Plants: As human-made disturbances increase, so does the demand for native seed. Lack of availability continues to be an obstacle. After some 40 years of native seed growing successes, the horticulture industry largely ignores this business opportunity. Because of climate change

pressures, federal land agencies are poised to both collect and grow ecoregional seeds themselves and partner with industry in no-risk contracts.

Understanding Restoration: Although the United States has almost 100 years of restoration history, succeeding without unintended consequences continues to be a challenge. We continue to pioneer with rewilding, too. As thousands of acres are restored, the process moves from an art to a science with increased diversity and function. Continued monitoring and managing over time will inform the next levels of success, ultimately measured by human survival.

Dealing With Invasive Plant Threats: Invasive plant threats require more action: increasing public awareness, creating new control tools, stopping terrestrial and aquatics at our borders, and increasing support at the local, state, and federal levels. Those are many action words! Because invasives threaten agriculture, the environment, and human health, a rapid response strategy and cooperative efforts make for a front-line defense. A robust, rapid response system is needed now.

Managing Vegetation: There is no silver bullet for protecting native plants and habitats from invasives on any given site. Training is critical to identifying both and eliminating only the invaders. We can no longer mow and spray weeds out of existence. Our toolbox remains limited while invasives continue to spread. They do not respect political boundaries, so no single group can afford to eliminate their movement. Partnerships are imperative!

Partnering: Sharing strategies, tools, and crews at the local, state, national and even international levels requires both funding and coordination. Once again, the public and legislators need to understand this need. Sharing information among disciplines and stakeholders at all levels is essential. Pollinator loss has inspired and focused many cooperative efforts. They prove that together, we accomplish more.

Acting: None of us wanted to become a “political animal”. However, changing the way we protect and manage biodiversity on the ground can take generations of effort and lost time. This section explores how one or more actions made a difference by lobbying, rulemaking, letter writing, coalition building and influencing legislators brought about change. Sometimes, rulemaking or regulation is the only way to change human behavior.

Ground-breaking Tools: On-the-ground as well as electronic tools have advanced our ability to identify and inventory flora and fauna, map, rank, and assess them, and wash away invasive threats. Mexico leads with a big-picture mapping view in their hope of protecting biodiversity and conservation usage. The next big step of combining North American databases would clarify priorities, cooperation, and long-range planning on a continental level.

Building on What We Learned: Actions require multidisciplinary input. Authors' truths should spur the next generation's innovation, determination, and hope for conservation and the greater good. Healing the earth of human-made scars requires responsible effort by the next generation as the climate changes, always with an eye for long-term consequences. Building on what we learned the hard way saves time and money, safeguarding the planet's health.

ACKNOWLEDGMENTS

When we try to pick out anything by itself, we find it hitched to everything else in the Universe.
—John Muir, 1869

Thus, it was when I contacted former colleagues with this essay collection idea, we were all connected by our past conservation work. What if we shared our problem-solving lessons with the next generation, who could learn from our experiences, saving future scientists, educators, practitioners and policymakers time and treasure?

I contacted people who:

were willing to share their knowledge in the past
knew how to solve problems
considered the big picture
learned how to navigate regulations, policies and missions
had applied research credentials
saw how to get things done
connected public and private sectors at local, state and national levels
became change agents or colored outside traditional lines (took action)
recognized where resources lay
understood the responsibility of a land ethic
cared about the greater good

Compiling the multidisciplinary invitation list revealed how all our work is interconnected. Not only were we connected out of necessity, but we worked in a world connected in reality "to everything else".

As intended, throughout the project the essays themselves remain in each author's "own words". I thank them all for their wisdom and generosity of time and spirit! This compendium would not have been possible without the patience of primary editor Gary Lore, who "knew how to solve problems" throughout. We welcomed proofreader Elanor Harris for the final manuscript polishing. Showing great patience, Elanor knew "how to get things done!"

NOTE: See the Contributor section for author statements.

INTRODUCTION

One truth about our environment is simply realizing that our actions today determine the future. We charged scientists, educators, practitioners, policymakers and more to share their stories about why and how they got things done for the sake of the environment and the greater good. These essays portray conservation history created by more than a hundred experts towards ensuring the future health of natural and human environments as rich in biodiversity and potential as possible.

