



Fox Haven
Voices of the Land

Fox Haven Mission Statement

The purpose of Fox Haven is to create mutually beneficial partnerships between people and the living earth. It provides sanctuary for people seeking to reconnect with the land and learn from the wisdom of nature. Fox Haven's retreat and learning center is grounded in nature and contemplative practice and is dedicated to nurturing deep, creative dialogue among diverse people.

Fox Haven provides an atmosphere that allows people to slow down, reflect and learn to hear their own inner voice, each other and the voice of the land. It is a gathering place for a community of people who are seeking innovative and systemic solutions to the complex social and environmental problems threatening our planet. Seeing patterns of relationship and movement in the natural world and learning to think systemically will provide new perspective on the challenging issues of our time.

Our intention is to do no harm as we discover how to balance the needs of the land: its water, soil, plant and animal life, including its human community. The entire farm is organic, practicing permaculture, working with the natural flows of energy; wind, water, sun, slopes, regenerating the life force of the land, using nature to heal nature. The farm fields, tree plantings, rain gardens, composting toilets, solar pumps, drip irrigation in the organic garden, chicken tractors, mixed forests and creeks are laboratories for learning the complex lessons of nature and discussing how to apply these learnings to our work lives.

Fox Haven serves the environmental community by offering a safe haven for meetings and solo retreats. Its meandering streams, nature trails, rolling hills, and spectacular mountain vistas provide a sanctuary for true dialogue and personal transformation.

REGENESIS



Partnering people
and their place
to regenerate
ecosystems and
the human spirit

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About This Booklet

This booklet arose out of a careful study of Fox Haven and its surrounding region. From April of 1999 through September of 2000, a site assessment and planning team from Regenesiis collected and developed the material presented here. The purpose of the study was to begin to understand Fox Haven as a living whole—a system. By revealing the ‘voice’ of this living whole, we can better understand how to enter into relationship with it in a way that respects and nourishes it while enabling us to live out the best of who we are.

This way of looking at a place arises out of a totally different way of thinking from how we usually approach the development and management of land. This way of thinking derives from a whole systems approach and seeks to regenerate all the diverse elements that make up a place—people, soils, rivers, forests, and wildlife. The first section of this booklet describes the underlying concepts behind this way of seeing ‘place’. The second section of the booklet describes the current state of Fox Haven, as viewed through this lens. The third section presents a portrait of the dynamic context surrounding Fox Haven, and the fourth section recommends an approach for regenerative land use at Fox Haven.

Fox Haven is an experiment, the application of this different way of thinking to a particular place. This booklet is intended to help us see Fox Haven as a whole, so that we are able to understand the role each of the parts plays in that whole. We encourage you to use this book as an introduction to the site as a living system, as a foundation for ongoing planning and design at Fox Haven, and as a basis for applying the learning of the Fox Haven community to broader systems.

Here, in the low, folded hills of Maryland, on the doorstep of our nation’s capitol, a dream is coming true. It is a dream in service to the future, a life-sustaining future where the land is restored and true community arises. Nourished by the vision and hard work of Harriett Crosby, along with the many colleagues who have joined her, its seeds are taking root now. The harvest they promise includes not only ecological practices reinvigorating soil and waterways and woodlands. It is to be reckoned as well in what happens to the men and women who come to Fox Haven, to look and learn. As they step aside from daily pressures, nature will speak to them, reminding them of their embeddedness in the web of life. Systems thinking will take on fresh, sensory, reality, as they discern and begin to trust the flowing cycles of the natural world. And as they choose to take part in the great adventure that is Fox Haven, I believe they will find new hope for their lives and for our country.

Introduction

by Harriett Crosby, steward

This land that we call Fox Haven (a collection of nine contiguous parcels of land which I purchased over the last 25 years) has come to shape me more than I have shaped the land. It's been kind of like falling in love, entering into a relationship that makes me want to know everything about my beloved. Composed of many different ecosystems (forests, fields, creeks, bottom land) systems within systems, the abundance and diversity of life on this land is breathtaking. Evidence shows Indians using the rock shelter cave by the creek 8,000 years ago, probably for ceremony, initiation and rebirth rituals. Walking on paths through the forest, one feels the healing power of the land, its sacredness, as if the reverence of the earliest inhabitants still resonates. I've spent a lot of time walking the land, treading paths made by deer, observing the flow of water in the creek where the beaver build their dams and make burrows in the creek bank. I've marveled at the grace of red tailed hawks and great blue herons, at the percussive rhythms of pileated woodpeckers. I've discovered the hidden places where foxes make their dens, where a bear once hibernated under a big rock, and where crayfish and invertebrates hide under rocks in the creek. I've meditated on the intricate web of yellow and black garden spiders and the halting movement of praying mantis, and listened to the lonely cry of owls in the dark of night. Wanting to meet Fox Haven's neighbors, I've gotten to know the local farmers, potters, woodworkers, hunters,

trappers, scholars, teachers, truck drivers, lawyers, bureaucrats and archeologists. Diversity seems to characterize our neighborhood as well as the larger watershed of which we are a part.

As I came to love this unique place and all its inhabitants, I wanted to protect it from the rapidly encroaching sprawl. It became apparent that simply buying and protecting the land wasn't enough. It needed to be cared for and the effects of decades of inappropriate use needed to be halted and reversed. We began by addressing problems—soil erosion, bare hillsides that never should have been cleared of forests, overgrazing by cattle, a wetland in danger of being filled in, eroding stream banks. We moved rocks in the creek to divert water away from where it was eating at the embankment. But the floods would undo and reverse our feeble efforts to act like little beavers because the real problem was upstream where clearing for farming and housing was reducing the land's ability to act as a sponge and absorb and hold the rain in place.

I began to wonder—if I could understand the intelligence of nature, what would she be asking of me? Wandering by the creek and listening to the gurgle of water, to the wind in the trees and the call of the birds, I learned to deeply appreciate and be nourished by this land. It made me want to better understand nature's intelligence. Through the Institute of Noetic Sciences I learned about Regenesi s and in 1999 commissioned them to do

an ecological study and planning process that could help us learn how to understand and translate the voice of the land. Thus began a journey of discovery and deepening connection that continues today, engaging ever-wider circles of people.

During this time neighbors of Fox Haven and a few city folks created the board of Fox Haven Center. Study groups and task teams formed. Working and learning together, we are growing a vision of the potential of Fox Haven and how we can help realize that potential. Together we have come to understand that our work here is more than environmental education and restoration of the land. If we are to truly reflect what we are learning from the land as a living system, then our work is about regeneration—building the capability to create and sustain life-giving and health-giving relationships between people and place that enhance the vitality of the whole.

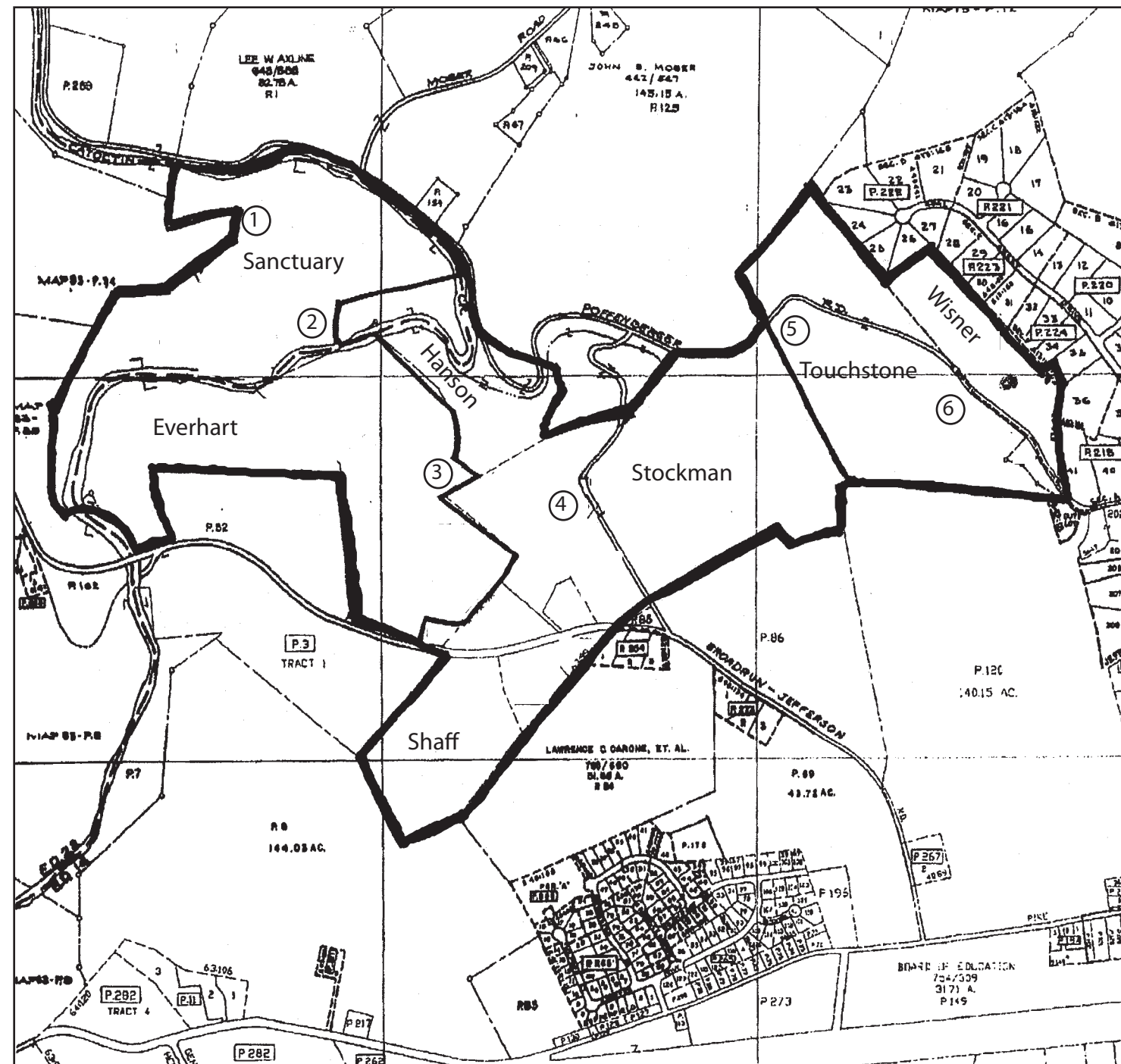
This report, which introduces an ecological way of thinking about and seeing Fox Haven based on living systems theory, reflects where we are in that ongoing journey. We have learned that, like changing the glasses we wear, we can change the way we see the world. Living systems theory gives us another lens with which

to understand life processes. Our society is in transition from a mechanistic, reductionist view of the world to an ecological worldview and this report is both an educational tool and a guide for this transition.

Reading this report is challenging because the ideas are complex and very different from the conventional way of understanding life. It tells us about the land at Fox Haven within its historic and geographic context. And it trains us in another way of thinking that enables us to engage in the life of the land as a partner in the dance of life. It lays out a framework for the next stages of our journey as we extend this life-giving way of thinking to how we might organize and govern ourselves at Fox Haven. We hope to create organizations and ecopreneurial businesses that are healthy diverse ecosystems, self-organizing, self-regulating, forever generating and regenerating new life.

The fox emerges...

Interestingly, the shape of Fox Haven, quite accidentally, is that of a fox. This was discovered while looking at a map after buying the properties that make up the entire parcel. The first piece of land, purchased in 1977 with the Hansons, was the tail of the fox—what we now call the Sanctuary because you have to cross the creek to get there. The torso and hind legs were purchased from Dr. Schneider in 1997, the chest, legs and neck from Donald Stockman in 1998, the front legs from the Shaffs in 1999, and the head from David Rinderle in 2001. The fox's head was in profile until the purchase of the Wisner property in 2003, which turned the head to reveal the full face. Now it's clear that the farmhouses on the Rinderle and Wisner properties are the two eyes and the fox is looking at you. We call the Rinderle farm Touchstone Farm. The first farmhouse, which originally belonged to Flo Riggs and which we renovated in 1999, is located in the center of the land, or chest of the fox, and we call it the Heart Center. HC



1. Anchor & Hope Yurt
2. Creek Cabin
3. Mountain Vista Cabin
4. Heart Center
5. Gaia Yurt
6. Touchstone Farm

A Matter of Perspectives...

Perspective: From Latin *perspectus*, *pp.* of *perspicere* to look through, see clearly. The interrelation in which a subject or its parts are mentally viewed; the capacity to view things in their true relations or relative importance.

Periodically throughout human history profound sea changes have occurred in the conceptual worldview that shapes the inner and outer landscape of human existence. We are moving into the 21st Century riding the crest of another sea change, one that has at its core a new understanding of life itself, and carries with it profound implications for the future viability of humanity and our planet.

In 1962 philosopher scientist Thomas Kuhn gave the name “paradigm” to these worldviews, and described the process by which one succeeded another as “revolutions”. Paradigms, he argued, create a common perspective by providing us a framework that determines what we pay attention to, the questions we ask and the problems we consider important. While Kuhn’s focus was science, a paradigm serves as a comprehensive model of reality—what is real and what is not real, and thus goes far beyond science to shape political, economic, and cultural priorities, decisions and actions.

Such frameworks are essential in building a coherent understanding of our world as a whole and a societal consensus as to appropriate decisions and behavior. At the same time, they can and have become mental blinders when we are ignorant of how they shape our thinking, and when we forget that the fundamental assumptions that form that perspective are just that—assumptions and not hard and fast truths.

The work of Kuhn and others has made it clear that we can choose to change the perspective through which we see our world. By making our perspective a conscious choice we can consciously participate in, rather than simply be reactive to, a sea change as it takes place. The first step in such a change requires becoming aware of the way a perspective shapes our thinking and its consequences for how our future unfolds.

This ecological study of Fox Haven reflects the new perspective that is emerging from the current sea change. It is meant as an invitation to explore an alternative way of understanding life processes, one that enables us to engage in the life of the land as a partner in the dance of life. Hopefully it will provide a new platform from which to engage with the issue of sustainability, one that opens up new creative possibilities and moves us from debate to dialogue.

Dancing is surely the most basic and relevant of all forms of expression. . . . In it the creator and the thing created, the artist and the expression, are one. Each participant is completely in the other. There could be no better metaphor for an understanding of the. . . cosmos.

We begin to realize that our universe is in a sense brought into being by the participation of those involved in it. It is a dance, for participation is its organizing principle. This is the important new concept of quantum mechanics.

Part One
Dancing with Living Systems

Choosing Life: A New Perspective

In the following pages Fox Haven speaks to us of her dreams and of her losses and invites us to join in the ongoing dance of creation, neither as a caretaker nor a master but as a participating partner. Her voice is more than a literary device. It is symbolic of a profound shift in perspective that is occurring—the emergence of an ecological model of reality. At a time when our relationship with our planet seems increasingly destructive, this model holds out new hope for understanding how we can harmonize human activities with the continuing regeneration of life on our planet even as we continue to develop our potential as humans.

Fox Haven extends an invitation to consciously try on this alternative perspective, explore its implications and experience oneself as simultaneously a creator in and a creation of the dance of life. It is an exploration that begins but does not end with Fox Haven.

A mechanistic universe

For several centuries, Western culture has been dominated by a mechanistic or Cartesian model of reality. Emerging out of the discoveries of the “Scientific Revolution” in the 16th and 17th centuries, it replaced an image of a living, organic and spirit infused universe with the metaphor of the universe as a machine. Mind and matter were seen as wholly separate and independent. All that composed the universe of matter, including living organisms, were seen as machines composed of separate parts functioning according to specific and predictable laws of physics and chemistry. In a world made up of machines, intelligence was the sole preserve of God and/or humans and the different parts that made up nature were ours to arrange and rearrange to serve our ends. Sixty years ago Aldo Leopold described the

approach to the earth that had grown out of this model. “We are remodeling the Alhambra with a steam shovel,” he wrote, “and we are proud of our yardage.”

A changing picture of reality

In sharp contrast, biologist Elisabet Sahtouris notes that Western science is “changing toward an understanding of nature as alive, self-organizing, intelligent, conscious or sentient and participatory at all levels. In this newer framework biological evolution is holistic, intelligent and purposeful.” This emerging ecological model places understanding life as central to understanding the nature of our universe. The following reflect some of the key discoveries of this changing science.

Living systems replace inert building blocks

A universal property of all life is the tendency to form multi-leveled structures of living systems within living systems. Cells combine to form tissues, tissues to form organs, organs to form organisms that combine to form societies or ecosystems. Each system is part of a larger whole or supra-system while at the same time forming a whole with respect to its parts. And the essential properties of each system derive from the distinctive pattern of organizing among its parts. A frog obtains its “frogness” from the characteristic way its “parts” interact with and are dependent on each other. The properties of the frog’s parts in turn can only be understood within the context of a frog as a whole.

In other words, we cannot understand living systems through reducing them to their “basic building blocks” and analyzing the parts. Indeed, we destroy the properties that give a living system its identity when we dissect it, either physically or mentally. Since systems are fundamental to the way life structures itself, understand-

ing life or the living nature of our world requires that we move beyond a “building blocks” approach. The word *synhistanai* (“to place together”). Thus to understand things systemically literally means to understand relationships within the context of a larger whole—the exact opposite of reductive analysis.

The web of life— from machine to network

A second key aspect of the ecological model is its replacement of the metaphor of machine with the metaphor of a network. Living creatures are members of ecosystem communities, linked together in a network fashion. At the same time, each organism is also a complex ecosystem in itself, consisting of a host of smaller organisms also linked in a network—a network of networks. Thus the network, or web, is the underlying or implicate pattern of all life.

Within this web of life, reciprocal relationship replaces dominance as the model for our relationship to nature—humans are neither dominant over nor subservient to nature. We are but one of many nodes in the network, fundamentally interconnected and interdependent with all the other components. And, as Sahtouris notes, “The best life insurance for any species in an ecosystem is to contribute usefully to sustaining the lives of other species, a lesson we are only beginning to learn as humans.”

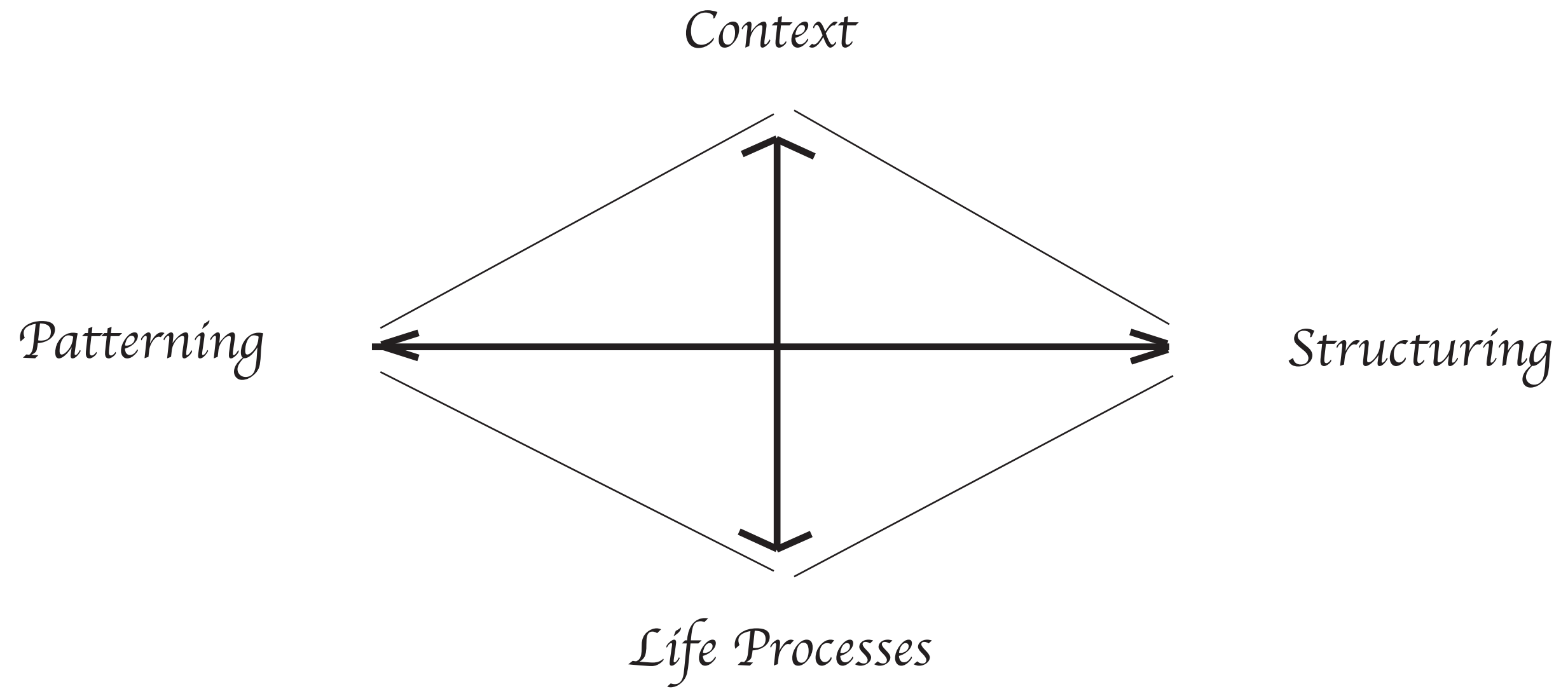
Reuniting Mind and Nature

In the ecological model, all of nature is mindful and intelligent and evolution is purposeful. The network connecting and composing living systems is not a collection of static components. Rather it is a dynamic weave of life processes through which each component and the network as a whole are continually “making themselves”.

Each living system is capable, through sophisticated feedback and feed forward processes, of regulating itself, learning from its mistakes, and reorganizing itself—it has so to speak, its own mind expressing itself through the process of self-organizing or autopoiesis. Autopoiesis is in a sense the overall process by which a living system manages all the other life processes that generate and sustain its vitality, viability and capacity for evolution.

Evolution enables a living system to express its inherent potential as an increasingly generative member of the web of life. It is, as Watson describes it, a creative dance, generating new structures, new behaviors and new life yet maintaining the basic network pattern of the dance. In the mechanistic model, the world is governed by laws of entropy and our lives are spent in battling run-down. In the ecological world, the drive to generate and regenerate life is the dominant characteristic of life—entropy is simply a phase in the overall cycle of life.

If we want to join with living systems in this creative dance, we must rise to the challenge of working in a way that enables them (and us) to realize their and our full potential. The dance is about the generation and regeneration of life, and the co-evolution of humankind and nature. Working to stabilize or conserve is only a small part of nature’s choreography, and only a small part of being human. The real



A Living Systems Framework

Learning from Nature

thrust of life is toward more life.

It is one thing to describe a new model of reality but how does that translate into our day-to-day thinking and behavior? The reassuring certainty of reductive, linear thinking has been exposed as fundamentally inadequate for comprehending the complexity of a living world in which “everything is connected to everything”. As the picture of an ecological world unfolds, we are gaining increasing appreciation for the wisdom of nature as it generates, regenerates and sustains life. But, despite growing recognition of the inadequacies of our old models, they are still predominant forces in shaping our thinking. Linear thinking is valued for its problem solving effectiveness, but it bars us from seeing the systemic context of our efforts and, consequently, their systemic consequences. Only through systemic thinking can we learn from and apply this wisdom.

The critical properties of systems are neither measurable nor quantifiable. Systemic thinking focuses on relationship, context and integration, qualitative rather than quantitative properties, dynamic rather than static. Even when addressing structure, which is quantifiable, systemic thinking focuses on its dynamic relationship to other properties, i.e., more on the process of structuring than on a structure. Systemic thinking requires that we image something as a whole (this is particularly difficult if it is a non-physical phenomenon) and hold that image in mind while thinking about the interrelationship of the parts.

Systemic frameworks are mental tools for creating an image in the mind to help understand the behavior of a system. Systems behave systemically whether we perceive them as a system or not. Thus the value of systems thinking and frameworks is to enable our thinking to better match reality. From that we can better design interactions with nature that enable living systems to be

increasingly effective in their life generating and regenerating capacities.

