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Damian Craniak Ph.D.
Prairie FEASSST, Inc.

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Dwelling on Common Ground: Scientific and Family Narratives of Change in Natural Landscapes

by Damian Vraniak, Ph.D. (Waubishmaa'ingan)

Prairie FEASST, Inc., W3177 Hamilton Road, Springbrook, Wisconsin 54875; maaingan@centurytel.net

Abstract

Can mapping past and current *changes* in prairie landscapes in relation to historical shifts in human culture suggest promising directions for efforts to restore the health of grasslands and other natural communities? During the last 20,000 years the Land shifted and altered; during the past 10,000 years Life moved and migrated; and during the past 5,000 years natural and human Law has been turned and twisted to produce changes unanticipated in the history of the world. In the past 500 years these changes have quickened as we have changed ourselves from foragers into fur traders, and then into farmers, foresters, financiers and finally into fun-seekers, overrunning the Land and other Life. As our contact and connection with the Land has become more specialized and more distant, as the balance and integrity of the Land continues to fragment, our own health and happiness declines as family life deteriorates. Is there a way to transform our current destructive use into efforts that are more creatively restorative?

In the last few decades we have concerned ourselves with the basic problem of the unavoidable effects of human population density (e.g., habitat loss and global warming), the critical challenge of how we partner and to what we become attached (e.g., cars as opposed to walking), and an appreciation of the power of group consensus and action (preserving ecologies as opposed to oil exploration). Can we shift our perceptions in ways that benefit natural communities?

Conceptual schemes used in the natural sciences to organize understanding of the relations among species and habitats have not been integrated with sophisticated conceptualizations used in the psychological and social sciences that might better define threats to natural communities posed by human motivations and activities. When human population densities, movements, and activities are considered in such an integrated manner, the social potential for restoration efforts may be enhanced in powerful ways.

This paper explores *change as disturbance* by proposing a comprehensive mapping of *conditions, connections, communities and contexts* affecting both grasslands and families. It offers specific suggestions to counter the destruction of healthy grassland and family systems by strengthening their positive relations with one another. The primary proposition is that families are the basic unit of care and connection in our communities. If family life is the primary relational process that determines and transmits our most valued participations in natural communities across generations through children, then perhaps we must re-balance our efforts, shifting a substantial portion of our focus upon individuals and groups toward *child, couple-centered, and family centered relations with the Land that are intergenerationally sustainable*. Perhaps it is possible that connecting with and caring for the Land can uncover greater connection and caring for one another, especially within the context of family, school, and neighborhood life.

Keywords: sustainability, change, family, care

Introduction

How might we find, inhabit and share a middle ground between the civil and the wild, a common ground between the narratives of science and the stories of family, a clear path from our past into a future that affirms common cause between humanity and other life forms, allowing our homes and habitats to exist together in shared benefit?

Once there were vast rolling prairies with millions of buffalo moving across them, where once also there were small bands of Native families migrating across the land in seasonal rhythms, sustained by the great variety of forbs, grasses and the other life supported by such green richness. Now there is so little left, a fraction of the abundance that once was; there are preserves, reserves and parks, a few representatives, reservations and small remnants for which we now have great

responsibility. Somewhere in the last 10,000 years as human beings we moved from participating in procreative disturbance to perpetrating pervasive destruction. How did this occur?

A description and examination of our relations with the landscape and with the varied life we share it with can be viewed from two overlapping perspectives—one is the systematic investigation that we call *science*, and the other is the wandering and adaptive *inter-generational perspective of families* as we struggle to survive, create home, and pass on what we have learned to our children and grandchildren in a very personal way. The reality we sense and perceive from these two different vantages helps to shape the relationships we realize. These perceptions help us to form representations of relations among the participants, processes, and principles of primary significance to us about us and our environment.

Within this paper these perspectives are organized into four sections:

- 1) a summary and brief description of climate change, with the resulting migration of species and shifting species assemblages since the last ice age;
- 2) a summary and brief description of climate change, human migration and the shift of cultural adaptations and configurations in response to changing landscapes during the past few thousand years;
- 3) perspectives of the simultaneous degradation of landscape ecologies (habitats and species loss) and cultural communities (family life) in the past 500 years; and
- 4) an approach that combines scientific and family narratives about sustaining healthy biodiversity and healthy family life by exploring the necessary and beneficial interdependence possible between the two, especially over the next few critical decades.

Each of these sections is divided into three parts. The first part presents the scientific perspective, using published research and the book-length works of others who have studied and written about one or more of the sections. The second part is the family and cultural perspective, which includes the history of my own family's involvement in these matters. Finally, the third part brings the first two together, blending science and family culture so that a direction may be revealed which will guide us to a better relationship with the land.

In order to enable and allow more healthy relations between the Land and Life, we need a few basic items:

- We need *clear and simple maps* of where we have been, where we are, and where we wish to go in relation to the landscape.
- We need *concise and sure methods* for the process of repairing and recovering a more intimate and healthy connection with the Land and other Life.
- We need *common, shared meanings* to which we might devote ourselves, together in relation to Land and Life.

With a few simple maps, sure methods, and shared meanings we might *recognize reality* in fresh ways, *realize new relationships* with Land and Life, and *represent these new relations* with one voice to others who might join with us in our endeavors to serve healthy human and natural communities with creative consideration and dedication.

I. Climate Change: Migration of Species, Shifting Assemblages

Scientific Perspectives

In scientific literature, researchers and scholars attempt to explore climate change, migration of species and the shifting assemblages of species during the past 10,000 years. Most efforts have been descriptive; many have explored the characteristics of succession. When actual mechanisms of adaptation to disturbance and the resulting shifting of plant and animal

assemblages are examined, the results are often surprising, as in the studies, for instance, of floristic succession data collected after the Mount St. Helens eruption.

More recently, Beth Lynch (Luther College), Sara Hotchkiss (University of Wisconsin), and Randy Calcote (University of Minnesota) reported that their analyses (Lynch and others 2004) of pollen samples from one of 50 lakes in northwest Wisconsin they are studying, which reveal significant changes in biodiversity during the past 2,000 years. Unequivocal findings of such studies illustrate the ever-changing nature of climate, the constant movement of species and shifting composition of species within communities, and the recent increasing rates of decline in numbers of plant and animal species across all landscapes and communities, that is, declining biodiversity.

Aside from focused research data, longer scientific narratives regarding climate change, migration of species and the shifting assemblages of those species during the past 10,000 years can provide a backdrop for understanding changes in biodiversity, locally and regionally. Examples of such narratives include:

- *The Vegetation of Wisconsin* by John T. Curtis
- *Huronian: A History and Geography of the Huron Indians 1600–1650* by Conrad Heidenreich
- *Man and Fire in the Central North American Grassland 1535–1890; A Documentary Historical Geography* by Conrad Taylor Moore
- *Savannas, Barrens, Rock Outcrop Plant Communities of North America* by Roger Anderson, James Fralish and Jerry Baskin
- *Conserving Great Lakes Alvars* by the EPA and The Nature Conservancy
- *Upper Mississippi: How the Landscape Shaped Our Heritage* by William J. Burke
- *Fire in America* and *Vestal Fire* by Stephen J. Pyne
- *From Coastal Wilderness to Fruited Plain* by Gordon G. Whitney
- *After the Ice Age: The Return of Life to Glaciated North America* by E.C. Pielou
- *The End of Eden: A New Theory of Extinctions at the End of the Ice Age* by Elin Whitney-Smith
- *The Destruction of the Bison: Social and Ecological Changes in the Great Plains, 1750–1920* by Andrew Isenberg
- *Climate and Vegetation in Central North America: Natural Patterns and Human Alterations* by John A. Harrington, Jr. and Jay R. Harman
- *Adaptations to Adversity: Agriculture, Climate and the Great Plains of North America* by Norman J. Rosenberg.