The premise is that their experiences provide not only a realistic portrait of past actions but also a unique summary of the lessons learned to guide future pragmatic solutions. These essays share problems and solutions not found in textbooks. These are the stories of multi-disciplinary conservationists working towards the goal of preserving, protecting, restoring, or managing one or more pieces of the environment through successful practices, policies, and partnerships. They overcame obstacles and knew an opportunity when they saw one. Their determination has much to teach us all.

Our natural resources become more limited as the world population increases. Among organizations and across political boundaries, a big-picture view is needed to find protective solutions. Moreover, solutions require understanding the consequences, both in the short and long term. Since our actions today informs our future environment, planning is required. We must also remember that it is not the plans that make changes, but rather the action of planning that produces change. History can inform our planning, but it alone cannot be the plan. “This is the way we have always done it” is not a reasonable solution as the world changes. Most of the essays challenge us to consider changes to protect that illusive greater good. Learning from the past reduces efforts that re-create the wheel, wasting time and treasure.

We have none of those to waste. Every issue is unique and requires its solution. We no longer live in a world where one size fits all. Even while looking for an ideal outcome, these are problem-solvers who understand that change is difficult, but with patience, progress is possible. In some cases, what seemed like a local problem, such as Sheila Kennedy’s County weed funding needs, resulted in regional, national, and international solutions. Some solutions are site-specific, but others have continental implications.

The value in this collection of essays is the realization that these authors' qualities of persistence, perseverance, cooperation, collaboration, clarity, and creativity strengthened their solutions. Furthermore, they got things done! Using these as your rubric as you read is helpful. The key to successful planning is to remember to ask, "…(and) how would this work?" The test of planning is defining the mechanics — not guessing if your plan will work, but rather knowing how it will work. Evelyn Howell's essay on "Teaching Restoration Ecology" clearly reveals the adaptability and value of such a process.

Persistence is illustrated by the story of biochemist Robert F. Betz, as described in Packard's essay. Betz likened his process of winning naysayers over to his view as being like that of a blow-up clown toy with a weighted bottom. His process was to let the officials punch away at his solution. They would punch, and the toy would stand back up every time. Moreover, the officials soon realized that after too many punches, their arms and arguments would tire, and they would eventually say okay.

Perseverance is demonstrated by Bolin's essay about a career marked by obstacles, rejection, and erratic political winds over the protection of statewide remnant prairies in highway corridors. She championed this conservation cause and prevailed as an unsung heroine. Nobody ever worked harder; nobody ever worked with a greater sense of purpose.

Cooperation with others proved symbiotic for Bonk's local yard-by yard-native planting effort. Her model led to a 1.3-mile-long Monarch Mile Corridor for thousands of migrating monarchs, as well as international recognition for problem-solving by local action. When she writes, the pronoun "We" (as in: "We did this") is omnipresent.

Collaboration among three agency levels became key to solving the state-sized Malheur County's weed problem on county, state, and Bureau of Land Management rights-of-way. By buying an obligated truck and sharing resources, each of the three agencies got the job done more efficiently and effectively and without red tape!

Clarity is a well-designed course of action, certain in purpose, with a sharply defined goal. Thus, it is with Gibson's essay about the establishment of the International Wolf Center and the continued reintroduction and protection of this once-endangered species. When (if ever) you hear the siren song—the howl–of a wolf, know that Nancy Gibson might just personally know that wolf.

Creativity won the day for essayists who were also letter writers to the president and vice president. Somehow, letters signed by 100 known constituents, or 500 scientists, resulted in protecting North America's monarch migratory routes and elevated the issue of invasive species to an Executive Order and National Invasive Species Council.

When reading these essays, you need only to realize that in your pursuit of caring for the Earth, you are not alone. Build on these lessons learned with truth and heart, knowing you can make a difference. Look at these essays as guideposts for protecting nature in the future. Edward Abbey is known to have said: "Saving the Earth is only a hobby." He was wrong: *Saving the Earth is a genuine life lived well.* You can quote me on that.

Gary K. Lore – June 17, 2024

PART ONE:

PROTECTING NATURE

CHAPTER 1

PRESERVING NATURE: WHAT KIND OF PERSON DOES IT?

STEPHEN PACKARD

Nine Adventures in the Tallgrass Prairie with Professor Bob Betz

Robert Betz and his prairies changed the world and its people. There had been prairie restorations before Betz, but not like his. He did not start with cornfields but instead with vanishing injured remnants. His mind and sweat mingled with the grasses, the pollinators, and the hearts of his neighbors. He cared for remnants like a nurse or parent. He inspired a new and grittier view of nature.