In addition to serving as a tool for designing with living systems, systemic frameworks help us understand how the whole of a system works. We can use them to assess the system’s current state of health in terms of its vitality, viability and capacity to evolve, and to determine what its potential is. These two images of existence and potential provide the ground and goal points for a wholistic approach.

A living systems framework

This section describes one systemic framework that can enable us to learn about and learn from living systems without destroying their essential properties. We encourage you to use this framework to better understand the thinking behind this booklet and its recommendations as well as a way of enriching your own engagement with Fox Haven.

Living systems are in a constant process of becoming—literally creating and recreating themselves minute by minute through an ongoing “dialogue” among:

- the pattern that gives them identity and coherence as a system,
- the structuring processes through which they express or manifest that pattern,
- the life processes they are engaging in and
- the context in which they carry out those processes.

We can use the interplay of these four dimensions to construct a dynamic image of how the system we seek to engage with is striving to evolve, how effective it is in that process, and how we can co-evolve with it.

Pattern

Systems derive their identity from the distinctive pattern from which their components are organized

—understanding their identity depends on understanding this essence or pattern. We recognize a chair as a chair or a tree as a tree only if a certain pattern of relationships among its parts is present or can be envisioned. Imagine dismantling a chair and putting all the parts in a pile. Now you have a collection of chair parts but it is no longer a chair. In reconstructing the chair you have a number of choices of how you could put the parts back together. As long as you retain the essence pattern of relationships that make it a chair, you could probably leave some parts out, substitute others and so on. You have changed the structure but its identity is still clearly that of a chair. Absent that fundamental pattern, you may have a piece of sculpture but not a chair.

Because a pattern is implicate, not explicate, we cannot perceive it directly with our senses, but we can conceive it through an imaging process.

The potential of a living system is inherent in its essence pattern. Potential is the value it has but has not yet manifested as a participant in the web of life. Its potential cannot be seen in isolation from the web of life, i.e., from the network of other living systems of which it is a part. In order to grasp the fullness of that potential, we must image that pattern manifesting itself in a progression of structures through time, past and future, and within its context—its immediate environment as well as its larger network of life-giving relationships.

For example, one entrée to understanding of the essence pattern of a living system is through understanding what is the core around which it organizes itself. In seeking to understand Fox Haven as an ecosystem, we looked to the core process by which she manages water and nutrients as a source of life—for herself as a whole, for the living systems that make her up and for the larger systems of which she is a part. The mental image we generated was that of a giant living sponge, absorbing and gradually releasing rainfall, modulating the swings in the continuous cycling of water to produce a life

nourishing rhythm. Working from this image we could then look at how Fox Haven sought to structure herself in order to manifest that pattern through time. We could trace how Fox Haven’s expression of this essence pattern is continually mediated by the changing weave of soils, climate, slope, hydrology, vegetation, animals and human interventions (its context). We looked at indicators for how effectively Fox Haven was able to manifest that pattern in the past and at present—the health of Catoctin Creek being one of the key indicators. We looked at what nature of structure best enabled the manifestation of that pattern and determined that, at this point in Fox Haven’s evolution, it was that of a mixed forest in productive reciprocal relationship with human habitation and use. The dynamic and systemic picture that emerged from this assessment provided a basis for better discerning the opportunities and the hazards of different development options.

Imaging the relationship of Fox Haven within her larger context and projecting it into the future, it was clear that work within the boundaries of Fox Haven would be insufficient by itself. The reforestation of the watershed will be critical not only to Fox Haven but to the larger ecosystem as a whole. The challenge is to reforest in a way that reinforces the reciprocity between natural and human systems, regenerating the life processes of the region and evolving viable livelihoods for the people who carry it out.

Structuring

Structure is the material expression of a system’s

pattern of organization at a point in time. It is the structure of a system, not the pattern, that we see when we use our senses to observe phenomena. As an expression of pattern, structure is also made up of relationships, but these are temporal and spatial relationships and, most important from the perspective of understanding living systems, these relationships change through time as a system evolves and responds to environmental forces. In other words, a living system is continually structuring itself and, if we look just at its current structure we catch only a still shot in an ongoing movie—a “freeze-frame” portrait that is as useful in understanding the life and potential evolution of a living system as a passport photo. A skeleton, a geologic formation, the rings of a tree trunk—these are history texts that, seen from this perspective, tell the story of a system’s ongoing effort to manifest its pattern in a material form. While we cannot directly observe a living system’s essence pattern, we can use our observations of structuring to help us interpret that pattern and the environment (context) in which that pattern was seeking to manifest itself. All oak trees are an expression of the oak tree pattern, but no two trees are ever identical. The structure of a particular oak tree is the result of an ongoing dialogue among the essence pattern seeking to manifest itself, the dynamics of its context and the life processes it engages in and enables.

For example, an oak tree growing at the edge of a forest or in a dry open meadow will have been shaped by sun and wind in a way that is very different from an oak tree of the same species growing in the heart of the forest. They will be recognizably related and they will both engage in the processes of leafing out, growing woody tissue, setting acorns. But the tree in the open will tend to have smaller, more leathery leaves. It will have been deformed and shaped by prevailing winds. Its wood will be denser, and it will branch lower.

The structure of a living system determines its use or usefulness to the other members of its larger network,

as well as to the network as a whole. As its larger network (context) evolves, a living system’s capacity to restructure itself while maintaining the integrity of its essence pattern is critical to its overall viability. While a pattern can be expressed in many different structures, not all structures are equally effective in expressing a living system’s potential to contribute value to the web of life. For example, at Fox Haven the structuring resulting from a regular cycle of low intensity renewing fires has been disrupted over the last few centuries. This, along with heavy logging and degenerative agricultural practices, led to forest regrowth that is dense, brushy, and uniform in age. The resultant structure provides inferior habitat for wildlife and is susceptible to devastating wildfires that could further degrade the watershed of Catoctin Creek. A different set of processes, introduced at a systemic level, are required if the forest structure is to enable Fox Haven to move toward higher expressions of its true potential.

A key premise of the ecological model is that living systems operate from a purposeful intelligence. Based on that, we can thus envision the continuing dialogue that occurs between pattern and structuring as moving toward a goal of creating a structure that is the highest order of expression of the pattern, one that has the highest order of value within its part of the web of life.

Life processes

The self-organizing property inherent in all living systems derives from life processes—a continual stream of productive activity. Fritjof Capra describes a living system as a “network of production processes in which the function of each component is to participate in the production or transformation of other components in the network. In this way the entire network continually ‘makes itself’.” Ground squirrels eat the fruiting bodies of fungi, activating the spores as they pass through their intestinal tracts. Their spore-containing feces are pushed

out with soft piles of earth from their burrows. Jays collect acorns for later use and store them in the convenient piles of soft earth. The acorns sprout in a perfect medium—cultivated, fertilized, and inoculated with the fungal associates that will enable the tree’s roots to take up the nutrients it requires for healthy growth.

These production processes, which are the instruments through which this continual structuring and restructuring is carried out, require a continuing flow of energy (some of it in the form of material) to transform into nutrients and new structure. While the transformative capacity of these life processes are formidable, the structuring they produce is continually influenced by the nature, quality and quantity of the flows of energy through the system. For example, the report notes that the “sponge”—the interconnected web of life that holds nutrients and water in FoxHaven’s body, has been torn repeatedly. In these areas the quantity of available energy in the form of nutrients is compromised because the soils are no longer capable of holding water long enough for the nutrients to be fully utilized by all the living systems that depend on them. In other areas the quality of the nutrients is affected when the necessary fungal associates are missing, and the health of the trees is compromised and the whole forest system suffers.

One of the most remarkable aspects of this network of processes is its inclusion of “feedback and feedforward loops”—communication relationships that give it information about the relative effectiveness of its products and its processing. These relationships enable a living system to continuously audit and adjust its effect. By themselves however, these relationships would be meaningless noise. We must look to the fourth term in this framework, context, to appreciate how a living system interprets this flow and translates it into a source of direction for its ongoing self-organizing and self-ordering.

Context

The essence pattern of a living system relates to the configuration of relationships among its elements that is essential to its identity. Since all living systems are interconnected within the web of life, another set of relationships is equally critical to understanding the creative dance. These are the dynamic relationships between the system as a whole and surrounding larger systems or supra-systems. These relationships are what we mean by context. The word “context” comes from the Latin *contextere* - “to weave together,” presenting the image of a web constantly weaving and reweaving itself.

A living system seeks to manifest (structure) its potential (pattern) in a way (process) that adds value within the web of life (context). Using the framework above, we begin to see how a living system uses its relationship to its context as a source of direction for its processes. Process feedback loops continually inform the system about the degree to which its structuring is resonant with its immediate context. If the living system is healthy we can observe it reforming its processes and reorienting its structuring to achieve greater resonance in its drive to maintain mutually life-generating and regenerating relationships with the larger web. By seeing human interests as integral with, not isolated from, the flourishing of the overall web of life, we begin to develop insight into and appreciation for the intelligence of all living systems and are able to join in as co-creative partners in the dance of life.

Designing from a Living Systems Framework

Systemic frameworks, including the one described above, allow us to work on the parts of a system, to hold the dynamics of the whole in mind and to assess the potential consequences of any decision or intervention we make. For example, at any point in time we can observe the existing structure or material state of a living system and, by knowing the potential inherent in its essential pattern, determine the degree to which it is falling short of expressing its potential. We can then look at how its processes are enabling or disabling it in its interactions within its context and identify what is inhibiting its fullest expression. From this understanding, we can identify and design interventions that join with this intelligent, purposeful living system in ways that regenerate both it and the network it is part of.

Unfortunately, many of our interventions in regard to land are reactions to problems related to one of these four aspects. When we deal with a problem only in relationship to the aspect where it first came to our notice, we are operating from a picture of the world that is unlikely to reflect reality. As a result, we almost always start a chain of consequences that we cannot foresee, and that can ripple far out into the web of life. For example, we may notice that trees in the forest are declining in health. If we isolate this problem, assuming that it's only a disruption to the life processes of the tree, then we might attempt to intervene by introducing pesticides or fertilizers to bolster the health of the trees. However, the problem could be arising from disruptions to soil fungi and bacteria caused by acid rain and other pollutants—a problem that might actually be exacerbated by introducing fertilizers or biocides. In the following pages, we speak of the health of Catoctin Creek as an indicator for the health of the whole system. If we took a linear,

problem solving approach we might look to restocking the creek with a broader variety of aquatic life, or look for points where soil is being washed into the creek and build structural barriers. Then, rather than drawing on the inherent energies of a healing living system, we would find ourselves continually repairing the structural barriers and continually restocking the creek because the inhospitable qualities of the existing water have not changed.

Application of the Framework to Fox Haven

A systemic way of thinking underlies the recommendations contained within this booklet. Using this framework, we can begin to see how a systemic approach can guide future planning and development of Fox Haven.

For example, one of the specific recommendations made in this booklet is to develop an enhanced hardwood forest on the shoulders of the steep slopes leading down to the drainages. One could simply select a mix of species from one of the many lists of regionally appropriate trees and plant them according to standard approved practices. Or one could use the framework to set the parameters for all the questions involved in structuring this new forest, including determining which species and cultivars are most appropriate; what is the desired nature of relationships among them, both spatial and chronological in terms of different maturation levels; what are the desired relationships with other systems within Fox Haven and beyond its boundaries; etc. This could be done by defining an aim, based on previous thinking, for each point on the tetrad such as:

- Pattern: restore and enhance Fox Haven's

ability to effectively manage the water / nutrient cycling essential to vitality, viability and the capacity to evolve toward higher potential.

- Structuring: promote productive reciprocal relationships amongst humans, animals, trees and other plant species through conscious habitation and land use practices
- Context: facilitate and promote healing of the whole of the watershed
- Processes: generate resources that support creation of local value-adding land-based livelihoods

The value that can be realized from this type of design thinking is that it creates multiple possibilities for generating or regenerating life within the network of living systems that make up and surround Fox Haven. Appropriate species will provide food for wildlife and humans, high value poles for fencing and building, and timber for sustainable harvest. At the same time they stabilize and enhance the vulnerable soils of the shoulder and reknit the fabric of the watershed. They provide a genetic resource to the rest of the ecosystem, as nursery material as well as naturally dispersed pollen and seed. Overall such an enhanced forest enables economic return at an early stage, while producing increasing economic value in a sustainable way through time. It quickly provides the same soil building and protection (through creating a dense canopy and root mass that generates high volumes of biomass) that one would expect to find in an older forest. And it creates a high quality of habitat

and edge for a wide diversity of wildlife species.

Because structuring is ongoing in a living system, we want to introduce managing processes that will encourage the evolution of increasingly generative structures. In observing healthy natural systems, we notice that they tend to organize themselves into mutually beneficial guilds of plant and animal species that improve the nourishment and shelter available to each member of the guild. The booklet thus recommends forest management practices that will foster and encourage this within the enhanced forest. This mode of self-organizing provides the basis for envisioning how Fox Haven could grow through “guilds” of ecopreneurial enterprises. (See Part Four)

These are but a few examples of how this framework can help deepen our understanding of the life generating properties of systems and increase our creativity in designing with living systems. As you read through the following observations, conclusions and recommendations, use the living systems design framework to look behind these thoughts to image the thinking that formed them.

Applying Living Systems Models to Human Communities and Social Systems

When we apply the ecological model to natural

living systems (including the human body), the focal point for our assessment and the central criterion for designing possible interventions becomes the life generating and regenerating capacity of the system in question. As systems theorist and educator Charles Krone states, applying this model requires “elevating ourselves so that we think in terms of living systems rather than in terms of things. We need to see what allows living systems to operate in a way that they are capable of managing their own vitality and viability and their own evolution. Can we live with the forest in a way that makes it possible for the forest to evolve? That’s different than harvesting the forest appropriately.” It is through evolution that a living system can express its inherent potential as an increasingly generative member of the web of life.

When we bring the lens of the ecological model to our human societies we see living systems all around us. Businesses, economies, schools, communities, people—all are living systems, continually adapting and evolving in response to changing internal and external environments. As in nature, each system consists of networks of smaller systems and each is one of many nodes in a larger network, fundamentally interconnected and interdependent with all the other components.

What then if we were to apply the capacity to generate and regenerate life as a yardstick for assessing our manmade living systems? For example, are our schools life-generating systems for those who are a part of them and for the systems they are a part of? Are they designed and operated to increase the capacity of students to be life generating? Do they aim to create students who are capable of managing their own vitality in different environments? Do they seek to build students’ capability to ensure their own viability through the contribution they make to the viability of the larger systems of which they are a part? Do they enable students to

continue their evolution over their lifetime, regenerating themselves as the world changes to be increasingly value generating members of life?

If these questions were the guides for assessing the effectiveness of our school systems, would test scores have the same significance that they do now? Would we give the rate of increase of quarterly returns the same precedence in judging our businesses? Under the mechanical model we measured a farm by the quantity of goods produced and the financial margin achieved, and often judged it a success even as it depleted its core asset, the soil, of all its life-generating capacity. Are we taking the same path with our societal living systems? The answer may be indicated by the fact that increasing numbers of universities are moving to abandon SAT scores because they are finding they do not correlate to the students’ actual record of success in life or even in the university.

Applying the ecological model to societal living systems would affect our priorities as reflected in the goals and standards we set, as well as the way we measure and assess success. It also would change the way we design new systems or interventions with existing ones. Just as with natural living systems, rather than relying on a linear, problem-solving approach that leads to “a chain of consequences that we cannot foresee, and that can ripple far out into the web of life”, we’d use systemic frameworks like the one described above. Imagine looking at a school and asking what is the true potential of schooling in terms of the value it has but has not yet manifested as a participant in the web of life of which it is a part. What is the pattern of essence qualities that are the source of that potential, that make a school a school and not a business or a prison? What constitutes the larger network of systems, the web of life that constitutes the context for schooling, and what does this network require of schooling to maintain its life-generating capacity? What

nature of structure would best enable manifesting that potential to contribute value to the web of life?

Applying Living Systems Models to the Fox Haven Community

We began this section by noting how the emergence of the ecological model of reality offers “hope for understanding how we can harmonize human activities with the continuing regeneration of life on our planet even as we continue to develop our potential as humans.” Fully realizing this hope requires us to bring this model to the man-made systems that form the fabric of our lives as social animals as well as to the natural world. It means abandoning the falsely reassuring certainty of reductive, linear thinking —thinking that cannot comprehend the complexity of a living world in which “everything is connected to everything”. And it means opening ourselves to becoming full participants in the dance of life, learning to continually recreate ourselves to be increasingly intelligent dancers and choreographers.

Part Two
The Voice of the Land

“Tell me the story of the river and the valley and the streams and woodlands and wetlands, of the shellfish and finfish. Tell me a story. A story of where we are and how we got here and the characters and roles that we play. Tell me a story, a story that will be my story as well as the story of everyone and everything about me, the story that brings us together in a valley community, a story that brings together the human community with every living being in the valley, a story that brings us together under the arc of the great blue sky in the day and the starry heavens at night, a story that will drench us with rain and dry us in the wind, a story told by humans to one another that will also be the story that wood thrush sings in the thicket, the story that the river recites in its downward journey. . . “

—Thomas Berry, *The Dream of the Earth*

Fox Haven's Story

I exist within a nested web of being. I am a holon: simultaneously whole unto myself and a part of other living wholes. Long ago, people named this place Catoctin — "Land of Abundant Wildlife." I am a part of Catoctin, as many other beings are a part of me.

My body rests upon ancient bedrock bones, and my flesh, worn from those bones, covers itself with trees. I am a complex forest—this is my natural self-expression.

There was a time when the tissue of soil and plants over my bones was thick, rich, and resilient. People appreciated my wild nature. They gave me the gift of renewing fire, encouraging my fullest expression. In return, I gave them abundance: nuts and berries, and animals. We nourished each other.

Later, others came. When these people met me, they saw me as a savage to be tamed. They did not know that I could nourish them in my fullest expression, or that they could nourish me in return. I lost much of my tissue—plants, wildlife, and soil—in a very short time, over and over again.

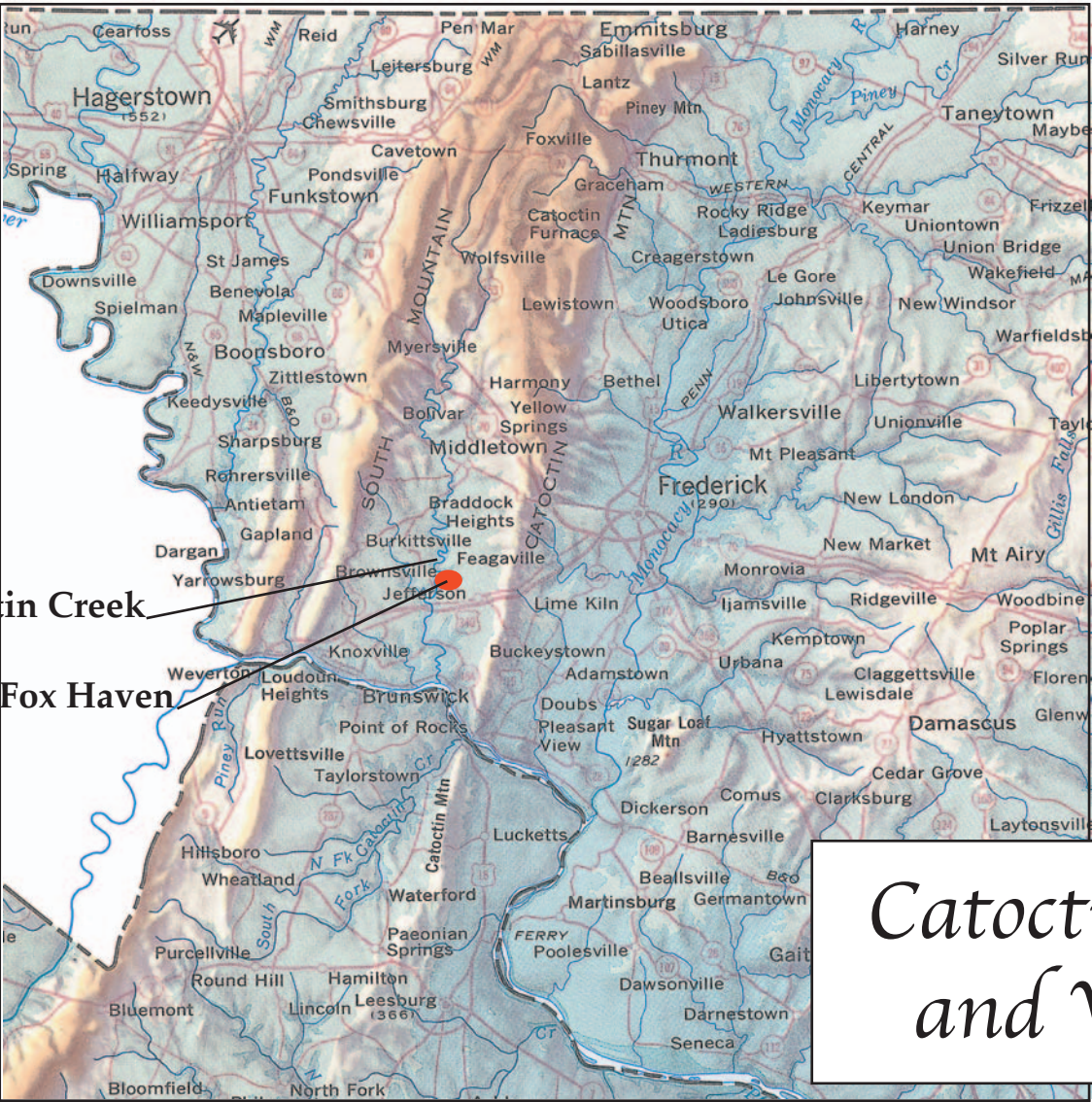
I always spring back. I am transformation. I unfold myself in every moment, each creation transcending a previous destruction. My slopes give a glimpse of how magnificently diverse I can be. I cover myself with beings within beings, nested one inside the other in glorious array.



Catoctin Creek: Looking upstream. The watershed surrounding Catoctin Creek forms Fox Haven’s bioregional boundary.



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Copyright 1992 Raven Maps & Images.

A Whole Within Wholes

If we could rise in the air like a bird, we would see Fox Haven’s fields as bald areas fringed by the wooded draws and slopes lining the waterways. The bends of Catoctin Creek and its tributary Lewis Creek dominate the lowlands, and the Fox Haven property encompasses most of one full bend of Catoctin Creek. Just outside of the property boundary, Lewis Creek flows into Catoctin Creek at the site of historic Lewis Mill.

Looking beyond Fox Haven itself, we would see the mountainous arc enclosing the Catoctin Valley: South Mountain Ridge to the west, and Catoctin Ridge to the east meeting in the north near the tiny town of Foxville in the headwaters of Catoctin Creek. We would see the rolling valley floor carved by Catoctin Creek and its tributaries, patterned like a mysterious feather with a sinuous, winding quill. From here, we see Fox Haven’s position two-thirds of the way down the watershed, with 50 square miles of valley above it. We would also see that, in comparison with other places in this valley, Fox Haven is heavily wooded.

