

Sustaining Our Natural Heritage: Ten (Suggested) Conservation Commandments

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[The following synthesis is distilled from my presentation at the 30th anniversary celebration of the Missouri Native Plant Society, 26 September 2009, in Fulton, Missouri, and my opening address for the Wild Things Conference, 7 February 2009, in Chicago.]

In recent years there has been growing realization of the essential role of healthy ecosystems in sustaining a productive, vibrant human society. There is widespread agreement among diverse segments of society that it is a worthy goal to conserve the planet's natural heritage and healthy ecosystems for multiple reasons ranging from pragmatic and utilitarian to esthetic and ethical. However, the reality continues to be bleak: functional ecosystems and their component biota continue to be degraded and lost at alarming and often increasing scales around the globe.

Nowhere is this more evident than in the fragmented landscapes of midcontinental North America. Here large portions of states such as Illinois and Missouri once contained the most diverse and productive phase of what is now the most endangered, least conserved terrestrial habitat type on Earth – temperate grasslands – embodied locally by our tallgrass prairies and their associated woodlands. These systems sustained and shaped our history and culture from the advent of human occupation of the region, and our steward-

ship and restoration of them, or lack thereof, will significantly affect the quality of life for future generations.

IN THE BEGINNING: A BRIEF ECOLOGICAL REVIEW

During the past four billion years, as continental land masses formed, ebbed, and meandered across the surface of our planet, living things have influenced and been influenced by the physical environment, evolving, diversifying, and radiating in direct response to physical and evolutionary opportunities and constraints. The result is an unimaginably diverse and interrelated complex of life forms and ecosystems, each supremely adapted to the site conditions, process regimes, and biological interactions present at that specific locus and time period.

Only 15,000 years ago the northern portions of our region were under thick masses of glacial ice, and the entire area was influenced by the proximity of a continuous mass of ice extending northward to the pole. Glacially-influenced climate

patterns in the region supported vegetation similar to what one might find today in areas far to the north in Canada: spruce-fir woodlands, jack pine parklands, and other cold-adapted systems.

Since that time, as the climate warmed and fluctuated within a range more evocative of our modern weather, the ice sheets retreated by fits and starts to reveal their legacy of deposition and contour alteration. This new landscape and climate supported a different combination of biota and natural communities, which were profoundly influenced by a new force at once both organism and process regime: humans. The 14,000 year legacy of humans in the Midwest has shaped the genesis and perpetuation of our post-glacial biological systems. One of the most wide-ranging and significant impacts has been that of human fire, which vastly outnumbered lightning-caused ignition frequencies and fire coverage in the landscape. This history of thousands of years of deliberate wildland aboriginal ignitions has resulted in the contemporary matrix of fire-dependent natural communities in virtually every terrestrial landscape in the Midwest, as demonstrated by the grassland biogeographic influences evident not only in our prairies, but in our woodlands, forests, and even wetlands.

The take-home from the recent retreat of the glaciers and genesis of human-influenced natural communities is that our modern ecosystem, although composed of biota reflecting a multi-billion year evolutionary lineage, is young – 15,000 years being a blip in biological time. A mere 20,000 weeks ago, this young system was then subjected to the most rapid and catastrophic continental-scale impact to hit the planet in the past 65 million years. This occurred when

Old World humans settled the New World. In a single stroke, the largely hunter-gatherer, nomadic pattern of human influences on the land was replaced by a culture predicated on permanent population centers and intensive agriculture focused on a few domesticated species.

This recent influx of humans arrived in the New World complete with their camp followers: legions of wanted and unwanted plants and animals specifically adapted to the impacts and processes imposed by their sedentary agrarian society. North America's native systems and their component biota are completely unadapted to this intensive land disturbance, fire suppression, and associated impacts. In the contemporary landscape, native biota are thus often less competitive than a host of introduced species which, through thousands of generations of evolutionary adaptation and selection, have become adapted to, and sometimes dependent on, the disturbances imposed by Old World cultural patterns. Our native biota is still reeling from this impact. It is hard to convey the scale, intensity, and especially the rapidity of this impact in biological time, since we tend to measure time in the scale of human experience, but the impacts of Euro-settlement are still radiating through the biological fabric of our region — sound waves from an ecological gunshot still echoing across the landscape.

These impacts have intensified with the increasing technological sophistication of human society. For tallgrass prairies, the ecological nadir was attained in 1837, in Grand Detour Illinois, when Vermonter John Deere developed the first effective steel moldboard plow. This enabled the deep, fertile, carbon-rich soils that were

the product of thousands of generations of prairie vegetation to be exploited for food production – simultaneously scribing the epithet for most tallgrass prairies and turning the region into the breadbasket of the world. In the process, a system with more than one thousand species of flowering plants was converted into endless rows of two non-native grasses and an Asian legume.