Few knew about prairies in 1959. Betz made caring for them the rage. We, the people of 1959 America, were alienated from the ecosystem—not knowing what it needed, having none of its dirt under our fingernails, more focused on cars and air conditioners. The few of us who thought about nature at all believed that the best care for Mother Nature was to leave her alone.

In nature, Betz was a volunteer. As a professor, Robert F. Betz was a biochemist. He never became professional in his adopted prairie world despite presenting at early prairie conferences and publishing technical papers. Love, the pure science of amateurism, was what empowered him. He would later tell me that he and I could do what we did and think the way we thought precisely because we did not have the proper academic training. Naivete empowered him.

He changed my life and the lives of many. I learned what the word "prairie" meant through his essay in a tiny book of photographs, Torkel Korling's *Prairie Swell and Swale*. When I found it, a precious jewel had come into my possession. Could it really be that those electrifying photos had been taken in remnants of nature? When I read the essay—ten

unnumbered pages—suddenly prairie plants and animals were crying out to us: “People! What’s the matter with you?! Help us!”

How the professor learned what the word prairie meant

It was July 6, 1959. Betz had loved wild plants and animals since he was a kid, and he thought he pretty much knew the local ones. However, on this day, now a professor, he attended a field seminar with ace botanist Floyd Swink. A few acres on the side of a railroad teemed with scores of plant species, all new to Betz. How could this be? Swink explained that these were the true prairie species, and they could rarely be found except along railroads, where the soil had never been plowed.

The richness haunted Betz. He started trekking down railroad rights-of-way through farm country to learn what he could about this nearly lost world. Yes, occasionally, he found remnants, mostly with just a few of his newly learned plant friends. One day, as he walked along a railroad in northwestern Will County, slogging past mile after mile of corn and soybeans, he glanced across an unpaved road to the east at what first seemed like a mirage. Blooming prairie docks waved in the wind. He raced over and discovered his own real remnant. However, this one had tombstones. Settler cemeteries turned out to be other places where the prairie was not plowed—and survived. Soon, in his spare hours, he was searching through maps and driving down back roads to find cemetery prairies, too.

Experimenting with a different relationship

Betz very much respected the academics for what they knew, but he was dubious about some of their judgments. They had known of prairies but in a different way. With relish, as he drove me to see a favorite prairie cemetery, he told me the story of meeting Professor Almut Jones, a stern Germanic botanist.

Betz was on hands and knees, grimy and sweating under the hot sun in a lonely cemetery. He had been learning to protect these orphan remnants from the “weeds” or “invasives” that seemed to be slowly erasing them. He was focused on this work and thoughts when a loud voice commanded, “Who are you? And What Are You Doing?!” Before him stood the august professor, and behind her, a puzzled group of students. He claimed to have replied in a high-pitched, childish voice, “Well, I’m just Bobby Betz, and I’m trying to care for this prairie remnant.” To her credit, this botanist knew prairie plants and was trying to interest others, but she did not approve of Betz asserting himself.

For another example of academic heritage, a highly respected botanist who deserves credit for her many contributions, Alice Kibbe—Department Chair and Professor of Botany in the Biology Department at Carthage College from 1920 to 1956—wrote of the tragedy of railroads burning their rights-of-way to control brush: The delicate prairie flowers are being eliminated by that thoughtless burning, she wrote, completely wrong. Betz explained to Jones and whoever would listen—and continued explaining for decades. Gradual agreement from most academics was slow, but it came. Nature needs fire and care.

How to negotiate like a blow-up toy

Later, after we had become friends of sorts, Betz would drive me to places he had found and was now caring for. He would tell me their stories with a passion for righting the world. Those stories mentored me as he intended them to.

"Oh, the cemetery boards!" he would say, with a tone of doom and wincing as if to ward off a blow. In each little town, there would be a few guys who had authority over the cemetery—perhaps one banker, one hardware store owner, and the owner of the adjacent farm, not fans of untended weeds. Betz would explain that true prairie species never invade a cornfield, that these were all very rare plants, the last remnants on the planet, a fitting memorial to their pioneer ancestors who had seen and conquered the original prairies. He would ask the board to stop mowing and would offer to pull all the farm weeds he wanted to burn. "They always said no at first," he admitted. However, Betz had a technique:

> You know those beach toys that kids like? A blow-up clown, with a weighted bottom, and a big painted-on smile, and you could tip it over, and it would always stand back up? I was that clown. I'd say, 'Please mister official,' and they'd punch me right in the face. But I'd pop back up, a week or a month later. I'd give them some news, some new discovery, I'd ask more about their crops and families. I provided the results of my research into whatever questions they'd asked last time. And then I remind them of my requests. Bam, I'm knocked down again. Bam, again and again. But you know what? I kept smiling. I actually liked these men. They took their responsibilities seriously, they were learning, and sooner or later, after too many punches, their arms would get tired. They'd say okay.