Family and Cultural Perspectives

Stories describing changes to both human cultures and the landscapes on which they depend also come from non-scientific sources. In *Prairie Relations: Book 1—Signs, Seasons and Stories of Flowering Plants of the Prairie and Savanna* (Waubishmaa'ingan 2004), I collected translated versions of stories told by my Native ancestors concerning the events,

changing conditions and relations experienced over at least the last 5,000 to 6,000 years. While multi-layered, these vignettes are accumulated direct experience with changing conditions and contexts (drought and desiccation, floods and fires, seasonal change from winter to spring, predation), and the characteristics of particular species responding to them, during long periods of time and in quite varied locales. These personally acquired, family-shared and culturally stored ecological narratives, among other aspects, suggest the importance of initial conditions, temporality (how quickly change occurs and adaptation is required), intensity (how powerful and pervasive some disturbances can be), and, perhaps most importantly, how each set of circumstances is unique. They demonstrate how the special and varied resources of individuals and family units are not only applied as they have been for generations, but also how they have adapted in slightly or largely innovative ways to meet the challenges of each new disturbance and change. A special feature of these narratives is the attempt to view events from the perspective of the particular species or contexts of interest (flowers, animals, natural forces).

There are four primary aspects of these stories that hold meaning and interest. The first is that these stories present a unique perspective of various *environments and conditions* that were experienced over millennia. Native people have had direct and extensive experience for more than 10,000 years of the periodically changing climactic effects and events that affected all life in North America.

The second aspect of interest is a highly developed perspective of the nature of life and how life *moves and migrates* across the landscape and how life *adjusts and adapts* to changing conditions. As ice retreated, plants returned, animals followed plants, and people followed both. As water contracted and expanded across the landscape so did various plants. As water disappeared many animals left, and hunter-gathering people then departed as well, seeking places more benign and hospitable.

The third aspect of interest in these stories is how language has been formed and used to explore the interconnectedness of all aspects of a changing world; that is, how best language might *represent the relations* among changing conditions and adapting life-forms as *principles* to live by successfully and well. Indeed, there are two aspects of language to consider: 1) the various and sometimes unique forms internal to a language family that enable users to perceive and express the world (*reality*) in particular ways and 2) the ways that language is used to transmit cultural learning (*relationships*), in this case, through stories that uniquely capture generations of adapting to change. This interest in language outlines some of the significant *principles* that Native storytellers *represent* as important to generating good *relations* with the land and with life. For instance, Algonquian languages, like Ojibwe and Cree, emphasize an animate/inanimate distinction rather than gender (female/male), and have first-person plural forms that are inclusive and exclusive – ‘we that includes you’ and ‘we that does not include you, the listener’ – that English does not, and are less oriented toward nouns (objective things)

than verbs (*relational processes*). Algonquian languages, like Mi'kmac, point their speakers toward relationships, process and flux rather than things, tending to name some “things” for the sounds they make rather than something about their form, which is less permanent. For instance, Mi'kmac speakers refer to the sound that wind makes when it blows through the leaves during autumn about an hour after sunset, when the wind usually comes from a particular direction.

The final aspect of interest is how these stories *interweave and integrate common themes* of recognizing when the current balance in the conditions of reality have been disturbed; of responding to and realizing relationships with those features, forces and forms of life in a manner that promotes mutual benefit; and of representing the relations among these crucial challenges in ways that facilitate coping and adaptation; that is, synchronizing to old and new timings in the climate, seasons, growth, and availability of plants and the movements of animals.

The Algonquians and the people who speak Siouan-related languages are people whose existence was closely linked to prairie and savanna flora, fauna, and climactic factors over several millennia. You might expect that not only would there be some important aspects of language that developed in some congruence with the intimate ecological relationship that existed over such a long period of time, but that there would also be an accumulation of information, knowledge and wisdom about the land, its plants and animals, and the relations with them. Attempting to bridge the perspectives of these family stories with the narratives of science entails bringing some sort of common vocabulary, language and shared conceptual framework to the task. The *parsittern* paradigm (Vraniak 1993) is one way this may be done.

Combining Perspectives: The *Parsittern* Paradigm

In order for science and family/cultural narratives to find a common ground in language—to complement one another—we need to determine basic elements that are most relevant, pinpoint crucial operations occurring between them, and propose what rules and roles identify and represent the most significant relations among the elements and operations of focus. Using the *parsittern* paradigm (Vraniak 1993) we can make an initial attempt to outline naturally generated disturbance, as well as the parts, processes, principles and patterns of healthy ecologies.

Everything changes. Changes beget new comings and goings, new life and death. The largest of the changes was the climate itself, warming the ice, melting the glaciers, and, eventually, drying up much of the water. As the land came out from under its cold blanket and watery covering, those familiar and accustomed to such a context had increasingly difficult times surviving, although some did not. As the climate warmed there were more insects who fed upon the large mammals. As new animals came into a new world bridged by uncovered land, slightly different viruses and germs

were carried along, entering new possible hosts. As the ice receded, a land corridor was re-opened periodically and new predators came into a world as new to them as they were to it.

Climate change, which altered the very context of life, created an opportunity for more prevalent disease or *new disease* and *new predators*. These two factors, in combination, would devastate susceptible populations. Who might survive the onslaught of such devastation? In conditions of increasingly difficult survival, space is created for old and new competitors. If a smaller beaver migrates down river and crosses land more frequently, rather than only staying in large lakes and bodies of water, perhaps it is more likely to survive the dwindling larger waters. If a smaller buffalo migrates long distances somewhat randomly across expanding prairies, perhaps predators may have greater difficulty finding it. Species slightly more resistant to infection and disease or more resilient to recovery from them are more likely to have more numbers survive.

Humans moved into these new contexts, searching for new energy resources, specializing effectively, and then diversifying predation and use. Such movement led to ever-increasing numbers, and eventually over-running (population 'packing') the places where we came to live in early North America. However, as it turns out, even humans would not be impervious to the effects of climate change (like drought), predation (more effective hunters; that is, other more technologically advanced humans), or disease (like the plague, flu, and smallpox). The time came, eventually, for those who migrated and became the native "new worlders" to be devastated in their turn. *Everything changes. Changes beget new comings and goings, new life and death.*

How are we to map this change simply? Is there a language that can bridge the language of science and of family and culture? Unless I have a map of some sort, even if it is only in my mind, it is very difficult to find a good path to my destination. With a map I can trace where I have been, where I am now, and determine the best route toward where I am going. The map I now share with you is a gathering together and integration of a few 'local' maps merged together from biology, psychology, sociology, and theology into a master template that I have found to be particularly helpful to myself and others—a rather simple but elegant map that can be easily internalized. Let me briefly try to describe the overall design or template of this map that is repeated throughout the material presented hereafter.

Every object or living organism has **parts**, the matter and material of which it is made. We have many different words for these: pieces, elements, substance, constituents, and 'essence' are some of

these. Whatever we call them, without the necessary and fundamental parts and without them being assembled in an appropriate structure, there cannot be a whole. If you have tried to start and drive a car that does not have a battery or does not have wheels, you understand that you must have all the parts and they must be assembled properly for the car to go. Without eyes you cannot see, without caring there is no kindness.

If whole, every object or living organism is processed by and processes the world. If there is one of something most likely there is another and a **process** that might connect the two in relationship. We have words for these, like manner and mode, operations or methods, that describe how food is broken down in the stomach, how oxygen is transferred into the blood, how sperm and egg make a human, how to love well.

We have discovered that certain **principles** describe the relations among essential parts and processes, structures and functions. 'Water runs down hill,' 'hot air rises,' 'anger begets anger,' 'do unto others as you would have them do to you,' each represent a myriad of different forms—ways in which various parts and processes might be connected, configured and synchronized.