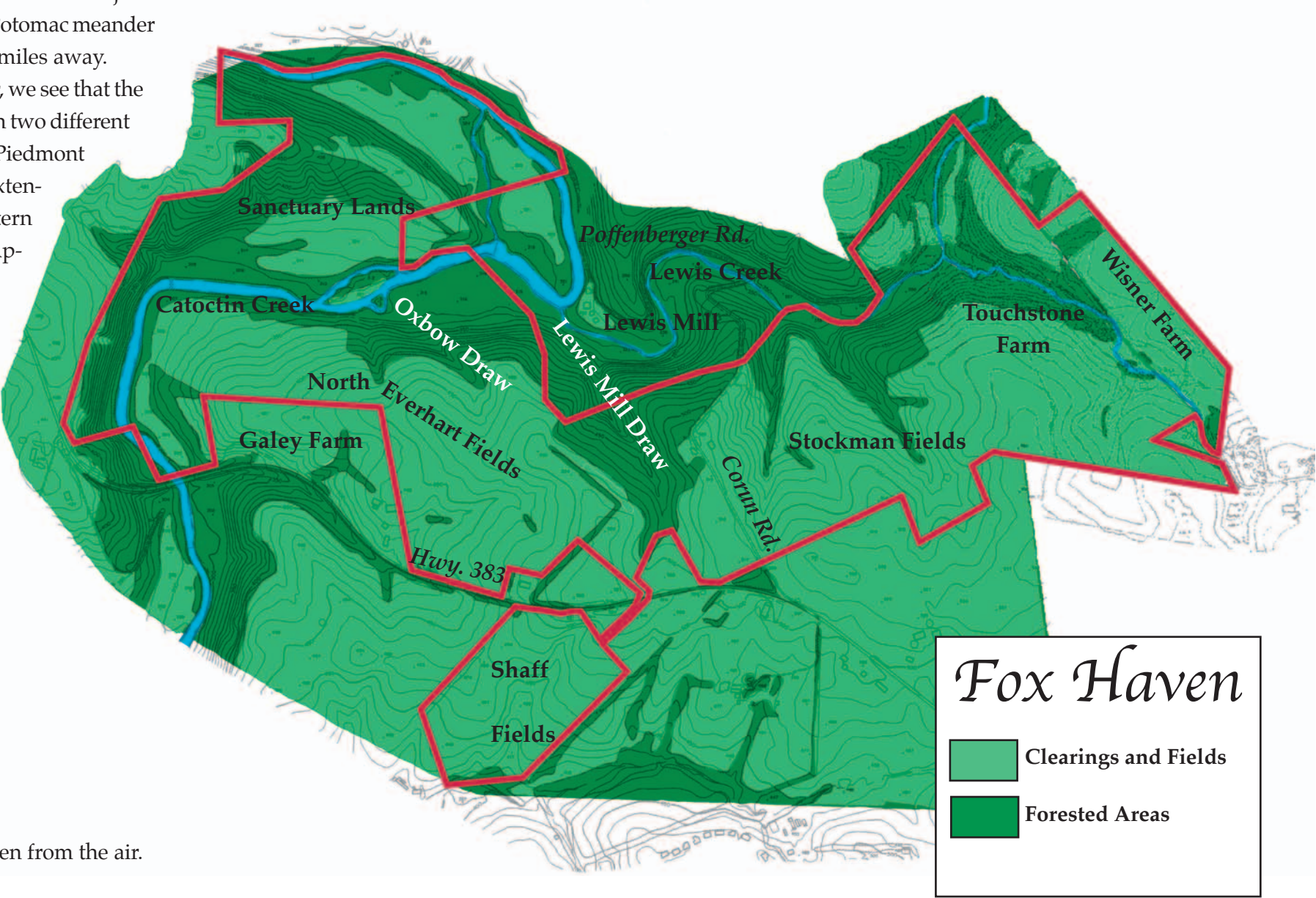
Rising even higher, and looking more broadly, we would see Catoctin Creek flow into the Potomac River



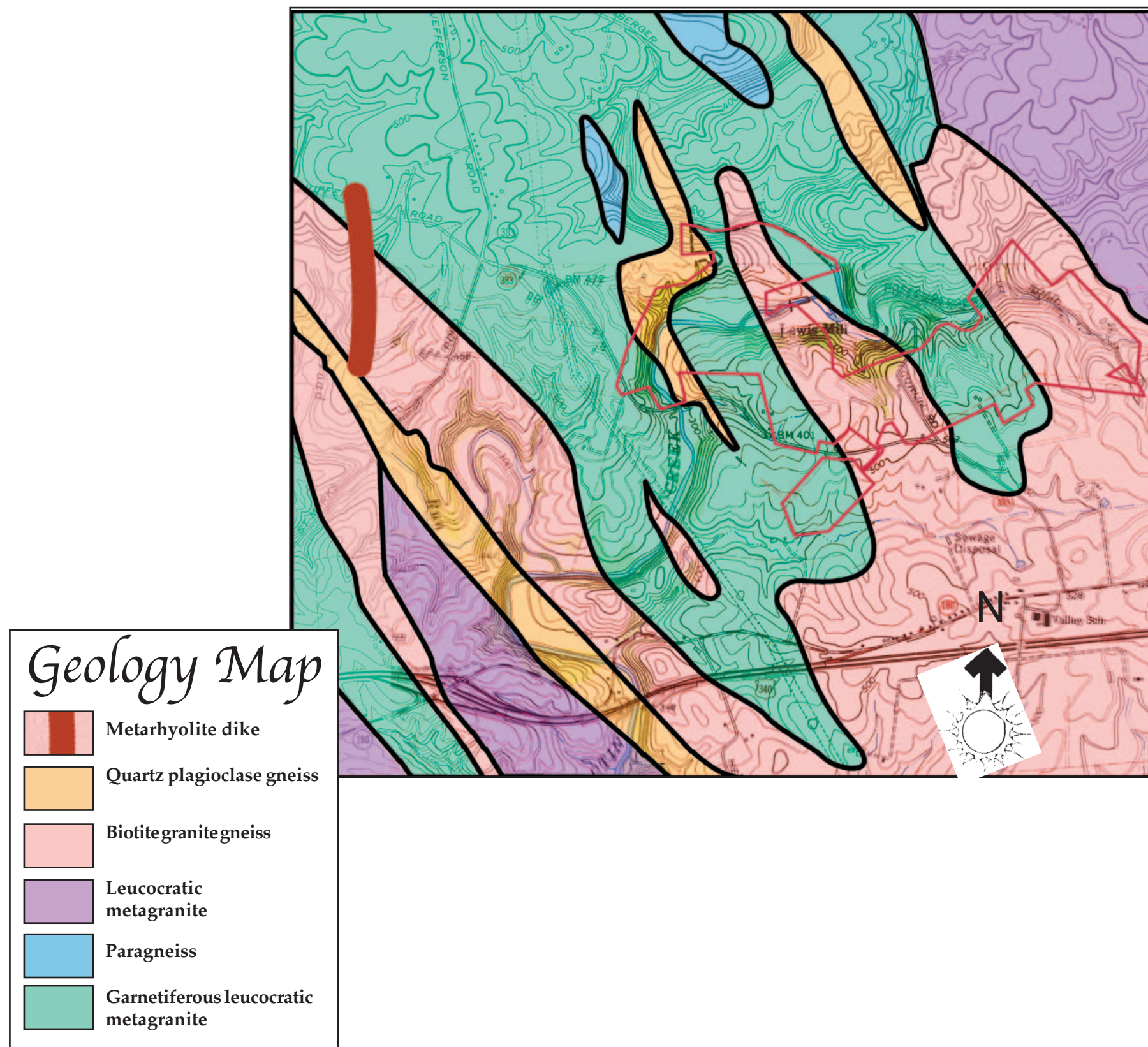
four miles south of Fox Haven, like a branch of a tree joining a larger branch. We would see the Potomac meander its way to Chesapeake Bay some 135 miles away.

And if we draw back even farther, we see that the Catoctin Valley lies at the edge between two different areas: the more populated coastal and Piedmont plain region, and a chain of the most extensive, intact wilderness areas in the eastern United States, a chain linked by the Appalachian Trail.

I exist within a nested web of being. I am a holon: simultaneously whole unto myself and a part of other living wholes. Long ago, people named this place Catoctin—“Land of Abundant Wildlife.” I am a part of Catoctin, as many other beings are a part of me.



Looking west toward Fox Haven from the air.



Above: A diving rock of Biotite granite gneiss juts out over Catoclin Creek.

Left: Quartz plagioclase gneiss forms the walls of the Everhardt Rock Shelter in the slopes of the Sanctuary Lands.

Very Old Bones

The bedrock under Fox Haven, exposed in rock outcroppings on the steeper slopes above Catoctin Creek, was formed almost a billion years ago, long before the present shape and form of Fox Haven emerged out of the turbulent collisions and upheavals of geologic time.

The form of the surrounding watershed tells a story going back millions of years to the birth of this continent. Three hundred plus million years ago, Africa slammed into North America, just east of what is now Fox Haven, forming a supercontinent called Pangea. The force of this collision threw up a massive range of mountains more than 20,000 feet high. These mountains have eroded into the Ridge and Valley region northwest of Fox Haven, and the Blue Ridge Province that embraces Fox Haven. A rainbow-shaped fold in the earth's crust, part of this mountain building, eroded into the arc of South Mountain and Catoctin Ridge that now defines the Catoctin Valley. Originally, this fold was topped with limestone sediments that were formed previously under the ocean before the two continents collided.

Starting around 200 million years ago, Africa pulled away from North America, creating a rift. Cracks appeared in the earth's crust and magma flowed through them to the surface, covering the limestone with a sheet of basalt. Then, sediment from erosion of the high mountains to the west was deposited over the basalt layer, and it metamorphosed into metabasalt.

Over many, many years, the crest of the rainbow-shaped fold (sediment, basalt, and then limestone) eroded away, eventually forming a portion of the Piedmont plain south and east of Catoctin Valley. Water flowed off of the fold in several directions; erosion of the softer layers created gaps in the ridges that became significant to the movement of people through the area.

My body rests upon ancient bedrock bones, and my flesh, worn from those bones, covers itself with trees. I am a complex forest—this is my natural self-expression.

The long-term nature of the erosion created the gentle grade of the streambed and the meandering form of Catoctin Creek.

Eventually, only the ends of the fold remained: South Mountain and the Blue Ridge in the west, and Catoctin Ridge in the east. These rims of Catoctin Valley, and the ridges farther west, are remnants—mere roots of the giant structures that once were.

Erosion cut all the way down to the basement rocks of the formation, the granite-gneiss formations that underlie the site today. These formations have weathered to form the acid soils of this place, best suited for growing trees. For the most part, the limestone washed to the south and east, into the Piedmont plain and onto the continental shelf. Metabasalt is still present on the tops of the ridges rimming the valley. Where basalt flowed through cracks to the surface many millions of years ago, metarhyolite dikes remain today. This metarhyolite was the main material used for projectile points and knives by indigenous cultures.

Garnetiferous leucocratic metagranite found in an abandoned quarry on the east-facing steep slopes above Catoctin Creek.



Garden-Like Lands

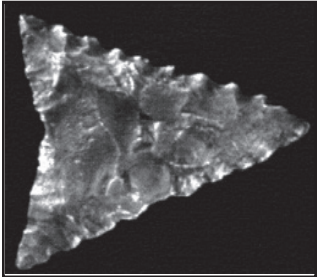
The first European travelers in the New World painted a picture of a highly productive perennial agriculture created by indigenous people—a forest of food for humans and wildlife. The chronicler of one early explorer noted that his expedition “journeyed a full league in garden-like lands where there were many trees, both those which bore fruit and others; and among these trees one could travel on horseback without any difficulty, for they were so far apart that they appeared to have been planted.” (It is likely that some had been planted.) One of the first settlers in southeastern Pennsylvania reported that one “could have driven a horse and cart. . . in almost any direction through the forest without meeting any obstruction.” William Penn detailed the variety of foods available in this perennial agriculture: “The fruits that I find in the woods are the white and black mulberry, chestnut, walnut, plums, strawberries, cranberries, hurtleberries, and grapes of divers sorts . . . Here are also peaches very good, and in great quantities, not an Indian plantation without them.”

These “garden-like lands” were the result of the coevolution of human culture with the forest system. Current thought suggests that rather than being the passive beneficiaries of the slow evolution of the chestnut/oak/hickory forest communities that spread and flourished in the warming climate after the last Ice Age, hunter-gatherers actively participated in the spread and evolution of the forest systems that emerged at this time.

Fire played a particular role in this coevolution of people and forests. As people experimented with fire as a tool for hunting, they discovered other benefits. Cool ground fires:

- Opened up undergrowth in uncleared areas, which made hunting, shooting, and stalking of animals easier, and provided a clear field of vision around villages and the defensive positions near villages.
- Created clearings that produced more edge between forest and open areas. This increased mast (nut production), browse, and grazing for game animals. It favored edge-loving species such as berries, nuts, and herbaceous plants that fed people and wildlife.
- Favored the germination and spread of nut-bearing fire-dependent species like oak, hickory, and chestnuts, and discouraged the growth of the less productive thin-barked elements of the climax phase of succession, such as beech and maples.

Hunter-gatherers deliberately set cool ground fires, eventually using fire in a sophisticated way as a management tool. By encouraging the mid-range successional plants (rich in fruit, nuts, and food for people and wildlife) and allowing them to mature, and by increasing edge between different-aged stands and occasional glades, these people created extremely robust stands of ‘food forest’. They planted favored fruit and nut species in these managed areas and also transplanted medicinal



An Susquehannock arrowhead and a pestle used for grinding nuts represent evolution in hunting and gathering technology that developed with increasingly sophisticated forest management

and ceremonial plants close to their villages. These practices, combined with the practice of moving villages periodically, were probably responsible for minor changes in forest composition.

Under the pressure of growing European settlement, tribes were forced to abandon these forest gardens and move to new territory. As well as the more recently inhabited forest gardens described earlier, settlers also found areas that had not been inhabited for some time, where the forest had reverted to doghair tree growth: “The forest is so thick that the tree trunks almost touch. . .” and they wrote of areas “unuseful and troublesome to travel through. . .because it rents and tears the cloths of them that pass.” Without the sophisticated management of earlier inhabitants, the forests returned to a less productive state.



Oaks, hickories, and formerly chestnuts, provide mast—a nut crop that fed wildlife and people.

The entrance to Everhart Rock Shelter, located in the rock outcrops above Catoctin Creek. Archeological excavation revealed that the shelter was used for approximately eight thousand years, probably as a hunting and traveling shelter.



Coevolution Weaves the Web

The wooded slopes of Fox Haven are covered by a young forest: the remnant of the web of life that evolved at the end of two successive ages of glaciation. At any given point in time, this system expressed itself in a way that fit within the constraints of climate. In this region of abundant rainfall, the expression resonant with climate was a complex forest system. Forest acted as a kind of sponge that held available resources in the dynamic suspension, allowing growth and evolution to occur without loss.

This forest system is not limited to plants—it includes the large and small creatures living in soil; the plants we see above ground, and the fauna that act as mobile messengers, transporting genetic material to each new edge of the system, increasing its breadth and reach.

Perhaps as early as 10,000 years ago, but certainly by 8,000 years ago—a mere instant in geological time—a new mobile messenger entered this dynamic evolutionary dance, taking a crucial role in the evolution of this forest system. These first human inhabitants lived in small, mobile groups, hunting and gathering the cold-adapted animals and vegetation including now-extinct mammoth and prehistoric bison. They concentrated in major drainages, upland bogs, and swampy floodplains, probably moving seasonally in response to available foods. They quarried rhyolite outcrops north of Fox Haven for raw material for their projectile points.

Over time, people learned to not only use the products of the forest, but to create greater opportunities for plants and animals with their management practices. (See *Garden-Like Lands*, above.) As their sophistication in practices grew, tools and material culture reflected the new bounty. Diverse tools for hunting, gathering and

processing food evolved.

Eventually, trade routes to the west introduced corn, bean, and squash seed and hunter-gatherers developed annual agricultural practices. Although constituting only 20% of the food supply, annual crops provided depth and resilience in food reserves that allowed populations to grow and become increasingly sedentary. By the 1600s, many tribes lived in large, semipermanent villages. Remains of such villages have been found along the Potomac.

These villages were often associated with peripheral small camps and rock shelters such as the Everhardt rock shelter on the west end of the Fox Haven property. Artifacts excavated from the floor throughout the cave testify to its use as a hunting shelter, or a traveling shelter, from 8000 years ago through approximately the 1600s. The presence of artifacts from the Tidewater region of the lower Potomac is thought to indicate that this was a stopping point for coastal cultures journeying considerable distances inland, perhaps to visit the quarries north of Fox Haven. Bones found in the cave give a portrait of the wildlife present at that time: bear, beaver, bobcat, cougar, chipmunk, deer, Indian dog, fox, groundhog, muskrat, opossum, rabbit, raccoon, skunk, squirrel, turkey, turtle, and woodrat, with a majority of bones from white-tailed deer.

There was a time when the tissue of soil and plants over my bones was thick, rich, and resilient. People appreciated my wild nature. They gave me the gift of renewing fire, encouraging my fullest expression. In return, I gave them abundance: nuts and berries, and animals. We nourished each other.

With the arrival of colonists, the rich hunting grounds in the Catoctin Valley became contested territory as pressure from the rapidly growing colonies and the devastating impact of disease destabilized tribal patterns, creating a changing palette of tribal territories, alliances, and animosities. By 1732, in the face of increasing pressure from growing colonies, the Susquehannock

people left the land from Chesapeake Bay to the Allegheny Mountains; by the time the first pioneering settlers arrived in Catoctin Valley they found an uninhabited area.

The Mighty Chestnut

The mighty chestnut was a keystone species in the chestnut/oak/hickory forest of the past. Nuts from chestnut—and to some extent oak and hickory—trees were the equivalent of modern-day grain crops: an easily stored, highly palatable source of starchy food. What made the chestnut so significant was its enormous size, and consequently, enormous productivity. Ecologist Tom Wessels paints a vivid portrait of the massive size of chestnuts: “I came across what was once a mature stand of American chestnut. . . . The chestnut trunks averaged seven to eight feet in diameter and ran for more than eighty feet on the ground. . . . All about the downed chestnuts grew a forest of oaks averaging two to three feet in diameter. . . . a majestic oak forest. . . seemed a sorry replacement for the once grand chestnuts that lay on the ground.”

To get some idea of the productivity of this type of system, imagine these enormous trees, alive and standing, bearing their annual nut crop. Perhaps one in ten thousand chestnuts would sprout; the rest would have fed other living things, including people.

All mature chestnuts in North America were lost by the 1950s, after the introduction of chestnut blight from a botanical specimen in the early 1900s. Blight-resistant chestnuts are in the process of being developed.

The Turbulent Years

The Church of the Brethren played a major role in the settlement of Catoctin Valley. This church formed in Germany in 1708 as a small group of dissenters from the state Lutheran church. The Brethren's practice of nonviolence and refusal to cooperate with war or pay war taxes brought them into conflict with authorities. Experiencing persecution in Germany, many from the group emigrated to America. They initially settled in Pennsylvania, and some later moved on to Maryland and Virginia, looking for new land.

In 1744, Daniel Boone (whose father had converted to the Brethren from the Quaker Church in 1734) joined Henry Roth, Sr., a friend of his father's living near Burkittsville. Church records indicate that Daniel Boone joined him in trapping beaver on Catoctin Creek. Apparently, the Fox Haven area was a rich hunting ground on the outskirts of settlement at this time, just as it had been to indigenous people earlier.

Many settlers fled to safer areas during the French and Indian War, beginning in 1755, as Indians raided along the frontier. Denser settlement in the Catoctin Valley began after the French and Indian War, reflected in the construction of saw and grist mills in the area—one of which was the mill on Catoctin Creek, later called Lewis Mill, in approximately 1764.

The Revolutionary War was a turbulent period for members of dissenting religions such as the Brethren, Mennonites, and Quakers. Daniel Miller, who appears to have owned the saw and grist mill now known as Lewis Mill, was a newly appointed minister in the Brethren church at this time. The Brethren opposed slavery as well as participation in warfare, and Daniel Miller was likely one of the church leaders who

bought slaves at auction and freed them—making them highly unpopular with slave owners of the time. Additionally, Brethren refused to become soldiers or pay war taxes during the war. In the wartime hysteria that developed, some paid a high price for this unpopular stand.

In 1781, Peter Suman, a relative of Daniel Miller's, paid the highest price of all. One of seven men accused of treason and collaboration with the British by a court of the Continental Congress, Suman and the others were sentenced to death—by hanging, beheading, drawing and quartering. Attempts to moderate the sentence failed. A group of three, including Suman, was executed as prescribed by the court, and their heads were hung over the gates of Frederick. It is said that the two thousand witnesses of the executions were so appalled by their brutality that they appealed

to the authorities to rescind the sentences of the remaining four men, which was done. Peter Suman was unlucky enough to have been chosen to be in the first group. At some peril to himself, a friend of Peter Suman's from Burkittsville obtained his mutilated body and buried it in an unmarked grave.

During this turbulent time, many Brethren had their properties confiscated by the Continental Congress. Daniel Miller was probably one of these. Records show that a Daniel Miller was buying land in the Shenandoah Valley of Virginia in 1778, after Miller's land in Catoctin Valley was confiscated. After the war, many records of these incidents were destroyed, as well as deeds relating to confiscated lands, making definitive statements about land ownership during this period difficult.



An aerial view of Lewis Mill, at the confluence of Lewis Creek and Catoctin Creek. The mill served neighboring farms as a grist mill and saw mill until the early 1900s.



Surveyor's stone on current property line reading "A.R. A.H. 1766" corresponds to the year of Daniel Miller's purchase of the property containing the saw and grist mill.



A grinding stone from Lewis Mill.

The Web Unravels

As Europeans settled in the coastal areas, the hardiest of them ventured further west. Trappers, traders, missionaries, and explorers followed Indian trails to the mountainous areas west of the Piedmont plain. The Monocacy Road was an early and important accessway to points west, and it is not surprising that the town of Jefferson began as ‘Traptown’, or ‘Newtown Trap’, a play on words that referred not only to the trapping activity in the region, but also to the taverns at each end of town. At this time, Catoctin Valley was still a semi-wild outback area.

The first stirrings of the agricultural era to come began in the 1730s. Lord Baltimore encouraged settlement by offering up to 200 acres to settlers, uncontested and free for the first three years, with minimal rents thereafter. These large tracts of land were often granted to English colonists, and subsequently subdivided and sold to other settlers. By 1739, the land that is now Fox Haven lay within a land grant called Anchor and Hope, made to Roger Touchstone, a Monocacy Valley landowner.

The initial focus of settlement in the region of Fox Haven was in the Burkittsville and Broad Run area, near the junction of two major Indian trails. One group of several families settled in the Broad Run area in the 1730s rather than continuing with the rest of their party to the Shenandoah Valley. They were followed by another group, and by 1744 several dozen families were scattered over the Broad Run section of the lower Catoctin Valley. These early settlers were part of a group of dissenters from the Lutheran church, popularly called “Dunkers” (for their practice of full-immersion baptism), but properly known as the Church of the Brethren. (See *The Turbulent Years*, above.)

After the turmoil of the French and Indian War and the Revolutionary War, many Brethren remained in the

Catoctin Valley. Church records state that other settlers with more money could afford to buy the more productive tracts of land with limestone soils in adjoining valleys; the Brethren had little funds, and tended to buy the less productive land with acid soils in Catoctin Valley. After this turbulent early period in its history, the Fox Haven area settled into a relatively uneventful period as a farming community.

From the time it was first settled, Fox Haven was likely logged three or four times. Much of Fox Haven appears to have been logged approximately 90 years ago; the most recent logging appears to have occurred below Stockman Fields 30 to 40 years ago. Only the trees in areas too steep to reach, or along fencelines, were spared, and some of the oldest trees on the property occur in these areas. After logging, bare slopes were likely used as pasture; farming was likely limited to the flattest



Later, others came. When these people met me, they saw me as a savage to be tamed. They did not know that I could nourish them in my fullest expression, or that they could nourish me in return. I lost much of my tissue—plants, wildlife, and soil—in a very short time, over and over again.

areas with the deepest, richest soils. Farming was inherently limited by the acid character of the soils in the area, requiring amendments to be productive.

Each time Fox Haven was logged, the ‘sponge’—the interconnected web of soil life, plants, and animals—was torn. In effect, much of the tissue of its body was removed. The greatest impact occurred in the areas that were plowed and farmed; pastured areas had the advantage of a more continuous plant cover. Because this ‘sponge’ held resources in dynamic suspension, when it lost its integrity the body of Fox Haven began to lose resources. Nutrients, water and soil flowed downstream, off the land.



Left: Cleared fields: a view over the Stockman Lands.

Top right: Remnants of American wire, used in earlier times to confine valuable dairy cows or sheep.

Bottom right: Barbed wire, used more recently to confine beef cattle.

Erosion Can Be Like a Wasting Illness. . .