REALITIES OF CONTEMPORARY CONSERVATION

Sometime around May 23, 2007, the world underwent a profound change. For the first time in history, there were more people living in cities than in rural regions. In part a reflection of growing world population, this illustrates the increasing pressures on natural systems around the globe. Conservation success will mean making societal decisions that both meet the growing needs of human populations and ensure that the natural systems upon which we ultimately depend for providing healthy soils, clean water, and other basics of life are sustained and retain the full array of diversity to ensure ecological resiliency and viability.

This will not be a trivial feat. Today there are about seven billion people on Earth, and this is projected to increase to eight billion in less than 20 years. Population in Missouri and the Chicago Region is expected to increase by more than 20% in that time. During the same interval, global per-capita caloric intake is projected to rise 10%, as people in developing nations acquire better diets – and this will be exacerbated by an increasing consumption of meat, and the energy inefficiencies associated with meat production. Degradation from climate change, ecologically and economically destructive

invasive species, and irreversible historic impacts to ecological health and economic productivity in many of our most productive lands render the situation even more challenging. With 40% of the Earth's total land area currently in some type of agriculture or pasture, sustaining this increased productivity without negative impacts to our remaining natural habitats and waters will be daunting. It will require the full integration of economic, societal, and conservation needs into the fabric of every decision and action.

People have long recognized the need for resource conservation. In the New World, this was evident as early as 1620 with the first sea turtle regulations in Bermuda. Since that time, driven by multiple goals ranging from pragmatic to esthetic and moral, numerous policies and approaches have been developed to meet human and ecosystem needs, with varying degrees of success. At the same time, our increasingly sophisticated technology has fostered a growing disconnect between people and the natural systems upon which we ultimately depend. This disconnect is both spatial and temporal, as modern technology allows us to defer the consequences of bad decisions across areas and intervals — bad decisions such as expending thousands of years of prairie-accumulated soil tilth and fertility to unsustainably produce a few decades of high-yield crops, or vast energy expenditures to transport resources and abate the consequences of locally unsustainable practices.

As a result, the majority of people, both in our region and throughout the world, have become personally disenfranchised from the natural environment. This is certainly the case for the populace as a whole, as exemplified by the concept of

“nature deficit disorder” portrayed in Richard Louv’s book *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*¹. I submit that this is also increasingly the case for conservation practitioners, as we become ever more enamored with models, theories, and “big picture” philosophical approaches, even as our institutions of higher learning become ever less proficient at research and education activities requiring organismal expertise. With modern research and academic agendas often driven by funding opportunities and prestige, vital fields of study and knowledge are withering, even as the need for them has never been more acute.

Regardless of models or grand theories, the only immutable truths in nature are those to be learned from the performance of the biota. Discerning these truths requires a culture with the commitment to train and nurture a vibrant community of experienced field practitioners engaging in a disciplined, deep immersion in understanding the individual organisms that comprise our ecosystems – beginning not least with the ability to competently identify them in the field. It is depressing for human society that, even among cutting edge conservation institutions and agencies, field organismal biology is increasingly regarded as a quaint, outdated, al-

¹ (Algonquin Books, 2005). However, as an eminent Illinois ecologist has pointed out, it seems glib to ascribe the dire state of contemporary conservation solely to lack of children’s immersion in nature, since the immediate previous generations, who putatively grew up more immersed in nature than did contemporary generations, were responsible for the most intensive epoch of deliberate habitat destruction in world history.

most Victorian pursuit that has outlived its utility².

SUSTAINING OUR NATURAL HERITAGE AND A VIBRANT, PRODUCTIVE SOCIETY

If we are to succeed as a sustainable society that allows future generations to have the opportunities and resources that have benefitted us, we must embrace a new vision that integrates conservation and human needs into the fabric of our thinking. Depending on the specific situation, the two factors will be weighted differently, but the old paradigm of a polarized model where either one or the other reigns absolute must be replaced with something more reflective of ecological sustainability and the realities of contemporary society.

We must not only recognize, but celebrate, our dependence on functional ecosystems and the role of humans in shaping and sustaining our post-glacial natural environment. By accident of biological and human history, this region contains unique and irreplaceable resources of global conservation significance, including the remnants of the most productive phase of Earth’s most imperiled terrestrial habitat type. For both practical and ethi-

² A compelling account of this is provided in biologist David Ehrenfeld’s essay, [Vanishing Knowledge](#), which appeared in *Beginning Again: People and Nature in the New Millennium* (Oxford University Press, 1994) and was reprinted in *The Sun*, December 1995, and *Harper’s Magazine*, March 1996. It includes a searingly poignant summary:

“I fear for us when there is no one left in our places of learning who can tell one moth from another, no one who knows the habits of hornbills, no one to puzzle over the diversity of hawthorns, no one to even know that this knowledge is needed and is gone.”

cal reasons, we have a sacred obligation to ensure that the full spectrum of this precious biological tapestry is maintained in healthy arrays. To that end I propose ten conceptual conservation commandments for achieving successful conservation of our natural heritage and a viable planet sustaining healthy human societies.