These three aspects, **parts**, **processes** and **principles**, make a **pattern** of which the world is universally composed (see Gregory Bateson's search for the 'pattern that connects' in Bateson 1972, 1974). The maps and metaphors on the following pages are always described using these aspects: the parts *within*, the processes *between*, the principles *among* and

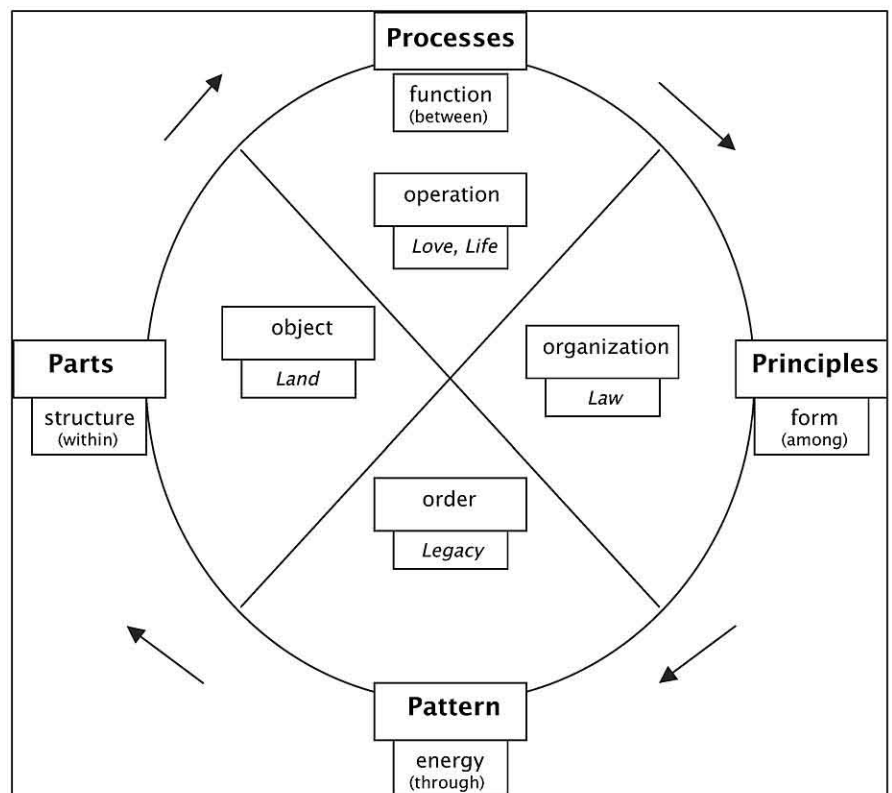


Figure 1. Parsiterns: Parts, Processes, Principles and Pattern



the pattern that runs *through* and composes them into a whole. In general, I refer to this master design as 1, 2, 3 and 3-in-1, which can be represented linearly or in circular fashion as illustrated graphically (see Figure 1 and Table 1.). Taking the letters of each primary word, I have called this partitioning and mapping *parsitterning*.

Essentially, the suggestion that all and everything is made of three layers and a fourth that integrates them, provides each of us with a simple way of perceiving and mapping our world. Therefore, simply I might organize and define the primary aspects of our world as follows:

Land is the fundamental *structure of reality* that is sensed and perceived at the most basic level. It just exists. It is appropriate *parts* hydrogen, oxygen, nitrogen, and carbon ... earth, water, air, and fire ... bacteria, fungi, plant, and animal ... assembled in just the right *balance* so that there is *integrity*. The parts comprise a singular whole where each is at its proper place and point of potential contact. There is unity.

Life is the operation, function, and *flow of relationship* that is felt when one singularity connects with another. It engages. It is the movement and transfer of parts internal to one into another ... water into root, flesh into stomach, sperm into egg ... through processes of *harmony* that create a unique and terrible *intimacy*. Two distinct singularities join into one unified movement that is offered from within and accepted between. The two become one. There is unity.

Law is the order and *form in representation* of the relations among land and life. It expresses. It captures for a moment the principles that properly *synchronize* parts and processes in such a way as to construct a special consensus and *identity*. Three aspects or layers are apprehended, welcomed and shared amongst. Two create or join a third ... water, yeast, and flour become bread ... man, woman, and child become family. There is unity.

Using this organizational approach to mapping, we may create a typology of disturbance in natural systems by *parsitterning* change in them (Table 2). And if we have some map of change and disturbance, obviously we need a simple map of what the healthy constituents, interactions and relations might look like (Table 3).

Once we have these basic maps, exploring how human beings might enter these matters becomes very relevant.

II. Climate Change: Human Migration and Shifting Cultural Configurations

Scientific Perspectives

It is clear that human beings currently generate the most intensive and extensive types of disturbance that contribute directly and indirectly to rapid declines in biodiversity in grasslands and other natural communities. Scientific studies of how this has come to pass have been many and primarily concern the history of human migration, population growth and settlement, technological innovation (especially fire-based technologies), and cultural conflicts that established who was to determine the primary approaches to interacting with land and life (whose/which 'rule of law').

Among the most relevant summaries of these developments are those by Binford (2001), who analyzed the movements and methods of hunters and gatherers; Bettinger (1991), who conceptualized 'handlers' and 'processors' as populations began to mass in primary settlement locations; Diamond (1997), who reviewed domestication and cultural conflict as populations grew and innovations competed; Moore (1972), who summarized Native and European differential uses of fire; and Pyne (1997), who explored the significance of fire in the transitions from foraging to horticulture to agriculture.

These narratives of science clarify the human cultural shifts from being *travelers* (moving between high-quality resource patches) to *processors* (settling in high-quality resource locations) to *makers* of goods located in high population centers, and finally to becoming *suppliers*, transporting needed goods and services widely among population centers. These narratives also show how these shifts led to population densities that devastated local landscapes and transportation networks that fragmented what heretofore had been more continuous and overlapping wild habitats and communities. The dual devastating effects of human population density and technology run parallel to classes and types of natural distur-

I. Physical, biological , ecological, economic Sense, seek, sow ... perceive, procure, provide ... locate and Learn	Survival & Sustenance (attend & aware)	Land (contact) fundamental structure of/to <i>integrity</i>	Parts & Participants
II. Emotional, psychological , interpersonal Savor, succor ... process ... like and Love	Partnering & Pairing (attach & affiliate)	Life (connect) essential function of/to <i>intimacy</i>	Processes
III. Mental, sociological , political, socio-cultural Share ... perform, produce ... Live	Common Cause & Community (affiliate & affirm)	Law (contribute) variation in form of/to <i>identity</i>	Principles
IV. Soul, religious , sacred Store ... save, bequest ... Leave	Intergenerational Continuity (abide)	Legacy (cease, commend) encoding energy of/to <i>integration</i>	Pattern

Table 1. Four Primary Layers or Domains of Analysis: Within One, Between Two, Among Three and Through All



Conditions Change:	Connections Change:	Communities Change:	Context Change:
Disturbance (perturbations)	Disease (pathogens)	Displacement (predation)	Destruction (physical removal)
1.1 Earthquake (bedrock)	2.1 Infections (bacterial, viral, fungal)	3.1 Parasitism	4.1 Combined & Multiple Perturbations
1.2 Flood (ice)	2.2 Invasions (alien species, toxins)	3.2 Competition	4.2 Combined & Multiple Pathogens
1.3 Storm (gale, hurricane, tornado)	2.3 Infestations (insect)	3.3 Predation, Substitution	4.3 Combined & Multiple Predation
1.4 Fire (drought)	2.4 Inundations (ash, dust, hail, methane)	3.4 Replacement	4.4 Complete Removal

Table 2. Typology of natural change and disturbance. Italicized items are more specific examples of the general categories.