Fox Haven contains several areas that are actively eroding. The soil between watercourses is like the flesh between blood vessels, and plants act as a protective skin covering this flesh. This tissue of soil/plant communities acts like a gigantic sponge that absorbs rainfall. When plant cover is removed, the sponge-like capacity of the tissue between watercourses is greatly reduced. Water that cannot be absorbed flows downhill, concentrating in larger and larger watercourses until it reaches the main artery running through Fox Haven, Catoctin Creek. As it flows, it initially floats away exposed fine particles. As the velocity and force of runoff increases, coarser and coarser particles wash away.

Erosion can be like a wasting illness, ever running downhill, growing like a snowball, as it undermines the very plants that might stop it. As erosion disintegrates the remain-

ing sponge, its absorbency and fertility decrease, and it takes less and less rainfall to overwhelm its capacity. Even more water flows away. Lower in the drainage pattern where the vessels are bigger, runoff from the smaller capillaries above comes together in greater amounts. In the steeper draws, water flows downward much more quickly. The faster it flows, the more destructive power it wields—power to tear at the roots of plants trying to establish themselves, power to tear more soil away.

When the rate of soil removal exceeds the rate at which soil is created, there is a net loss of soil. The average rate of soil loss under conventional agricultural practice is conservatively estimated at six to eight tons per acre per year, nationally. Soil building under the best organic farming practices approaches a gain of two tons per acre per year in flat land conditions. A healthy and mature forest situation probably quadruples that rate of



Erosion exposes roots along Lewis Mill Draw.



Runoff removes exposed soil particles in Shaff Fields, exposing bedrock.



A nickpoint at the top of Oxbow Draw (see map pg. 19) occurs where runoff concentrates and moves more rapidly down the steeper slope.



Erosion progresses: A deep cut midway down Oxbow Draw (see map pg. 19) has been used as a dump by previous



Catoctin Creek runs brown after even a modest rain event.

This type of relationship with people—one in which the activities of people continually extracted resources from the land—left it in a degraded state. However, while the whole of the site is considerably degraded from the “Land of Abundant Wildlife” the original settlers found, its outlying nature and marginal character as farmland protected it from the kind of severe degradation that can occur after intensive commercial farming over many years.

The current condition of the farm fields within Fox Haven is a product of the inherent nature of the soils in any given area, combined with the kind of treatment the area received during the time it was farmed. While none of the soils found on the site inherently support

annual agriculture (they all require amendment to raise their pH to a level suitable for annual plants), those in the North Everhart Fields, Shaff Fields, the uplands of Stockman Fields and Touchstone, behind the Touchstone house, much of the Wisner farm, and the Touchstone fields along Lewis Creek are the more desirable agricultural soils.

In certain areas of the farm fields, slopes greater than 8 percent have been cultivated and farmed: most of Stockman Fields, much of Shaff Fields, and approximately one third of the area of North Lewis Fields. On slopes steeper than 8 percent, runoff encountering unprotected soil will inevitably have enough force to dislodge soil particles, humus, organic matter, and the soil’s enliven-

ing communities.

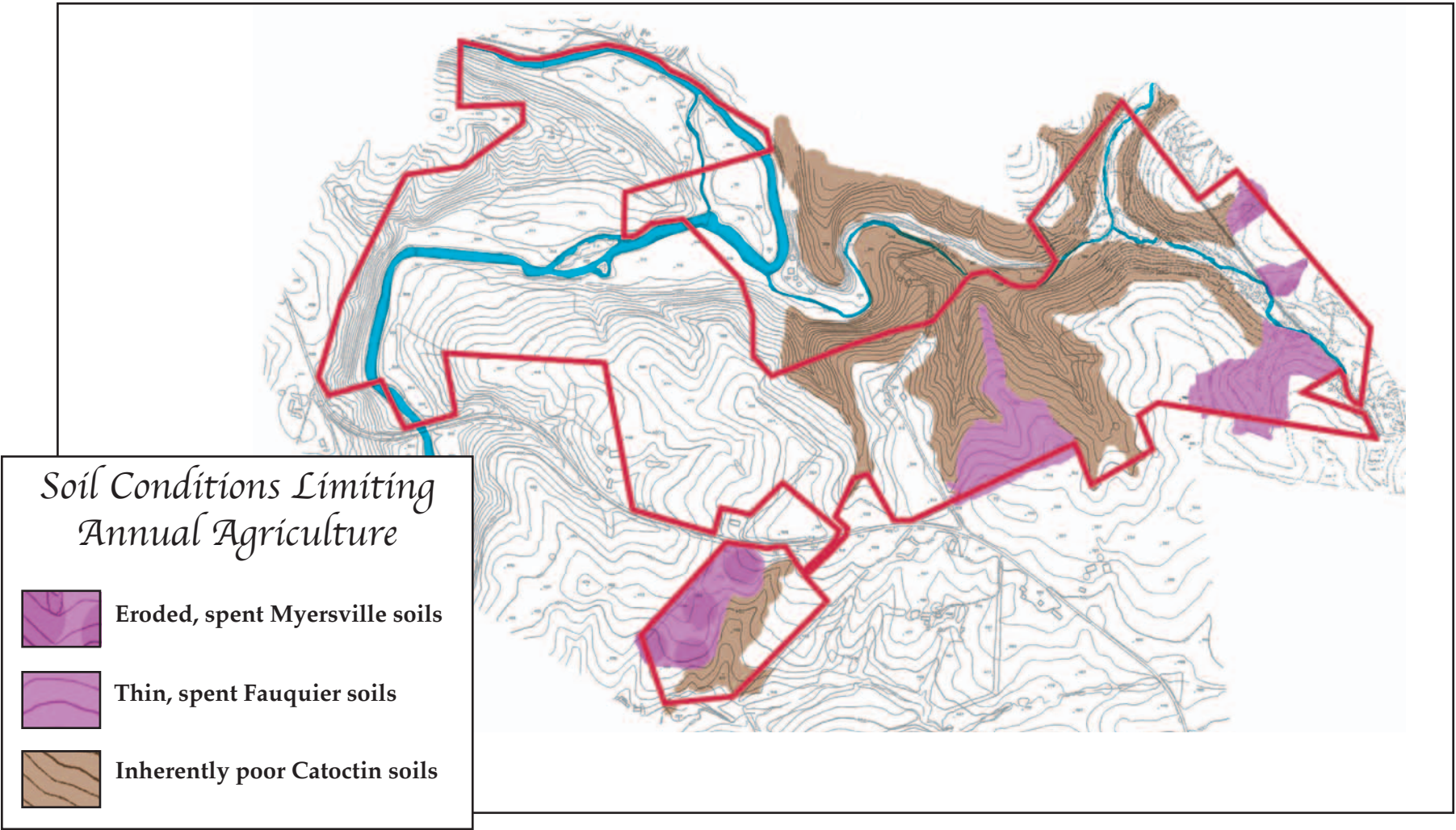
Of all the agricultural fields, North Everhart Fields have retained some of the best soils, partly because they were not farmed as intensively in recent history, and partly because they contains more flat areas of less than 8 percent slope. The same is true for much of the Wisner and Touchstone Farms.

Stockman Fields, on the east end of the property, was used primarily for pasture and haying. The soils at the top of the property are compacted and severely eroded, and although they would be some of the most productive on the property by nature, are now some of the poorer soils on Fox Haven. In contrast, the upperfields at Touchstone, while used in a similar way

have maintained better soils. They are somewhat flatter and have had contour swales and fences installed. The steeper slopes and draws in both Stockman and Touchstone are problematic. Because of it’s steep nature erosion is a serious problem on the Touch-

stone Farm. The watercourses are all deeply incised and the steep fields along the creek are highly susceptible to erosion. There is some serious erosion south of the creek where a poorly built contour swale meets a draw. The worst erosion on the Wisner Farm is along the creek below the driveway crossing. Concrete waste has been used to try to fix this problem. The two gullies running toward the road (in pink on the map) have also been repaired using concrete. The soils in the bottoms of the draws are suited only for trees by nature.

Ultimately, erosion deposits soil particles in Catoc-tin and Lewis Creeks. The soil becomes a pollutant in the creek, lowering oxygen levels and limiting aquatic life to creatures that can survive in a low-oxygen environment. This is a watershed-wide phenomenon, with the extensive denuded areas in the watershed above Fox Haven contributing much more greatly to the problem than Fox Haven itself.



Looking west toward South Mountain and the Blue Range beyond, across North Lewis Fields. Soils here are in better condition than those of other fields within Fox Haven.



The Dynamic Dance of Succession

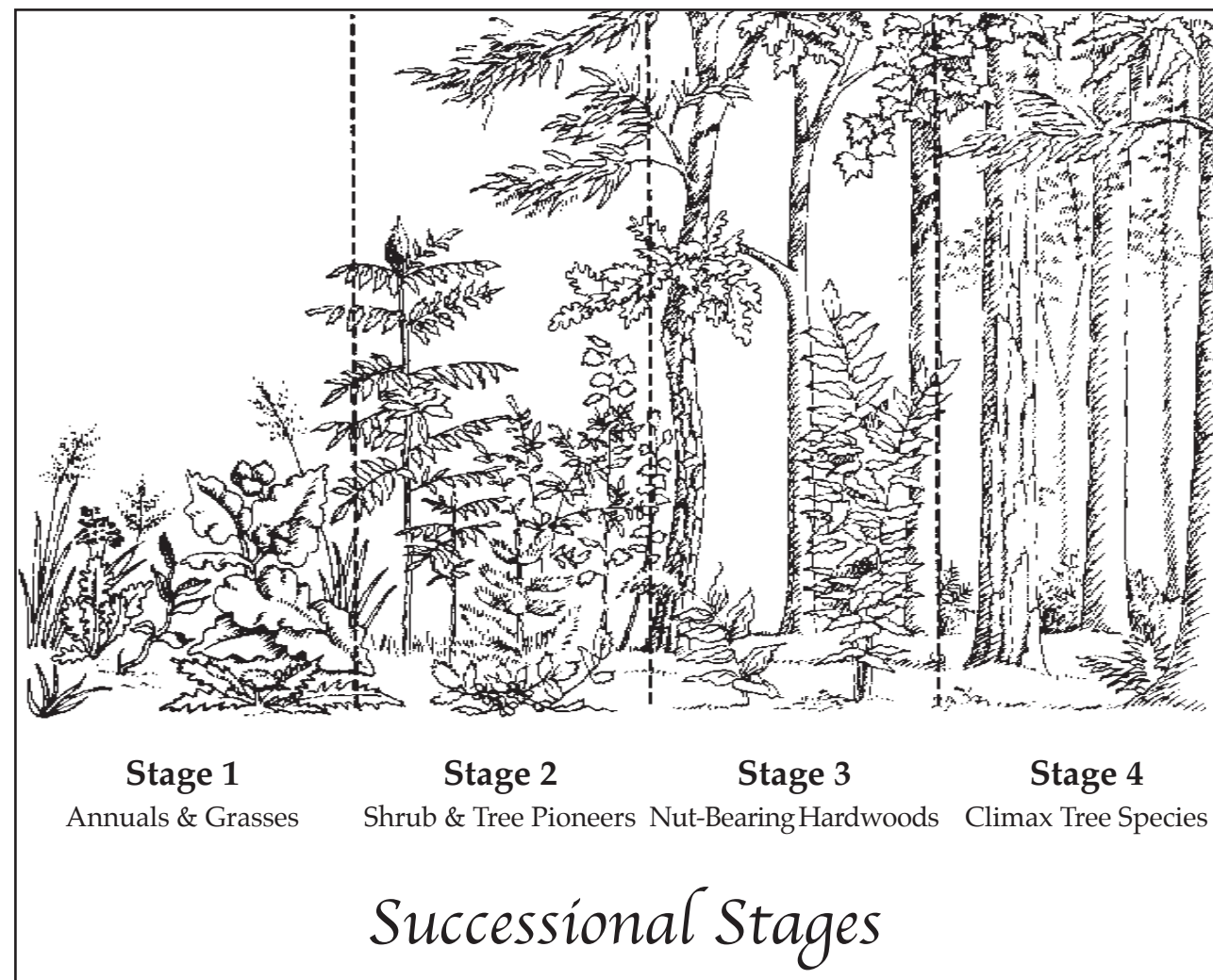
Life organizes itself effortlessly, as each entity expresses its nature. For example, a bird eats a berry from the sunny forest edge and flies off. It deposits the seed from the berry in a clearing, neatly packaged in guano. Where the seed finds a sheltering dip in the land, favorable soil conditions, and protection from marauders, it grows into another berry bush. The bush pulls things out of the whirl of life around it: its branches catch seed and detritus blowing in the wind or riding on the flow of water; a bird from over the next ridge lands in it, eats berries, and deposits seed packages from its last meal. The bush incorporates the minerals in the soil into its tissue and then sheds them onto the ground below, where soil life makes them available to nourish other plants. In this way, a guild of plants, animals, and insects assembles itself in the shade and stillness and richer soil of the pioneer, drawn together by their innate ability to nurture and be nurtured by each other.

Guilds coexist in communities. Communities reflect the different qualities of place that support them: some like the cool moist places in the draws and along the creek, others prefer the warmer, drier sunny slopes.

Communities also express stages in the evolutionary process of the ecosystem. This evolutionary process is called succession. Each expression of the ecosystem responds to the environment created by the previous stage of succession, and each stage of

succession creates the ideal conditions for the next expression of the ecosystem, in an orderly progression from grasses and annuals, to pioneering trees and shrubs, to nut-bearing hardwood trees, to climax tree species. The system rolls through these stages like waves in time. And, always, the edge advances, pulled forward

by the vacuum of cleared ground—whether cleared by catastrophic events like fire or flood, or by the handiwork of man. Life continually springs forth, recklessly abundant and vibrant, until the end of the cycle creates new opportunities.



A pioneering poplar competing with a pioneering cedar. The poplar is thriving and the cedar is waning. Eventually, the poplar will be succeeded by Stage 3 trees such as oaks and hickories, or, potentially, chestnuts.

Turning Point

Fox Haven reached a turning point in its history in 1980, when it was purchased with the intention of protecting it from development, conserving its resources, and repairing damage. Stockman Fields and the Shaff lands were purchased later with the same intent. The Renderle farm, now called Touchstone, was added in 2001, and the Wisner farm in 2003.

Since the original purchase, the wooded slopes have been undisturbed. A Forest Stewardship Plan has been started: extensive bands of trees for soil and water conservation, as well as wildlife and forest conservation, have been planted. During this time, farming has continued in North Everhart Fields, with an increasing emphasis on organic methods and soil conservation. More recently, experiments with keyline plowing and sheet mulching have been performed.

The northwest side of Catoctin Creek has been treated as a sanctuary for wildlife and people. A farm field within this area has been planted to summer grasses, with the intention of providing nesting sites for birds and fawning sites for deer.

The study of Fox Haven’s potential continues. As well as the information developed in this booklet, an inventory of flora and fauna is being conducted, including native plant identification, and bird counts. This booklet provides a foundation for a new phase of work that will enfold the work on conserving, protecting and restoring the land that has gone before into a regenerative relationship with Fox Haven.

Fox Haven possesses inherent characteristics that give it exciting potential for this type of relationship. Its complex topography, combined with diverse levels of soil moisture from relatively dry to moist, offers a wide diversity of microclimates—small areas of different

climate than the whole. This gives the potential for rich forest expression.

As a result, the existing forest cover is diverse in species. We see different plant communities adapted to different conditions—some to the sunny exposed slopes, others to the cool, moist draws, and still others to the wetter areas at the creek margins. For example, on the riparian flats east of the oxbow, we find dominant species that are much less prominent on the other bank, such as river birch, paw paw, and osage orange. The floodplain is a cooler, wetter microclimate than much of Fox Haven. These flats were deposited by the creek within the last hundred years, so it’s likely that the species here are pioneers in this microclimate. This is an example of the kind of diversity that microclimate enables.

Fox Haven contains representations of all the life stages in the succession process, from pioneers to climax species. These expressions interact with microclimate to produce a mosaic of life expressions.

Fox Haven also contains some diversity in the age of the species within its wooded areas. This is largely due to a random pattern of clear cut harvest of timber that has created many patches of relatively uniform age that date to different harvest events. In general, the average age of the oldest patches is approximately 90 years.

My tissue always springs back. I am transformation. I unfold myself in every moment, each creation transcending a previous destruction. My slopes give a glimpse of how magnificently diverse I can be. I cover myself with individuals within families, within communities—beings within beings nested one inside the other in glorious array.

Older specimens throughout Fox Haven were probably spared because they were not useful or large enough in that particular harvest (like the weak-wooded sycamores) or because they were boundary



Above: Tree roots anchor the bank of Catoctin Creek.



Left: New tree plantings at the shoulder of the landscape will eventually build a living ‘sponge’ in this vulnerable area.

Two Kinds of ‘Edge’

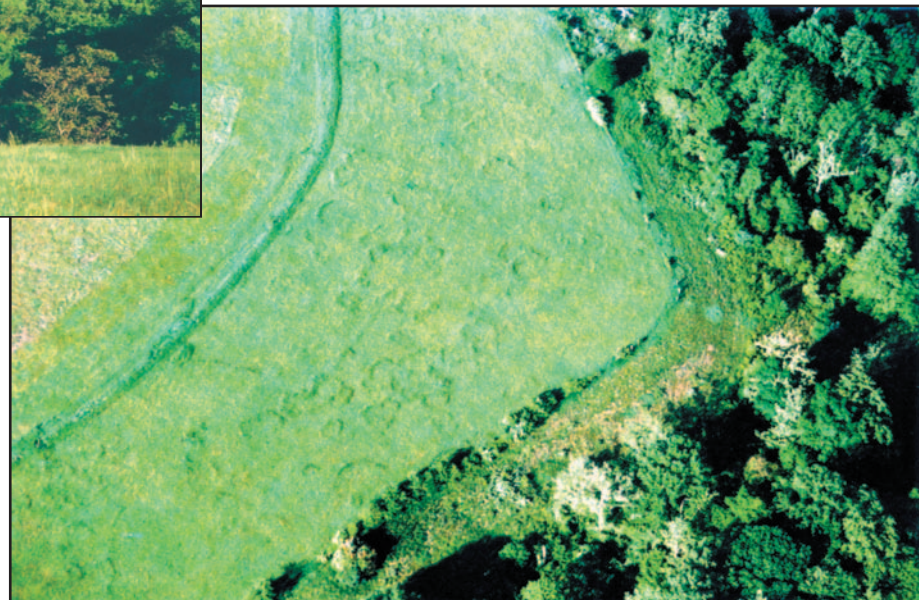
An ‘edge’ is an interface between two kinds of media—for example, the interface between soil and air, between water and soil, or between air and leaf. Edges are significant in regenerative design because life emerges at these interfaces. The more edge is present in a system, the more opportunities exist for the emergence of life.

In assessing Fox Haven’s current state as a forest, we are looking for the presence of two kinds of edge. The first is horizontal edge in Fox Haven’s forest cover: the interface between wooded and cleared areas that occurs on a horizontal plane. These areas would naturally occur through catastrophic events: fire, earthquake, flooding, etc. These edges favor the growth of

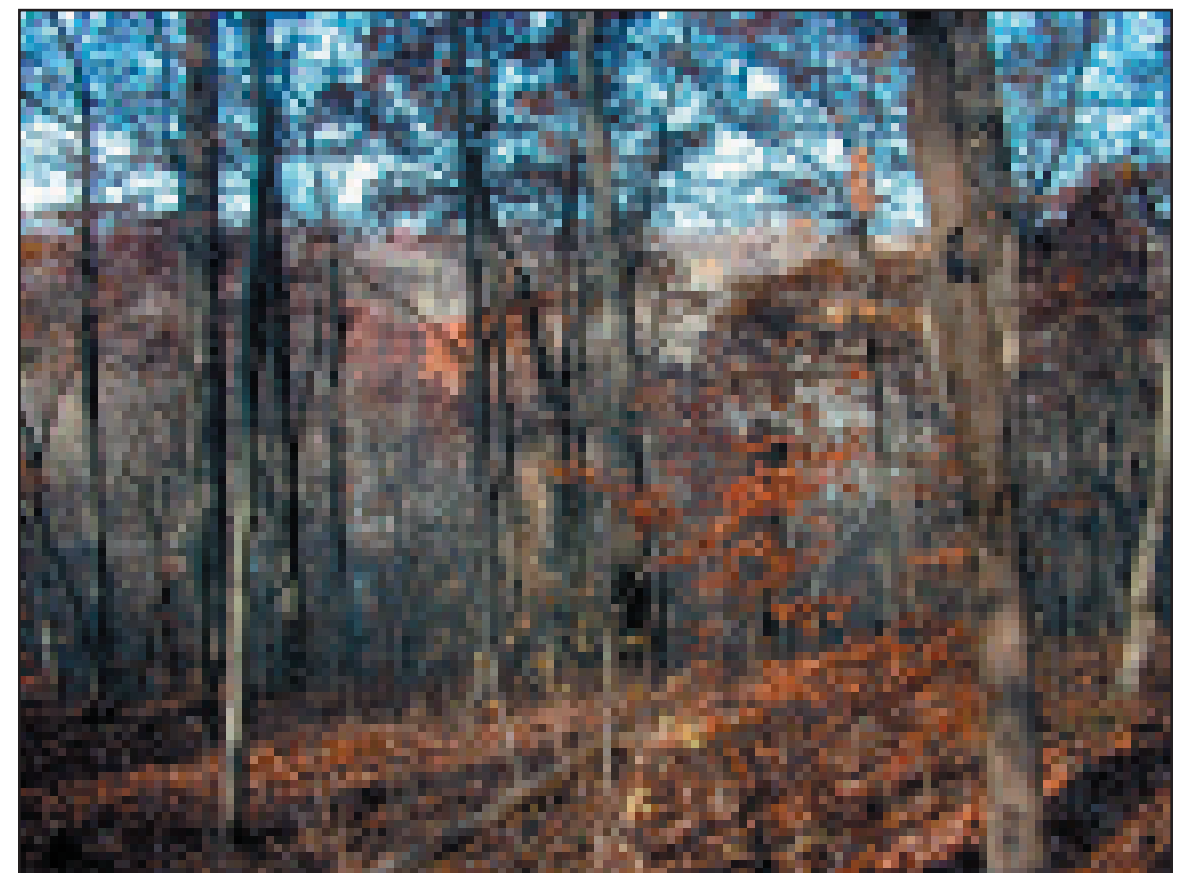
berries and many useful herbs that need some sun to thrive. Fox Haven possesses a great deal of this kind of edge: it occurs at the field margins and at the edge between the creeks and the wooded areas.

Another kind of edge occurs in the vertical plane: the stacked canopy in a mixed-age forest. In this type of system, individuals stack one under the other to form an extremely rich environment with many elements of different heights that coexist in layers. This kind of edge is not as prevalent within Fox Haven, primarily because the forest consists predominately of trees that are fairly young due to past logging and clearing of the site. However, the existing wooded areas offer a tremendous asset in creating greater com-

plexity. As in the early stages of the evolution of chestnut/oak/hickory forest after the ice ages, new elements could be strategically introduced to complement what already exists and to assist the evolution of forest to a richer state far more quickly than would occur without



Above and right:
Examples of horizontal edge, in
perspective and aerial view.



An example of young forest growth in the slopes overlooking Lewis Mill. This young growth is beginning to develop vertical edge.

elements, or even living fence posts.

While relatively diverse in species, and to a lesser extent in age, the wooded slopes and flats of Fox Haven lack the structural and age diversity possible within each individual patch. The existing young forest possesses a fair amount of horizontal edge—that is, interface between cleared areas (such as the upland flats and the riparian banks) and the wooded slopes. However, it possesses little vertical edge—the stacking of multi-age elements seen in healthy, mixed-age forest. This is not unusual today: ancient “patriarchs” or “matriarchs” do not remain in most modern forests.



Without burning as a management tool, rampant undergrowth, including invasive exotics, can strangle the growth of young trees.

The majestic chestnut/oak/hickory forest encountered by European settlers no longer exists, nor do the management practices of the indigenous inhabitants that once held it at such a rich level of nurturance for people and wildlife. We must rely on our imagination to appreciate the difference between the forest of yesteryear and that of today. At one time, the bountiful and useful chestnuts made up fully 25 percent of the forest. The potential of the forest to provide habitat for wildlife and people has diminished considerably since then.

