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Restoring the Mississippi River Ecosystem in the Twin Cities: The Values of a Historical Approach

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Restoring the Mississippi River Ecosystem
in the Twin Cities: The Values of a
Historical Approach

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Environmental Studies Honors Thesis
Advisor: Christopher Wells, Environmental Studies
Submitted May 4, 2009

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Abstract

The National Park Service has begun the ecological restoration of areas along a 72-mile stretch of the upper Mississippi River known as the Mississippi National River and Recreation Area. These projects aim to ecologically restore degraded landscapes by removing invasive species and planting native vegetation. The Park Service uses species compositions from pre-settlement Minnesota to inform its restoration efforts. I have investigated what plant species grew in the region centered around the confluence of the Mississippi and Minnesota Rivers through extensive research into eighteenth and nineteenth century sources such as the journals and notes of Euro-American explorers, government land surveys, and Native American cultural uses of plants. My research has culminated in a list of vegetation that grew along the river before Euro-American settlement in what is now the Twin Cities, which the Park Service can use in its restoration of historical landscapes. My project illustrates the uses of a historical perspective to research and understand the underlying philosophy and values of the field of ecological restoration. I show that all ecosystems are the products of human economic activities, which change over time, which complicates efforts to restore historical, dynamic landscapes.

Introduction

In 1988 Congress set aside a seventy-two mile stretch of land along the Mississippi River in Minnesota called the Mississippi National River and Recreation Area (MNRRA). It charged the National Park Service, under the Department of the Interior, with the management of this unique stretch of the Mississippi River, which flows from the towns of Dayton and Ramsey south through Minneapolis and St. Paul to Hastings to provide special protection as well as recreational and educational opportunities to the public. The Department of the Interior does not own this national park, but instead works with various city and state agencies and organizations to protect it and provide opportunities for citizens to enjoy and learn from the river environment.

MNRRA protects, preserves, and manages this crucial corridor for many different reasons, some of which are ecological, and others cultural or economic. The river is important as a continental watershed, a source of freshwater, and for the role it plays for migratory birds and other plants and animals. Minnesota's stretch of the river sees it grow from a modest size to an enormous floodplain river as it gathers tributaries and winds south towards the Gulf of Mexico. The park is the only national park along the two thousand and three hundred mile course of the river. According to the park's website, humans have altered the Mississippi in order to exploit its potential for water, power, and transportation more than almost any other natural resource.¹ Recognizing its importance—

¹ "Nature and Science," Mississippi National River and Recreation Area, National Park Service, Department of the Interior, <http://www.nps.gov/miss/naturescience/index.htm>.

ecological, commercial, and cultural—the Park Service now aims to restore the great river’s environment for its own sake as well as to provide educational programs and recreational opportunities that enable citizens to experience nature in the midst of the heavily populated Twin Cities metropolitan area.

One way in which the Park Service plans to restore the river throughout the seventy-two mile stretch is through habitat restoration. Seas of prairie once swayed as far as the eye could see along the river’s banks. Pockets of forest dotted its shores. Native Americans lived in the area and hunted in the forests and prairies and collected vegetables and rice from the river. Their presence, coupled with the later establishment and growth of the Twin Cities by Euro-American settlers, severely altered the ecosystem of the area, radically changing its plant and animal communities. The Park Service now recognizes this fact and seeks to reverse the trend. A set of site development policies from the park’s Comprehensive Management Plan includes providing “uninterrupted vegetated shorelines” by preserving and restoring native vegetation.² Although there are many reasons for preserving the river as a national park, the Park Service states “restoration of native plant communities and removal of exotic species are high priorities for the Mississippi River corridor.”³ A handful of restoration projects have been carried out since the 1990s and many more are planned for the future.

² “Comprehensive Management Plan,” Mississippi National River and Recreation Area, National Park Service, Department of the Interior, <http://www.nps.gov/miss/parkmgmt/cmp.htm>.

³ “Plants,” Mississippi National River and Recreation Area, National Park Service, Department of the Interior, <http://www.nps.gov/miss/naturescience/plants.htm>.

The National Park Service in St. Paul undertakes the restoration of degraded landscapes to self-functioning ecosystems through the use of citizen volunteers, in a double-pronged effort to promote citizen stewardship and health and to restore landscapes. It is primarily volunteers who carry out the actual work of replanting native species and removing invasive species with the help of the Park Service. Since its inception in 1988 the Mississippi National River and Recreation Area began working on ecological restoration projects as a way to foster community involvement with the park's river environment under the mantra that access to nature creates healthy and lively citizens and communities regardless of the effectiveness of park interpretation or ecological restoration. Richard Louv, in his popular book *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder*, argues that the increasing disconnect between children and nature that has come as a side effect of the Information Age contributes to childhood obesity, attention disorders, and depression.⁴ Louv's thesis that contact with nature is inherently beneficial underlies the Park Service's guiding philosophy that incorporates citizens into restoration projects. The Park Service heeds Louv's call to engage community members with their local environment to combat the disturbing distance between most children and nature, as well as carry out successful restoration projects. Therefore restoration projects along the Mississippi River serve a dual role for the park service: restoring habitats to self-functioning ecosystems and allowing citizens to connect with nature by involving them in hands-on restoration projects. Citizens getting their hands dirty in direct

⁴ Richard Louv, *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder* (Chapel Hill, NC: Algonquin Books, 2006).

hands-on activities is just as important to the Park Service as the stated end-goal of returning habitats to self-sustaining systems.⁵

My job has been to research the historical ecosystem of the area that now comprises the Mississippi National River and Recreation Area, with an emphasis on native plant species, in order to assist in the ecological restoration of certain sections along the corridor. My project focuses on two objectives that can contribute to the Park Service's efforts to restore the river ecosystem.

Firstly I sift through historical evidence of the Twin Cities landscape, including journals, notes, letters, maps, and manuscripts, to understand what plant species grew here, what animals lived here, and what the landscape looked like prior to European and American settlement. Most of these sources date back to the eighteenth and nineteenth centuries, when Euro-American explorers surveyed the land of Minnesota and later, when Fort Snelling was the backdrop for shifting cultural and economic relationships between Euro-American settlers and Native Americans (the fort was a site for treaties, ceremonies, and trading, but it also served as a concentration camp and prison for the Dakota in 1862). No other researchers have explored the ecological history of St. Anthony Falls and the area around Fort Snelling, so my work contributes to a broader historical understanding of the Twin Cities by incorporating its ecosystems into its history. My research is also designed to directly inform the National Park Service in its

⁵ Thomas Ibsen (Volunteer-In-Parks Coordinator, Mississippi National River and Recreation Area, National Park Service), in discussion with the author, March 2009.

ecological restoration efforts, in the form of a list of historical plant species that grew in the area that I have gleaned from my various sources.

Secondly, I aim to set up a discussion about the field of ecological restoration, in which I explore its limits and problems, but also explore the possibilities and opportunities associated with restoration work. As a student of environmental history, I wish to express the value of a historical perspective in the restoration of areas along the Mississippi National River and Recreation Area. A historical perspective brings challenges and opportunities to restoration efforts, including choosing a reference date for restoration work and understanding the troubling idea of “authentic” and “natural” landscapes. Using human technological prowess to restore the environment is a power-laden process that speaks volumes about our relationship to the natural world. How does ecological restoration create new ways in which humans live and work in their environment? How can humans know how to “fix” nature? While these questions bring up difficult ideas and decisions, I believe a historical and at times philosophical analysis will ultimately enrich the Park Service’s ecological restoration efforts.

My goal is to assist the Park Service in its restoration work by showing the value of the methods and insights of a historical approach to site-specific restoration projects by combining and analyzing the collected ecological history of the Mississippi River in what became the Twin Cities Metropolitan area, compiling a list of endemic plant species, and exploring the philosophy behind ecological restoration.

Ecological restoration is a complicated process that involves many decisions, based on a host of sources that are incomplete and at times opaque. In order to begin to restore the ecosystem along the Mississippi River, restorationists first must pick a point in time that they want to try to restore. The goal of restoration involves the planting of native species, although historians and ecologists believe that “native” is a tricky concept to work with. The Minnesota Department of Natural Resources understands native species as those that existed in Minnesota prior to European settlement.⁶ As I show, using this baseline ignores the presence and impacts of Native American populations on the ecology of Minnesota and may hinder restoration efforts. The next step involves understanding the species composition of that period. It is also helpful to know the larger ecological dynamics between plant and animal species and humans. Ecologists striving to understand the inner-workings of complex communities have concluded that all parts of an ecosystem shape it, not solely plants. The concept of wilderness—areas free from human influence—teaches that ecosystems are large, complex, and ever changing, which complicates efforts to choose a static historical period for restoration. If ecosystems naturally change over time, what period should restorationists use as a model? Understanding and embracing the wilderness ethic also means accepting natural factors such as fire and drought under the recognition that restoration work seeks to recreate self-functioning ecosystems with minimal human management.

⁶ Norman E. Aaseng et al., *Minnesota's Native Vegetation: A Key to Natural Communities* (St. Paul: Minnesota Department of Natural Resources, 1993), 87.

To identify the plant and animal species that historically lived and grew in what is now the Twin Cities metropolitan area, I refer to many sources. My main pool of resources is the written accounts of Euro-American explorers, which offer primary evidence regarding what Minnesota looked like (to their eyes) during the period of Euro-American exploration. Numerous expeditions traversed the land of Minnesota from 1600-1861 during the early Euro-American exploration and settlement period. Journals, notes, and letters from these historical observers often described the nature they witnessed, which gives us an intimate window onto the past. Written accounts are only as good as the word of the writer, however, and we cannot always trust historical narratives to be one hundred percent truthful or accurate. Each writer has personal motivations, biases, and skills at describing ecosystems accurately, which can color the integrity of individual accounts. An analytical comparison of numerous accounts from different actors and periods of time mitigates these limitations and fosters a fuller understanding of Minnesota's ecological history.

To glean the fullest possible understanding of historical ecosystems, I cross reference early Euro-American accounts with historical land surveys and data taken from geological cores. Land surveys provide a good source of material for reconstructing the historical biological communities of Minnesota. A set of maps known as the Marschner maps lay out the original vegetation of Minnesota as taken from state land surveys from 1847-1907. The Minnesota Department of Natural Resources has also done extensive research in order to describe the native vegetation of the state. Surveys unfortunately contain mostly data for recent or

current plant species and do not probe that deeply into the past, though they offer the cutting edge in our ecological understanding of Minnesota today. Scientific research and data drawn from geological cores and other sources offer another set of historical clues about of Minnesota history. Scientists obtain geological cores by digging deep underground and extracting layers of earth (cores). When analyzed for pollen and other biological material these samples can give an idea of the climate and ecology going back hundreds of years. Cores present plant data in a straightforward manner, free from the biases and subjective accounts of historical actors, but present their own problems of ambiguity and interpretation.

To obtain a balanced portrayal of the upper Mississippi River's historical ecosystems, I rely primarily on Euro-American explorer accounts, which I back up with land surveys and geological core data. A combination of these sources, when analytically compared and contrasted to one another, provides the most trustworthy account of the historical ecology of the Mississippi River running through the modern Twin Cities.