Components and Constituents (integrity)	Critical Connections (intimacy)	Corporate Communities (identity)
1.1 <i>genetic material</i>	2.1 <i>biological relationships</i>	3.1 <i>species diversity</i>
1.2 <i>reproductive capacity</i>	2.2 <i>symbiotic relationships</i>	3.2 <i>assemblage diversity</i>
1.3 <i>sufficient population(s)</i>	2.3 <i>assemblages (community)</i>	3.3 <i>community diversity</i>
1.4 <i>species existence</i>	2.4 <i>ecosystem existence</i>	3.4 <i>ecosystems diversity</i>
Composition (integration)		
4.1-4.4 Establishing essential constituents and components, maintaining critical connections and sustaining corporate natural communities (that is, fostering and allowing the free-flowing composition and re-composition of whole systems)		

Table 3. Natural ecology: Parts, processes, principles, and pattern.

bances, but at a level of quickness, pervasiveness, intensity, and duration unmatched except by the most extreme environmental catastrophes (e.g., comet collision). Perhaps one of the most notable primary features of the past 10,000 years is that climate changes necessarily led to the migration and movement of plants, animals, and humans. Such change and mobility caused disruption, which was exacerbated by new or more prevalent disease and by extremely proficient predation by humans. When such change, movement and disruption happens too quickly, however, species die out and the landscape is altered in major ways.

After the last ice age, it is evident that moving and migrating allowed humans fresh access to untouched resources until population levels so packed resource patches that hunting and foraging could no longer provide sufficient suste-

nance. Lewis Binford's (2001) impressive study of more than 300 examples of hunter-gatherer groups worldwide, examined the processes around the population-packing threshold, including shifting between terrestrial animal, terrestrial plant and aquatic resources, and from small group mobility to more densely centered sedentary living centers. He found that when populations reached certain thresholds the typical hunting and gathering residential mobility was no longer viable because the places with high-quality resources that a small group might travel to were already accessed and used by other groups. Response to this 'packing' was to cultivate plants and exploit domesticated animals, which led to sedentary settlement in the richest resource locations. In short, there was a change in residential density in the direction of "megapacking" at high-productivity locations. We began to urbanize, and the primary features of this process, as we will see later in this review, had dire consequences.

Robert Bettinger, a student and then colleague of Binford's, described the different ways "travelers" (hunter-gatherers) and "processors" (horticulturalists) used 'time minimizing' as opposed to 'energy maximizing' strategies (Bettinger 2001). Shifting from 'traveling' to 'handling' meant settlement in favorable locations and the beginnings of village, town, and city life. Issues of food storage and distribution became important. However,

even maximizing the yields of domesticated plants by maximizing handling time could not prevent the disasters of large-scale climate change, such as drought. For even the efficient agricultural communities, along with those who still tried to be mobile, were at the mercy of large-scale climate change. The collapse of Mesopotamian and Mayan agricultural-based civilizations, which were due to two and three centuries-long droughts, illustrates that, even after the shift from foraging to agriculture, major environmental disturbances greatly affected even very efficient adaptive strategies by humans. Indeed, such climate change temporarily favored those who traveled, as is illustrated in the case of the Algonquin-language family groups—my ancestors—as they migrated during a 5,000–6,000 year period from around the Columbia River basin across the plains to the Mississippi, onto the Atlantic



<u>OPTIMIZATION</u>		<u>COST - BENEFIT</u>			
<u>Intensify by</u>		<u>Space</u>	<u>Time</u>	<u>Energy</u>	<u>Information</u>
Search	<u>Traveler</u>	Movement between high quality resource patches			Minimize time (special tools)
Handle	<u>Processor</u>	Settlement in high quality resource locations			Maximize yields (storage)
Produce	<u>Maker (manufacturer)</u>	Location in high population locations			Minimize time & Maximize production (specialized labor & material, marketplace)
Provide	<u>Supplier (Distributor)</u>	Transport widely among population centers			Minimize time, Maximize production & Maximize coverage (access consumers, commerce)
Shifts in Producer – Consumer grouping: individual - co-habiting family ... family – local village ... work group – distant towns/cities ... corporation – individuals in different countries					

Table 4. Shifts in human cultural forms: Cost-benefit and optimization.

coast, and finally back west along the St. Lawrence River and Great Lakes watersheds to the Great Plains (Benton-Benai 1988, Denny 1991, Fay 2002, Hill 2002). The shift from hunting and gathering to trading, horticulture, and agriculture meant shifting from minimizing time to using *more* time to maximize yields (of corn and cattle). Of course, when strategies for maximizing productivity top out, another shift occurs, which is to minimize time again, by processing the same amount of yield in a smaller amount of time. We begin to the general outline of the modern world of work, minimizing time and maximizing productivity (see Table 4)!

As population levels reached a second threshold, local storage of food was supplanted by the necessity of longer-distance transport. What paths had been well worn by trading specialists now became important distribution routes for most food and other materials critical to urban life but not available where high densities of population had already stripped the landscape. We began to move material and goods and developed many transport specialists and supports (e.g., roadways). Indeed, once settlement in urban areas intensified, promoting specialization and centralization, other processes, such as disease and war technology, figure ever more prominently (along with our continuing refinement in the use of fire technologies).

In his Pulitzer Prize-winning book, *Guns, Germs and Steel* (1997), Jared Diamond observed that food production has been based on relatively few species of livestock and crops and that the migration of domesticated species and the diffusion of innovations in technology within a continent contributed importantly to the development of its societies. Diamond suggested that a larger area or population means more potential inventors, more competing societies, more innovations available for adoption, and more pressure to adopt and retain innovations, because societies failing to do so tend to be eliminated by competing societies.

Family and Cultural Perspectives

Our changing relationship with the Land is also told in the experiences of my family as we slowly traversed the Great

Lakes region from east to west during the last five hundred years. It is the story of how, in the most eastern region of the Great Lakes, in the savannas between the St. Lawrence River and Georgian Bay of Lake Huron, my Huron great-grandparents used fire to clear trails of underbrush, to burn-off felled trees in order to plant corn ... of how, in the central portion of the Great Lakes, at the Sault Ste. Marie and in the area of Mackinac, my Ojibwe and Cree great-grandparents used fire to smoke the fish and parch wild rice ... of how, in the region near Green Bay all the way past Portage, my Ho-chunk great-grandparents used fire to melt lead ... of how, on the prairies west of the Great Lakes and the Mississippi and Red Rivers, my Siouan great-grandparents used fire to cure meat, improve berry crops, hunt, and as a weapon in war.

This story is also of how the Europeans invaded from across the sea, with fire in their guns, and changed these Native relationships with the Land. It is the story of how my French, British and American great-grandfathers married my Native great grandmothers and created a new cultural community of “half-breeds,” or *Metis*—individuals the Native people called “*half-burnt-people*” in reference to their skin color.

The Huron moved every forty years or so in order to grow corn well, allowing the soil to rest and replenish itself. The surplus corn was traded to the far reaches of the Great Lakes region among many tribes. With the coming of the French, this Huron surplus corn was one of the fundamental supports for supplying the *voyageurs* and *engagees* of the fur trade. Within fifty years of the coming of the French, the Huron nation had been destroyed as it had previously existed and French *habitants* were farming the land, using European methods, where Huron corn once flourished among the oaks and prairies.

The Ojibwe and Cree had fished the waters between the narrow waters that passed through Sault Ste. Marie and Michilimackinac. The abundance in these straits provided year-round sustenance for those who fished it sustainably for thousands of years. As control of this passage between the lakes briefly passed into and out of the hands of the British, so

too did the great fisheries eventually pass as they collapsed from the European methods that overexploited them in the nineteenth and twentieth centuries.

Upon the prairies of Minnesota and the rolling plains of the Dakotas, the various Siouan peoples (including the Assiniboin [Nakota], Dakota, and Lakota) hunted the buffalo with great respect and gratitude. However, just as the French and British interest in the beaver had been for the value of its fur, the American interest in the buffalo was not one of sustenance and survival, and soon the buffalo, like the beaver, nearly passed out of existence. How and why did such devastation occur?

During the previous 10,000 years successful adaptations to local habitats and ecologies in and around the Great Lakes and Great Plains regions had been sufficient for considerable population growth in Native communities. There was a myriad of variations in hunting, gathering, and horticultural methods tailored to local conditions that permitted sustained growth. Where and when there was depletion of some resources, there was also some room to move about and allow recovery. The primary adaptive challenges were then, as they are today, the need to secure adequate shelter, water, food, and energy in a manner that did not take too much time either to find (search or transportation time and energy) or to procure and process (handling time and energy). The focus upon these four primary resources characterizes the ancestral roots of our problems today, but we deal with them much more poorly and destructively today.