This diminishment has affected habitat for wildlife. Wildlife populations depend on the integrity—that is, the wholeness and completeness — of the vegetative components of forest, and the state of wildlife populations mirrors the state of the vegetative system. While most of the wildlife whose remains were excavated from the Everhart rock shelter are present today, and while Fox Haven’s expression of wildlife and vegetative diversity is far greater than on many surrounding properties, what is missing in the expression of wildlife are animals that need larger expanses of habitat to circulate through on a seasonal basis, such as bison, badgers, and river otters. Large predators such as mountain lion and wolves are missing completely, while others such as bear are rarely seen. The main predators in the area are bobcat and fox, with coyotes coming in to fill the gap left by wolves. The absence of predators has changed population balances. Deer populations have grown as woodland has increased since 1900, and have become a nuisance in some areas.

The state of the whole of the Catoctin Creek watershed explains this. Aerial photographs show that the woodland on the Fox Haven slopes is the most extensive in this part of Catoctin Valley. Most surrounding properties have been cleared for development or agricultural fields, leaving sparse fringes of woodland at field margins. This loss of forest cover affects aquatic life as well. Turbidity and flashiness in the stream adversely affects

aquatic mammals such as river otter and beaver, and many fish and amphibians.

Active management for a full range of forest expression would open new possibilities for plant species and wildlife. Such a plan would enable maximum age and species diversity within each microclimate of Fox Haven. This type of diversity will bring increased stability and resilience to the forest, including wildlife populations.

This type of management could also generate new possibilities for people, possibilities that could be instrumental in the regeneration of the Catoctin Valley. For maximum benefit to the forest system within Fox Haven, this type of management plan would need to find a leverage point for affecting practices within the whole of the watershed. Modeling an economically-viable perennial agriculture within Fox Haven could provide this access to influencing the larger watershed. Farmers will need to see that they can still make a living in order to adopt regenerative practices that will benefit the whole of the valley.



An abandoned bear den near the quarry.



Above: An adolescent fox and kit near their den.



Left: Two curious kits.

Part Three
The Energetic Context

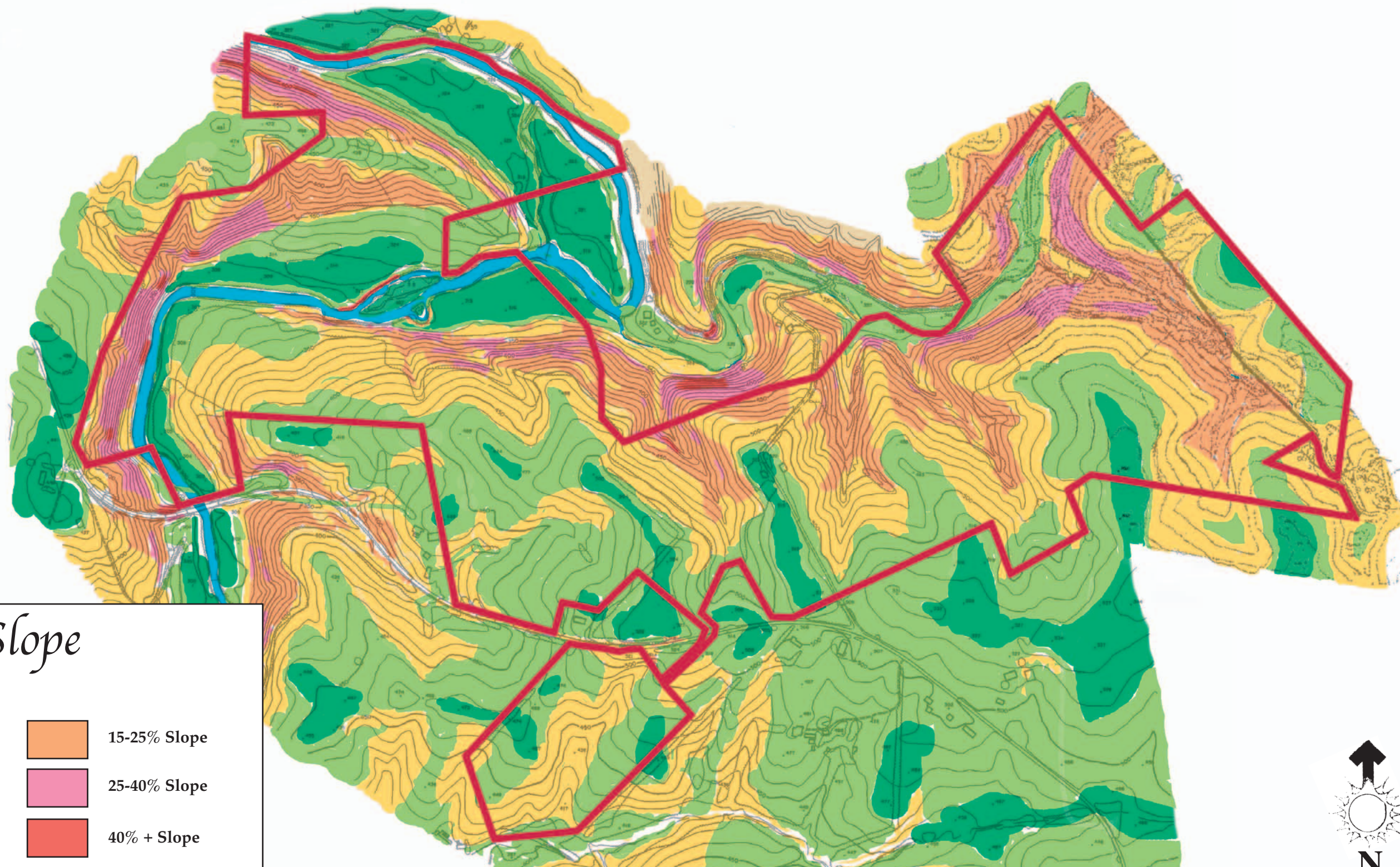


Flows of wind, water and other forces created this dynamic sculpture in the floodplain of Catoctin Creek.

Flows across the landscape...

The larger wholes embracing Fox Haven generate the energies that move over and through it. Water, air, and wind stream through Fox Haven's tissue like blood and breath, enabling exchange and transformation wherever they pass. The sun fuels the metabolic processes of Fox Haven's flesh; fire, like fever, can stimulate or lay waste.

These flows can be seen as an energetic field that forms the context for Fox Haven's life processes. If we are aware of this context, we can place human development so that these energies contribute to us rather than becoming forces that we struggle against. We need 'right relationship' with these forces, otherwise they can present hazards, losses, or even dangers.



Slope

The term ‘slope’ refers to the pattern of change in elevation in a landscape—a pattern that gives the body of a place its unique form. The steepness of slope is often described as the ratio of fall to distance along a given line—a ratio can also be expressed as a percentage. For example, the ratio of one foot of fall along ten feet of distance can be expressed as ‘1:10 slope’ or as ‘10 percent slope’.

Fox Haven contains a broad diversity of expressions of slope. Approximately 60 percent of the land is too steep for sustainable annual agriculture. Plowing in those areas, no matter how carefully done, will inevitably lead to erosion and damage the deeper tissue of the landscape.

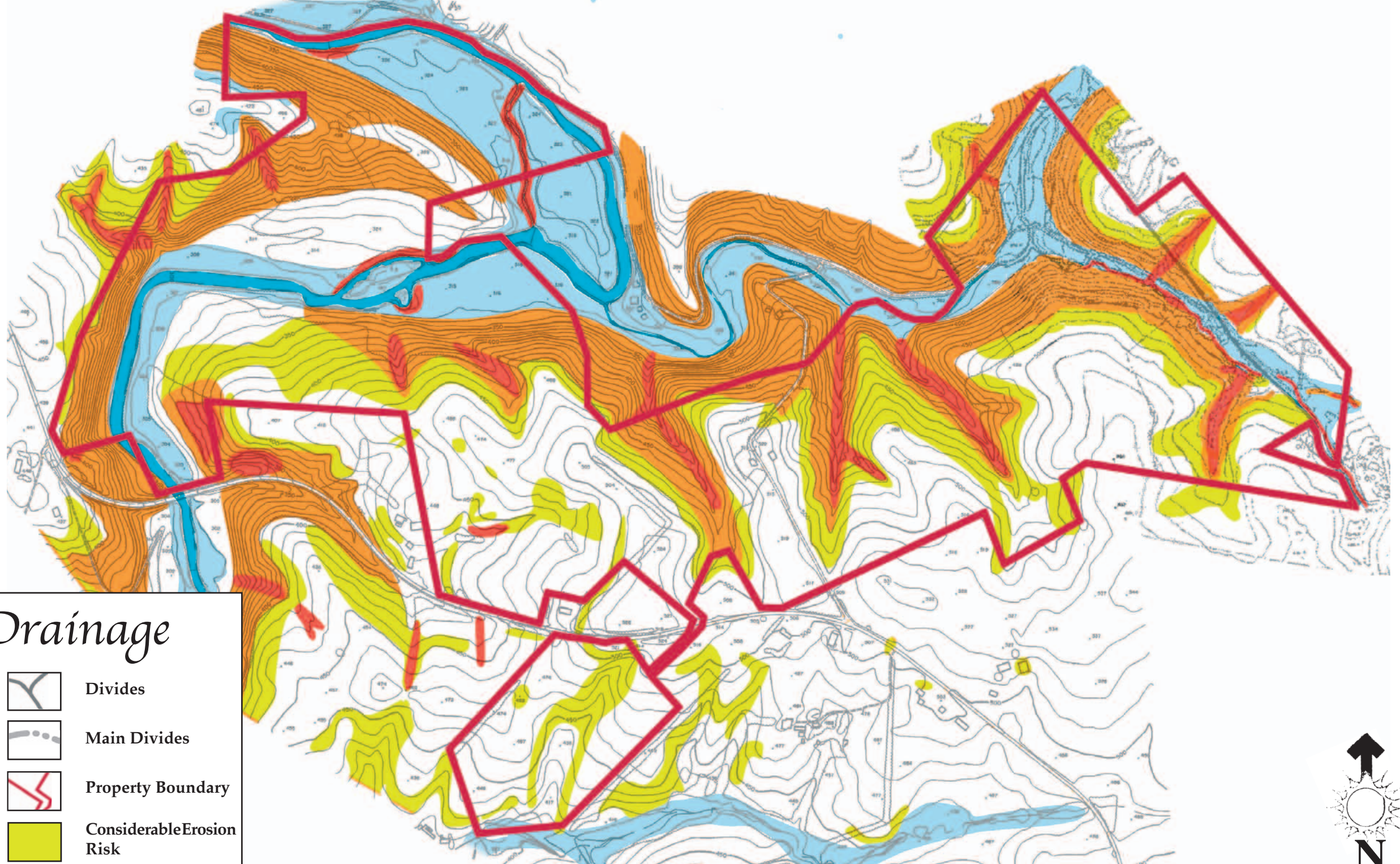
At Fox Haven, awareness of the leverage potential of the shoulder of the landscape is key to managing the tissue of the landscape in a way that allows regeneration to occur. The shoulder of the landform is the place where flatter ridges break into steeper slopes below; it ranges from 8 to 15 percent slope. This is a key ‘edge’—a boundary between two different areas where water behaves very differently. Below this edge, gravity pulls excess water more strongly. It moves here with greater force, comes together in thicker streams, and, in the absence of plant cover, causes damage. Above this edge, any water that the tissue of the landscape does not absorb moves relatively slowly and gently.











Above: Looking over the shoulder of North Everhart Fields toward the diverse slopes of the Sanctuary Lands.



Right: Red arrow indicates the shoulder of the landscape in North



Water Drainage

	Watercourses		Divides
	Approximate Floodplain		Main Divides
	Active Erosion		Property Boundary
	High Erosion Risk		Considerable Erosion Risk

Water Drainage

Fox Haven contains some areas that are vulnerable to serious flooding. The root cause of flooding exists higher in the watershed system, in the degradation of the tissue of the watershed. Because the Catoctin Creek is the lowest point in this system, it accumulates the effects of all the losses above it, whether within Fox Haven or outside its boundaries.

Erosion from agricultural fields and denuded areas is occurring in the finest capillaries of the tissue of Catoctin Valley, and the results of this erosion accumulate within its vessels. As erosion disintegrates the remaining sponge, runoff carries dislodged soil particles, humus, and organic material into the vessels of the landscape, and ultimately into Catoctin Creek, choking the waters with sediment. As the sponge deteriorates and more and more water runs off, the capacity of the bottommost vessels to hold water is overwhelmed, and flooding results. The creek overflows its banks, while scouring and devouring tissue along its way and depositing it elsewhere. The water of the creek now runs brown in even modest storm events, and silt can be seen covering the rocks at the creek bottom in quieter times. This limits the expression of life in the creek to those who can tolerate the low oxygen levels and low pH—species like carp.

Additionally, any life-inhibiting substance used higher in the watershed will affect the health of Fox Haven. The state of the creek is a barometer of the health of the whole. If the waters of the creek are full of health and vitality, it means that the whole system is full of health and vitality.

Amphibians—the miner’s canaries of aquatic environments—were found in lower levels than expected for

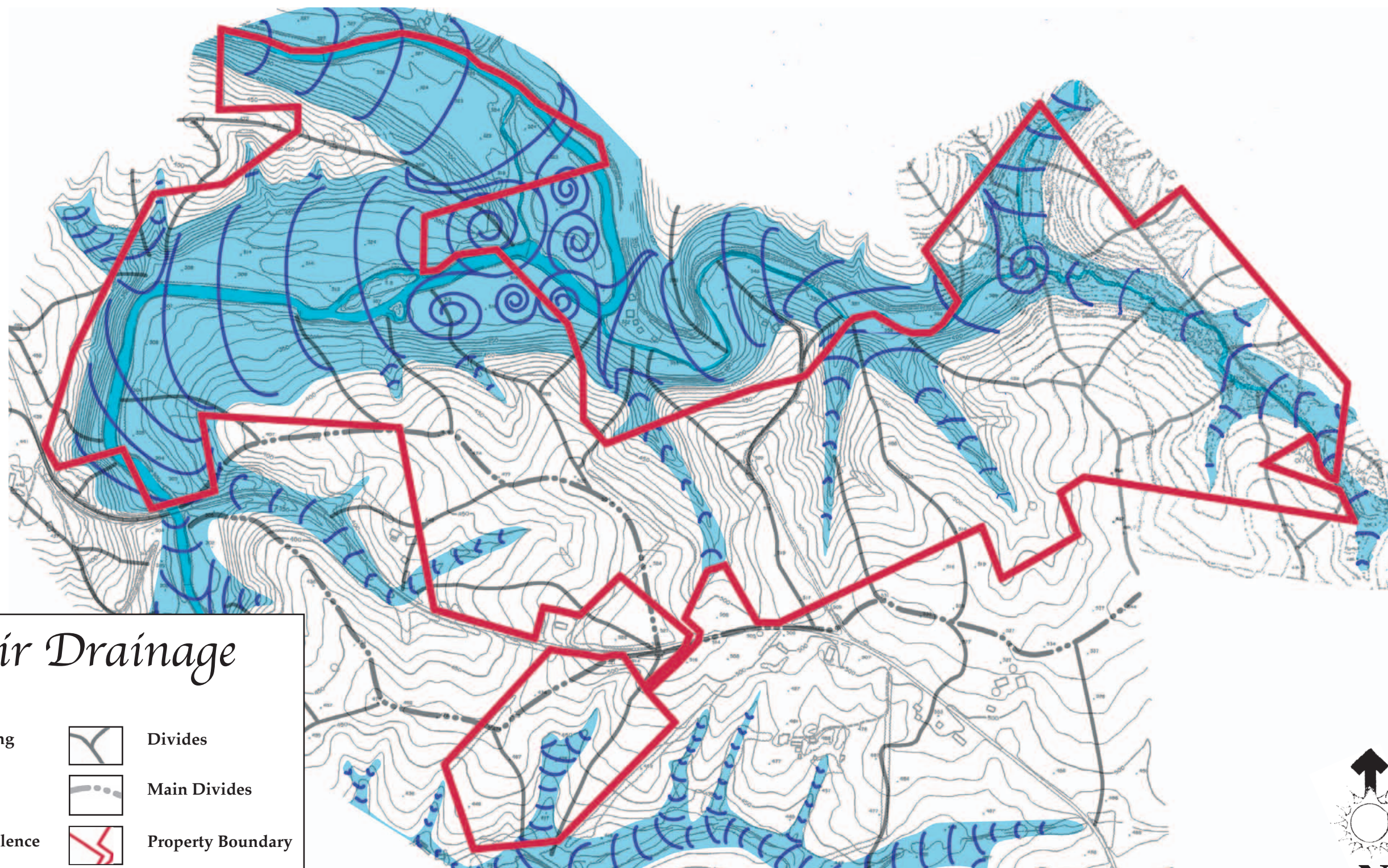
such a moist and verdant environment. The observation of deformed frogs is of serious concern. Further study is recommended.









Above: Juxtaposed forces of intermittent flooding and prevailing winds contributed to the contorted trunk of this tree in the floodplain of Catoctin Creek.



Right: Flotsam in a lodged tree along Catoctin Creek indicates the high water mark for the previous season.



Cold Air Drainage

	Cold Air Pooling		Divides
	Cold Air Flow		Main Divides
	Cold Air Turbulence		Property Boundary



Cold Air Drainage

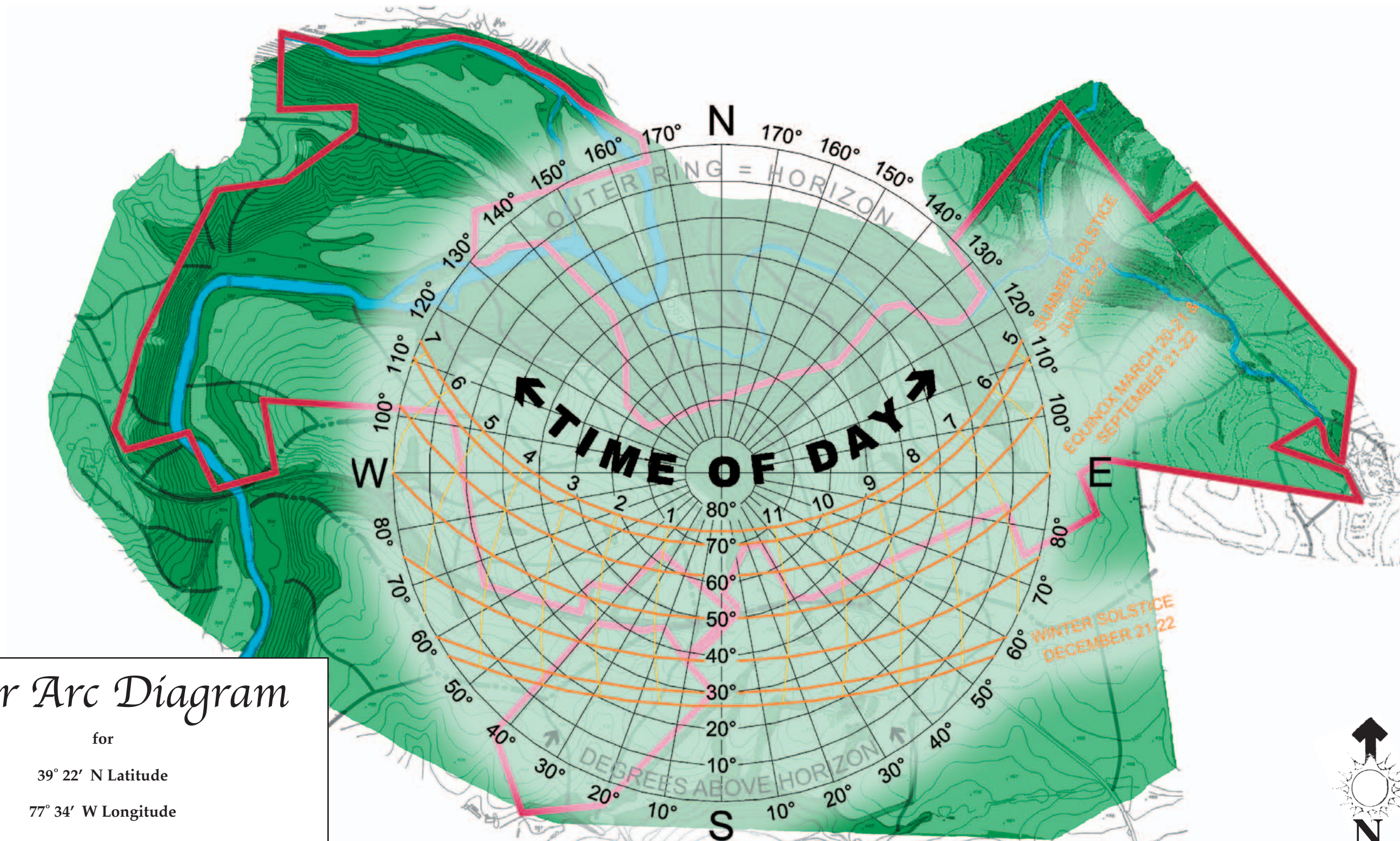
Just as hot air rises, cold air sinks. Cold air behaves very much like water, but is more viscous, flowing more like syrup. Cold air drains off ridges; it pools in low spots, puddles behind cross-slope barriers, and runs downhill, concentrating in drainages and flowing along them, leaving the landform warmer above the pools of cold air.

At Fox Haven, the effect of cold air pooling is moderated by the high humidity characteristic of this area, but will be most pronounced on clear, cold, dry nights. Within Fox Haven, cold air drains quickly off the uplands due to steepness of slope. Cold air pools above the bridge and the narrowed stream channel near the southwest corner of the land. This forms a large cold air lake that affects the Mill, the hairpin bend area, and much of the Sanctuary Lands.

The lack of lingering cold air expands the possible expression of plant life in an area. Areas that readily shed cold air are warmer. And since the winter low temperature is a key limiting factor in determining what plant species can survive in any given site, these warmer areas have a greater range of possible species. Additionally, since late spring and early fall frosts both limit the productivity of fruit trees and growth of annual gardens, these areas can allow a greater range of stability and productivity for gardens and orchards. In Fox Haven, these warmer areas occur in the uplands.



Ice damage associated with late winter thaws to bridge (above right) and trees (above and below



Solar Arc Diagram

for

39° 22' N Latitude

77° 34' W Longitude

Sun Sector

Sun plays over the land in a daily and yearly pattern. Each place within Fox Haven has a slightly different relationship to the energy of the sun.

Each day, the sun arcs across the sky from east to west. On the summer solstice, this arc lies directly above Fox Haven, and on the winter solstice, this arc arches 30 degrees to the south of its highest position. The Sun Sector Map shows the solar arc for Fox Haven throughout the year, as well as the sun’s approximate location in the sky at any time of day. On the map, the topmost northern arc shows the sun’s path during the summer solstice; the bottommost southern arc shows its path during winter solstice. The central arc shows the sun’s path during both equinoxes. The number in the middle of each arc indicates the sun’s angle above the southern horizon at noon.

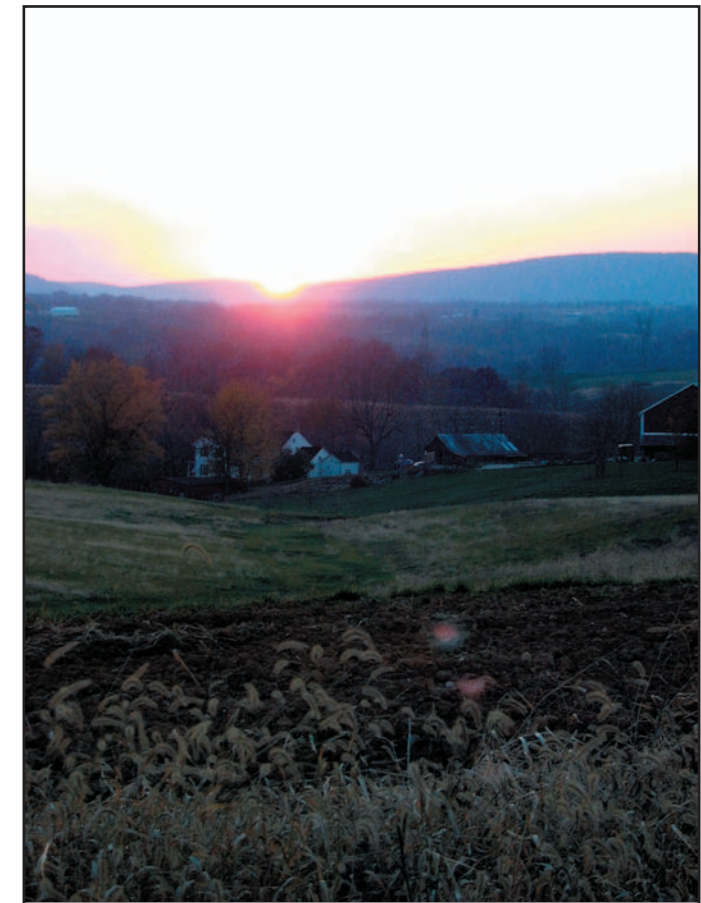
An ideal sun sector is a ‘window’ in the landscape that allows solar energy to reach inhabitants when needed. This window (shaded yellow on the map) occurs from approximately 6:30 am to 3:00 pm.