When he got approval, he would put up a sign explaining that this rare remnant, in honor of the pioneers interred here, was being protected by the

Prairie Preservation Society. As Betz reminded me, “I didn’t mention that I was the only member.”

The first book

His was a very new vision—learned from the remnants. Prairie nature would die without our help. His essay in the book was the single most influential in my life and some other people’s lives back then. The photographer Torkel Korling self-published the thin book of 64 photos of prairie plants in nature–each on a 4¼ by 6½ inch page. Neither the front nor back cover contained a word. Given the photo, any word would have detracted. Magically, the photo showed 11 prairie white-fringed orchids blooming among the pink of phlox, the white of Culver’s root, and the yellow of black-eyed Susan in the highest-possible quality prairie. The simple title of Betz’s ten-page essay was “What is a Prairie?” He wrote:

> The destruction has been so complete that most of the farmers in this vast region have never seen a virgin prairie. Most prairie plants are so rare or uncommon today that field guides published to aid amateur naturalists in identifying plants do not even mention them. To the uninitiated, the idea of a walk through a prairie might seem to be no more exciting than crossing a field of wheat, a cow pasture, or an un-mowed blue-grass lawn. Nothing could be further from the truth. It seems immoral to destroy an integral and important part of the biological world from which mankind arose … In our modern world with its artificiality, complexity, and instability, wild prairies can provide us with places to go for peace and solitude. For this alone, prairies should be preserved and cherished.

Note the word “cherished.” He loved them. He sought to empower us to love them, too.

Cyclone fences

“Prairie Preservation Society” signs helped but were often insufficient. People rutted prairie remnants with vehicles. They dumped farm waste, dug rare plants, and disposed of old tires.

Betz and a growing army of inspired activist colleagues started raising funds for fencing, which soon surrounded many prairies, including Woodworth, Vermont, and Glenbrook Prairies. For St. Stephan’s Cemetery Prairie, folks raised what funds they could, but the campaign stalled. So they used what funds they had to put in just the poles. The prairie became surrounded by what looked like an anorexic Stonehenge. The starter fence

made a statement and expressed confidence that the cyclone "fabric" would eventually come, as eventually it did.

Betz had a speech that he would often make about those fences. His tone would be ominous and harsh. "These precious ecosystem remnants can stand no more degradation! I want to fence them all! Put a big padlock on the gate! No one has the key!" And then, in a very small voice and a hint of a smile, he would add, "Except me." Today, I would judge that as a mistake. He wanted appreciation but did not think many people were worthy of being part of the ecosystem's recovery. He was a towering figure, but the prairie needed more.

Ambush

My first actual encounter with Betz was a shock and a trap of sorts. Inspired and educated by his book, some of us had started the North Branch Prairie Project in 1977. A year later, we were a struggling group with a certain amount of momentum. To our horror, despite their promises, the Forest Preserve staff mowed the four beautiful prairies they had allowed us to become stewards of. People flooded the Forest Preserve staff and Commissioners with calls and letters full of heartfelt concern and earnest argument. A Democratic ward committeeman did the same.

The superintendent of conservation, Roland Eisenbeis, had tentatively approved our work. Now, he organized a field meeting of four Forest Preserve officials, two of us volunteers, and, it turned out, Betz. Eisenbeis asked a prejudicial question. "So, Professor Betz, we know that there are a number of high-quality prairies that you want us to care for. Now we want you to look at four sites here and tell us whether we should put our efforts here. Are these prairies?"

Betz, always expressive, kept getting looks of great pain on his face. We sought to exacerbate that pain by asking follow-up questions. "Dr. Betz, do you think people who are getting "prairie fever" should go visit the best ones and trample over them—or should they come to places like this—and watch the miracle of recovery?" (I do not guarantee the exact words in quotes here, but I remember them as best I can to tell the story.)