I. RECOGNIZE OUR IGNORANCE — We need to recognize, but be not paralyzed by, how little we know about our native habitats, ecosystems, and their component biota. As a society, we lack the knowledge and technological capability to even identify every organism in an acre of high quality native prairie, let alone begin to construct a cogent assessment of the complex interrelationships and dependencies these organisms have both among themselves and with the physical environment. It is humbling that we have the responsibility to restore, manage, and sustain complex biological systems, habitats, and populations while veiled by this blinding cloak of ignorance. All too often, we tend to believe our own hyperbole regarding the state of our knowledge, displaying the hubris of thinking that, for the first time, we have finally figured it out — just as countless individuals and generations on whose knowledge we stand have thought before us. It is time to adopt a more realistic assessment and recognize that much remains unknown, and that there are undoubtedly errors in our contemporary thinking that will be revealed iteratively in the future. Conservation action must not be held hostage by these knowledge gaps, but we also must have the humility to accommodate uncertainty, eschew deterministic “end state” models, and commit as a society to continually operate in a context of action,

humility, uncertainty, and willingness to learn and adapt concepts.

II. GLORY BE UNTO THE ORGANISMS

— Humans must re-embrace nature at its most fundamental level, celebrating biodiversity and empowering organismal expertise at various levels across broad swaths of society. We must embrace a societal commitment to immerse humans in nature, cultivate a stewardship ethic and sense of obligation to the landscape, facilitating knowledge and hands-on experience. Successful conservation requires a bivalent vision for success – we must conceptualize, plan, implement, and innovate at regional, landscape, continental, and global scales, even as we remain disciplined to monitor success at the collective organismal level, for nothing else is a fundamental gauge of true conservation success. Success measures should be explicitly linked to organismally-based responses enfranchising broad spectra of biotic diversity, and these outputs should drive an adaptive management decision process.

III. CELEBRATE THE ESSENTIAL ROLE OF HUMANS

— Humans have been an essential factor shaping the genesis and perpetuation of the post-glacial environment, and our native biota and natural systems have an obligatory dependence on an ongoing, interventionist human role. We must establish a societal paradigm of humans as an integral part of the natural world, while simultaneously inculcating the need for human activities to be attuned to system constraints and bio-historic precedents. This includes avoiding a philosophically derived “wilderness” mentality seeking to “protect” nature from humans – an aberration without biological precedent

in post-glacial North America. We need to focus on pragmatic conservation and sustaining irreplaceable constellations of biota. Rather than a constraint, this is an opportunity to fully involve society in an ongoing hands-on interaction and immersion in our natural heritage, while cultivating a collective stewardship ethos.

IV. HONOR THE PAST, BUT RETURN

NOT — Conservation success requires that we be cognizant of the past and learn from it, while not engaging in counterproductive attempts to recreate a static version of past ecosystem or habitat states. All too often, previous conservation efforts have either rigidly tried to preserve or reconstruct static historical artifacts, or else blithely assumed that succession and change were “natural” and ecosystems were unshakably elastic, rendering biological history of no value. In reality, the organismal richness underpinning stable systems evolved as assemblages of biota under a specific range of conditions, meaning that these systems function within a window of constrained dynamism within which they and their component biota will flourish and in turn enable us to flourish as a society. It is thus requisite to understand in detail the conditions, process regimes, and range of variation within which these systems existed in the pre-Eurosettlement period, and to emulate conditions, biotic relationships, and process regimes within the amplitude of this constrained dynamism. The goal is not to create a static preconception, but to allow the flourishing of the full array of native organismal diversity that characterized these systems and habitats prior to the depauperizing impacts associated with Eurosettlement. From an individual perspective, we can

be enriched through learning the human and biological history of the locus on Earth’s surface that we inhabit.

V. KNOW THY ENEMIES

— We must develop systematic, concise, nuanced, and predictive, science-based analyses of threats to the long term viability of our natural systems and their component biota. This will require the discipline to look beyond what “seems” to be bad, and instead use data to determine the actual threats which, if unabated, are likely to expunge or degrade irreplaceable facets of our natural heritage. I suggest recognition of three categories of threats and the differences inherent among them: 1) historic impacts creating current threats and thus requiring remediation; 2) current threats requiring abatement; and 3) future threats that require deterrent actions in the present. We must learn to effectively determine true, not perceived or emotionally-sensed, impacts of threats, and have the discipline to ensure an objective, science-based approach targeting resources accordingly. This will require credible measures for assessing threat abatement, and developing and implementing unified threat abatement strategies that accommodate economic and societal needs.