During the previous 5,000 years, people in Europe developed technologies to the point that most of the environment was managed and used, and, except in the event of war and disease, there was little room for population growth that did

not greatly increase negative impact upon sustainable resources and/or other peoples. Large rural families could be supported, but younger children had few options in terms of accessing land and other 'inheritable' resources. The new world became a land of opportunity for Europeans with 'advanced' fire technologies, especially for young men who saw vast potential for themselves unavailable in the old world.

A primary challenge for young French men as they came to settle in the new world after 1500 was to determine *what to accept and adapt to* of the existing physical, biological, and cultural contexts they found upon arrival, and *what to attempt to modify*. Determining *how to adapt to* and *how to modify* the local environments was an important and immediate survival imperative: *Do we farm and fish and forage and get along with others as we did in France or do we do so as the Natives do here?* Native methods had been adapted to natural conditions locally for generations, while French methods, developed in Europe, were dictated by church and governmental decree (e.g., the seigneurial system of land allocation and use). Consequently, the new settlers were often caught between local customs and distant laws, between the experience and exigencies of immediate reality and the expression of culturally represented civil regulations from afar.

Movement and migration was a very competitive and destructive mobility based upon population levels in Europe that exceeded the ability of children to have much of anywhere to go or opportunities to secure the kind of life they had grown up to know. Indeed, my family's movement and migration was an adaptation in the face of new European disease, war, land development, and cultural change between 1500 and 2000. It was an adaptation to the consequences of changes in how we transported ourselves and our food across

the landscape as well as how we changed how, where, and why we sheltered ourselves and used energy.

At a more specific and detailed scale, my family narratives bring a Native, European immigrant, and Metis set of perspectives to these cultural shifts and their ecological consequences in relation to living in the Great Lakes and Great Plains regions. As members of my family constructed the largest private shipping fleet in the world in the 1700s, formed the largest timber company in North America in the 1800s (while other relations were plying the fur trade from Quebec to Winnipeg and hunting buffalo on the plains), major historical movements brought about by war, immigration, and technological advances periodically re-defined possible relations with local land and life. My family's history reveals a four-generation pattern (100–110 year periods)

1500's – 1600's	1600's – 1700's	1700's – 1800's	1800's – 1900's
Quebec Huron French	Mackinac Ojibwa Cree French British	Green Bay Ho-Chunk Menominee Assiniboin Metis British American	W Wisconsin Native American Metis
<u>Grandbois</u> : Ouellette, Marcellais, Petit	<u>Cadotte</u> : Grignon, Landry, (Langlade)	<u>Rogers</u> : Nolin, Frederick	<u>Wagoner</u> : Ritchie, Gilmour
LAND: corn Furs	WATER: fish Furs	AIR: buffalo Forests (Pines & Prairie)	FIRE: crops & cows Farms
<u>Ships & Boats</u> (waterways: age of the sail)	<u>Horses & Carts</u> (paths & trails: canal era)	<u>Oxen & Wagons</u> (roads: railway epoch)	<u>Trains, Tractors & Trucks</u> (highways: time of internal combustion, electric dynamo)
<u>Forager & Fur Trader</u> (tools and traps)	<u>Fur Trader, Fisherman & Family Farmer</u> (wheels & weapons)	<u>Forester & Farmer</u> (saws & plows)	<u>Farmer, Forester & Financier</u> (money & management)

<u>Hunter - Gatherer</u> (find & gather) Kill share -- barter Visiting	<u>Horticulturalist - Agriculturalist</u> (plant & grow) Harvest trade -- exchange Gathering	<u>Silviculturalist - Industrialist</u> (exchange) Manufacture monetar commerce Meeting
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Table 5. Mapping the pattern of my family: Times & places, people & provisions, processes & processions, principles & professions



in adapting to these challenges and changes, whereby the fourth generation typically moved and had smaller families, perhaps in partial response to having to adapt to larger transformations going on in the transitions between these periods.

Thus, each generation had to answer the same basic questions in relation to new forces and circumstances: what *parts* of the world provide integrity and balance (what of the Land provides sustenance)? Which *processes* promote intimacy and harmony (how to relate to other Life mutually and beneficially)? Which *principles* produce identity and shared success (social consensus or Law)?

Forced by large-scale world developments and dislocations, families who moved into new environments had the least adaptive knowledge, made the most mistakes, and created the greatest destructive disturbances. The famed mobility and creativeness of Americans continues to be based upon the early survival imperatives of accessing and securing shelter (resources) and water, food, and fire (energy). These imperatives define human-initiated disturbance and provide an excellent framework for organizing relevant typologies that might clarify human-initiated disturbance and any counterbalancing restoration activities.

As we struggle to answer these questions today, many people look back into our history of relationship with the Land and relations with one another to see where we have failed and faltered and where it has gone well. Some have looked at specific historical events, others have looked at particular cultures or communities, and still others have looked at ecological, psychological, social, and cultural dynamics. Yet it is in the intimate relationship between husband and wife, between parent and child, and *between successive generations of family life* that these questions are pragmatically and developmentally answered. I am aware of few explorations that follow one family down the centuries to see how change and adaptation have occurred in transmission to each succeeding generation. This sort of exploration, which I call **genealogical ecology**, would benefit each one of us and give us a view of our own family's history of changing relations with the Land so that it might inform us of what to avoid and what to cherish and carry forward (see Table 5).

Combining Perspectives: The Parsittern Paradigm

We have a strong need to develop a way of conceiving language that allows us simultaneously to talk about the physical-biological world and the human psycho-social world of experience, so that we might explore the relationships between the two. Using both science and family narratives about the consequences of human-land transactions in our region over the past 400

years can help to organize and inform our need to clearly focus and prioritize the threats and opportunities of human action. The concepts I have gathered together for this are outlined in Tables 6 and 7.

Essentially the individual unit or organism seeks to determine the location of point-source energy and recognize whether it is high- or low-energy and whether it is a force to be fled or fought or whether it might be taken in (information). For instance, plants are well designed to sense light and water and allow entry, and have some defense capacities to fend off virus or animal predation. Similarly, even young children are well designed to sense the difference between heat and warmth, mother's milk and lemon juice.

Once bad stuff is avoided and connection to good things has occurred (mod-energy coupling), issues of containing and permitting the flow of useful energy occurs. Stomata open and close, children eat and excrete, adults mate and reproduce at good times.

When enough individuals get good enough at survival, enough coupling occurs, and certain population thresholds are reached, a variety of forms come into being that increasingly accomplish higher energy transfer, storage and management. Taller plants shade younger or smaller ones, families protect and provide for children, neighbors support families.

Over time, various efficient forms of storing and transferring energy inter-generationally (energy compacting, information encoding) favor long-term continuity of groups, communities, and populations. In general, individuals grow and develop if there is structural integrity, mating and reproduction occur if there is functional intimacy, and if enough groups (assemblages, families) store, share, and contribute to

Sense and seek (approach or avoid)	Force (vector)	Contact Capture	Danger/harm Safety/sustenance	Stimuli (pain/pleasure)
Secure	Flow (valence)	Contain	Use/utility	Signal (good/bad)
Share	Form (value)	Control	Effectiveness/efficiency	Symbol (synthesis)
Store	Free (void)	Compact Compose	Benefit	System (synergy)

Table 6: Basic conceptual language for exploring the relationships between the bio-physical and the human psycho-social worlds.

Structural Integrity	<i>contact location, recognition</i>	hi-lo energy determination (force)	Information source	Stimuli (pain/pleasure)
Functional Intimacy	<i>connection</i>	moderate energy coupling (flow)	Energy source	Signal (good/bad)
Formative Identity	<i>common contribution</i>	hi energy transfer, management (form)	Information/energy Fields (resources)	Symbol (synthesis)
Information-energy Integration	<i>composition</i>	information/energy compacting/encoding (free)	Information/energy Field integration	System (synergy)

Table 7: Basic conceptual language—energy and information.