We spent much of the day looking at our four putative prairies. Each time, Betz was asked the same questions. Each time, he squirmed. At Sauganash Prairie, I mentioned the need to cut some trees, and the previously smiling Chief Forester, Sam Gabriel, now turned white with horror. Betz pulled me aside and whispered, "Steve, let up. You've got 'em." I was thrilled with the mentoring. It meant he was on our side. Finally, Betz said, "Okay, I've seen enough. Yes, these are incipient prairies." A

glorious victory. North Branch Regional Superintendent John Mark (probably the guy who ordered the mowing) looked crabby. In time, he became a good friend and supporter. His staff did what they could to help the prairies. Amen.

How to deal with authority

In public and formal situations, Betz was impressively deferential to authority—especially to the botanists of the academic establishment. He had no degrees in the fields he dedicated his free time to, that is, botany, ecology, entomology, ornithology, etc. When asked a technical question, if biology academics were present, he would likely toss the ball to one of them. When he gave papers at conferences, he would always make humble reference to the official experts in the field and suggest that he hoped his little contribution would have some minor worth.

He shied away from stating anything as a fact but rather used language like "it would seem," "the data suggest," or "one might wonder if" when he expressed what he was learning about the ecosystem. At first, his humility seemed too vaguely abject. In time, as he became my friend and sought out my company on prairie road trips, he made it plain that the good of the prairie required him not to step on the toes of the powerful.

Professors were key to the decisions being made by the emerging Illinois Nature Preserves Commission. Betz would describe debates at commission meetings on whether the prairies should be burned. The academic opposition was ill-informed but ferocious. He would shudder and raise his shoulders as if to protect his head when describing the barbs that would be aimed at him when he would "suggest" or "wonder" about fire. Bit by bit, most of the academics came around. Some grew old and died. Gradually, the prairies were being burned more and getting healthier, but progress depended on not rocking the wrong boats. Betz's humility was strategic. He might confide:

> Oh, if I said that, too many people would be unhappy. You go slow, and there's a process. First, they say it's obviously wrong, then they claim it's insignificant, then they say, 'of course, it's obvious, we knew that all the time'. That's the point when they'll take credit, and you give them the credit, and the argument is won.

Fermilab

His biggest project (measured by acres) was a testament to "prairie fever." Companies, subdivisions, and products were increasingly being named "Prairie This" and "Prairie That." Betz joined forces with Manhattan Project

physicist Robert R. Wilson, who was building a "best in the world" electron accelerator underneath a mile-wide circle on former cornfields just outside Chicago. Wilson was looking for ways his institute might capture the public imagination. Betz talked him into restoring prairie in the protected center of that circle.

Soon, big bluestem and prairie dock waved throughout the mile-wide circle and began spilling out on much larger swaths of this federal land. Betz would say something like:

> The half-life of government research institutions is (some number of) years. We've got to get this prairie good enough and appreciated enough that the public will demand saving it when the physics research here goes belly up.

Markham

Perhaps Betz's most consuming love was a discovery he made while visiting relatives in Markham, a suburb south of Chicago. He named it the Gensburg-Markham Prairie after the suburb and the Gensburg brothers who owned much of it. In this unbuilt, failed subdivision, most people had stopped paying taxes. As a result of the recognition, and upon being shown that economically they "could do well by doing good", the Gensburgs donated 60 acres to The Nature Conservancy (TNC) in 1971.

There was a great deal more surviving prairie nearby, and Betz advocated tirelessly for more to be saved. He was so persistent that the TNC director at the time, Neal Gaston, got his board to pass a resolution decreeing that the Markham project was finished. Done. No more land. At that time, I was a field rep for the Natural Land Institute, and Betz appealed to me for help. I plunged in, researching deeds and meeting various characters who owned parcels. One was an aging former boxer who still seemed "punchy" and liked to kiss me and almost everyone in reach. Bit by bit, we acquired additions within the five semi-separate parcels where the best prairie survived.

When the institute lost funding in an unrelated drama, and I moved to TNC, I convinced my colleagues that it was embarrassing that TNC had dropped this important project, and we rolled up our sleeves again. Betz was thrilled. The protected prairie amounts to 468 acres.

Like all large prairies, much of it was degraded in various ways. Betz used what he had learned from the cemeteries, gathered seeds of species that survived nearby, and broadcast it in the preserved areas to great results. As with every biodiversity site, the threats, challenges, and opportunities continue. Nevertheless, the jewel survives and brightens.