Ecological Restoration with a Historical Focus

Henry David Thoreau, the famed naturalist and philosopher, visited the western frontier of Minnesota the year before his death in 1862. His doctors urged him to leave the East in search of fresh air and a change of climate, in a desperate hope of ameliorating his worsening tuberculosis and bronchitis. Thoreau saw this as his last chance to visit the great western frontier and reveled in the opportunity to examine the ecology of the area and witness the exchange between Euro-

Americans and Native Americans. He searched in particular for a wild crab apple tree, which he found to his great delight on the shore of Lake Calhoun in modern Minneapolis. He also traveled up the Minnesota River by steamboat to witness the annual government payment to the Dakota at Redwood, which included a ceremony and dances.

Thoreau arrived in Minnesota on the morning of May 25th, 1861, with his young friend and companion, Horace Mann Jr., a budding naturalist himself at seventeen years old, and immediately began cataloging the nature he saw.

Thoreau's journals from his voyage west reveal a great deal about the mid nineteenth century ecology of the area that later became the Twin Cities. One of only a handful of botanists to come through Minnesota in the state's early years, his notes provide crucial details into the biological makeup of what is now the metropolitan area, since he traversed the land that is now occupied by Minneapolis and St. Paul with an eye to the earth and a fascination with plant and animal species.

Part of what drew Thoreau to Minnesota and the great western frontier was the idea that its landscape was somehow more "authentic" than the heavily modified landscapes of the East. Humans have a tendency to idealize the past, and Thoreau was no exception. Six years before he came to Minnesota, Thoreau sat down with William Wood's 1633 survey of the land of New England to compare the forests of Wood's time with those of 1855. As William Cronon points out in his groundbreaking environmental history, *Changes in the Land*, Thoreau wrote, "I cannot but feel as if I live in a tamed, and, as it were, emasculated country," as

he cataloged the disappearance of many animal species from New England's forests including, "—the cougar, panther, lynx, wolverine, wolf, bear, moose, deer, the beaver, the turkey, etc. etc."⁷ As a naturalist, Thoreau desired to know nature completely: "I wish to know an entire heaven and an entire earth."⁸ Yet he convinced himself that he saw only the remnant pieces of the incomplete puzzle of nature that Euro-American settlers had degraded. Most of the same species of trees were still growing, except they were less abundant than in Wood's descriptions. This nostalgia for an earlier time and a more complete nature caused Thoreau to muse, "Is it not a maimed and imperfect nature I am conversant with?" Thoreau lamented the fallen state of nature, advocating setting aside areas free from human influence—the precursor to the protected wilderness concept. Although restoration ecology did not exist at this time, Thoreau might have wished to restore the forests he saw to the more "perfect" and less "maimed" state of William Wood's 1633.

The same problem of finding an "authentic" nature that troubled Thoreau continues to beguile ecologists working with degraded landscapes today. Humans have always been modifiers of their environment. Like any animal species, people interact with their surroundings by eating, drinking, building and so forth. Modern human impacts on the environment have caused dramatic ecological harm. Yet ecologists today—unlike those of Thoreau's era—have the knowledge and ability to completely alter landscapes in ways that restore the natural functioning of their

⁷ William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 2003), 4.

⁸ *Ibid.*, 15.

ecosystems by planting native vegetation and removing invasive species. The field of restoration ecology arose in the early 1990s, defining itself as “the process of intentionally altering a site to establish a defined, indigenous, historic ecosystem. The goal of this process is to emulate the structure, function, diversity, and dynamics of the specified ecosystem.”⁹ With such an emphasis on the past in restoration efforts, the work of the historian is paramount in order to understand the social, economic, and natural history of areas targeted for restoration. This original definition of restoration ecology prompted much controversy over the values inherent in the process of restoration, which an environmental history perspective can help unpack. How much credence should ecologists give to the history of a place? Can ecologists decide on how an ecosystem *should* look? What point in the eons of history represents the “original” state of a landscape, given the fact that ecosystems naturally change?

Finding a baseline for restoration efforts proves tricky. In Europe, for example, no one pretends to know what “indigenous” means, since the continent has multi-thousand-year histories of peoples moving all over. If the “naturalness” of ecosystems is relative (and based solely on human judgment), all landscapes can be seen as “maimed and imperfect” by outside arbiters. Eric Gibbs, a Canadian professor and author on the subject of ecological restoration, points out that the idea of “restoration” changes too, in *The Oxford English Dictionary*, which has six definitions for restoration, including, “the action or process of

⁹ Eric Higgs, *Nature by Design: People, Natural Process, and Ecological Restoration* (Cambridge, Massachusetts: The MIT Press, 2003), 107. Precursors to restoration ecology existed as early as 1930 when Aldo Leopold restored Wisconsin prairies.

restoring something to an unimpaired or perfect condition.” One can restore a painting in this sense, since a painting had a definite condition to refer back to.¹⁰ Nature on the other hand constantly changes as lightning erupts forests into flames, rivers shift their beds and dry up, ice ages sweep in, and climates change over time. When, in this context, can we say that nature was ever “unimpaired” or “perfect” in the sense of the *Oxford English Dictionary’s* definition?

The concept of ecological restoration is simple enough to understand, but applying the idea of restoration to a dynamic entity proves problematic. At what point in time is an ecosystem “authentic?” Humans invented the concept of authenticity and continue to struggle with it as it relates to ecological restoration. If restorationists select an arbitrary point in time as the “correct” and “authentic” basis for restoring an area, they are apt to forget the varied history of that place. When restorationists aim for restoring the floral and faunal species composition of pre-settlement Minnesota, they ignore the thousands of years Native Americans inhabited and influenced the land. But going back past the presence of Native Americans would leave restorationists trying to mimic the environment of an ice age, and that is certainly not the goal. How then to arrive at a baseline date for restoration projects?

Cronon cautions against divorcing history from nature in a search for authenticity. Imagine an epic poem chronicling an earlier time with the best pages missing, to use one of Thoreau’s metaphors. “Human and natural landscapes are too entangled for us, and our historical landscape does not allow us to guess what

¹⁰ Ibid., 96.

the ‘entire poem’ of which he spoke might look like,” writes Cronon. “Our project must be to locate a nature which is within rather than without history.”¹¹ As restoration projects proceed, it is vital to pick a starting point as a model and defend it with good reason.

This process is further complicated by the fact that ecosystems have their own histories. Ecologists once considered wilderness a steady state where nature flourished in a largely unchanging condition. Yet as Cronon explains, ecologists now reject this idea: “There has been no timeless wilderness in a state of perfect changelessness, no climax forest in permanent stasis.”¹² Going to great effort to restore and then display an ecosystem means little if restorationists do not pay attention to what caused an ecosystem to arise and what caused it to change. Restorationists then must make every effort to consider the thought, history, and reasoning that went into its degradation, as well as its subsequent restoration and maintenance. It is crucial, in other words, to recognize and acknowledge the assumptions, values, and choices that restorationists make regarding different versions of nature in one place at different points in time.

Numerous anthropocentric and Eurocentric forces hide just below the surface of many well-intentioned efforts to restore ecologically degraded areas. In *Miracle Under the Oaks*, William K. Stevens writes about the surge of interest in nature rehabilitation in America. He says the purpose of ecological restoration, as most American restorationists interpret it, “is to return an ecosystem as nearly as

¹¹ Cronon, *Changes in the Land*, 15.

¹² *Ibid.*, 11.

possible to the condition in which it functioned before Europeans disturbed it.”¹³ Americans romanticize the past, and often view pre-contact America as a primeval, barren wilderness that Europeans arrived and conquered. Environmental historians agree that this was not the case.¹⁴ Native Americans have lived in North America for millennia and had reshaped its ecosystems on a continent-wide scale. Ignoring or denying the lasting effects of their presence clouds any attempt to restore ecosystems and furthers the ideological dispossession of their ancestral lands. Restoration ecology can fight this unintentionally damaging tendency by accounting for the roles Native Americans have played in shaping both historical and present river landscapes and incorporating them into National Park Service interpretation projects.

As long as the significant influence of Native Americans is accounted for, the vegetation pattern of the upper Mississippi ecosystem as it existed in the years just before Euro-American settlement remains a worthwhile goal for restoration projects because the ecosystems of that period were robust and diverse, scores of trustworthy sources document this period, and this period provides an excellent chance to examine the cultural transition from a Native American economy to a settler economy. If all human impacts on the environment occur in history, we have to choose a historical point of reference for restoration projects. A time period with many sources makes sense to ensure accuracy. Minnesota, despite its

¹³ William K. Stevens, *Miracle Under the Oaks: The Revival of Nature in America* (New York: Pocket Books, 1995), 151.

¹⁴ See Spence, *Dispossessing the Wilderness*; Cronon, *Changes in the Land*; and Steinberg, *Down to Earth*, for discussions about Native American effects on the land before Euro-American settlement.

long history of Native American presence, still looked new to the eyes of early Euro-American explorers and settlers who ravenously explored *and* documented the frontier land of Minnesota. Good historical environmental descriptions come from the frenzy of scientific exploration of the eighteenth and nineteenth century that accompanied the Euro-American conquest of Minnesota. The shift in cultural hegemony from Native American tribes to Euro-American traders and settlers occurred under a climate of inquiry where explorers and settlers wanted to learn as much about the land and its features as possible in order to successfully annex it for the young United States. Euro-American explorers arrived at Minnesotan land, described it, and then settled upon and altered it. The numerous scientific and explanatory journals from early explorations leading up to settlement offer prime historical evidence explaining what the land looked like—how the rivers and bluffs looked, what plant species grew, where animals lived, etc.

Thus it is important to recognize the reasons for choosing the ecosystems of early Euro-American settlement for restoration. This was a time of cultural and economic transition, a fact that the Park Service should incorporate into interpretations of restoration projects in order to fully inform and educate the public. The Park Service should self-consciously explain Euro-American settlement as the historical framework for its restoration projects and its interpretations should reflect this, given the varied history of the Mississippi/Minnesota River confluence. Neglecting to explain the reasons behind restoring pre-settlement plant species risks ignoring other time periods and presenting a lopsided view of the ever-changing Mississippi River landscape.

Indeed, exhibiting a restored ecosystem that explains neither the history of Native American presence nor the idea that ecosystems are constantly in flux does the public a disservice. Accounting for the cultural transition from Native American to Euro-American influence as a temporal framework for restoration adds richness and complexity to its interpretation as well as historical accuracy.

Therefore park interpretation has multi-faceted goals. Revegetated parks along the river should stress that ecosystems constantly change, sometimes in ways that are healthy and others in ways that lead to degradation, and also explain how and why *this* pre-settlement time period—of the many possible historical ecosystems that could be restored—is on display. Otherwise, visitors are in danger of misunderstanding the nature of restored ecosystems and may fail to appreciate the complex history—both ecological and socioeconomic—of landscapes and the work it takes to restore them.

The notion that humans disturb nature comes directly from our troubled relationship with it, and rests on the premise that humans stand both inside and apart from nature. We recognize that we originate in nature yet now live almost as outcasts with little connection to it besides mastery. Environmental author Michael Pollan explains that although humans live in nature, we believe that we are no longer strictly *of* nature.¹⁵ We have a superiority complex. We do not think any other species disturbs nature, except for species from other parts of the world that move in and dominate a new region, known in ecology as exotic or invasive species. We treat ourselves like perpetual invasive species on the planet we call

¹⁵ Michael Pollan, *Second Nature: A Gardener's Education* (New York: Grove Press, 1991), 196.

home. The beaver gnaws down trees to build dams that block rivers, yet it still simply lives in, and interacts with, nature rather than “disturbing” it.