Vegetation or structures should be placed in a way that blocks solar energy from living space when it is not needed (as in summer, or fall and spring afternoons), and leaves the solar collection window ‘open’ (unobstructed) when it is needed (especially in the early morning in cold months). Deciduous vegetation can be placed to block solar gain in the warm months, while evergreen vegetation should be placed in such a way that it does not block the solar window during the cooler seasons. This ideal relationship to the sun sector also applies to walls and window openings in the built environment.

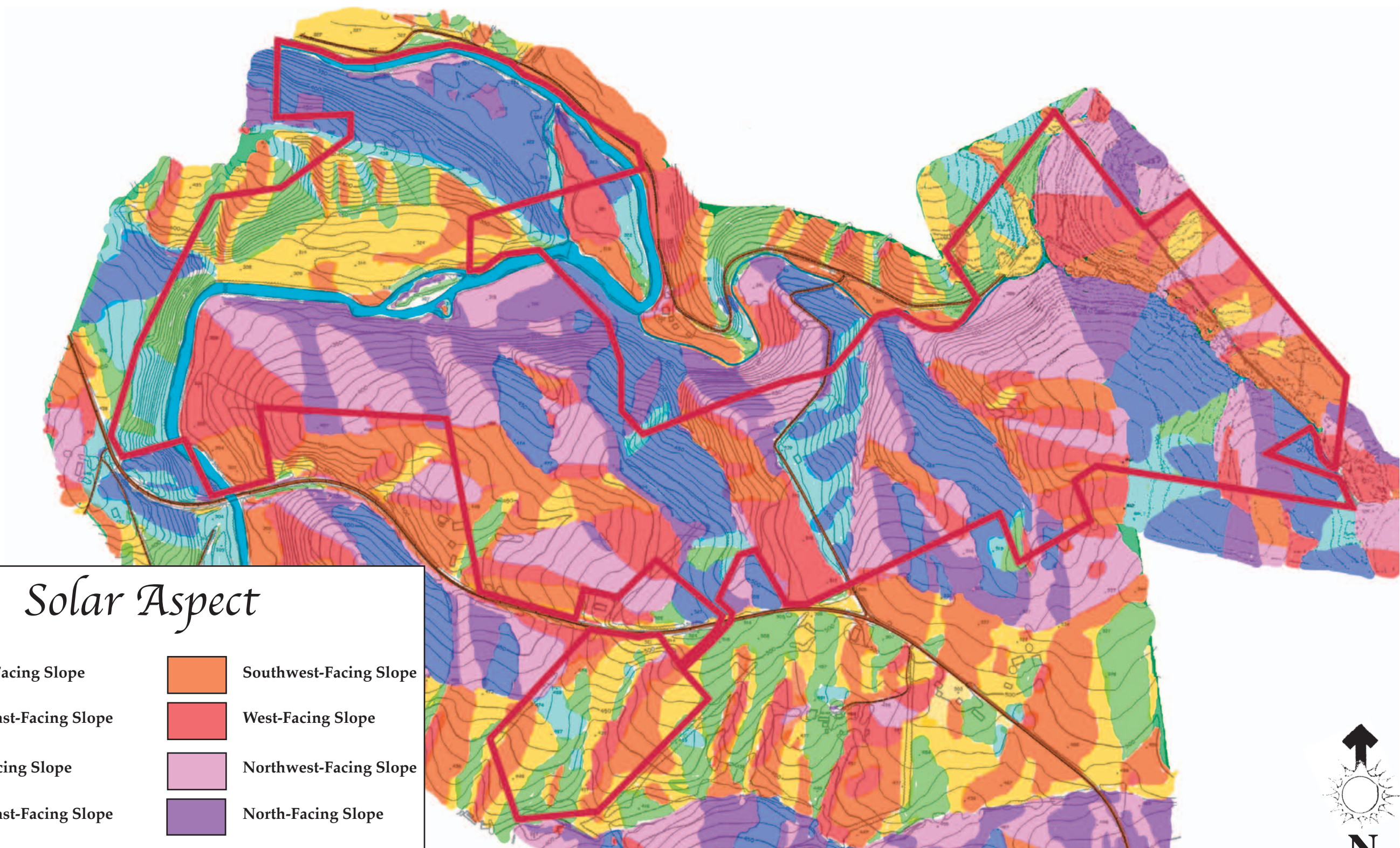
The best sites for solar gain at Fox Haven are on

the Wisner Farmstead. Both the house and the barn are ideally situated for solar gain. There are numerous other excellent solar sites on the Wisner Farm. Throughout the uplands of the rest of Fox Haven there are a number of areas such as the top of the Stockman fields and the Everhart fields with passable solar gain.

Although overcast skies in this climate will limit opportunities for optimal solar gain, some gain will occur even under cloudy conditions. On average, gain is most important in early morning and less important later in the day. The window described above would allow radiant heating of thermal mass and people as soon as the sun rises during the cold months, indoors or outdoors.



Sun setting over South Mountain.



Solar Aspect

	South-Facing Slope		Southwest-Facing Slope
	Southeast-Facing Slope		West-Facing Slope
	East-Facing Slope		Northwest-Facing Slope
	Northeast-Facing Slope		North-Facing Slope

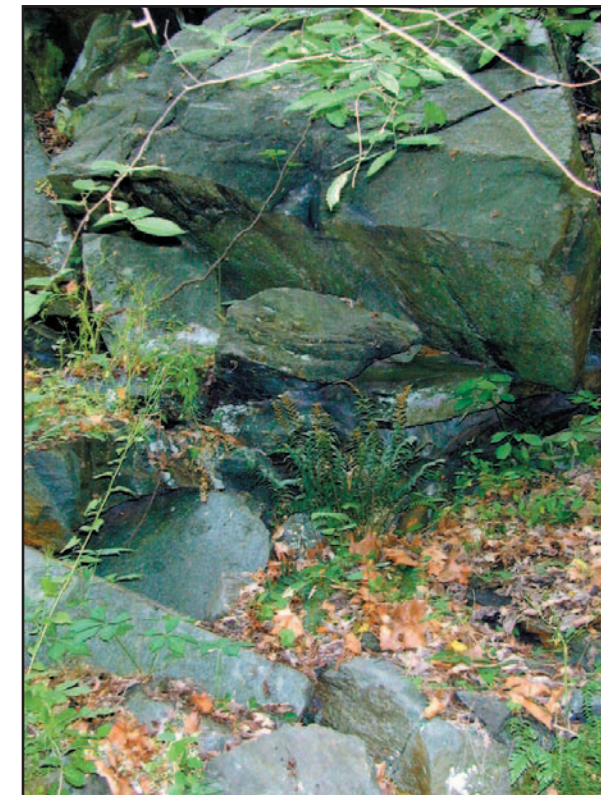
Solar Aspect

The sun strikes the slope of the land at different angles and different intensities, depending on the direction, or ‘aspect’ of the slope. This phenomenon produces slopes that are warmer or cooler, drier or more moist. The colors of the map correspond to the temperatures generated by the solar exposure of the slopes. The hot colors correspond to the hotter places and the cool colors to the cooler ones. For example red (west) is the hottest and blue (north) is the coolest.

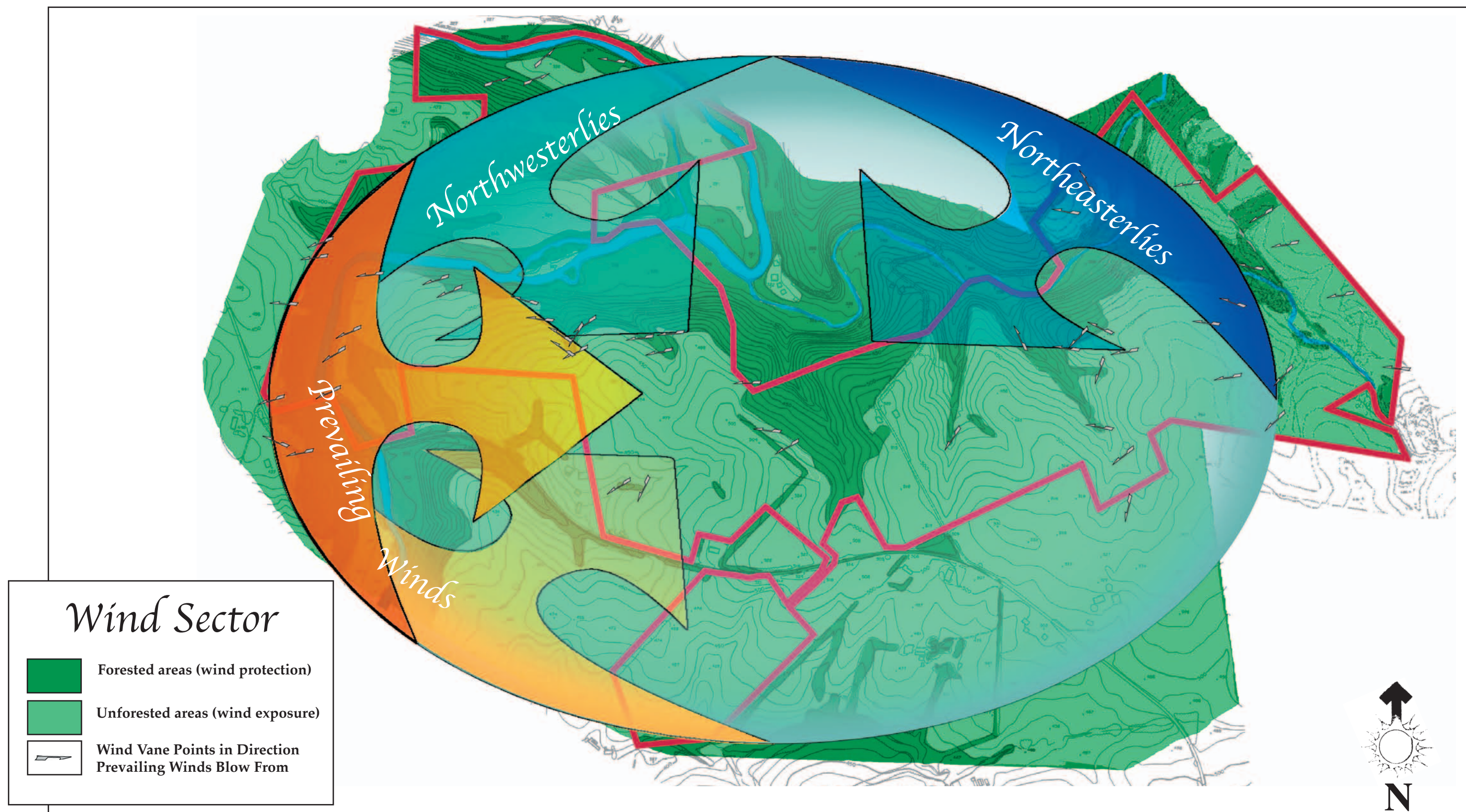
Fox Haven’s shape and form—sculpted by Catoctin Creek, Lewis Creek, and their tributaries moving sinuously through a gently hilly landscape—creates significant diversity of slope and solar aspect. This is an advantage for supporting species diversity. Fox Haven contains a lot of north aspect, some east and northeast, and also northwest. These areas (primarily parts of Touchstone and the North Everhart Fields) will receive more chill, will hold moisture better, and are best suited for more mesic species. The Shaff Fields have primarily south, southeast, and southwest aspects and lend themselves to more drought tolerant species.

The northwest through east facing slopes (shaded pink through blue-green on the map) are relatively cool and moist, enabling them to support plants needing more moisture than available on the site in general. The hottest and driest slopes face west, southwest and south, with west slopes the most extreme in terms of exposure to hot afternoon sun. South and southeasterly slopes (shaded yellow and green, respectively, on the map) lie mostly in the Sanctuary, the Touchstone and Wisner farms or in the Shaff Fields,. They are ideal sites for solar buildings and heat-loving plants capable of weathering

extremes of temperature and moisture fluctuation.



A north-facing moist microclimate supports moisture loving vegetation.



Wind Sector

Wind can seriously impact and affect plant, animal and human comfort and well-being, both negatively and positively. Wind can physically damage or even destroy plants and buildings, and cause stress on all living and nonliving things. On the other hand, wind can also cool stifling air, pollinate flowers, and produce electricity. By knowing the pattern of winds on the land, we can place ourselves and our activities where the wind can provide benefit, and where we are protected from its undesirable effects.

Landform channels and redirects general wind flows. Low lying areas of the land can offer protection from some of these winds, as can the coves in the tree cover and ‘islands’ behind isolated clumps of trees. (see map)

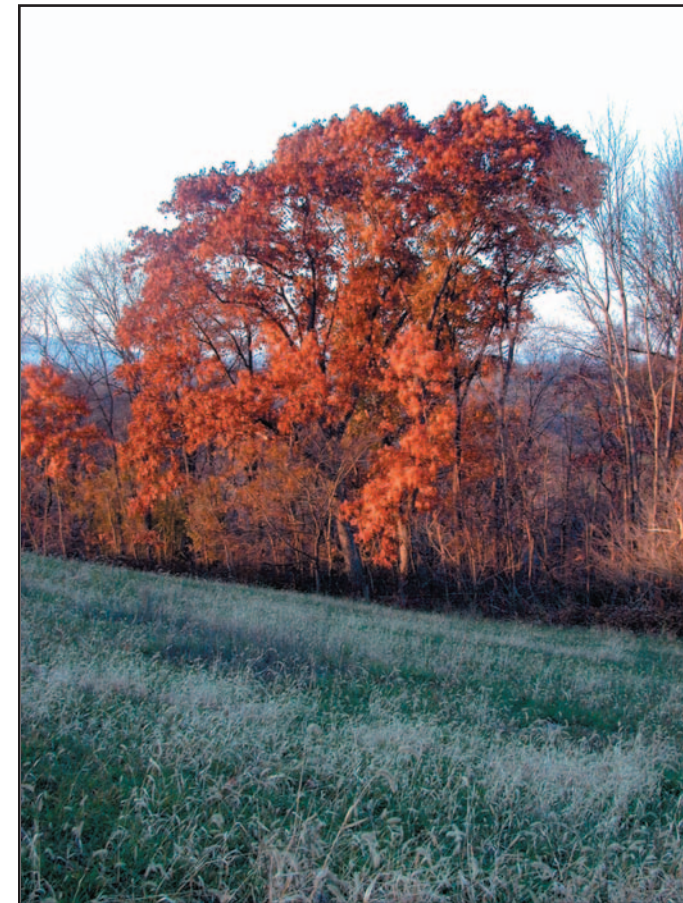
Planted windbreaks are preferable to solid structures for protection from winds. Plants act like a cushion; their permeability allows some air through while deflecting most of the winds upward. Solid barriers concentrate winds and cause focused turbulence which pulls winds down behind them, much like breakers behind underwater barriers.

Several types of wind affect Fox Haven. The prevailing winds on the site are out of the west and the southwest, with a minor influence from the south. The winds are modified by landform, which directs the flow of the prevailing winds. These winds sculpt the bulk of the vegetation into aerodynamic forms that accommodate this force.

Tree flagging in areas protected from prevailing winds indicates that there is also a northwesterly wind influence. These are the cold dry arctic winds that follow winter storm systems. They are responsible for the wind chill and discomfort people experience the day after

these wet storms.

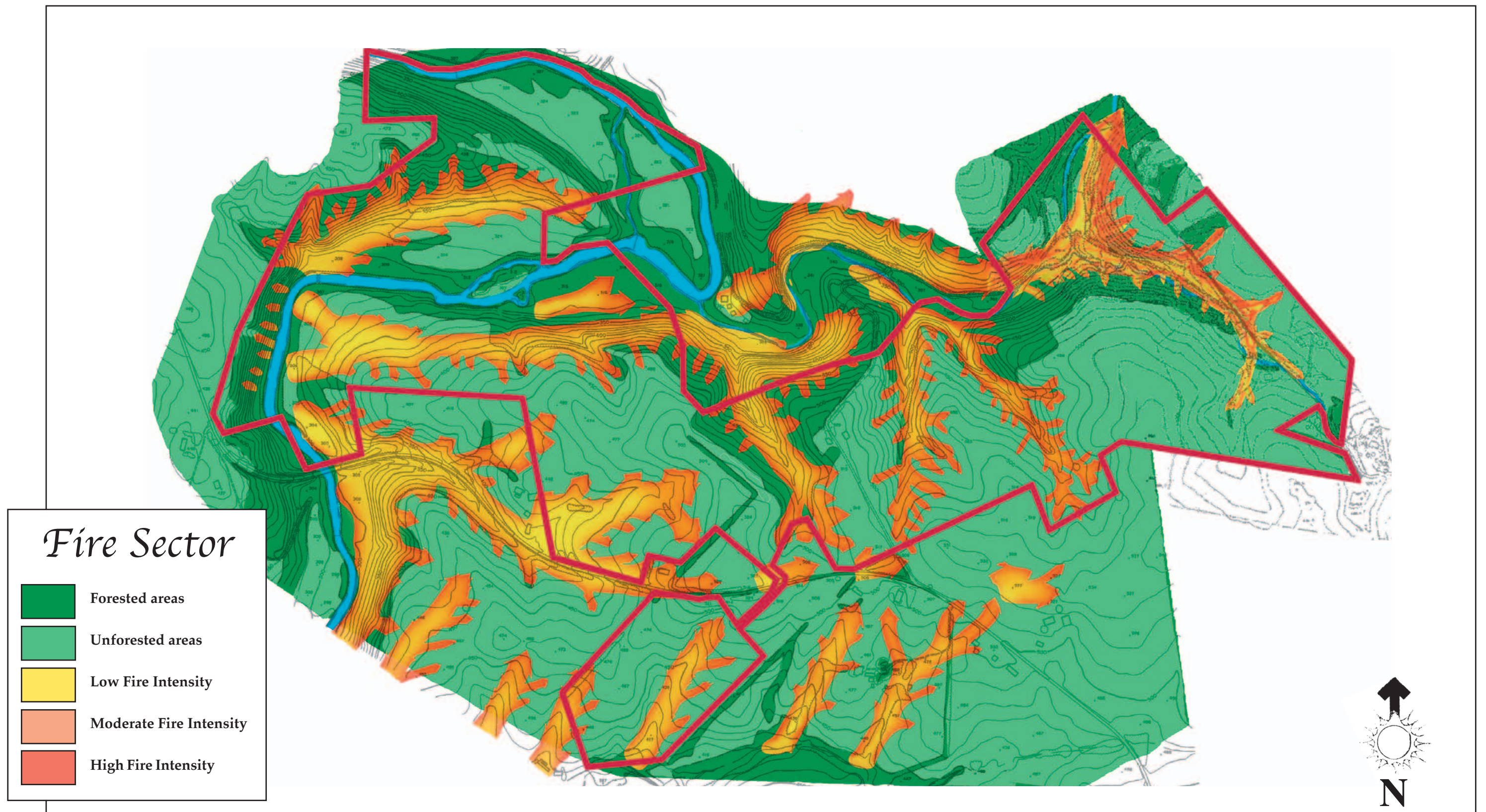
Snapped tree trunks on the margin of North Everhart Fields may indicate a northeasterly wind. This is caused by the severe winds associated with strong low pressure systems arriving from the coast, including hurricanes. These erratically-timed winds run in direct opposition to the prevailing winds and therefore can cause severe damage to trees sculpted by the prevailing winds.



Above: Aerodynamic sculpting of an oak by prevailing winds.

Right: Severe northeasterlies, probably associated with a 1936 hurricane, may have snapped these tree trunks on the margin of North Everhart Fields.





Fire Sector

Fire has the potential to be a renewing force in the landscape, disintegrating old forms to feed the growth of new forms. However, when this process does not occur regularly in wooded areas, keeping fuel loads low, the intense fires that result can be very destructive rather than stimulating.

Fox Haven is protected somewhat from fire by the wet climate, however fire becomes a consideration in drought years like 1999, where conditions are tinder-dry and hot winds associated with high pressure domes can fan a fire even through a stable hardwood forest.

When it occurs, fire can be expected to move with the direction of the prevailing winds. Fire is ten times more likely to move upward in the landscape than downward. Because fire generates intense convection currents, it actually creates local wind patterns that direct its movement. These updrafts of hot air preheat and dry vegetation immediately above the fire path, and in the canopy above the fire. This preheated vegetation is more likely to ignite than that below, and the fire is essentially pulled upward by the effect of its own convection drafts. Fire tends to converge on the crests of ridges.

The configuration of a canyon or a draw increases the convection effect considerably, creating a convection chimney that spreads fire quickly up the draw. A saddle—the low place on a ridgeline where a drainage crests—is potentially the most hazardous location along a ridge during a fire.

Fire affecting Fox Haven can be expected to be generated by lightning, arson, trash burning, careless smokers, campfires, or accidental structural fires.

The landform and the prevailing winds indicate that the dominant path of fire across this landscape would be from the west, but north-facing draws constitute a

potential fire chimney that could pull fire to the south up the draw. The likely sources of fire would be Highway 383, the Galey Farm, campfires along the creek on the west margin, and Lewis Mill. On extremely windy days, fire could originate in the farmlands to the west, and embers from that fire could ignite the fields and then the forest.

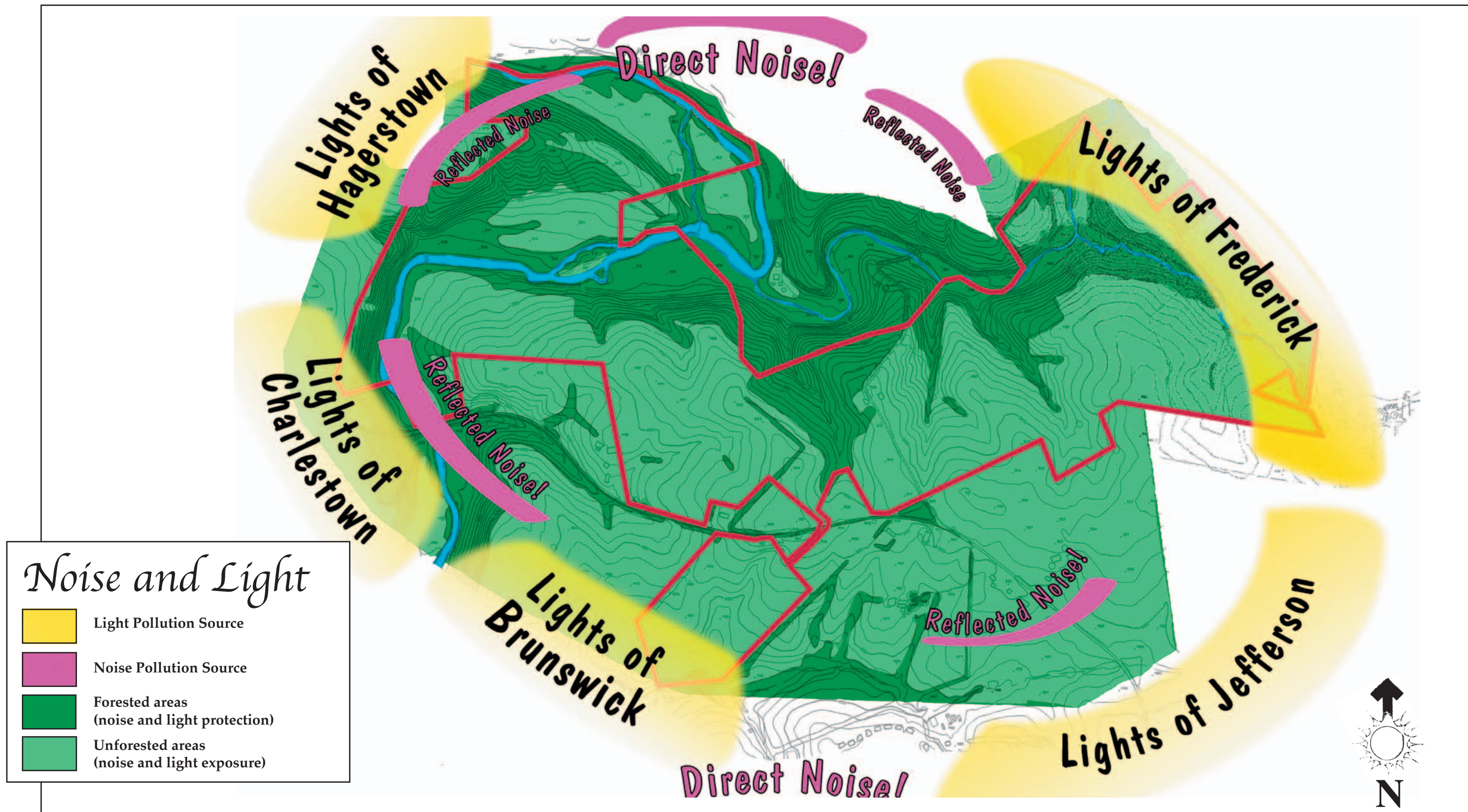


Left: Lightning scar. Lightning is one potential source of fire.