VI. EXPLICITLY AND EMOTIONALLY VALUE NATURE

— To erode the divide between much of contemporary society, its decision-making processes, and the natural world, we must value nature from both pragmatic and cultural perspectives. This means suffusing across society an enthusiasm for and understanding of why biodiversity is critical to human well-being. People should have pride in the significance of local and regional biodiversity and its role in

defining us as a culture and imbuing a sense of place. Planning and land use decisions should include explicit valuation of the economic services provided by healthy natural systems, including considerations of future value of services and long term costs of replacing these services if ecosystem function is degraded or lost.

VII. BE VIGILANT IN PROTECTING THE IRREPLACEABLE — Despite laudable progress and achievement in ecological restoration, human society lacks the ability to restore any natural habitat to the level of diversity and function of its natural congener. This mandates that we effectively conserve and steward existing natural areas and high quality habitats and remnants, since they are by definition irreplaceable. Conservation practitioners must engage society to vigorously defend areas with remnant biological integrity against the “death by 1,000 cuts” scenario, whereby any one example is considered expendable, despite the impoverishing impact on the health of the whole. We must use science and documentation to adjust societal expectations to be intolerant of “acceptable” loss levels or degradation of priority natural habitat and inject the concept of irreplaceability into societal dialog.

VIII. AVOID FALSE PROPHETS OF SIMPLISTIC AND UNIVERSAL GREENERY — People like simple, feel-good solutions, and as a society we tend to oversimplify complex ecological issues. This is exemplified by reductionist propaganda (and misguided regulation) such as planting trees is always a beneficial “green” solution to environmental woes, in promoting highly subsidized inappropriate biofuel production or unre-

stricted wind farms to cure our energy issues, and other damaging thinking. We as a society must learn that dealing with complex systems and problems requires acknowledging complexity and the need for a nuanced series of strategies and solutions. Every action (or non-action) has consequences good and bad, and these consequences do not play out consistently across landscapes, habitats, and human communities. Conservation success mandates recognition of the uniqueness of habitats, biota, and societal interactions at each spot on the Earth’s surface.

IX. NURTURE A PERMANENT STEWARDSHIP ETHIC — The regional conservation community must instill an understanding of the ongoing interdependency between human society and natural habitats, inculcating cultural expectations of permanence, continuity, and an obligation to future generations. This can be an uplifting opportunity to enfranchise people as collective curators of our natural heritage, celebrating a sense of place here as nowhere else on Earth (even as the same is replicated endlessly around the globe); we should regard this as both our responsibility and our great privilege. The resultant stewardship ethic also has the potential to produce societal benefits beyond the immediate conservation benefits achieved.

X. GROW BEYOND LOCAL BORDERS — Even as we recognize the importance of our region’s natural heritage to both local and global conservation success, we should strive to develop mechanisms to export and adapt lessons learned, and to learn from others outside of the region. Both successes and failures have value beyond the region where they occur.

Societal success means conservation being embraced locally everywhere across the globe. Our region is positioned to play a pivotal global role, both for the unique biological systems and biota conserved, and for our long legacy in projects such as Chicago Wilderness and Kansas City Wildlands, which are model platforms for intimately fostering an ongoing recognition and relationship between people and the natural systems that sustain us.

AND SO...

Achieving these societal transformations and achievements will enable the opportunity for success, but will by no means guarantee it. Our challenge is nothing short of suffusing an understanding of the role of nature and a full integration of conservation issues across human society, ensuring full awareness of humanity's ultimate dependence on our natural systems. Conservation, economic needs, and other issues are not equally weighted across the natural and cultural landscape, but each should be considered in the decision making process, whether the area is a unique prairie habitat or an industrial parking lot. Decisions should be made with the understanding that all actions have social and ecological consequences, that success means meeting both societal and ecological needs, and that some habitats and lands contain irreplaceable natural heritage that directly benefits all of us. Success will not be quick, easily measured, or effortless; hard decisions and compromise will be required. I believe the fate of human society depends on achieving this, and it is the measure by which future generations will judge us. As never before in human history, we cannot afford to fail.

KUDOS

Thanks to Mike Arduser, Blane Heumann, Justin Thomas, and Gerry Wilhelm for discussions inspiring this essay, and to Amy Hepler and Cindy Pessoni for comments and suggestions.