To be sure, humans have grown adept at exploiting other species for our societal gain. Evile Gorham, ecologist at the University of Minnesota, however, asks us to consider that ants exploit other fungi and aphids, primates use tools, and birds transport other organisms across environments, all of which occur in “nature.” Why then do all these actions seem distinctly human? Realistically humans make up but one member of a community of millions of species sharing planet earth. Gorham, however, emphasizes certain traits that distinguish humans from other species. Humans have large brains capable of memory, language, compassion, and other traits that have caused our population to grow unmatched. “The human species is unique—its role in the biosphere is not strictly comparable to that of the other species with which it shares the planet—and, therefore, deserves a different sort of consideration.”¹⁶ Early in human history, *Homo sapiens* were just another species. Today, though, humans have largely interrupted natural processes and have contributed a great deal of pollution to the land, water, and air. As the dominant species on the planet, humans exert undue influence on the rest of the world. We know that we are different. Recognizing the human capacity for large-scale ecological degradation is the first step towards realizing the complete human potential for ecological restoration, which places humans in *and* of nature.

¹⁶ Evile Gorham, “Human Impacts on Ecosystems and Landscapes,” in Joan Iverson Nassauer ed., *Placing Nature: Culture and Landscape Ecology* (Washington: Island Press, 1997), 30.

What if all human action did not “disturb” ecosystems, but instead ameliorated them? Ecological restoration arose as a boon to the guilty consciences of many environmentalists, who lamented the state of the world and the ignorant complicity through which most humans polluted the land. Ecological restoration is based on the premise that humans can work with nature for mutual benefit. Ecological restoration desires more than just to conserve land but to improve it. This logic guides conservation biologists that mean well in their efforts to fix the nature that humanity collectively broke. Michael Pollan writes that restorationists think humans “should intervene to re-create damaged ecosystems: polluted rivers, clear-cut forests, vanished prairies, dead lakes.”¹⁷ He describes early restoration work from 1930 in which Aldo Leopold and some followers at the University of Wisconsin re-created a tall-grass prairie ecosystem at the university’s arboretum. It has been continually managed and survives today.¹⁸ The reconstituted prairie exemplifies humans recognizing their error and successfully recuperating ecosystems that past human actions had ravaged. Of restoration, Stevens writes, “This seems not only logical and practical, but also just: Humans have disrupted the system, so humans should fix it.”¹⁹

This is all well and good. Few environmentalists doubt that ecological restoration is a good thing. Environmentalists would rather see an area rehabilitated with native species and restored to an idea of naturalness, than let economic development run rampant and take all the green out of the place. Not

¹⁷ Pollan, *Second Nature*, 197.

¹⁸ Ibid.

¹⁹ Stevens, *Miracle Under the Oaks*, 152.

only that, but restoration work also allows humans to discover the inner-workings of nature by trying to mimic it. Like gardening, “The best way to learn about nature’s ways is by trying to imitate them,” Pollan says.²⁰ In doing ecological restoration work, ecologists must humbly consider why they want to do it and how they are going to do it.

The idea of wilderness provides a useful framework for thinking about the vitality of ecosystems on their own grand scale, which restoration seeks to mimic. A wilderness is an area of land that humans have not modified in any way, so globally wilderness remains outside the sphere of human influence. While wilderness as a concept remains hard to nail down, it has no doubt helped humans restrain the tendency to dominate the lot of nature, as Pollan writes.²¹ It has led to the preservation of large areas like Yellowstone and Denali, which are managed today as “wilderness.” The wilderness ethic dictates that without the influence of humans nature may freely run its course. Ecologists understand wilderness areas, in their various forms, as necessary harbors of biological diversity that allow millions of species to flourish and evolve on their own.²² Any work of ecological restoration must heed this axiom if it hopes to succeed over time. Large tracts of “wilderness” in Alaska present different challenges than restoring urban riverside landscapes in the Twin Cities, however. Inhabited landscapes nonetheless share complex interactions among species that make up a site’s ecology. Understanding wilderness-scale ecology will facilitate the management of restored ecosystems

²⁰ Pollan, *Second Nature*, 197.

²¹ *Ibid.*, 180.

²² Gorham, “Human Impacts on Ecosystems and Landscapes,” in Nassauer ed., *Placing Nature*, 22.

by causing restorationists to consider the full spectrum of ecosystem dynamics regardless of scale or location.

Ecological restorationists should “think like a mountain,” as Aldo Leopold suggested, which means recognizing that disturbances such as fire, storms and drought naturally occur in ecosystems.²³ Ecologists should view disturbance regimes as part of an ecosystem rather than impediments to it. Although difficult when working with small scales and urban environments, they must embrace these forces as actors in biological communities. For example, fire has been instrumental in maintaining prairie ecosystems by killing hardwood species while allowing grasses to thrive. The city of Saint Paul can revegetate sections of the Mississippi River with native species that historically grew along its banks, but if the city does not consider the myriad ways in which plants, animals, bacteria, fungi, disturbances, and especially humans interact within ecosystems, it will fail. The result might look like a short-lived riverside museum ecosystem of restored plants without the necessary conditions for longevity such as fire, foragers to disperse seeds, bees to pollinate flowers, and so forth. A poorly thought out ecosystem restoration project will eventually buckle under the pressures against it.

Gorham suggests thinking like a mountain to take a holistic approach to restoration work. “What we must strive for is to preserve the dynamics of wilderness ecosystems, free as far as possible from the influence of human perturbation.”²⁴ Plant communities consist of much more than plants. From the

²³ Aldo Leopold, “Thinking Like A Mountain,” from *A Sand County Almanac* (New York: Ballantine Books, 1970), 137-141.

²⁴ *Ibid.*, 23.

pollution in urban air to the microorganisms in the soil, ecologists must account for every aspect of restored ecosystems using an integrated approach that allows for natural functioning with minimal human oversight. He cautions against stubbornly suppressing nature into one agreed-upon historical format. In the process of maintaining ecosystems, “we cannot possibly freeze them forever in time, nor would it be right to do so.”²⁵ Taking a wilderness approach to restoration, or thinking like a mountain means understanding the intricacies of the natural forces at play in any ecosystem, natural or restored.

Wilderness ideology is useful for thinking ecologically, but harmful when thinking historically. The concept of wilderness, areas where the land feels no human influence, ties many environmentalists together in a common cause for the protection of nature, yet ignores the historical realities that most areas considered “wilderness” in the United States have been inhabited and influenced by humans at some point. Gorham, along with many others environmentalists, falls prey to the notion that wilderness areas today have always been wilderness areas. The network of tracts of wilderness protected under the Wilderness Act has long histories of human settlement, making wilderness in the United States more of a myth than truth. Mark David Spence provides an eye-opening account of Native American removal in the creation of national parks such as Yellowstone, Yosemite, and Glacier—some of the nation’s most popular. In the creation of Yosemite National Park, Native American tribes that actually lived there were

²⁵ Ibid.

originally included in the park as attractions.²⁶ They were later removed after ceding their rights to the land amid great pressure from the United States.

Lambasting the historical presence of Native Americans in areas that we now call wilderness is not only the ultimate fiction, but it also dehumanizes and further dispossesses indigenous groups with original claims to land.

The philosophy of wilderness, although helpful for thinking ecologically, impinges our rehabilitation efforts since it ignores the historical presence of people and wholly separates humans from nature, which is a false notion in opposition to ecological restoration. Wilderness means nature making its own decisions without human actors having a say. Pollan calls the wilderness ethic absolutist: “man or nature, it says, pick one.”²⁷ The idea of wilderness precludes humans and human involvement in restoration work. When wilderness guides our value system for nature, humans have no rightful place in it except as a “visitor who does not remain,” to use the language from the Wilderness Act of 1964.²⁸ Humans cannot fix landscapes under this worldview. Wilderness and ecological restoration are antithetical. Environmental historian Donald Worster recognizes two opposing views that guide our relation to nature in his book *Nature's Economy*. Either we appreciate nature aesthetically and try to live in harmony

²⁶ Mark Spence, “Dispossessing the Wilderness: Yosemite Indians and the National Park Ideal, 1864-1930,” *The Pacific Historical Review* Vol. 65, No. 1, (1996): 28.

²⁷ Pollan, *Second Nature*, 187.

²⁸ *Wilderness Act*, Public Law 88-577, 88th Congress, 2nd Sess., (September 3, 1964).

with it or we see it simply as a resource for human exploitation.²⁹ This forces us to decide whether humans live within nature or outside of nature, where nature is just an economic resource for human pursuits.

But why not have both? All other species arguably use nature beneficially while also living in its great community. The wilderness mantra is harmful to restoration efforts because it confuses the human actors who do not know whether they should protect nature from above or appreciate it from within. Through wilderness logic, “once a landscape is no longer ‘virgin,’” writes Pollan, “it is typically written off as fallen, lost to nature, irredeemable.”³⁰ Wilderness thinking denies humans the ability to rehabilitate ecosystems, which makes more sense than preserving a small percentage of land while completely altering the vast majority of the landscape in ecologically destructive ways.

Ecological restoration provides a way for humans to interpret their relation to nature as one of dwelling, participation, and utilization. Consider the beaver: prior thought would contend, here is an animal that obstructs the natural flow of rivers by cutting down trees for its selfish gain. Ecology now calls beavers a keystone species, since they play vital roles in their environments because their dams create crucial habitat for hundreds of species. Beavers destroy natural elements in ways that enhance the diversity and functioning of ecosystems. They inhabit but do not inhibit an ecosystem while exploiting its resources. Considering this, humans no longer have to choose between harmony and utility as Worster

²⁹ Donald Worster, *Nature's Economy: A History of Ecological Ideas* (New York: Cambridge University Press, 1994).

³⁰ Pollan, *Second Nature*, 188.

outlined. Ecological restoration allows humans to engage nature in an enlightened, sustainable, and worthwhile role. This muddles the human/nature dichotomy because it places humans in nature in varying degrees from student and imitator to mastermind and agent. Restoration work is a mosaic consisting of part nature and part culture. Restorationists do not look solely to nature or culture for answers. Pragmatically they use cues from both. “Civilization may be part of our problem with respect to nature, but there will be no solution without it,” says Pollan. Wendell Berry, the farmer and writer, muses that culture, rather than nature, teaches us to observe, remember, learn from mistakes, share experiences, and restrain ourselves.³¹ With these human abilities we can use ecological restoration to fix not only ecosystems, but also our degraded relationship with the natural world. Stevens explains:

Restoration is gardening in a sense, and also agriculture, but with a big difference: its purpose is not to shape nature to one’s aesthetic taste or to make a living, but rather to enable nature to take its own course. It seeks not to control and modify natural processes, but free them. It places humans not above the rest of nature, but in it, and not just as an admirer but as a participant.³²

The traits of the farmer or gardener, combined with knowledge of the laws and ways of nature, creates renewed ecosystems as well as a beneficial place for humans in nature.

³¹ Ibid., 195.

³² Stevens, *Miracle Under the Oaks*, 189.

The Mississippi River and its Ecosystem

The Mississippi River, one of the world's largest, begins in humble Lake Itasca in northern Minnesota, where it commences through the Twin Cities on its way to Louisiana and the Gulf of Mexico. The name Mississippi derives from an Ojibwa word meaning "Great River." Along the river's twenty-three hundred mile journey it collects many tributaries, such as the Missouri and Ohio rivers, which together make the largest river system in North America and form the basis of the watershed for 41% of the continental United States. The Mississippi-Missouri river system represents the third largest watershed in the world, second in area only to the Amazon River in South America and the Congo River in Africa.