**Abstracts for Other
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securing, storing and transporting water and food, and providing for our families by working for others, can be summarized as: 1) the loss of natural landscapes to farms and then the loss of farmland to cities, 2) the loss of individual happiness and small social group life, and 3) the deterioration of family life in small rural communities that mirror similar losses in urban living.

Family and Cultural Perspectives

Robert Putnam, in *Bowling Alone* (2000), begins to discern the underlying patterns of this dispersal into the countryside, exploring how Americans have become disconnected from one another and how social structures have disintegrated. He suggests that we are not happy, we are more greedy, we do not trust one another, we stay at home after work and do not visit as much as we used to, and we watch more TV and sit at the computer screen more than we commune, cooperate, and help out in our communities. In other words we have lost direct and regular contact with the world and with one another. Robert Lane, a life-long friend and classmate at Yale of my neighbor, the Nobel laureate Jim Tobin, extends this view in his book, *The Loss of Happiness in Market Democracies*, by focusing on the primary process operating these patterns—the inability to connect and maintain relationship. Alienating ourselves from natural and human communities, the loss of contact and then connection results in the loss of the common contributions we make to one another that support and promote health and well-being.

Analyzing 100 years of changes in household composition in my own community (Figure 2), validates the observations of Putnam, Lane, and others—more and more people migrate into a community; more and more people build more houses; more and more people begin to live alone, as family life begins to break down and deteriorate. Currently in Sawyer County, Wisconsin, married adults living with children are the smallest household group and seasonal recreational homes the fastest growing structures on the local landscape (as a result of in-migration and increasingly living alone).

How did this occur? My family's involvement in logging the upper Midwest in the 1800s describes a series of shifts from fur-trading to logging to farming to forestry and fire management. Written family histories by Purcell (1967) and Morrison (2002) include first-hand accounts of the rich riverine habitats in this same area, sequentially created by the

Disturbance (perturbations)	Disease (pathogens)	Displacement (predations)
Drugs/violence (comforting contact)	TV (experience reality)	Organized sports, recreation technology (play)
Sex (caring, connection)	Internet (engage relationship)	Medication, therapy (passion)
Consumption, domination (considerate contribution)	Cell phones, malls (express relations)	Institutional, organizational, corporate work (purpose)
Isolation (ceasing)	Cars (exit and rest)	On the go, ever busy (pause)
Destruction (physical removal)		
Combined and multiple perturbations, such as homelessness, suicide, divorce, drugs, additions, affairs, affluence (loss of attention, concentration, connectedness, tranquility)		

Table 10: Human disturbance, disease, displacement, and destruction.

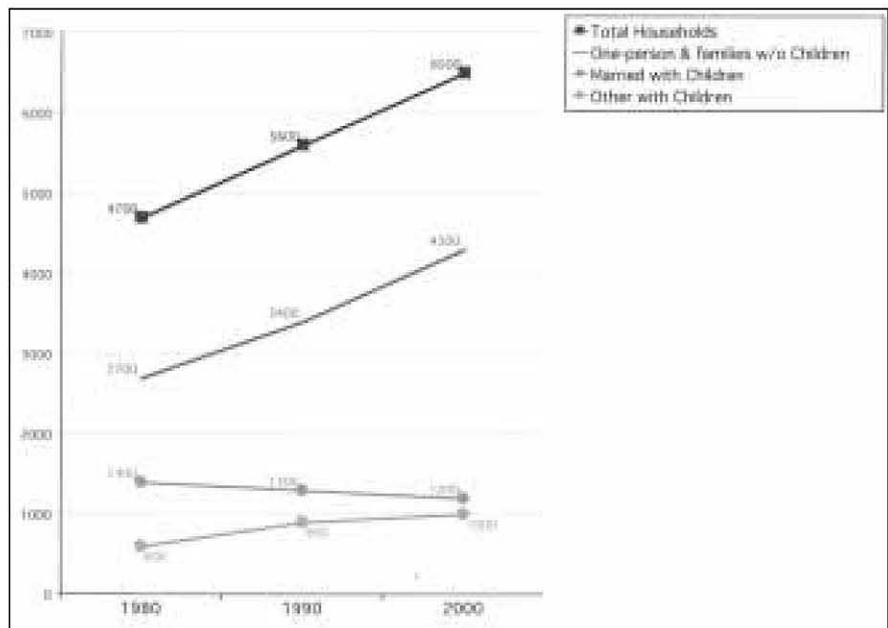


Figure 2: Household composition in Sawyer County, Wisconsin, 1980-2000.

'war roads' during two centuries of conflict between the Ojibwe and the Sioux that could not be used during conflict. They illustrate the major changes brought about by the new railroads into the region, the survival challenges of the logging and farming eras, and the rapid development of recreational hunting and fishing and the building of seasonal homes. These and other written and oral narratives of my family are rich in details about the shift from intentional burning to fire suppression and include significant information about such things as how trapping sharptail grouse was part of some families' survival strategies in the winter during the 1960s.

There are many paradoxes as we examine such family historical narratives: While changing from using moccasins to boots, lodges to houses meant more effective protection from the elements and easier survival, *insulation against natural*

forces contribute to our being oblivious to the consequences in the human use of force ... reducing harm by encapsulating ourselves as we increase harm to all else ... fundamentally changing what we see and touch. While shifting from using walking trails to using canoe routes, wagon roads, canals, railways, highways, and airways create more links, the result is often less connection ... making the flow of things, people, information and energy easier, faster, and more efficient with transportation corridors fragments the landscape and isolates us from one another, disconnecting and constraining the movements of other life ... fundamentally changing what we feel and hear. While moving and managing objects, people, energy, and information among corporate entities at a faster and faster pace leads to more productivity, it may also lead to less contribution to one another during our unavoidable busy engagements ... constructing group forms that organize individuals more productively separates us from our families and neighbors, alienating us from proximal communal life ... fundamentally changing what we think and share. Less contact with the Land, less connection with one another and other life has led to greater fragmentation of Land and Life, decreasing our capacities and opportunities to contribute to our mutual well-being together.

Combining Perspectives: The *Parsittern* Paradigm

Seeking to survive and seeking to secure providence upon the Land we have lost direct and regular contact with it, confused by the diverse goods and comforts we have created with which to please ourselves. Seeking the attractions of 'the good life' we have acquired many unhealthy attachments, losing our way in lonely wandering amongst a plethora of materials things and self-pleasing activities. Seeking to survive, being attracted and attached to our own meager material constructions, we have been confused by the innumerable bits of data and information, policies, plans, and programs that others design and do, losing our local opportunities to contribute, to give rather than to get. Table 10 shows a 'disturbance grid' for the current circumstances we have created for ourselves. What are we to do with these disturbing dysfunctions that have covered and destroyed the Land?

Incorporating the scientific view of the effects of population density and movement with the personal accounts of family relations, neighbors, and friends begins to weave a tapestry that richly focuses our attention on the fundamental nature of the basic human activities of *play*, *passion*, *purpose*, and *pausing*. Combining these perspectives also illustrates the central place of the family unit in mediating choices and manners in which we spread across and act upon the land. Indeed, while individual and corporate choices define the extreme positions that enable disturbance, disease, dysfunction and destruction, it is in the middle ground of family-life that may hold the most significant opportunities for renewal, recovery and rehabilitation of civic and wild communities.

The words of Wendell Berry in *Life is a Miracle* perhaps illuminate this best. Echoing the words of Leopold, Muir and Thoreau, Berry says:

"In speaking of the reductionism of modern science, we should not forget that the primary reductionism is in the assumption that human experience or human meaning can be adequately represented in any human language. This assumption is false. To show what I mean, I will give the example that is most immediate to my mind:

My grandson, who is four years old, is now following his father and me over some of the same countryside that I followed my Father and Grandfather over. When his time comes, my grandson will choose as he must, but so far all of us have been farmers. I know from my grandfather that when he was a child he too followed his father in this way, hearing and seeing, not knowing yet that the most essential part of his education had begun.