Fluted burn pattern on stump (left) and fire scars on living trees (above, below) reveal the past path of fire through Fox Haven.





Noise and Light Sectors

The effects of ambient noise are subtle yet should not be underestimated. Excessive or obnoxious noise can make an otherwise pleasant place unbearable. Unless directly blocked by architectural features, trees, or geological features, sound travels unimpeded. The mountains bounding the Catoctin Valley reflect noise from highways inside the valley, bouncing it back toward Fox Haven. Because of this, Fox Haven experiences a high level of background noise for a rural area. The map defines areas where the convolutions of the landscape or white noise from the creek offer protection from noise pollution. These areas are outlined in red.

Fox Haven receives light from most directions, due to surrounding communities of greater population. The light bounces off clouds or haze and appears as a diffuse glow. This light pollution can impact stargazing on clear nights. The map defines protected places along the creeks and in trees where night sky viewing should be optimal. Additionally, plantings of trees can be developed to create light-free wells—protected star-viewing areas.

Part Four
Dancing with Fox Haven

I once visited a huge standing rock formation at sunset, in a glowing red canyon. . . with a man of the Cherokee tribe. . . . When we arrived he sat down directly facing the stones and played a lilting melody on his flute. Later, he said that the stones have silicone crystals inside them, through which they listen! “They are like lonely old people, standing and waiting to be sung to. Our people have always sung songs of admiration to the qualities of strength, beauty, and endurance that stones bring into the world. . . . They are tired and lonely now because the white world has become so blind and selfish. They live in a hollow, unsung world.”

Fox Haven's Invitation

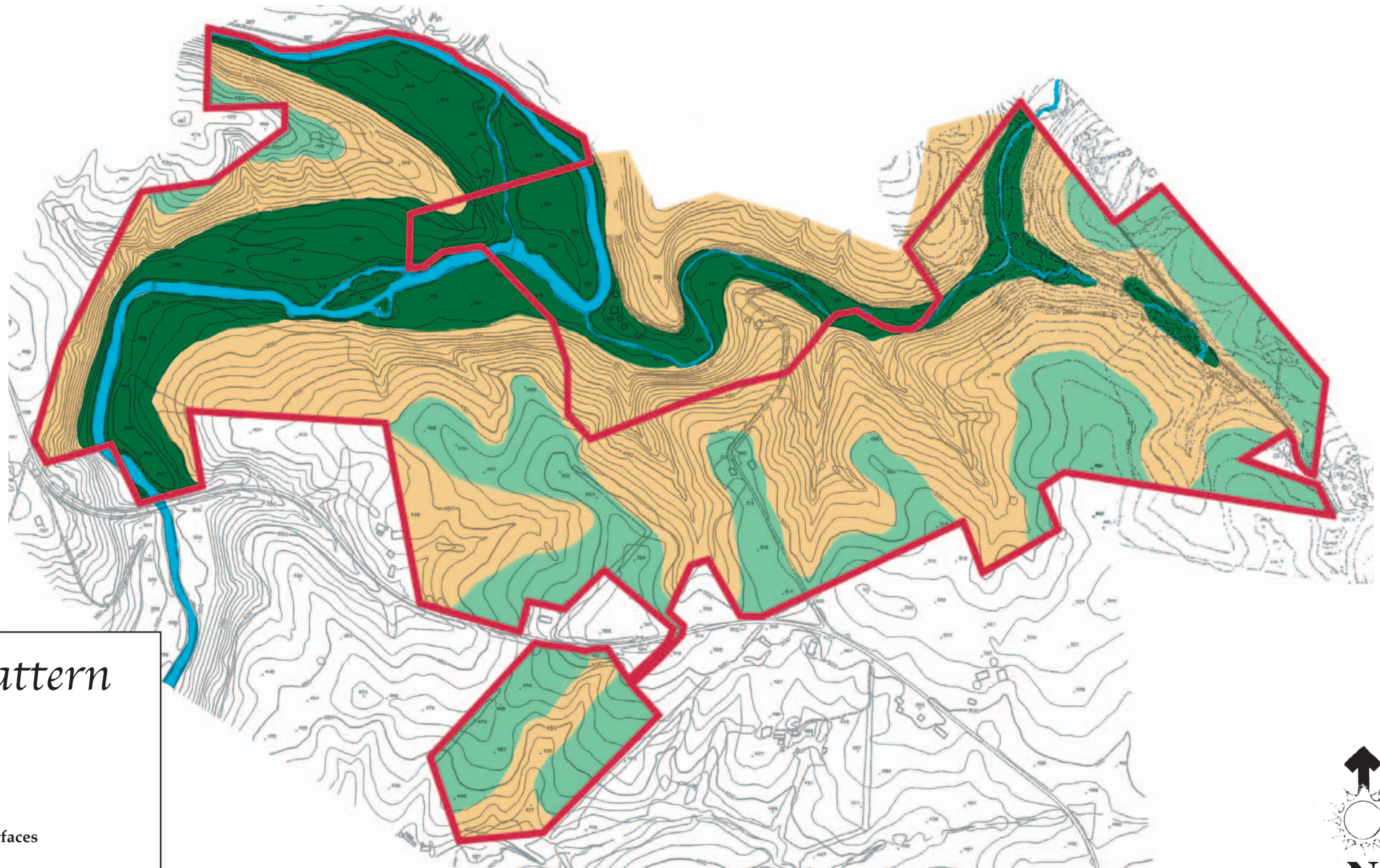
I will be a richer, deeper, more vibrant place in relationship with you. Engage with me. Resume your coevolutionary role within the web of life. Use your abilities to protect and regenerate my tissue, and to assist me in unfolding my natural bounty far more quickly than I could without your help. Accept my nourishment: food, shelter, quiet, and wisdom.

Extend your vision past my boundaries. Use your skills to inspire others within my greater whole—my watershed. Restore Catoctin and Lewis Creeks to higher expressions of life, as a gateway toward a deeper relationship with me, as well as my larger whole.




Observe me. Learn my internal logic—the logic of the dynamic, changing, ever-unfolding self. Apply it to other relationships in your communities.

Use your unique skills as human beings to inspire others in other watersheds.

I only ask that you appreciate me and nourish my transformation while you discover my values within this place once named Catoctin.



Land Pattern

-  The Bottoms
-  The Slopes
-  The Upper Surfaces



Accepting the Invitation

Fox Haven’s invitation to join her “in the ongoing dance of creation” is timely, even urgent. Ultimately we are being invited to participate in co-creation of a model that can serve as a beacon of hope for the future. The first step in that act of co-creation was to develop a means for understanding Fox Haven as a living system. The major portion of this booklet was dedicated to articulating that understanding, for it is the necessary foundation for a genuine and regenerative relationship.

This final section speaks to the potential of Fox Haven as dance partner and co-choreographer. And it speaks to our potential role in this dance, how we can weave our own essence rhythms with the rhythm of place, whether as inhabitants or periodic visitors. It offers guidance on how to use and develop the different areas that make up Fox Haven in ways that grow the generative potential of each area and the whole. And as an organizing context for this work, it outlines a vision for growing an ecopreneurial model for structuring and governing human activities at Fox Haven, one that is inspired by natural systems and maintains a dynamic harmony in which both people and place flourish.

The Pattern of the Land

If we are to dance with Fox Haven, we need to know where and when certain kinds of dances, steps and rhythms are appropriate. Dancing requires wide angle attention. We need to be aware of ourselves, aware of our partner, aware of other dancers, and aware of the space we’re dancing in if we’re not to stumble or crash into one another. We need to understand our capacity and the capacity of our partner, so we don’t move too fast or too slow. And dancing requires balance

in motion—the ability to continually respond to change and variation.

Of course, all of these capabilities are also required in our dance with Fox Haven. We need to learn how to move with the land, to change direction in response to the changes we see. This means that we need to learn to see Fox Haven as a living, growing, changing entity. This report is meant to provide such a dynamic understanding of the site. Each section is a lens through which to view the landscape in order to see its limitations and its potential.

The shape of the landscape dictates many of the living and dynamic processes that occur within it. Many of the characteristic patterns described in this report, such as the distribution of soils, plant communities, solar aspect, and the movement of wind, fire and water can be traced to the structuring influence of the landform. Therefore, if we wish to come into a responsive and appropriate relationship with this place, an understanding of the role of landform can be a powerful tool.

The primary structure of the landscape at Fox Haven is an “S” curve, consisting of three parts: 1) the flat tops of the hills that make up the upper surface of the landscape; 2) the slopes of the hills; and 3) the valley bottoms that make up the lower surface of the landscape. Each carries on a different core process within the larger process the landscape as a whole is engaged in. As a living system, the landscape as a whole is working on capturing and upgrading the energies that flow through it. It works to absorb and slow these flows so that they can be organized at an ever higher order of energy. Where the landscape is able to successfully engage in this cycling process, we see a corresponding increase in species diversity and richness in the system.

The movement of nutrients and water through the landscape offers an illustration of this concept. A healthy watershed will slow the through-flow of nutrients and water to a long languorous process. Nutrients and water cycle along numerous and complex pathways through the bodies of the living beings who make up the system. At each level in the system new agents come in to catch and utilize water and nutrients before they can leave the system. Living plants retard the wash of nutrients by building their bodies from them; dead plants by locking them to their decayed tissues. To paraphrase Aldo Leopold, it is more important that an animal defecates and dies higher than it ate than almost anything else.

Through this process of cycling and storing nutrients, the net of networks that make up this living system is able to create platforms from which new relationships, niches, and opportunities can arise. This enables the system as a whole to continually move to higher and higher levels of richness, diversity, and complexity. As the richness increases, so does the ability to effectively cycle and use water and nutrients, resulting in an upward spiral to levels of order in the system. In other words, the land gets better and better over time at becoming herself. At Fox Haven, her forests and streams become stronger, richer, more capable of supporting life.

The Upper Surface

Every part of the landscape plays a unique role in carrying out the cycling process of the whole. The upper surface’s role is absorption. Its broad, flat surface has the largest exposure to the sky, so precipitation is evenly distributed over it. In a healthy state it takes in the nutrients and water that then slowly feed the rest of the landscape. Therefore, this is a good place to introduce nutrients into the system, allowing the land to absorb, cycle, and slowly release them. Through design, we can ensure that our land management practices support

this feeding function (as, for example, when livestock are encouraged to defecate here, rather than close to watercourses.)

If the ability of this portion of the landscape to absorb and hold nutrients and water is compromised, the health of the rest of the landscape will be affected. Downstream areas become starved or overfed. As this is the top of the system, any toxins entering here are liable to enter the entire system. However, here in the gateway is also the greatest potential for trapping pollutants before they enter the rest of the landscape.

These areas are flat enough for annual cultivation. Unfortunately, this has led to compaction, simplification of the biological community, and erosion with a resulting loss in ability to absorb water and nutrients. Annual agriculture has also exposed these areas to numerous agricultural toxins. However, annual agriculture is not an inevitably destructive practice, as long as it is sized, placed, and structured appropriately for the dynamics, capability, and role of the place. The absorptive role needs to be enabled by plant growth that builds and opens these soils to absorb the water that comes to them. These soils need to be protected from exposure. Any cultivation needs to be across the fall line or along the contour. The upland fields are the appropriate place in the landscape to concentrate nutrients.

One example of a system which is in alignment with these parameters consists of contour strips under annual cultivation alternated with strips of perennial grasses and nitrogen fixing groundcovers

harvested by animals on a rotational basis (chickens in tractors for example). These strips could be rotated on a biennial or triennial basis. These strips could also be in relationship to strips of trees or other perennial crops. This is also an ideal place for a no-till rotational grain system such as Fukuoka describes in *The One Straw Revolution*. Excess biomass from other parts of the farm could be used as mulch here, or animals fed from other parts of the farm could live or spend the nights here. Additionally, manure from animals housed in existing barns or shelters near the watercourses could be applied here on the upper surface of the landscape.

The Slopes

In a healthy state, the biological communities that inhabit the slopes act as a filter and brake for the nutrients and water that run off of the hilltops. As the land becomes steeper, flows tend to speed up. This has created the need for a system that slows these flows. A thick mat of ground covers, plant roots and fungal mycelia need to catch any soils and water coming over the top. Soil, water, nutrients, and toxins can all be slowed and captured here. The slopes are the most fragile portion of the landscape and, as a result, they are currently the most damaged. The soils here tend to be thin and rocky. It is here that the rainfall absorbed on the uplands emerges as springs. If tree-lined and shallow, these spring branches allow the water to meander slowly to the valley. At Fox Haven all of these channels have been severely eroded. The long-term cultivation of the upper surface has led to torrents of soil-laden runoff down these channels with every rainstorm. These slopes need to be in permanent cover so that they can carry out their filtering/braking role in the larger system and escape further damage. The greatest threats to these areas are erosion and invasive exotic plants crowding out native ones. Both of these hazards threaten the stability of the fabric of the

native plant community and the land itself.

The slopes are best suited to permanent multi-storied forest cover. Endeavors which support and enhance the braking role of this portion of the system need to be developed. Mushroom cultivation on tree trunks felled on contour or coppicing (cutting root-spreading trees or shrubs so they can be continually reharvested) would be appropriate examples. Browsing and grazing in a controlled manner to control invasive species, the harvesting of crafts materials, tours or retreats, selective logging might all be appropriate endeavors in this part of the landscape if they are patterned to enable the braking function of the slopes.

The Bottoms

The bottomlands are where everything concentrates. While these are the richest lands, they are also vulnerable to everything that occurs upslope. There are always two upslope directions from these bottomlands: the hill above as well as the watershed that drains down the valley in which they lie. In a healthy state both directions would feed these areas. In a depleted state both directions can bring toxins or catastrophically erosive floods. These lands bear the brunt of the land-use above them and the streams that run through them testify to the health or lack thereof in the entire system. The land here works to catch the flowing nutrients and water before they leave the system. The largest trees grow here, as does the richest undergrowth. The deer and other creatures often feed here. Nature is trying to trap nutrients in plant growth before they are lost to the stream, and recycle them back to the top of the landscape through the animals.

Any form of system that can harvest the richness here and cycle it back uphill without exposing it to damage from floods is ideal. The process here is concentration. One form of concentration is high value protein

production. Traditionally this portion of the landscape would have been very rich in wildlife—including fish. Anadromous fish (fish that spawn inland, spend their lives in the open sea, and return inland at maturity to spawn again) along with their predators were one mechanism the system used to cycle these concentrated nutrients back up to the top of the system.

These fish and their predators are currently missing from the system. Work needs to be done on the watershed as a whole, as well as in those larger spheres of Fox Haven’s influence, to bring these critical members back into the system. In the meantime, we are the primary predators and need to play that role. We need to move the animals in a way that ensures that the richness concentrated in this part of the landscape is harvested and distributed through the whole.

The low lands in the upper ends of the tributary streams provide a special case. They are not prone to flooding. Therefore, small clearings in flat areas could be used for annual cultivation. Sloping areas adjacent to streams may be appropriate for grazing. However, the waterways themselves need to be protected from nutrient runoff by buffer strips and flood prone areas should be kept in permanent tree cover.

Infrastructure

When we look at a landscape in order to determine the most appropriate patterns of use, it is important to take into account not only the landform and the living systems that it supports, but also existing infrastructure. This is because many human made structures (e.g., buildings, roads, fences, etc.) are virtually as long lasting as landscape features. These structures represent large amounts of embodied energy, so if they can be conserved or put to good use, they should be. At the same time, infrastructure that is badly placed can be so destructive to the system that removal may be the only

option. For these reasons, construction of any new major structures should be very carefully considered for the kinds of impacts (positive and negative) that they will have for many years to come.

Human infrastructure affects the landscape in many ways. Roads, paths, gates, and buildings all affect human access and hence, where humans are likely to interact with the place. This helps to indicate what areas are suitable for what activities. Any intensive activities need to be carried out close to where people live and close to good access. If we think in energetic terms, it becomes clear that the activities that require the greatest human interaction should be located closest to where people are. This can be seen in the traditional location of kitchen gardens, small animals and animal shelters close to human homes while field crops or large mature animals were placed further afield. Fruit orchards were located intermediately between the two.

When we look at Fox Haven, we see that it is spread out in a broad arc. The extensiveness and diversity of this spread allows for varied activities and enterprises. However, it also precludes the easy clustering of activities around a single center, creating the need for multiple sub-centers. Areas of intensive activities need to have centers that can function as nuclei to build systems around. These centers of activity and organization are like nodes of their own local networks that together compose the larger net

work of Fox Haven.

Besides being divided into hilltops, slopes and bottomlands, the land can also be spatially divided into thirds along its arc. There is the eastern portion centered around the Touchstone and Wisner places, the northern portion centered around the garden shed, and the western portion potentially centered on the sanctuary hut. Sub-sub-centers may be required at some point. For instance, if the Shaff tract is to be intensively gardened it may require it’s own sub-center.

All of these potential centers are well placed. Both the Touchstone and Wisner Farmsteads reflect good traditional relationships between homes, garden spaces, barns, and fields. The fencing of paddocks around the Touchstone place is also good. Every effort should be made to utilize the minimum amount of infrastructure for the maximum benefit. This means structuring activities to make the best use of existing infrastructure, and insuring that all structures serve multiple purposes. An exemplary division fence, located on the Touchstone place, provides a good example. It follows the contour near the top of the hill before dropping down to the barn. The on-contour part is an excellent illustration of infrastructure being built to the pattern of the landscape so that it will serve multiple functions (erosion control, ensuring appropriate animal traffic patterns in relationship to slope, etc.)

The barns also provide good examples of multi-purpose design. They are located to be simultaneously proximate to the house, to water, and to fields. Internally, they are designed so that feed can be moved by gravity and manure can be removed at ground level. In addition, the feed acts as insulation over the places the stock live. Similar care should be taken as we think about designing for the future use of these and other structures or as we begin to design new ones. Design of infrastructure should integrate with and contribute to natural process-

es and their interactions.

As an example of how we might apply our two organizing concepts (landscape form, and spatial relationship among elements) to the actual design of the farm and its managing systems, here is some initial thinking about how sheep might be used to advance the multiple objectives of Fox Haven. Sheep could be housed for the winter in the barn at Touchstone. This would provide them with a protected place to lamb close to water, stored hay, and people. Early in the spring they and their lambs could graze the small pastures close to the house. These paddocks could also be useful to isolate sick or weak animals or to concentrate them for shearing. As the weather warms and the lambs get stronger and bigger they could be moved up into the upper fields. Throughout the summer they could be rotated through pastures and new trees to control weeds and also be used to mow lawns. By resting on the tops of hills, as is their wont, they would concentrate nutrients on the upper surface of the land while improving the sod. Their manure from the barn could be used on vegetable gardens or fields. As the weather cools they could move closer to the barns where hay from bottom-land fields has been stored. The richness of the bottoms would feed them through the winter and then be cycled onto the toplands come spring. During the summer the various “centers” could act as hubs for their movement. They could be centered around the garden shed to graze the strips between grain crops, or to glean fallow garden plots. They might temporarily graze native grass meadows in the sanctuary and bring that richness back to the tops of the sanctuary lands or to the northern or eastern ridge tops.

We will also want to think about developing “centers” on the land:

- The Touchstone place is interesting in that,

though it is in a bottom, it is in the upper end of the drainage and so has easy access to the uplands. This makes it strategically located to be an ideal hub. Its relationship to the land around it, both spatially and with regard to landscape form, makes it a great starting place for many endeavors. There is already a concentration of valuable infrastructure here.

- The Everhart fields (where the garden shed is located) are an ideal hub in another way, and form a good compliment to the Touchstone center. While Touchstone is in a place where concentration occurs, the garden shed is at the top of the landscape. Despite its exposure this position enables us to work with gravity. It is a great tool here at the top of the watershed and a good place to start the work of reweaving the fabric of the land.
- The Sanctuary center has an entirely different character from Touchstone and Everhart. Very private and forest centered, its activities bring us close to the wild heart of the land. Here we begin to sense the spirit of Fox Haven and touch the deeper purpose behind all our other activities here.

In conclusion, it is important to remember that there are no recipes for good design. Although we can formulate general observations about the character of the uplands versus the lowlands or the slopes, the map is never the territory. Ultimately it is the distinctive and particular nature of each part of the land that needs to dictate our actions. This is both the challenge and

the reward of working with natural systems—a kind of antidote to the monotonous sameness of most modern industrial life. For example, one of the most important places to be aware of is where these larger landforms meet. The bottoms meet the slopes at a place called the keyline, and the uplands meet the slopes at a place known as the shoulder of the landform. These intersections of systems are often very rich and provide leverage points from which to work and design.

In short, none of the recommendations we make in this report will be equally applicable in every part of the land. Experience and observation should be the guide for Fox Haven. Each subsequent generation who cares for the land will benefit from the experience and learning of the generation who precedes it. We are called on to set out with joy, consciousness, and a sense of exploration as we enter into this partnership, this dance, with a living place.

Looking to Nature for a New Economic Model

Background

On a 500-acre farm near Kent, England in the mid 1970s, Neil and Jennifer Wates began an “exploration of what it would be like in practice to live and work sustainably.” Named Commonwork, this exploration grew into a network of ecological businesses and educational organizations that continues today. It has inspired a number of similar efforts around the world that have varied in both form and success. Taken collectively, they are developing a rich source of new thinking for how we can organize our economies as living systems, integrating the work of human and natural systems to the benefit of both. As Fox Haven sets about designing its own model, the Commonwork concept offers valuable guidance as well as inspiration.

Premises behind a Commonwork system:

- **Human Development in a Context of Inter-connection.** Commonwork was founded on the belief that “the central agenda for humankind is to develop as whole persons” in a way that both feeds and is fed by our interdependence with all forms of life.
- **Work as a Core Process for Development.** The best process for enabling this nature of development is work, in particular common work—“work which empowers people to do what they have in them to do” within a context of mutual accountability.
- **Models from Nature.** Commonwork systems pattern themselves after healthy ecosystems, particularly their ability to be self-creat-

ing, self-managing and self-regenerating through reciprocal relationships among their parts and with their larger environment. At a physical level, their particular structure or form grows out of the unique character and spirit of the place they inhabit.

Envisioning the Working of a Commonwork System

Human beings have long sought ways to equitably distribute access to land and the bounty and products of the Earth. One of the consistent stumbling blocks in realizing this end has been the issue of ownership. Private ownership of land has shown many shortcomings but so have more socialist or communal strategies. The Commonwork system transformed the idea of ownership by looking at nature for models to learn from and adapt for human use.