The Twin Cities of Minneapolis and Saint Paul sit side by side along the Upper Mississippi River, in the south-central section of Minnesota. It is a land of lakes, streams, prairies, woodland, bluffs, and of course, the Mississippi. Just as the river divides Minneapolis and St. Paul today, it has bisected the upper Midwest and formed a continental boundary where the Great Plains of the West meet the wooded forests of the East. The melting of glacial ice led to a warmer and drier climate about 9,000 years ago, which allowed prairie vegetation to replace oak forests. About 3,000 years ago the climate became wetter and cooler, which caused the formation of the forest-prairie border that continues to characterize Minnesota.³³ F.J. Marschner of the United States General Land Office compiled a map in 1930 entitled "The Original Vegetation of Minnesota"

³³ Drew M. Forsberg, "Early Native American Life in the MNRRA Corridor," *Historic Resources Study of the Mississippi National River and Recreation Area*, National Park Service and U.S. Corps of Engineers, (Saint Paul: 2003), http://www.nps.gov/miss/historyculture/historic_resources.htm.

using notes from the Public Land Survey between 1847-1907. It shows the western half of the state covered in tall-grass prairie species such as bluestem and Indian grass. A south-central mixed deciduous forest region consists of maple-basswood and oak woodland. The northern coniferous forests have aspen, pine, cedar, and ash.³⁴ The maps show Ramsey County as surveyed in 1853 containing mostly oak species with areas of deciduous forest species such as maple, ash, aspen, and birch. Floodplain forests made up the land around the confluence of the Mississippi and Minnesota rivers with maple, oak, ash, and cottonwood. Much of Hennepin County at this time was forested with oak species except for the eastern section, which contained mostly dry prairie species.³⁵ Southern and western Minnesota's original tall-grass prairie has now been transformed into farmland and less than one percent of it remains.³⁶ Much of the forests have changed due to logging and agriculture and white and red pine have heeded to aspen and birch.

Data taken from geological cores confirms that Euro-American settlement beginning in the early nineteenth century altered the vegetation composition of the state. Agricultural fields replaced forests, which resulted in more open space for weed species to grow like ragweed and sage. In 1987 the University of Minnesota extracted a geological core from a slough along the Minnesota River near Belle Plain about thirty miles downriver from Fort Snelling in Scott County.

³⁴ F. J. Marschner, "The Original Vegetation of Minnesota," (map scale 1:500,000), USDA Forest Service, (St. Paul: North Central Forest Experiment Station, 1974).

³⁵ Ibid.

³⁶ John R. Tester, *Minnesota's Natural Heritage: An Ecological Perspective* (Minneapolis: University of Minnesota Press, 1995), 25.

Their pollen analysis shows a sharp increase in ragweed in the early 1800s, which illustrates the degree to which agricultural clearing had affected species composition in the few decades since the beginning of Euro-American settlement.³⁷ Geological cores extracted from Lake Pepin, a widening of the Mississippi River in the southeastern corner of Minnesota, and Lake St Croix which is east of the Twin Cities, confirm that an increase in ragweed after 1800 marked the beginning of the wide-scale agriculture of early settlers.³⁸ The large degree of land clearing resulted in open fields for much of the year, which led an overall rise in prairie grass species in the area. The analysis of pollen from these three cores shows that common weedy species flourished like goosefoot, as did aster, goldenrod, and sunflower. Their data shows large increases in willow and grapes and a preponderance of oak, elm, ash, birch, cottonwood, and a variety of pine species during the early nineteenth century.³⁹ Aquatic plants such as wild rice, cattail, water lily, and heir leaf thrived in the riverside environment. Plant species at this time underwent a transition that accompanied early Euro-American settlement, which resulted in fewer pine and spruce due to logging and more grass species due to newly cleared agricultural fields.⁴⁰

The Minnesota Department of Natural Resources defines “native” vegetation as “species that existed in Minnesota prior to European settlement,”

³⁷ Edward J. Cushing (Professor Emeritus of Ecology, Evolution, and Behavior, University of Minnesota) in discussion with author, March 2009.

³⁸ David J. Blumentritt, Herbert E. Wright Jr. and Vania Stefanova, “Formation and Early History of Lakes Pepin and St. Croix of the Upper Mississippi River,” *Journal of Paleolimnology* (2009): 13.

³⁹ Ibid.

⁴⁰ Ibid.

and although this makes sense from a Euro-American point of view, it leaves out hundreds of years of human and ecological history.⁴¹ Assuming that any species growing before European settlement is “native” may misconstrue a true picture of Minnesota’s historical plant communities. At this point of Euro-American contact, Native Americans had inhabited and shaped the land of Minnesota with their economy of gathering, hunting, farming, and burning for hundreds of years. They also used numerous plants for ceremonies, medicines, and crafts. Given their cultural uses of plant species (see Appendix II), they surely affected the local ecologies of their lands. Moreover, they migrated from areas to the East as other groups pushed westward. It is highly possible that tribes brought plants and animals with them. This complicates efforts to denote all pre-European Minnesotan “native vegetation.” Finally, at this time, no one cataloged endemic species, so it is hard to determine whether species naturally spread across the continent or arrived in Minnesota as cargo with humans.

The ecology of the Mississippi river, or any region for that matter, has always been inextricably linked to the human economic activity along it. Restorationists need to remember that the interactions among species, especially dominant humans, shape environments. Along the Mississippi, the ecology has changed over time as human economic activities have shifted. Every change in human economy has conditioned the river landscape in various ways. Native American subsistence economies used prescribed burning to clear forests and prairies, which allowed their foraging prey and hosts of plants to flourish. They

⁴¹ Norman E. Aaseng et al., *Minnesota’s Native Vegetation: A Key to Natural Communities* (St. Paul: Minnesota Department of Natural Resources, 1993), 87.

planted and harvested rice from the surface of the river. English explorer Jonathan Carver in 1766 described how the Dakota “paddle in among it,” collecting it in small canoes.⁴² The Dakota also collected clay at St. Anthony Falls and drew upon the timber from its banks for canoes and shelters. French and English fur traders, and Native Americans patrolled the river and hunted “large supplies of beaver and other valuable skins”⁴³ such as buffalo, elk, and deer that lived in its forests and prairies, as early explorers described. The later growth of the cities of Minneapolis and St. Paul spurned extensive timbering and sawmilling along the river. In 1857 a steamboat traveler romantically summed up the fast-changing landscape of the Mississippi around St. Paul:

How different is the scene presented now to the voyager on the upper Mississippi, from that which he would have beheld in the same localities only a few years ago! Where the surface of the mighty river was then broken by no human agency but the dip of the Indian’s oar, and the occasional keel of the fur trader, it is now lashed into boiling foam by fleets of busy steamers; where the primeval silence of Nature over millions of acres of prairie and wild meadow was then broken only by the howl of wild beasts...the voice of civilization and the hum of busy industry now fall pleasantly on the ear.⁴⁴

Industry hummed along at an incredible pace. Soon the river was dammed directly where the waters of the Mississippi at St. Anthony once fell, to allow lanes for commercial shipping to navigate the extent of the river down to New Orleans. History proves that the human economy, whether belonging to the

⁴² John Parker, *The Journals of Jonathan Carver and Related Documents, 1766-1770* (Saint Paul: Minnesota Historical Society Press, 1976), 98.

⁴³ William H. Keating, *Narrative of an Expedition to the Source of St. Peters River* (Philadelphia: H.C. Carey and I. Lea, 1824), 426.

⁴⁴ E.S.C., “From the Upper Mississippi,” *New York Daily Times*, September 9, 1857.

Native American, trader, settler, or modern citizen, has actively shaped the river landscape going back hundreds of years.

More importantly, the economy of today differs from the economies of the past, which has repercussions for restoration efforts. Native Americans used to harvest wild rice that thrived in the clean waters of the Mississippi but today pollution prevents wild rice from growing in the metropolitan area. Buffalo, elk, and deer used to forage in large numbers that checked the populations of plant species—a relationship which today no longer exists in the same way. Exotic species enter areas and out-compete their native counterparts. Plants and animals become endangered or possibly extinct. Human economies have gone from harnessing waterpower in dams, to releasing effluent from factories, towns, and cities, to navigating large boats through the river. Species that grew along the river at any point in history may not be able to grow today since the Mississippi River is now very different than it was a century ago. If we restore an ecosystem from the past, how can we ensure its effective and sustained livelihood in the economic and ecological climate of today?

Once ecologists restore a riverside ecosystem, management of the area must account for the economic, societal, and ecological changes that have taken place since the time period it was restored to, since historical economies shaped past environments. For instance, the subsistence economy of Native Americans no longer influences the land to the extent it once did. Logging and sawmilling similarly no longer occur in downtown Minneapolis like they did during the mid nineteenth century. Human actors and economic forces that shaped the river

ecosystem have shifted. Restoration managers must consider the changes in human economy and make up for their absence in order to maintain a restored ecosystem in its historical condition. They must use their ecological restoration knowledge and tools to implement new ways of human intervention that keep a landscape vibrant and sustainable in the absence of the socio-eco-economic conditions that created the historic landscape in the first place.

Local Native American History and Culture

Minnesota has a long history of Native American occupancy that has no doubt shaped its historical and present landscape. We must study and acknowledge the historical presence of Native American tribes to fully appreciate the diversity of human economic activities that have transformed the ecology of Minnesota. A failure to examine and understand the ways in which Native economies and cultures reacted to and manipulated the landscape deprives these historical actors of agency and furthers the mistakenly ingrained concept that Native Americans did not originally occupy and shape the land of North America, including Minnesota. Quite to the contrary, indigenous groups may not have altered ecosystems as systematically or quickly as the modern, industrialized economy has in two hundred short years, but they have inhabited the land for a much longer period of time during which the land of Minnesota felt their widespread impact through the practice of agriculture, gathering, hunting, and most importantly, burning.

The first human inhabitants entered the Mississippi valley nearly 10,000 years ago, as fossil evidence of Clovis shaped spear points found with mammoth skeletons suggest. Between 8,000-6,000 B.C.E. human colonists had settled the entire upper Mississippi valley, spreading out and forming different cultures and lifestyles based on where they lived, and most populations stayed in upland areas and did not live among riparian environments.⁴⁵ Native American tribes have inhabited the land directly surrounding the upper Mississippi River for nearly 500 years.⁴⁶

The area that now comprises the Twin Cities traditionally belonged to two tribes of various bands: the Dakota (Sioux) and the Ojibwa (Chippewa), who both benefited from the river's resources. By the 1700s the two tribes had firmly established themselves locally along the Mississippi and its tributaries north and south of the confluence with the Minnesota River in present Minneapolis and St. Paul.⁴⁷ The Dakota lived in the southern and western regions of today's metropolitan area while the Ojibwa concentrated more to the north and east into modern-day Wisconsin. The two neighbors did not always get along but mutually coexisted for hundreds of years. By the early eighteenth century, Euro-American settlement forced many tribes westward. The Huron tribe moved into what is today Ontario, Michigan and Wisconsin for more hunting grounds. This forced

⁴⁵ James B. Stoltman, "Ancient Peoples of the Upper Mississippi River Valley," from *Historic Lifestyles in the Upper Mississippi River Valley* (Lanham, MD: University Press of America, 1983), 208.

⁴⁶ The Dakota creation story asserts that they have always lived in the upper Mississippi valley.