And so in this familiar spectacle of a small boy tagging along behind his father across the fields, we are part of a long procession, five generations of which I have seen, issuing out of generations lost to memory, going back, for all I know, across previous landscapes and the whole history of farming.

Modern humans tend to believe that whatever is known can be recorded in books or on tapes or on computer discs and then again learned by those artificial means.

But it is increasingly plain to me that the meaning, the cultural significance, even the practical value, of this sort of family procession across a landscape can be known but not told. These things, though they have a public value, do not have a public meaning; they are too specific to a particular small place and its history. This is exactly the tragedy in the modern displacement of people and cultures.

That such things can be known but not told can be shown by answering a simple question: Who knows the meaning, the cultural significance, and the practical value of this sort of generational procession across its native landscape? The answer is not so simple as the question: No one person ever will know all the answer. My grandson certainly does not know it. And my son does not, though he has positioned himself to learn some of it, should he be so blessed. I am the one who (to some extent) knows, though I know also that I cannot tell it to anyone living. I am in the middle now between my grandfather and my father, who are alive in my memory and my son and my grandson, who are alive in my sight.

If my son, after thirty more years have passed, has the good pleasure of seeing his own child and grandchild in that procession, then he will know something like I now know.

This living procession through time in a place is the record by which such knowledge survives and is conveyed. When the procession ends, so does the knowledge."

IV. Clarifying, Recomposing, and Focusing Efforts in New Ways

Scientific Perspectives

There have been a variety of efforts to slow down and reverse the decline in biodiversity where I live, including the Karner Blue Butterfly Conservation Plan (2000), the Northwest Sands Planning Effort (Northwest Regional Planning Commission and Wisconsin Department of Natural Resources 2000), efforts to restore and manage pine barrens and sharp-tail grouse (Evrard 2000, Temple 2004) and, most recently, Wisconsin's comprehensive planning effort focused on species



Thesis 1: There is a difference between proactive disturbance and complete destruction.			
Thesis 2: Basic survival depends upon shelter, water, food and energy and the information that can be used adaptively in securing them.			
	If ...	Than there is ...	Consequence
I.	In seeking provision, we move across the landscape <i>too fast</i>	little contact	Many serving the one becomes one serving the many
II.	In securing and storing what we need, we have and use <i>too much</i>	little connection	Giving and receiving becomes getting and keeping
III.	We have grown large in number, we are <i>too many</i>	little contribution	Sharing and welcoming (<i>gathering together</i>) becomes withholding and denying (<i>meeting, negotiating</i>)
IV.	We do not stop, we are <i>too busy</i>	little ceasing	Play-passion-purpose-pause becomes purpose- and product-driven
Conclusion: We must <i>slow down and pause</i> , learn to <i>stay closer and smaller</i> , choose to <i>share with others what is most appreciated and valued</i> , and to <i>re-compose</i> the fundamental structure of <i>how we learn, love, live and leave</i> the Land and Life.			

Table 11: Primary outline of challenges and proposed adaptations.

of greatest conservation need and their habitats (Wisconsin DNR and others in prep.).

One new perspective regarding such efforts is Daston and Mitman's *Thinking with Animals* (2005), in which the authors show how taking an anthropocentric attitude toward animals and treating them as individuals can have a dramatic effect on attitudes to animal conservation. They outline the management of elephants in Kenya in the 1960s when 'hard' science ruled and thousands of elephants were killed in order to keep populations within what was considered to be the carrying capacity of Kenya's national parks and reserves. However, in the 1970s Iain Douglas-Hamilton and others made the public aware of the social life of elephant families, which led directly to the promotion of the elephant as an endangered species and the banning of the ivory trade. More recent research has detailed the important intergenerational learning that is acquired by young elephants from mature females and when that does not occur, the abnormally aggressive behavior of young male/bull elephants which results.

The parallels with human family life are obvious. Yet, a narrow concern for environmental context, as in *Habitat for Humanity* (or *Humanity for Habitat* in the Kenyan example), only deals with the structural necessities and not the functional aspects of family relationships. Mooney and his colleagues make a similar mistake when they take their suggestions to an economic extreme in a summary of the recommendations in the *Millennium Ecosystem Assessment* (2005). While this worldwide assessment critically describes the collapse, degradation and fragmentation of entire ecosystems, continued land-use expansion and conversion, with the concomitant loss of biodiversity, these leader-authors revert to the very old hunter-gatherer strategy of *intensification* to solve the problem of not being able to expand any longer, and to the more modern approach of how ecosystem changes affect human well-being, which lead them to 'objectify' the 'capacity of ecosystems to provide *services* that benefit society in *economic* terms. Putnam and Lane have shown conclusively that 'economic benefits' do not bring happiness or health.

Other efforts to gain purchase in the middle-ground of scale (see Allen and Starr 1982) include the efforts of Taylor and Irwin (2004), who developed a formula for predicting 75% of state-by-state invasion by exotic plant species using a simple model of United States census data and indicators such as the amount of new construction, land clearing, numbers of developers, land buyers and sellers, called real estate gross product. Again, this is much closer to dealing with family households than larger macro-economic models.

In Africa, Biggs (2005) describes a simple and practical biodiversity intactness index that meets criteria for policy relevance set by the Convention on Biological Diversity (2004), but which uses estimates based on an *activity* basis rather than *source-by-source* summation. The chosen land use activities used in the index ranged from complete protection to extreme transformation, such as in urbanization, and all activities were expressed on the basis of the area affected. The index was aggregated by weighting the area subject to each activity and the number of species occurring in that particular area, making it highly useable, transparent, and credible to a variety of users. Again, this is an effort that begins to provide functional detail at the very interface that is most crucial—population density and the household activities that disturb or restore healthy habitats and wildlife species populations.

Family and Cultural Perspectives

So, what have we learned in our journey since the last Ice Age? Can we summarize and organize the most salient changes and the challenges these changes have wrought?

The original adaptive shift from unicellular life to multicellular life was a shift in organizational adaptation from *one serving itself* to *many serving one another*. As hunter-gathering omnivores, we shifted from accessing many plants to using only a few plants—from foraging to horticulture and agriculture; from accessing many different animals to using only a few animals—from hunting to herding and domestication. In a very real sense this was a shifting from *many serving the one* to *one serving the many*.

This shifting from *many serving the one* to *one serving the many* has taken many forms: now many families and communities use one aquifer, whole communities rely on using the same soils over and over again in the Corn-Belt; now millions rely upon only a few resources transported as commodities to us; we travel alone (long rides to the workplace) and travel faster across the landscape; and we live in large numbers in one place and meet briefly in small groups in many different places away from home (workplace). Now we spend most time

in the marketplace not in natural habitats ... malls as compared to meadows.

As we have moved away from primarily securing sustenance for ourselves and our family toward serving others (market and service industries), we have made a similar shift toward *one serving the many* in each fundamental enterprise that serves the body (healthcare), the heart (human services), the mind (education), and the soul (religion).

Other changes attending our increased mobility and altered relationships with one another include shifts from receiving the gifts of Land and Life to getting and keeping material goods, from welcoming the gifts we share with one another when we gather together to withholding and denying such sharing as we competitively meet and negotiate, and a singular focus on a purpose and product-driven life which minimizes and subordinates healthy play, passion and purpose.

The problem with these transitions is that they included shifts in negative directions with regards to basic communal values, as illustrated in my Primary Outline of Challenges (Table 11). How are we to begin to rectify this situation?

Always has Life moved and migrated across the landscape in manners determined by other creatures and various conditions. We had been so mobile, until we began to run into ourselves wherever we went. So, because there were few other empty places to travel to, we settled and processed the Land and Life to yield greater energy benefits than when we traveled. But we sacrificed our time. Where before we spent much time however we wanted when gifted with seasonal surpluses, later we came to work long hours, intensively producing, processing, and storing a few food items. As our purpose in providing grew our play became less.