People have tended to limit land use at any one time to single enterprises or owners and to single purposes at a time. One result is greatly increased land costs associated with any enterprise: they cannot be shared and they become a burden that often drives the enterprise to choose short-term financial returns over long-term health and sustainability. The effect of this land-use approach can be seen in the ongoing demise of family farms.

In the natural world there is no such thing as sole use or ownership. Different plants and animals use different areas at different times of the day or year or at different levels at the same time. This is one of the reasons for the stupendous richness and productivity of natural systems. A cardinal may keep all other cardinals away from a specific tree but he will not even notice squirrels

or bats. Similarly, ducks and fish and many invertebrates may use the same body of water at the same time. Cattle and sheep and geese can feed together on the same field as they graze differently upon the same grass. Certain trees, shrubs, vines and ground covers can all grow happily together in the same space. Indeed, in most cases the creatures who share a space behave in ways that are beneficial, sometimes essential, to each other’s well being.

In the typical Commonwork system individuals own their own business. They own leases for certain land use rights, not certain parcels of land. Because each business is financially responsible for its own improvements and operations, costs are shared and the land-owner doesn’t carry the entire burden. For instance one person might hold the lease to raise fish in a pond in which someone else holds a lease to raise water lilies, while someone else holds a lease to water his sheep there. Similarly cows and bees could forage in the same pastures. These rights are not mutually exclusive. Ideally in fact, they are constructed to be mutually beneficial. For example, small businesses can be set up to use the waste products of other businesses such as a worm farm set up to use extra manure from a dairy, selling both worms to the fish farmer and compost to the gardeners. The “waste stream” of businesses is thus used as the resources for other businesses, recycling the riches of the place within and building both biological and economic wealth. In another example of reciprocal benefit, shared equipment or office space further diminishes the financial burden on any single enterprise. A successful Commonwork system thus spreads financial responsibility, creates conditions favorable to all its members and at the same time, is structured and operated in a way that is

financially and legally sound.

Growing a Commonwork

Nature is supremely opportunistic—always offering up opportunities to transform energy and nutrients into new life, and always attracting life forms that can create a viable niche for themselves by carrying out that work of transformation in a particular ecosystem. Each species in turn “earns its welcome” so to speak, and maintains its viability by contributing to the conditions that favor the viability of other members of the ecosystem and the ongoing health and evolution of the whole.

The Commonwork system relies on this opportunistic reciprocity for its “business growth” strategy. Each Commonwork business that is created is governed by these principles of reciprocal benefit and wholistic accountability, and based on the belief that waste is simply a misplaced resource. Thus individual members as well as the Commonwork as a whole are always exploring how the products, by-products and “waste” of an existing business open up new opportunities. In this way one business generates the setting for the next business to evolve, often in ways that could never be predicted at the outset. For example, the original Commonwork began with a dairy farm as its core enterprise. Excavating to build the farm structures and infrastructure required dealing with the heavy clay soils of the region. Exploring this

as an opportunity rather than a problem attracted the right match of human energies and skills and led to the establishment of a successful handmade brick enterprise.

Not only does a Commonwork system model itself on ecological principles, it also grows organically out of the very specific character and essence of the land and the spirit and creativity of the people who are drawn to that place. While it utilizes many of the conventional business “tools” such as leases, business plans, market analyses, etc., it is never formulaic in their creation or their application. This is possible because the over-arching context that shapes all activities is the intelligence that comes from understanding and appreciating the living systems that make up the place a Commonwork inhabits—understanding how they work and appreciating what they contribute to and what they require for sustainability.

Growing Fox Haven

The Commonwork offers a pattern for consciously growing a model of regenerative relationship between people and place. It can help Fox Haven grow in a way that integrates people and place into a “healthy ecosystem” that is continually “self-creating, self-managing and self-regenerating through reciprocal relationships among its parts and with its larger environment.” Fox Haven’s success in growing its own model will depend greatly however on the degree to which its members can develop an understanding of how such ecosystems work and apply it to managing the growth process for the whole.

Ecosystems are living systems, dynamic, complex and intricately interrelated. We can appreciate them by learning to still the mind and be present in Nature. But as Part One of this booklet described, being able to learn from and apply the wisdom of Nature as expressed by

these ecosystems requires systemic thinking. It also described the challenge of learning a mode of thinking that is so different from the linear analytic thought process in which most of us have been trained. Systemic frameworks are mental tools that enable systems thinking. They help us image something as a whole while thinking about the interrelationship of the parts and assessing the potential consequences of any decision. One such framework was introduced in Part One as a means of understanding how living systems continuously create and recreate themselves, and designing interventions that enhance that process. The following section introduces two additional frameworks as mental tools for “process management”—organizing and managing the process of growing Fox Haven as a Commonwork type system.

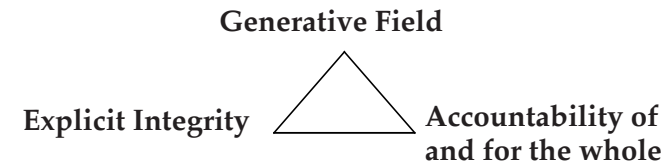
From a linear analytic perspective, managing tends to focus on discrete activities and measurable outputs. Like problem solving, this is valuable but full of hazard if done outside of a systemic context. From a systems perspective, managing involves stepping back from discrete activities to focus on process as continuous flows through the system with success measured against how well the potential of the system and all its members is being brought into existence. Designing and managing specific activities then takes place within this context. Emphasis is less on specific forms and structures, these will come and go with time, and more on the pattern of relationships we want to encourage or maintain.

The following frameworks address two aspects of life processes—self-ordering and self-organizing, that are critical to a systems ability to manifest their potential. The first framework deals with ordering processes and addresses the capacity for continuous evolution toward higher orders of potential. “Higher” here means states of order that are characterized by such qualities as greater complexity, diversity, resiliency, connectivity, etc. The second framework deals with organizing processes and addresses the capacity for maintaining health and integ-

rity as a living system even as the environment and the system itself evolve to new orders of being. Each consists of three interrelated elements that are translations of key principles that provide these capacities to healthy ecosystems. In each case, the weakening of one of these elements threatens the other two and therefore the success of the whole.

We have provided for each element a very brief explanation and some initial suggestions for application but it is important to remember that the interrelationship of the elements is of primary importance. Ultimately, the real value of these frameworks is as a source of ongoing dialogue among those working to develop and evolve managing processes for growing Fox Haven. Seen as a pattern for managing rather than a formula, they should enable our understanding and our ways of dancing with Fox Haven to live and change as she does.

Evolving toward Higher Orders of Potential



- ***Explicit Integrity***
Growth should be opportunistic and organic. No matter how tempting an opportunity may be however, Fox Haven can only maintain her vitality by pursuing those opportunities that are explicitly in integrity with place and purpose.

Ideas for Application: Develop the capability to assess opportunities for growth against how well they harmonize with and enhance the essence character of the land, the spirit and creativity of the

people who would be involved, and Fox Haven’s overall purpose.

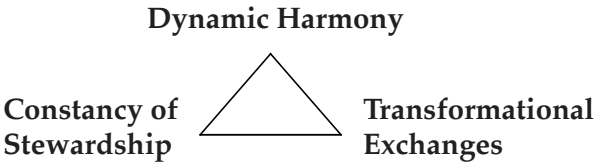
- ***Accountability of and for the whole***
Because the viability of the whole and the parts is interdependent, reciprocal benefit should be the defining characteristic of all relationships within Fox Haven and between Fox Haven and her environment.

Ideas for Application: Develop systems and processes and a culture (rituals, taboos, totems and status symbols) that cultivate a shared sense of accountability for the health of the whole and of each member, and develop the understanding required to live out that accountability. Create ways for ecopreneurs as well as visitors to track their systemic impact and forums for sharing information and ideas for improving performance toward more wholistic benefit.

- ***Generative Field***
Some places inspire us the moment we enter them; we feel nourished and both called to and capable of new levels of creativity. Others have just the opposite effect. Fox Haven grows her future through the generative quality of the field she creates within and around herself.

Ideas for Application: Consciously seek ways to grow a “field” that continually stimulates the generative and regenerative capacity of all who engage with and enter into it. Invite reflection on and solicit feedback about people’s experience of that field (as distinct from feedback on the facilities, operations, etc.)

Maintaining Health & Integrity:



- Constancy of Stewardship**
Every healthy ecosystem has, at its core, invested inhabitants for whom that ecosystem is their primary home, and who maintain and enrich the fabric of place through a constancy of stewardship. In the same way, everyone who works and/or lives at Fox Haven, including the trees, the foxes, bees and so on, should be committed to sustaining the stability and coherence of the whole.
Ideas for Application: Grow a core community of ecopreneurs engaging in earth-based livelihoods centered in Fox Haven. Develop processes that recognize and reinforce their unique roles, and support them in building their capability to carry out those roles.
- Transformational Exchanges**
Fox Haven’s renewal, resilience, and relevance require a continual exchange of

energies across the system’s boundary that benefits the lives of both visitors and the community in transformational ways. For example, song birds play a critical role in maintaining habitat during their periodic visits just as the habitat nourishes and shelters them at critical periods of their life cycles. Similarly, visiting artists, farmers, thinkers, and leaders would enrich the culture and thinking of Fox Haven, just as they would be enriched by exposure to practices that are informed by living systems thinking.

Ideas for Application: Integrate periodic participation of those outside Fox Haven’s boundaries into the community processes, e.g., involve them in the stakeholder meetings to assess environmental changes (see below).

- Dynamic Harmony.**
As Fox Haven’s environment changes and affects the flow of energies moving through a healthy ecosystem, she should be able to “reweave” herself so as to thrive in the new conditions while maintaining her essential character and her effectiveness.

Ideas for Application. Create governance systems whose primary purpose is to maintain a dynamic harmony of diverse energies in order to maintain health and wholeness while staying in consonance with the shifting energies of the environment. A council of stakeholders (board members, ecopreneurs, advisors) might meet regularly to assess the changes and trends in the external environment against the health and level of performance of the internal environment. Initiatives for change would be based on how to better realize Fox Haven’s potential within this changing environment, thus creating a model of governance based on system evolution.

*An Example of Commonwork
Analysis
Applied to the Fox Haven Land-
scape Pattern*

Forest openings created by blowdowns, in which burrowing animals have created fertilized and inoculated mounds of loose soil, attract jays to bury their acorns which sprout into oak trees. Similarly, the unused grass and clover in the fields is an attractor for local operations to mow or graze on contour, returning all manures to the uplands. The appropriate cycling of nutrients and water in the upland meadows will enable the continuing health of the grasses there, as well as the slopes and the creek. Therefore, any operation that utilizes these upland meadows needs to understand and direct its activities so that the meadows can continue to play a steadily improving role in the health of the whole system. In this way, both the meadows and the operation remain viable within the context of an improving Fox Haven. Also, clover strips used for feed could be cycled into higher value raspberries and then trees. In this way each money-making endeavor sets the stage for a higher order business, thus increasing the skills and financial strength of participating ecopreneurs while feeding the ongoing evolution of the whole. At the same time it represents the ecological successional process as well. The clover sets the stage for the higher value raspberries and the brambles set the stage for the forest.

Appendix

Earlier Recommendations

[Please note: While the configuration of the total property has changed, these recommendations from an earlier document contain valuable suggestions and provide a useful comparison to the conclusions offered in this document.]

In each zone this basic question is a barometer for decision-making: Will this action ultimately lead to increased health and vitality of Fox Haven’s waters—its creeks, intermittent streams, and springs?

Annual Farm Zone

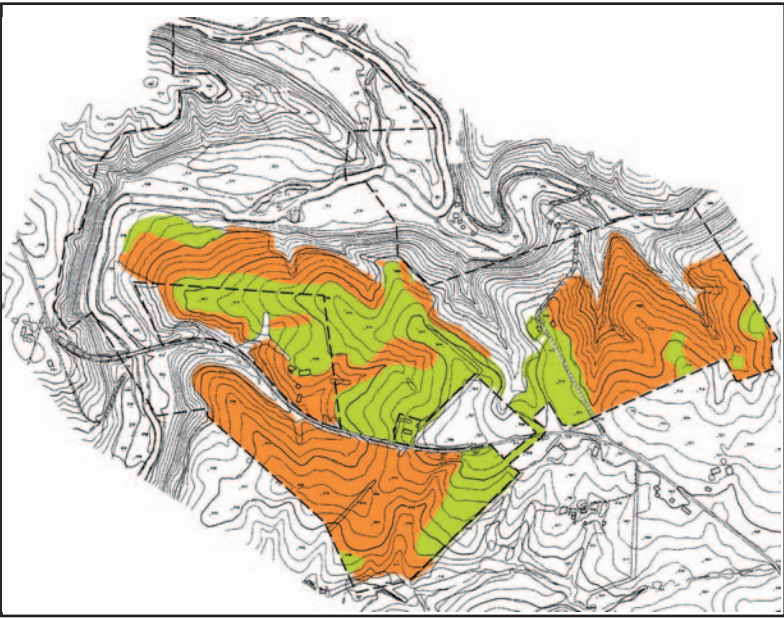
Potential for this area. This area has a flat enough topography to withstand the pressures of annual agriculture, if care is taken to minimize tillage. It has potential to support annual crops that require a minimum amount of input and yield a high order of return in a way that builds soil and is economically viable.

By its nature, annual agriculture tends to be a degenerative investment. The lands proposed for annual agriculture production are the areas where chances of this outcome are minimized. The idea is to make the crops chosen resonant with soils, climate, the larger whole of the Fox Haven system, the amount of labor available, and the marketplace as a way of minimizing the degenerative potential of this type of investment.

Current state and relevant issues. This zone is in a period of recovery from past practices. It’s in an experimental stage. It is less eroded than in other zones on the farm—this zone has the most remnant topsoil and most fully expressed soil profile. There is some erosion going on, however, it is probably not losing more soil than it is generating under current management practices. It’s probably in equilibrium, although it is not yet regenerating.

Annual Farm Zone Recommendations

- 1 Use organic practices.
- 2 Use practices that minimize the inversion of soil layers: keyline plowing, low tillage practices, successional seeding in undisturbed beds, and intercropping; also, explore the viability of other forms of clearing like burning.
- 3 Choose crops that require minimal inputs and build soil life, and also have a high dollar return on seed, such as



- wildflowers and native grasses.
- 4 Avoid exporting large amounts of organic material from the system—such as baling an entire field and carrying it off the property. Restrict export of organic material to less than 15 percent of what is grown in a season.
 - 5 Generate nutrient inputs on-site and find cost-effective ways to distribute them. Examples are turkey or chicken tractoring and using grazing animals to reincorporate organic material in Savory-type rotation or dynamic “fold-ing” practices.
 - 6 Divide the farm into a series of patterned plots that allow for uniform keyline practice in individual plots for plow-ing, seeding, and harvest. Restrict the size of plots to four to eight equipment passes and create perennial borders between the plots.
 - 7 Create a crop rotation pattern that is flexible enough to protect the soil struc-ture of wet fields, and also protect wildlife during birthing and nesting season.

Perennial Farm Zone

Potential for this area. This area is vulnerable to erosion: it is suited to building soil and soil life by nearly eliminating tillage. Its accessibility tends itself to ready harvest and utilization, making it ideal for food forest, pasture, and as a growout reclamation resource. Orchard is highest level of succession in this cropping system.

Current state and relevant issues. This zone is seeing a higher order of soil loss than the annual farm zone due to various forms of erosion, mostly water. It has a less fully-expressed soil profile. The potential for damage due to erosion is significantly higher from a regenerative perspective when this area is treated as an annual agricultural zone due to degree of slope.

Perennial Farm Zone Recommendations

- 1 Pattern according to keyline layout, resonant with the annual farm zone.
- 2 Group orchard and nursery on the near reaches of this zone, closest to the farm center.
- 3 Create a multistory, stacked perennial farm—a food forest. Use higher-grade cultivars and more costly plants in this area, as compared to the more outlying areas.
- 4 Consider patterning this zone over time using the succession model as a guide. Create a successional wave

- across the landscape: rotate through grasses and wildflowers (becoming pasture), then nut and berry shrubs, then orchard, then return to grasses and wildflowers.
- Plant perennial polycultures in guild relationships.
 - Place perennial grass and wildflower seed production and perennial nut and berry shrubs in guilded relationships in the farthest reaches of this zone.
 - A range of 8 to 12 percent slope may be suited for perennial pasture.

Enhanced Forest Zone



Potential for this area. To create an accessible, enhanced heritage hardwood forest complex that stabilizes the shoulder of the landscape while providing yield of different types and qualities over a long range of time for people and wildlife. This would dramatically enhance wildlife habitat while providing a yield for consumption on-site, and for the marketplace. This area could provide a model for a commercial perennial agriculture for the rest of the watershed. It has the capacity to make a genetic contribution to the wild gene pool in the whole of the watershed—it could function as an ark for species diversity in the Catoctin Valley. This zone is the logical place for the reintroduction of the keystone chestnut, when blight-resistant chestnuts are fully developed and available.

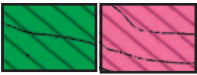
Current state and issues. This is the area of most significant erosion or soil loss on the site, and the most critical place to attend to from the standpoint of erosion. A significant part of this zone has already been planted in trees, as part of the conservation plan effort, and reversal of soil loss has already begun.

Enhanced Forest Zone Recommendations

- This area is not suitable for development.
- Focus on planting cultivars that have enhanced value, disease resistance, and commercial qualities.
- Select species for optimum productivity and potential for mutualistic relationship within guilds, for resonance with energetic flows and landform characteristics, and for their ability to support larger populations and greater diversity of wildlife.
- Build on existing vegetation and existing tree plantings to create guilds of high-value heritage hardwood nut and timber trees interplanted with guilds of nut and berry shrubs. High-value cultivars can be grafted on existing tree

- bank plantings.
- Choose species to tolerate or take advantage of global warming; include more southerly elements.
 - Inoculate with key species: fungal species, soil symbionts, wildlife, and missing tree species—the whole range of things that would support the interconnected diversity of the whole.
 - Over time, thin and harvest for durable rot-resistant high-strength posts and poles, while nut yield is increasing.
 - When a solid canopy has been achieved, selectively harvest valuable timber, creating openings and glades in the canopy.
 - Begin the cycle again in the clearings, creating a multi-age forest complex.
 - Introduce herbs and fungi with high commercial value in relationship to guilds and landform.
 - Reintroduce chestnuts into clearings in the system when blight-resistant varieties become available.
 - Develop a management regime that simulates the effects of fire, perhaps using goats, or chickens on another level. Could be a rotation of goats, sheep, and cows. Creating some form of exclusions would be necessary.
 - Eventually succeed into Perennial Farm Zone, if desired.

Sanctuary Zone



Potential for this area. To create a heritage hardwood forest that stabilizes the shoulder of the landscape while providing yield of different types and qualities over a long range of time.

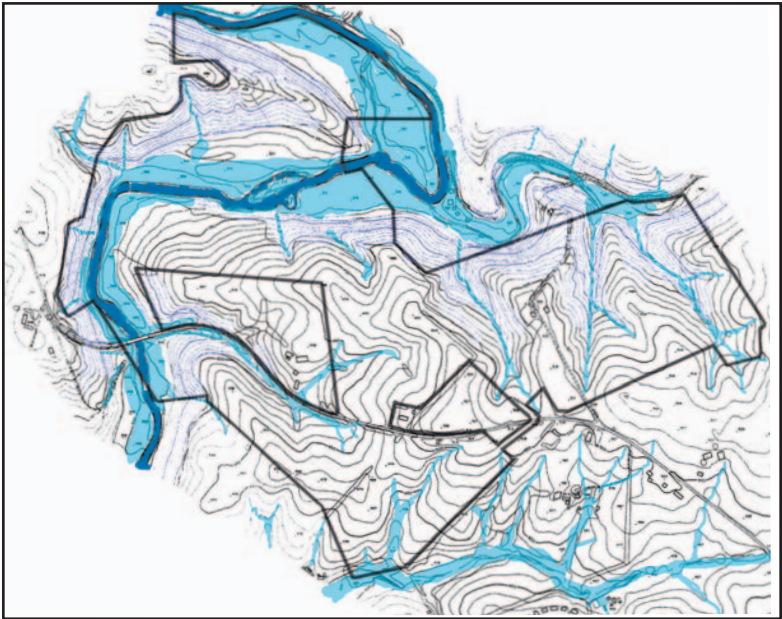
Current state and issues. The most remote aspect of the holding, and probably the best existing wildlife habitat. In the highest state of health of all of the system. This zone has been protected from disruption, except in the bottom cleared fields in the floodplain that are now in trees and summer grasses. These are probably the oldest farm fields on the property.

Sanctuary Zone Recommendations

- This area is not suitable for development.
- For the most part, do not disturb.
- Very occasionally, perhaps every ten years, create glades by sustainably harvesting timber in a small area. Harvest intensively to simulate the effects of natural catastrophic events such as fire. The resulting glades may be planted to keystone species such as chestnut.
- Inoculate with fungi and introduce a broader diversity of berries to edges.
- Transition the summer grasses meadow to a more diverse native prairie system.

Riparian Zone

Potential for this area. The riparian zone consists of the creeks, creekbanks, and floodplains. Catoctin Creek is a generator of edge; it is constantly destroying and creating, cutting and depositing. It is the creator of the valley itself. It’s a principal corridor for nutrient delivery and genetic transport in the watershed. It has the potential to be the richest zone of Fox Haven from the standpoint of diversity of life, of health and resilience, of vibrance and vitality because it is both connected to and the connection through the whole of the system.



Current state and issues. The riparian zone is one of the most vulnerable areas of the system. It’s like the canary in the mine shaft in relation to the health of the system. What’s currently missing for its potential to be fulfilled are the conditions that would allow keystone elements like beaver to truly flourish and do their work in support of the health of the system in a comprehensive way. Beaver are a keystone species for rebuilding the integrity of the whole—they complicate the aquatic edge, increasing aquatic habitat, creating biological filters that cleanse the system. While currently present, their numbers need to be much greater.

Currently, the creek is too flashy and sediment-laden to fully support keystone elements. Intact forest cover no longer protects it from climatic variation, allowing the stream to ice up every year. Intact forest no longer regulates and filters runoff. Violent catastrophic events keep beaver from completely damming the main creek. If conditions were present to allow beaver to do their work in the watershed, that would take care of the other missing elements like trout and otter. Introducing chestnuts into the tissue of the landscape on the shoulder and slopes would create an exponentially greater sponge and filtration system, ultimately supporting more stable conditions in the water flow of the creek. In addition to stable conditions in the water flow, specific species, like poplar, are needed along the creek to support beaver.

Riparian Zone Recommendations

- 1 Look at how agricultural practice in the whole of the watershed could be economically vital and viable while replacing the sponge in the tissue of the watershed. The chestnut is a keystone species in replacing the sponge in the tissue between drainages.
- 2 Model that approach within Fox Haven.
- 3 Within that context, consider how beaver habitat and populations could be increased by specific, economically viable actions that could simulate conditions found in the creek upon European contact.

Work Song

If we will have the wisdom to survive,
to stand like slow-growing trees
on a ruined place, renewing, enriching it,
if we will make our seasons welcome here,
asking not too much of earth or heaven,
then a long time after we are dead
the lives our lives prepare will live
here, their houses strongly placed
upon the valley sides, fields and gardens
rich in the windows. The river will run
clear, as we will never know it,
and over it, birdsong like a canopy.
On the levels of the hills will be
green meadows, stock bells in noon shade.
On the steeps where greed and ignorance cut down
the old forest, an old forest will stand,
its rich leaf-fall drifting on its roots.
The veins of forgotten springs will have opened.
Families will be singing in the fields.
In their voices they will hear a music
risen out of the ground. They will take
nothing from the ground they will not return,
whatever the grief at parting. Memory,
native to this valley, will spread over it
like a grove, and memory will grow
into legend, legend into song, song
into sacrament. The abundance of this place,
the songs of its people and its birds,
will be health and wisdom and indwelling
light. This is no paradisal dream.
Its hardship is its possibility.

Wendell Berry



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