⁴⁷ Louis B. Casagrande and Orrin C. Shane III, "The Historic Tribes of the Upper Mississippi River Valley," from *Historic Lifestyles in the Upper Mississippi River Valley*, 260.

the Ojibwa southwest into the territory of the Dakota, living around the confluence of the Minnesota and Mississippi rivers just south of modern Saint Paul.⁴⁸ The Mdewakanton band of Dakota most precisely lived along the Mississippi river where the Twin Cities now stand. Other Dakota bands in the area included the Sisseton, Wahpeton, and Wahpekute tribes. Together these tribes shared a common culture and language that made up the Dakota, which is a native word meaning “allies” or “league.”⁴⁹ Zebulon Montgomery Pike explored the upper Mississippi region in 1805 and wrote of the Dakota:

We next come to that powerful nation the Sioux, the dread of whom is extended over all the savage nations, from the confluence of the Mississippi and Missouri, to the Raven river on the former, and to the Snake Indians on the latter; but in those limits are many nations who they consider as allies; on a similar footing with the allies of ancient Rome, i.e. dependents.⁵⁰

European traders and other Native American tribes alike respected and feared the Dakota for their military prowess, which was an area in which they took great pride. Pike, however, was a visitor to their land and culture and did not get a full understanding of Dakota life during his short time in the area.

A woman named Mary Eastman, however, spent considerable time living amongst the Dakota near Fort Snelling and wrote about Dakota culture. Eastman lived for seven years with the Dakota around Fort Snelling in modern St. Paul “in the very midst of the once powerful but now nearly extinct tribe of Sioux or

⁴⁸ Ibid., 258.

⁴⁹ Gary Clayton Anderson, *Kinsmen of Another Kind: Dakota-White Relations in the Upper Mississippi Valley, 1650-1862* (Lincoln: University of Nebraska Press, 1984), ix.

⁵⁰ Donald Jackson ed., *The Journals of Zebulon Montgomery Pike, with Letters and Related Documents* (Norman: University of Oklahoma Press, 1966), 210.

Dacotah Indians.”⁵¹ She synthesized her experiences and knowledge into a thoughtful volume entitled *Dacotah: or, Life and Legends of the Sioux Indians around Fort Snelling* in 1849. Together with her husband the illustrator and military man Seth Eastman, they recorded firsthand the life and culture of Dakota people in Minnesota in the 1830s, while stationed at Fort Snelling, with a stated emphasis on objectivity and factualness. Eastman’s accounts intimately portray the cultural exchanges that went on between Dakota groups and white settlers and show affection for the Dakota and their plight in the face of expanding Euro-American control of their ancestral lands.

Eastman treasured the rich Dakota culture and wrote about the people and their many stories with fascination. The legends she recounted show a people intimately attached to their land, since it featured so prominently in their stories. Each story included pieces of their landscape that defined Dakota history and identity such as the high bluffs around the river’s banks and Lake Pepin, downriver from modern St. Paul. The culture of the Mdewakanton band of Dakota was well adapted to life around the Mississippi and its features. Their name means “people of the spirit lakes” and their wise men asserted that their nation had always lived in the Mississippi valley.⁵²

The Dakota living around the confluence of the Mississippi and Minnesota rivers had a highly successful way of life tied to their river ecosystem, which proves that they were not merely passive inhabitants but active agents in the

⁵¹ Eastman, *Dacotah: or, Life and Legends of the Sioux Indians around Fort Snelling*, 1.

⁵² Mary Eastman, *Dacotah: or, Life and Legends of the Sioux Indians around Fort Snelling*, xvi.

ecosystem they called home. Men and boys hunted deer and elk, which provided primary subsistence through the winter, while women tapped sugar maples for syrup and collected berries, nuts, roots, and harvested wild rice and corn.⁵³

English explorer Jonathan Carver visited Dakota land in 1766 and voyaged up the St. Peters River, which is now called the Minnesota River. He remarked on the bounty of the landscape, “Almost every necessary of life grows here spontaneously” and described how the Dakota told him of droves of buffalo, elk, deer, bear, and other game stretching west to the Pacific Ocean.⁵⁴ Describing the traditional homeland of the Dakota, Carver felt humbled by its beauty and richness:

The country of the Naudowessee [Dakota] of the plains about the river St. Pierre exceeds for pleasantness and richness of soil all the places that I have ever seen. On each side of the river which is very full of windings, is large medows with scarcely any trees. Here grows plenty of wild baum [mint], hoppers, angelica, nettles, and all sorts of herbs of a most aromatick smell...For a space between the medows and the plains is thousands of acres of marshy land where grows vast quantities of Indian rice [wild rice].⁵⁵

The Dakota tribes harvested as much rice as they could from the bountiful supply, as Carver describes. This remained true in 1850 when Philander Prescott, a settler who worked agriculturally with the Dakota, wrote about their rice cultivation. Prescott explained that “wild rice is a favorite article of food with the Indians,” used in all their great feasts.⁵⁶ He described how the Dakota collected it in the

⁵³ Anderson, *Kinsmen of Another Kind*, 3.

⁵⁴ Parker, ed., *The Journals of Jonathan Carver and Related Documents*, 98.

⁵⁵ *Ibid.*, 95.

⁵⁶ Philander Prescott, “Farming Among the Sioux Indians,” House Exec. Doc. #20, 31st Cong., 1st Session (Washington, D.C.: U.S. Govt. Printing Office, 1850), 453.

same way Carver did. Carver writes how it grows in shallow water and the “sqaws paddle in among it,” collecting it in small canoes. They then dried it and stored it.

The Dakota did not attach themselves to one food source, but migrated according to seasonal availability of a host of resources. In spring, bands moved to previous camps to live off the abundant fish and waterfowl about the myriad lakes and rivers. They frequently moved about the land and utilized semi-permanent dwellings such as teepees and wigwams. Andre Penigault, a French traveler through their land in the seventeenth century, called them “toujours errante,” which meant always wandering.⁵⁷ Constant mobility meant that they would not deplete an area’s resources and their absence from an area allowed resources to replenish themselves. When bands moved periodically, the Mississippi valley provided a wealth of food and resources for the Dakota, evidenced by their many feasts.

Philander Prescott’s accounts from his time at Fort Snelling reveal even more about Dakota agriculture. Prescott took a job at the fort as an interpreter and principal among his duties was “looking after the farmers and wants of the Indians.”⁵⁸ His new job filled his hands with the business of treading the middle ground between the agricultural pursuits of Minnesotan settlers and Dakota tribes people, which positioned him as a unique observer of Dakota farming and culinary practices. Prescott wrote to the Commissioner of Patents in Washington

⁵⁷ Anderson, *Kinsmen of Another Kind*, 2.

⁵⁸ Donald Dean Parker, *The Recollections of Philander Prescott: Frontiersman of the Old Northwest, 1819-1862* (Lincoln: University of Nebraska Press, 1966), 174.

in 1850, in which he described the agricultural pursuits of Minnesota Territory and made an account of Dakota modes of cultivation. Prescott wrote from St. Peters, Minnesota in response to the Patent Office's quest to obtain information about farming from all parts of the Union.

Prescott's letter lists the roots that the Dakota dug "when other food is exhausted," including Mendo or wild sweet potato, Tip-sui-ah or wild prairie turnip, Pang-he or wild artichoke, and Omen-e-chah or wild bean.⁵⁹ The sweet potato "is found throughout the valleys of the Mississippi and St. Peters, about the bases of bluffs, in rather moist but soft and rich ground." The Dakota usually boiled them in water or cooked with fat meat. Moving onto the prairie turnip, Prescotts wrote, it "grows on the high dry prairies, one or two together." Women collect them with long pointed sticks and they are eaten boiled and mashed or dried for future use. Sometimes they ground the dried turnip into flour to "make a very palatable and nutritious bread." The artichoke, Prescott says, "is found in every part of the country where the land is rich and loamy, but particularly near fallen and decayed timber." The Dakota only ate it when in or near a state of starvation, "from dread of its flatulent qualities." The wild bean, on the other hand, "is found in all parts of the valleys where the land is moist and rich," and apparently the Dakota were very fond of them. Prescott's descriptions here reveal that the Dakota cultivated much more than corn, beans, and squash, signifying

⁵⁹ The following is taken from Philander Prescott, "Farming Among the Sioux Indians," House Exec. Doc. #20, 31st Cong., 1st Session (Washington, D.C.: U.S. Govt. Printing Office, 1850) 451-455.

their intimate knowledge of all the food that the Mississippi river landscape could provide.

Prescott's letter described edible roots that the Dakota gathered for food from ponds and lakes, which further illustrates the adeptness with which the Dakota lived off the land (and water). Dakota women gathered all plants that came from the water. They waded through it and used pointed sticks or hoes to uproot vegetables that floated to the surface. "The psui-chin-chah or swamp potato," Prescott tells, "is found in mud or water about 3 feet deep." It has a slightly pungent taste so Dakota ate it with salt or meat. The psui-chah is similar to the above but the taste is more preferable. Even though they grow in deeper water and are harder to reach, Dakota prized them for their flavor. Prescott noted that Dakota women found both of these roots in large quantities in muskrat lodges, since the animals stored them for winter use. The last root, held in high esteem, the Dakota called ta-wah-pah. "It is found in the lakes, in water and mud, from 4 to 5 feet deep," Prescott wrote, and "is generally boiled with wild fowl, but often roasted" due to its "slightly sweet and glutinous taste." The Dakota would preserve all of these roots for winter use by boiling them and drying them over a fire or in the sun. The descriptions Prescott gave prove that the ecosystem of the Mississippi region furnished a wide variety of foodstuffs, which the Dakota happily exploited. The Dakota had six varieties of potato available to them in one area alone! Thanks to Philander Prescott's letter to Washington, we know a variety of vegetables that the Dakota harvested with acumen and aptitude that

could only come from the years of knowledge and experience in interacting with their environment of a culture firmly rooted in the rivers and lakes of Minnesota.

Prescott wrote to the Patent Office to detail agricultural operations in what he called “our newly sprung up Territory of Minnesota.” The rich descriptions of Dakota farming practices indicate, however, that the land of Minnesota was not new but had instead nourished a people and culture in plenty for hundreds of years. All told their culture was well adapted to the network of rivers and lakes of the upper Mississippi valley and made it a productive and hospitable home for at least three centuries.⁶⁰

The Dakota periodically burned forests and prairies, which had huge impacts on the composition of floral and faunal species in their Mississippi river ecosystem. Today we see wildfires as an enemy since they destroy homes and crops. Ecologists, however, recognize that fire plays an important role in the ecology of prairies. Most prairie species are well adapted to fire and survive multiple burnings.⁶¹ Prescribed annual burning allows certain species such as Indian grass to dominate prairies and keeps deciduous forest species from moving onto prairie land. Yearly Dakota burning enhanced species diversity and richness, which attracted buffalo and elk. John Tester, an ecologist at the University of Minnesota, explains: “Although fire may destroy all of the aboveground vegetation, the plants quickly produce vigorous new shoots from the growing point just at or below the soil surface.”⁶² Young shoots encouraged game

⁶⁰ Ibid., 13.

⁶¹ Tester, *Minnesota's Natural Heritage*, 137.