As we grew in numbers based upon our planned productions and storages, fewer and fewer specialists supplied more and more of our population. Distribution to distant members of our communities created an opportunity for innovations in transport and so also, like our food, did we begin to travel again. Since fewer and fewer specialists produced for more and more of our communities, most of the rest of us created crafts or worked for landholders as labor. This meant that we had to travel first to the market place and then to the work place. We were mobile again, but in a different fashion. We moved as individuals without our families to places they were not and we came home to them at the end of our working day; most of us no longer worked alongside our family or our neighbors. We became increasingly disconnected from the Land that supplied us and from the kin and social kinships that nurtured and supported us. We became consumers of one another (services).

In the process of locating near to where we might work productively and purposively provide for our families, we build permanent structures called houses that specialized our living space much in the same way that work specialized and commercialized what we could do—there was a room for eating, rooms for sleeping, rooms for the kids and rooms to store things; there was a separate place for each specialized activity, even a so-called living room, unlike Aldo Leopold's shack or Henry David Thoreau's cabin. And so, even when we

came home from a long work day, we might still be separate from our family members, if they were watching TV in the "family room" or in the "living room", while we were eating in the "dining room" or "kitchen."

In order to secure an adequate housing structure with many rooms, we had to travel further and spend more time working in order to "pay" for a specialist to build it. In order to travel further more quickly we needed more sophisticated transportation vehicles and smooth transportation routes and needed to spend more time working in order to "pay" for specialists and machines to build our cars and trucks for us. Provision became the primary purpose in our lives and even those who cared for children historically (women) became "workers."

We lost our time and one another in ever increasing cycle of minimizing time and maximizing yield (productivity). We gave up our land and moved to the cities where there was more work. We covered our land with highways and housing developments, after cutting down the forests and plowing up the prairies for food production. We paved and covered the land with housings for all of the material "goods" we put in our separate rooms.

Where before we had given our time to our children and to one another, we now "spend" our time "getting" the good life—a car and a house, energy to run them, and a good education (lots of information). We have objectified and commercialized ourselves as consumers, those who get instead of give, those who leave (divorce) instead of love, those who travel alone to meetings instead of those who gather together and visit.

We became commercialized consumers as first we cultivated the land from fencerow to fencerow, then constructed over the land with urban housing development and transportation routes, polluted the land with power production and distribution, and, finally, polluted our disembodied minds with ever faster and filling information and media networks.

Much earlier some of us had rather simple and skilled methods, like the Apache, for securing flexible shelter, good water, a nutritious variety of food, using fire in ways tailored to the scale of our living and moving upon the land in rhythms suited to knowing the land and life intimately. But first we ran out of space, then we ran out of easily available energy, then we ran out of time, in our more modern encompassing attention on securing food, shelter, health and transportation in our consuming, commercial way trying to get the good life. Now we are hurried and harried, busy and burdened, alienated and alone, disappointed and in despair.

Combining Perspectives: The *Parsittern* Paradigm

In the following tables I have tried my hand at organizing and detailing this middle-ground of relationship between domesticated household activities and implications the accumulation of the expanding numbers of such households have for wildlands and wildlife, especially grasslands and grassland species. Essentially, the attempt is to name a middle-ground of earth



shared by the narratives of science and families, the domesticated civility of home, and the unfettered freedom of the wild.

In Table 12 I have attempted to organize the threats to biodiversity and the components of a response or conservation intervention that could be implemented to address any given threat. Issues of scale and scope apply to each of the four *parts*. Narrowing and defining manageable parameters for each *part* determines the design. We can narrow and define the parameters of each part as follows:

1. Habitat features may be considered resources species use to survive; classification of 16 “natural communities” and identification of specific geographical areas narrows and locates the *context* for each species of concern.
2. Determination of which species are of “greatest conservation need” in these natural communities and agreement that *population numbers* and ongoing *reproductive success and offspring survival* are excellent proxies for habitat health (and other biological and ecological domain features) narrows the focus to *monitoring* these two variables and ascertaining the need and *focus for intervention* should either or both decrease significantly.
3. Discernment of *who* has the time and capacity to most effectively monitor species numbers (children, youth, adults or seniors), and determination from which context(s) (*when and where*: home, school, work, community) this can most efficiently be accomplished as well as identifying those activities (*how*: methods and tools) that lend themselves most easily and strongly to this task; narrow and define who will be the primary participants attempting this project and its goals. The same determination must be made in relation to who will initiate intervention (conservation) activities, when, where, and how.
4. If money is the primary resource supporting monitoring and intervention activities, determining the most effective application targets and methods is only partly accomplished after completing design elements 1–3. Understanding and determining the most relevant *processes motivating human action and interaction* and the most *potent processes initiating and maintaining change* is crucial to success. Essentially, this aspect of the overall design specifies those health-promoting features of

PARTS (recognize reality)	PROCESSES (realize relationships)		PRINCIPLES (represent relations)	PATTERN (recompose)
	Threats (disturbance)	Conservation (interventions)	Concepts and Theories (language)	Framework (maps)
1. Habitat (natural communities)	0	x	Ecology	+
2. Species (mammals, birds, herps, fish)	0	x	Biology, chemistry, physics	+
3. People (participants)	0	x	Psychology	+
4. Money (equipment, activity, time, focus)	0	x	Socio-economics	+

Table 12: Organizing threats to biodiversity and components of interventions.

Protect and Preserve (save)	Restore (secure)	Conserve (sustain)
1.1 Genetic material	2.1 Biological relationships	3.1 Species diversity
1.2 Reproductive capacity	2.2 Symbiotic relationships	3.2 Assemblage diversity
1.3 Sufficient population(s)	2.3 Assemblages (community)	3.3 Community diversity
1.4 Species existence	2.4 Ecosystem existence	3.4 Ecosystems diversity
Consecrate (serve)		
4.1-4.4 Combined and multiple efforts to Preserve essential constituents and components, Restore critical connections, and Conserve corporate natural communities (i.e., to foster and allow the free-flowing composition and re-composition of whole systems).		

Table 13: Human preservation, restoration, conservation, and consecration.

human ecology that oppose and contradict destructive ones.

It is notable that the first two parts have been dealt with in some depth, the last two remain ill-defined and poorly mapped.

In Table 13, I have sorted and organized the primary activities and words we use that might arrange our efforts to counterbalance destructive human actions with more beneficial actions.

Concluding Remarks

Clearly, the advantages of having historic and current maps of natural disturbances and their trajectories gives some background to begin to map and assess the impact and momentum of human disturbances in a specific locale. Having a comprehensive framework or grid within which to place various disturbance processes is indispensable if something like a comprehensive assessment of natural- and human-generated change in grasslands and other natural communities is to occur.

Obviously the same principle holds for preservation, restoration, and conservation efforts at the landscape level.

Without knowing what genetic reservoir, what animal-plant and plant-plant symbiotic relationships, and which forms of particular prairie, savanna or barrens ecologies are being restored or conserved in a specific region, the overall and combined impact of individual efforts may not be determined. Indeed, unless a comprehensive understanding of natural and human disturbances in relation to restoration/conservation efforts is mapped, it is impossible to determine landscape results.

If you have ever tried to keep a pail filled with water that had some holes in the bottom, by hand-pumping in water at a slightly slower rate than it was flowing out, then you know through direct experience the most likely outcome. For example, are there more efforts to change or reduce genetic diversity in various ways then there are efforts to preserve genetic diversity; is one set of efforts proceeding more quickly or more efficiently? Are we limited in restoration efforts, in the sense of some bottlenecks, because restoration is proceeding far ahead of preservation and accessibility of appropriate genetic or symbiotic organism components? The relative balance of procreative and destruction processes is extremely important to ascertain, as well as the supports or obstructions to tipping the balance in the direction of viability and vigor.

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