⁶² Ibid.

populations that prized them to graze within easy reach for the Dakota. This complicated farming technique on a very large scale dramatically affected the vegetation of the upper Mississippi valley ecosystem. The Dakota method of annual prescribed burning exemplifies a main way in which they manipulated their environment to suit their needs. It also shows that the economy of the Dakota people influenced the species makeup of the region. Ecologists agree that the wildfires set by Native Americans determined the prairie-forest border prior to European settlement.⁶³

Ecological Decline in Dakota Land Around Mississippi and Minnesota River Confluence

The fur trade blossomed in the seventeenth century as the French hunted and traded with the local tribes to sustain a lucrative business for all parties. Beginning in the French controlled city of Montreal, Canada, Native Americans came and traded goods and moved them westward. The goods then dispersed along the abundant rivers and lakes to reach other tribes. The French model of fur trading was mutually beneficial as the Native Americans received previously unknown goods as well as gifts, often meant to show peace between them and the Europeans. Despite the fruitfulness of the fur trade, it spelled the beginning of the end for indigenous populations in Minnesota. It brought more and more white settlers into the area. More importantly, it encouraged tribes to assimilate western goods and culture into their lifestyles. Over-reliance on western items saw the decline of previously strong, intact indigenous cultures and a break down of their

⁶³ Ibid., 138.

traditional ways of life. Coupled with susceptibility to a host of European diseases, Native American tribes grew weaker physically and culturally. By the early nineteenth century, the Ojibwa and Dakota bands around St. Paul relied heavily on the garrisons at Fort Snelling—the strategic trading post, “Indian Agency,” and military fort located at the confluence of the Minnesota and Mississippi rivers. The fur trade soon became a tool to dispossess Native Americans of their land and resources.

The popularity of the fur trade, centered around Fort Snelling in the homeland of the Dakota, caused the ecological destruction of their land and forced them to make cultural adjustments in order to survive. French scientist Joseph Nicollet explored the region in 1838 and noted the poorer state of the local ecosystem when compared to regions he saw farther south. Nicollet left the settled area around the garrison at St. Peters and headed south to Cannon River where he could already notice a difference in species composition and richness. He documented red and white oaks, white and sugar maples, black walnut, white ash, and western hackberry growing along the Cannon River “in a perfection of health and size which is not to compare with any timber at the St. Peters or the Mississippi about St. Peters.”⁶⁴ The fur trade took an exhaustive toll on animal populations upon which the Dakota depended. Gary Clayton Anderson, a historical ethnographer, notes that the Mdewakanton band “found it necessary by the 1820s to hunt farther west each year, turning to such nontraditional food

⁶⁴ Edmund C. Bray and Martha Coleman Bray ed., *Joseph N. Nicollet on the Plains and Prairies: The Expeditions of 1838-39 With Journals, Letters, and Notes on the Dakota Indians* (St. Paul: Minnesota Historical Society, 1966), 123.

resources as muskrats for pelts and food.”⁶⁵ Dakota culture became so dependant on trading that the same system that ravaged their home ecosystem was now necessary for their survival. Although they had had a hand in the ecological destruction of their lands, they suffered for lack of food and clothing while fur trading companies only lost profits. Fur trading caused the decline of elk, beaver, and deer populations. When explorer Zebulon Montgomery Pike ventured north to Rum River in 1805 he noted that the Mississippi became a great chain of rapids, observing that, “both sides are prairie and scarcely any timber but small groves of scrub oak,” in an area considered “one of the best fur hunting grounds for some hundreds of miles.” Pike documented that “the elk begin to be very plenty; some buffalo, quantities of deer, raccoons, and on the prairie a few of the animals called by the French brelaws.”⁶⁶ Game had been exterminated from the river valleys and buffalo herds had moved west by the 1820s. Joseph Nicollet in 1838 spoke with Dakota who told them of the absence of buffalo. Nicollet described Indian Lookout Mound, a place the Dakota used to climb to see the movement of buffalo herds. He wrote that as recently as 1830 the herds would come through but sadly they no longer did by 1838.⁶⁷ By 1835 buffalo and muskrat were the only viable commercial game.

To supplement their diet, Dakota bands began to rely more on corn and other crops.⁶⁸ Beginning in the early 1800s, the Mdewakantons had numerous

⁶⁵ Anderson, *Kinsmen of Another Kind*, 104.

⁶⁶ Jackson ed., *The Journals of Zebulon Montgomery Pike*, 202.

⁶⁷ Edmund C. Bray and Martha Coleman Bray ed., *Joseph N. Nicollet on the Plains and Prairies*, 58.

⁶⁸ Anderson, *Kinsmen of Another Kind*, 108.

fields of corn spread throughout their lands. As Pike ventured through the Minnesota River, he wrote that they cultivated species of vegetables including “a small quantity of corn and beans.”⁶⁹ Corn became their sole source of food in times of extreme want. Prescott, who worked with the Dakota in their farming operations around Fort Snelling, recalled in a letter his first winter in Minnesota (1819-1820), how “the Indians planted small patches of corn” with metal hoes acquired through trade or “the branch of a tree sharpened.”⁷⁰ He described how they usually roasted the corn, although sometimes put it into soup with venison.

The fur trade’s insatiable appetite for game upon which the Dakota depended caused them to adapt to a new lifestyle—one tailored to Euro-American customs. Native Americans increasingly took up farming for subsistence when hunting could not fully support the needs of their communities. They also ceased to craft traditional tools from sources like the vanishing buffalo and replaced them with European tools like pots, pans, and guns.

The Upper Mississippi Landscape Through Euro-American Eyes, 1766-1861

After the French-controlled fur trade flourished in the seventeenth century in the Mississippi valley, many Euro-American explorers began to traverse the area to exploit its furs, learn about the land, its waterways, and its people in the beginning of the eighteenth century, in the hopes of eventual settlement. The massive river system of the Mississippi commanded the attention of English colonists in the late eighteenth century and later American settlers after the

⁶⁹ Jackson ed., *The Journals of Zebulon Montgomery Pike*, 202.

⁷⁰ Prescott, “Farming Among the Sioux Indians,” 451.

Louisiana Purchase in the early nineteenth century. Scientists, military men, naturalists, and adventurers went on numerous expeditions up the Mississippi and its tributaries to survey the land, ally with Native Americans, and explore the potential for military and trading posts to assert their control over the area. Many missions had goals of finding the source of the Mississippi, which proved difficult, and negotiating land treaties with Native Americans for the construction of a military post, which became Fort Snelling in 1819.

The government sponsored these expeditions (which usually had both scientific and military purposes) through the upper Mississippi waterways, so explorers kept extensive journals in order to report back to their superiors and patriotically contribute to their country's growth. The journals of many explorers to have come through the region that became the Twin Cities went on to get published, since accounts from the western frontier fascinated citizens. Many journals became very popular texts that survive today.

Narrative accounts of expeditions through the upper Mississippi landscape provide extensive details that aid in the reconstruction of its historical ecosystems with regards to plant and animal species and geological formations. Explorers went to great lengths to catalog features of the land that was so new to them. Despite the different individual reasons for undertaking their specific explorations, the culture of scientific inquiry into an unknown area that underscored these expeditions unites them into journals that provide intimate clues as to what species grew prior to Euro-American settlement.

Despite the authenticity of these accounts as historical evidence, we cannot trust them to maintain one hundred percent factual accuracy for various reasons. We must account for human errors, biases, and motivations for writing. For example, some explorers had a natural talent for understanding the geology of bluffs they encountered, and wrote about them correctly. Other explorers only pretended to know what they were talking about when they described rock formations or plant communities. Some explorers wrote matter-of-factly about Native American cultures that they only experienced for a few days. Other explorers spent years with Native American cultures, which allowed them to more fully understand and describe them. Each narrative had its own focus and area of expertise. Moreover, individual surveyors had individual goals, aspirations, and motivations for undertaking their task. For example, English explorer Jonathan Carver desperately sought recognition for his unpaid career of military service, which may have caused him to exaggerate claims by describing areas as perfect for English settlement.

Everything in these narrative accounts, while they appeared objective to their writers, comes to the present as a subjective version of what each saw, experienced, and decided to record. Just as a photograph captures only what lies within its frame, so too do the first hand accounts of any one person portray that which he or she deemed worthy of record for various reasons. Furthermore, as environmental historian William Cronon stresses in *Changes in the Land*, “traveler’s accounts and other colonial writings are not only subjective but often highly generalized.” For my purposes regarding botany, Thomas Say in 1823

might have used European species names to catalog American species, which to him appeared analogous.⁷¹ Human error can mistake one species for another. Also, scientific nomenclature has changed since the early settlement period, which complicates attempts to use the name or genus of a historical species. Therefore history cannot take a traveler's single account alone in coloring a picture of the past. Instead we can compare one account with the accounts of other explorers through the region, as well as other sources that may tell what Minnesota looked like before the years of settlement. We can glean the fullest possible understanding of history by combining, comparing, and contrasting numerous pieces of historical evidence.

The first English-speaker to come through the upper Mississippi region was Jonathan Carver, who was one of the first Euro-Americans to explore and extensively catalog the nature of the Mississippi and Minnesota Rivers around the modern metropolitan area. In reconstructing what historically grew along the Mississippi between the modern Twin Cities, Carver's journals prove very useful. Many later explorers compared their expeditions' findings to his findings. Carver had no formal training in botany or any of the sciences, so his observations appear basic. The journals still give a sense of what the land looked like during the eighteenth century. Carver writes of a beautiful land full of natural wealth in the form of game, plants, meadows, and prairies, which stems from his desire to please his superiors and make a name for himself in the settlement of Minnesota.

⁷¹ William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 2003), 8.

Born of a well-off Massachusetts family in 1710, Carver grew up with big shoes to fill. His ancestry traces back to Robert Carver, who settled at Marshfield, Massachusetts in 1638. After a career in the militia for which he received little compensation, Carver wondered how he could make himself of service and receive recognition. The Treaty of Paris of 1763 ended the French and Indian War, which meant Britain now controlled all the land lying east of the Mississippi River. Carver signed on to explore Britain's newly gained land along the river, using his military experience and knowledge of frontier lands in Massachusetts. Robert Rogers, agent to the Western Indians and Governor Commandant of Britain's garrison at Michillmackinac (on Lake Michigan), commissioned Carver to "proceed along the north side of Lake Missigan [Michigan] to the [green] bay, and from thence to the Falls of St. Antinoies [Anthony] on the Missipee [Mississippi], taking exact plans of the counetry by the way marking down all Indian towns with their numbers, as also to take survaies of the diffrant posts, lakes, and rivers as also the mountains."⁷² Carver's mission entailed exploring the region of the Twin Cities (St. Anthony Falls is located in present-day Minneapolis), during which he kept a detailed journal and notes, which still survive today.

Beginning in late August of 1766, Carver traveled to and documented the land of the present metropolitan area beginning with St. Anthony Falls in present Minneapolis and wrote: "I arrived at the falls and measured the cascade which I found to be about 29 feet. About the middle of the falls is a small island and a

⁷² John Parker, *The Journals of Jonathan Carver and Related Documents, 1766-1770* (Saint Paul: Minnesota Historical Society Press, 1976), 192.

little below is another small island containing about an acre of land with several oak trees on which are a vast many eagles' nests."⁷³ After surveying the area, he found that "The land about these falls is a level spacious plain with a very few small trees of oak and hickery."⁷⁴ He proceeded up the Minnesota River, which was then called the St. Peters or St. Pierre in French. He continued to catalog, writing:

The plains back of these marshes afford a very beautiful prospect of gradual ascents and descents with here and there a grove of trees some of which are neat as tho planted by art, large groves of maple suitable for the sugar manufacture, plenty of [crab] apple trees which bear an apple much better than the common crab apple on the Mississippi, and plumbs of a very good taste.

The home of the Dakota along the Minnesota River clearly impressed Carver, and he wrote happily about the prospect it offered English settlers. Carver came through the region in August of 1766, which may account for the rosy descriptions and pleasantness with which he experienced the land. The climate between summer and autumn in Minnesota is welcoming.

Carver most likely described the land with such admiration because he wanted to portray the area in a positive way and give success to his journey. The land may well have looked beautiful, or he may have wished to paint a happy picture of fertile fields ripe for English settlement. To him, the trees already looked as if planted by art. Carver could already visualize the settlement of the landscape, even though what he might have seen were trees that Native Americans planted. His writing of rich soils, verdant vegetation, and sweeping

⁷³ Later measurements revealed the falls to be only about 16 feet.

⁷⁴ *Ibid.*, 93.

prairies and meadows set up an idyllic countryside that he reported back to his superiors. They most likely took note of his sweeping praise for the area as they pondered how to make peace with the Native Americans and move into their territory. Since he endeavored to help his country any way he could, Carver would have liked nothing more to see his survey journey as useful towards the Euro-American settlement of the land. In the introduction to his published journals from his trip, Carver indicates his reason for its undertaking: “I began to consider how I might... contribute as much as lay in my power, to make that vast acquisition of territory, gained by Great Britain, in North America advantageous to it... I determined...[to acquire] a knowledge that promised to be so useful to my countrymen.”⁷⁵

No one can determine the degree to which Carver’s sense of duty to his country colored his perceptions. It is helpful, however, to analyze the journals of other explorers through the area to see how their descriptions align and differ.

Zebulon Montgomery Pike was another explorer who went through the modern Twin Cities region on his 1804-5 quest to locate the source of the Mississippi River. Like Carver, Pike came from a life of military service yet yearned to be remembered for something extraordinary and useful to his country. Carver worked for Britain and remained loyal to the crown, while Pike worked for the young United States military. Born in 1779 in New Jersey, Pike looked to the west to set himself apart from his peers. He caught the eye of James Wilkinson, commanding general of the United States Army, and become somewhat of a

⁷⁵ Ibid., 58.

protégé. This led Wilkinson to give Pike the special and difficult assignment to traverse the Mississippi to find its headwaters. In 1805 Pike set out to explore the land that the United States government recently purchased from France. Lewis and Clark went northwest, while Pike, on two separate expeditions, first went north through Minnesota and then went west to the Rocky Mountains.

Pike's mission involved documenting the land, purchasing strategic sites for forts and inviting Native American leaders to St. Louis to counsel with Wilkinson. Interested in eventual conquest and settlement, Wilkinson charged Pike with the task of "calculating distances by time, noting rivers, creeks, Highlands, Prairies, Islands, rapids, shoals, mines, Quarries, Timber, water [,] Soil, Indian villages and Settlements." By this time the government sought to establish permanent posts on the river for trade and military purposes, so Pike's letter of commission additionally gave him the task of examining areas "suitable for a military fort" and obtaining "the consent of the Indians for their erection, informing them that they are intended to increase their trade & ameliorate their condition."⁷⁶ Wilkinson and Pike arranged this expedition without the formal knowledge or approval of President Jefferson. This became problematic once Pike's eventual treaty with the Dakota failed to muster respect and authenticity in Washington. Pike's journals provide useful descriptions of the land of the modern Twin Cities area. Pike's expedition only pseudo-acquired the land for Fort Snelling and did not detail it very specifically, which necessitated further expeditions up the Mississippi. He also incorrectly listed the source of the river.

⁷⁶ Donald Jackson ed., *The Journals of Zebulon Montgomery Pike: With Letters and Related Documents* (Norman: University of Oklahoma Press, 1966), 3.

His journals nevertheless provide insight into how he attempted to acquire land for the United States military on which to build what became Fort Snelling, an establishment that forever altered the economic, social, and ecological landscape of Minnesota.

Pike began his journey in St. Louis and reached the Twin Cities region on the 21st of September, 1805, noting its terrain. He spent less time in the area than Carver due to the nature of his assignment. As he passed through, however, he noted that the Mississippi River north of Lake Pepin appeared to him “remarkably red; and where it is deep appears as black as ink. The waters of St. Croix and St. Peters appearing blue and clear for a considerable distance below their confluence.”⁷⁷ He described the river around the island where he made camp in this same way. The island sits across from Fort Snelling and now bears his name: Pike Island. Pike continued on and observed how the river narrowed during the section between the St. Croix and Mississippi: “I crossed it once with forty strokes of my oar.” He noticed a difference in vegetation along the east and west bank. “The E. bank generally bounded by the river ridges, but the W. sometimes timbered bottom or prairie. The timber is generally maple, sugar-tree and ash.”⁷⁸ He noted balsam fir or sap pine, elm, what he called pinenett, hemlock, and aspen trees. Heading onto St. Anthony Falls Pike compared it to previous accounts, saying, “As I ascended the Mississippi, the falls of St. Anthony did not strike me with that majestic appearance which I had been taught to expect from the

⁷⁷ Ibid., 36.

⁷⁸ Ibid., 201.

description of former travelers.”⁷⁹ When Pike ventured north to Rum River he noted that the Mississippi became a great chain of rapids, writing that “both sides are prairie and scarcely any timber but small groves of scrub oak.” Pike documented that “the elk begin to be very plenty; some buffalo, quantities of deer, raccoons, and on the prairie a few of the animals called by the French brelaws.”⁸⁰

Pike worked hard to acquire land for a fort through a treaty with the Dakota, although his lack of professionalism caused problems for his single page treaty. In correspondence in council with the Dakota, dated September 23, 1805 Pike tells the tribe the wishes of his government and the intent of his expedition:

Brothers-It is the wish of our government to establish military posts on the upper Mississippi, at such places as might be thought expedient...I therefore wish you grant to the United States, nine miles square, at St. Croix, and at this place from a league below the confluence of the St. Peters and Mississippi, to a league above St. Anthony. [...] those posts are intended as a benefit to you. The old chiefs present must see, that their situation improves by a communication with the whites.

Pike delivered this at a council fire at the onset of his expedition north. It tells much about the overt plans of the US military towards expansion and control of the fur trade. It also shows the fact that while military posts were said to “benefit” tribes, they contributed significantly to ushering in an era of white dominance and the dispossession and dissolution of indigenous land and culture. The construction of a military post would turn the tide in favor of Euro-Americans and give them economic, military, and ecological control over the area. More settlers would move into the area and spur the growth of Minneapolis, St. Anthony (now part of Minneapolis), and St. Paul.

⁷⁹ Ibid.,

⁸⁰ Ibid., 202.

Pike's communications with the Dakota proved only partially successful in his assignment to buy land for a military post. On the same day of his council, Pike "acquired" the land on which Fort Snelling now stands through a treaty with Dakota leaders. The Dakota treaty with Pike granted "unto the United States, for the purpose of establishment of military posts, nine miles square...from below the confluence of the Mississippi and St. Peters up the Mississippi to include the falls of St. Anthony." It also required, "That the Sioux Nation Grants to the United States the full sovereignty and power over said Districts for ever without any let or hindrance whatsoever."⁸¹ Short and to the point, the treaty of less than one page included the signatures of Pike, Chief Little Crow and Chief Way Ago Enagé, the principal Dakota landowners in the region.

With no formal training in the matter of legal treaties and without the official sponsorship of President Jefferson, Pike's proudest achievement initially meant very little. The editor of Pike's journals, Donald Jackson, pointed out that his treaty was not a valid one. "Jefferson, who never seemed to view Pike's expedition as an official government undertaking, did not transmit the treaty to the Senate for ratification until March 20, 1808."⁸² Jefferson then never proclaimed the treaty or put it into effect. Since the Dakota never received any payment for the land cession they did not recognize it as valid until a Henry Leavenworth made a second treaty. The senate did not ratify this treaty however,

⁸¹ Ibid., 245.

⁸² Jackson, *The Journals of Zebulon Montgomery Pike*, 246.

and it took until 1838 for the Dakota to properly receive their payment of \$4,000.⁸³

Pike's journals of travels reveal a good deal about the nature he experienced around what is now the Twin Cities metropolitan area and exhibits the first American efforts to establish a fort on the upper Mississippi River. His mission required him to acquire land for a fort, which he did not completely accomplish. With the United States so intent on erecting a military post, further explorations went up the Mississippi to document the land and acquire some on which to build a fort.

After Pike, explorers who were even more in tune to the surroundings and more focused on botany would pass through the region. Major Stephen H. Long led a more official military expedition to create Fort Snelling in the Northern United States in 1817 and 1823. Both expeditions shed light on what these early Euro-American travelers through the Twin Cities region encountered ecologically, helping establish a baseline for modern restoration efforts.

Long was the next explorer after Pike to travel up the Mississippi to survey the land around the confluence of the Mississippi and Minnesota Rivers. Following up on Pike's expedition, Long set out much more properly prepared with a number of other specialists including James Calhoun, an astronomer, William Keating, a geologist, and Thomas Say, a botanist. Long himself was a topographical engineer with the US government whom the War Department had officially commissioned to explore the area and comment on the layout of the

⁸³ Ibid., 247.

landscape in hopes of constructing the strategic military post that became Fort Snelling. Careful not to repeat the mistakes of Pike, Long's expedition examined and ratified Pike's suggestion of the location for the fort by the confluence of the Mississippi and St. Peters [Minnesota] rivers. Led by the botanist Thomas Say, the expedition surveyed the land and its species in journals that survive today. The scientific focus behind this journey—to successfully establish and inhabit a Euro-American post—gives it great usefulness in reconstructing the area's pre-settlement ecosystems.

Long took general notes on the journey while Say's journals focus solely on the botany and zoology that the group encountered. Long led his crew up the Mississippi and made camp at St. Anthony Falls on a beautiful July evening in 1817, and, perhaps travel-weary, commented of the waterfall, "no embellishments are needed to render it romantic in the highest degree."⁸⁴ The next morning he went about the Mississippi describing the flora of the area in vivid detail:

The banks on both sides of the river are about 100 feet high, decorated with Trees and shrubbery of various kinds. The Post Oak, Hiccory, Walnut, Lynden, Sugar tree, White Birch, & the American Box, also various evergreens, such as Pine, Cedar, Juniper, &c, added their embellishment to the scene. Amongst the shrubbery were the Prickly ash, Plumb & cherry tree, the gooseberry, the Black and red raspberry, the Choak berry, Grape vine &c. There were also various kinds of herbage and Flowers, among which were the wild parsley, rue, spikinard...Red and white roses, Morning Glory, and various other handsome flowers.⁸⁵

Say, the group's botanist, happily accompanied the expedition cataloging plants in the Northwest Territory (which was then known only as a vast, unsettled

⁸⁴ Lucile M. Kane et al., *The Northern Expeditions of Stephen H. Long: The Journals of 1817 and 1823 and Related Documents* (St. Paul: Minnesota Historical Society Press, 1978), 70.

⁸⁵ *Ibid.*, 76.

wilderness) because he was excited about the opportunity to find new species. He summed up his botanical findings in “A Catalog of Plants Collected in the Northwest Territory by Mr. Thomas Say in the Year 1823,” which William Keating published the next year in his narrative of the expedition.⁸⁶

Say described the vegetation of a large portion of land: much of which now comprises the Twin Cities metropolitan area including St. Anthony Falls and the Minnesota River. Around St. Anthony Falls, Say noted American mountain-ash, hyssop, and ninebark. On the prairies along the Minnesota River, Say documented bent grass, panic grass, fescue, forget-me-not, loosestrife, wheat, strawberry weed, milk vetch, and prairie turnip. Most of the species Say described were native to Minnesota prairies, but a few had been introduced to the area either by trading or early settlement. Some species had not even been cataloged in botanical collections. In a fortuitous prairie along the Minnesota river, Say was pleased to discover a new species of gentian, now called Great Lakes gentian. He continued down the Minnesota River, away from the influence of Euro-American settlers, and cataloged native species like willowherb, neckweed, fringed gentian, white pine, tamarack, balsam poplar, red swamp-fire, and two species of dogwood trees.

While Say documented the area’s lush summer vegetation, Long focused his attention on the geology and topography as it related to the construction of a military post. He described how the Minnesota River discharged into the Mississippi and noted the flat prairie extending up the river. Long wrote, “This

⁸⁶ William H. Keating, *Narrative of an Expedition to the Source of St. Peters River* (Philadelphia: H.C. Carey and I. Lea, 1824), Appendix I.

tract is subject to inundation in time of high water, which is also the case with the flat lands generally situated on both of these rivers,” most likely with thoughts of a fortification in mind. “Next above this tract is a high point of land, elevated about 120 feet above the water and fronting immediately on the Mississippi but separated from the St. Peter’s [Minnesota] by the tract above described. The point is formed by the bluffs of the two rivers intercepting each other.”⁸⁷ He used the exposed earth of the high bluffs to make calculations about the soil and rock about St. Anthony to Pilot Knob (the high point at the Mississippi/Minnesota confluence). Major Long was more skillful at identifying and describing the area than Pike. Long made only a few mistakes and most of his geological estimations about the bluffs were correct:

The rocky formations at this place were arranged in the following order from the surface downward: a coarse kind of limestone in thin strata containing considerable silex. A kind of soft, fryable stone of a greenish colour & slaty fracture probably containing a vast number of shells...The next in order is a white or yellowish sandstone so easily crumbled that it deserves the name of a sandbank rather than that of a rock. It is of various depths from 10 to 50 or 75 feet...The next in order is a soft, fryable sandstone of a greenish colour...These stratifications occupied the whole space from low water mark nearly to the top of the Bluffs.

The editors of his journals corrected his sole error in which he described the last layer of sandstone, which was actually a part of the second layer of the bluff.⁸⁸

Long clearly had his goal of finding the most suitable location for the construction of the post that became Fort Snelling as he surveyed the area. He had just passed through Prairie du Chien, along the Mississippi in modern Wisconsin, and witnessed the construction of Fort Crawford there. Long objected to the

⁸⁷ Ibid., 71.

⁸⁸ Ibid.

military utility of Fort Crawford, arguing that “no complete command of the river can be had here.” Long knew that he had found the point that would enable the United States government to exert its control over the Upper Mississippi and Minnesota. Following Pike’s suggestion, he inspected the area and found it suitable for “a military work of considerable magnitude...to control the navigation of the two rivers.”⁸⁹ Within six years Long would see Fort Snelling constructed. The fort did much more than alter the navigation of the rivers.

Continuously eager to find the source of the Mississippi River and understand its landscape for military purposes, the United States War Department sent another expedition up the river just three years after Long’s.

In 1820 Secretary of War John C. Calhoun suggested that Henry Rowe Schoolcraft, a geologist with a keen interest in exploration, accompany governor Lewis Cass of the Michigan Territory in another attempt to find the source of the Mississippi River. Upon his return, Schoolcraft published his *Narrative Journal of Travels from Detroit northwest through the great chain of American lakes to the source of the Mississippi River in the year 1820*, which he dedicated to Secretary of War Calhoun. Cass’s expedition did not correctly locate the source of the Mississippi River. It concluded that the river began at what they named Cass Lake, about 50 miles northeast of the river’s source at Lake Itasca. Nevertheless, Schoolcraft’s narrative included several descriptions of the Mississippi and Fort Snelling area with a focus on rocks, minerals and plants, which he considered important for the military post and further settlement. Schoolcraft went to great

⁸⁹ Jones, *Citadel in the Wilderness*, 37.

lengths to learn about and interpret the land because he foresaw the imminent construction of the fort and the Euro-American settlement that followed. He also had an interest in ethnobotany and documented some of the ways in which the Dakota used plants. His scientific expertise and purpose, coupled with his fascination for Dakota ethnobotany, led him to describe the area in a way that greatly informs modern efforts to reconstruct the vegetation of this time period.

Schoolcraft vividly depicted the region that is now the downtown Minneapolis waterfront. On July 25th of 1820 (close to the exact three-year anniversary of Long's expedition), Schoolcraft and his group arrived at the Falls of St. Anthony in three large canoes. Schoolcraft hailed from Albany, New York and, therefore, felt obligated to compare the falls before him to those of Niagara. The two are quite different. "The falls of St. Anthony, however, present attractions of a different nature, and have a simplicity of character which is very pleasing."⁹⁰ Schoolcraft identified the different kinds of endemic rocks: carmelian, agate, jasper and coarser ones granite and hornblende.⁹¹ The falls must have rendered a sublime sight, since so many travelers remarked on it. It also represented a regional landmark and was the only waterfall on the entire length of the Mississippi. The area struck Schoolcraft, who commented, "We see nothing in the view which may not be considered either rude or picturesque, and perhaps there are few scenes in the natural topography of our country, where these

⁹⁰ Mentor L. Williams ed., *Narrative Journal of Travels* (East Lansing, Michigan: The Michigan State College Press, 1953), 290.

⁹¹ *Ibid.*

features are blended with more harmony and effect.”⁹² It is no wonder the city of Minneapolis developed on these shores.

Schoolcraft, like Long and Carver, experienced a beautiful summer day on the river and took special note of its verdant foliage. He saw rank grass and clumps of dwarf black oak on the prairie above the falls. He recognized the transitional nature of the location between the oak dominated prairies and the cedar and pine dominated limestone bluffs:

The beautiful prairies of the upper Mississippi, are merged in the rugged lime stone bluffs which skirt the banks of the river from the point downward.--With this change of geological character, we perceive a corresponding one, in the vegetable productions, and the eye embraces at one view, the copses of oak upon the prairies, and the cedars and pines which characterize the calcareous bluffs. Nothing can exceed the beauty of the prairies which skirt both banks of the river above the falls. They... are diversified with gentle ascents and small ravines covered with the most luxuriant growth of grass and heath-flowers, interspersed with groves of oak, which throw an air of the most picturesque beauty over the scene.⁹³

He identified elm, ash, black and white walnut, maple, and oak growing on the banks of the Mississippi. He said his party killed elk and buffalo near the falls, indicating that the area then contained a mixture of forest and prairie. Taken altogether he had nothing but praise for the beauty and simplicity of the falls of St. Anthony region.

Schoolcraft had similar praise for the land in his description of the American garrison on the Minnesota River, which pre-dated more permanent settlement. This temporary establishment until the construction of the fort planted 90 acres of crops including corn and potatoes. He let the fruits of the land speak

⁹² Ibid.

⁹³ Ibid.

for it, when presented with corn and melons of the most delicious ripeness to his hungry outfit. He wrote that the food provided the best commentaries that can be offered upon the soil and climate. “The former is of the richest quality... [and] presents all the peculiar appearances which characterize the fertile alluvions of the valley of the Ohio. In favour of the climate the officers of the garrison speak in terms of the highest admiration.”⁹⁴ Schoolcraft no doubt thought this a fertile place as suitable as any for settlement. He noted the rapidity with which Americans were settling “so remote a section of the union” and perhaps the beauty and respect he felt for the place explained why.⁹⁵

Geology has important implications for the plant species that grow on certain soils and rocks, so the geological descriptions of Long and Schoolcraft prove worthwhile in understanding what used to grow and what can grow today. If the geology of a place has remained largely unchanged since Schoolcraft described them in 1820, it is likely that historic plant species might thrive today, barring other environmental and social factors.

Schoolcraft, a geologist at heart, went to great lengths to study the rocks and minerals in the area, in hopes of understanding and using its geological base for the construction of what became Fort Snelling. He also wanted to note the land’s distinguishing geological features that might be of use for settlement and garrison life. He picked up on Jonathan Carver’s 1766 description of a rock “as white as the driven snow” at the mouth of the Minnesota River. Carver opined that the rock might be useful in architecture. Schoolcraft showed more expertise.

⁹⁴ Ibid., 295.

⁹⁵ Ibid., 293.

“The rock here alluded to,” wrote Schoolcraft, “is a white sand stone...overlaid by a stratum of secondary lime stone, containing petrified concholithes, and attaining, altogether, an elevation of about two hundred feet above the river.”⁹⁶

The geology of these bluffs was of special import to him because they were to make up the basis of the military post. Schoolcraft wanted to make sure his superiors felt confident that this area was the best possible location for it. He then noted the soil, “in which large fragments of lime stone, quartz, and hornblende, are plentifully imbedded,” and went on to praise the rich black nature of it that “extends eighteen inches in depth, and forms the surface of the country which is a kind of open highland prairie, covered with grass, and scattering oaks.”⁹⁷

Schoolcraft described the “luxuriant herbage” around the confluence of the Minnesota and Mississippi Rivers, and displayed an interest in Native American uses of plants, which provides great evidence of species that had been growing in the area for a long time. He cataloged the tree species he saw on Pike Island at the mouth of the Minnesota: “Among the forest trees upon its banks we noticed the box-elder *acer negundo* or ash-leaved maple. The inner bark of this tree,” he wrote, “boiled down with the common nettle into a strong decoction, is said to be used by the Indians as a remedy for lues venereal.”⁹⁸ Beside syphilis cures, Schoolcraft witnessed an aromatic grass that Dakota people highly esteemed. He wrote how he saw it used to celebrate a victorious warrior and wondered whether the grass was similar to one that native people distilled into an

⁹⁶ Ibid., 301.

⁹⁷ Ibid.

⁹⁸ Ibid., 302.

intoxicating liquor similar to brandy. Schoolcraft's notes on the indigenous uses of plants nursed his interest in Dakota and Ojibwa culture. Upon returning from his 1820 expedition he went on to publish many books about Native American culture with the help of his part-Ojibwa wife, Jane Johnston.

The geology and botany of Henry Schoolcraft's travels not only informed the construction of a military post, but also continue to inform modern efforts to understand the kinds of rocks and plants endemic to the area where the Minnesota River meets the Mississippi River.

Similar to Schoolcraft, Joseph Nicollet explored the plains and prairies of the upper Mississippi in three separate expeditions between 1836-1839, with a scientific acumen and a special interest in documenting the lifestyle of the Dakota. Nicollet was fascinated by Dakota life and culture as he witnessed it disappearing. A mathematician and geographer by trade, Nicollet came to America from France after some financial troubles. He commenced three separate expeditions between 1836-1839 through the upper Mississippi. He was one of the only Euro-American explorers to study the indigenous use of plants. Nicollet's accounts of the traditional uses of plants provide strong evidence of historically endemic species, since the Dakota incorporated certain species into their culture.

Charles Geyer, a botanist, accompanied Nicollet on his 1838 journey along the Mississippi and kept a detailed botanical journal of the plant species they encountered. By this time Fort Snelling was bustling and Euro-American settlement of the area had begun, so we cannot look to the notes of Nicollet and Geyer as de facto evidence of pre-settlement Minnesota. Settlers had already

severely affected the landscape by the 1830s and the Twin Cities, although small by today's standards, were growing at phenomenal rates.

By the time Nicollet traversed the Upper Mississippi, ecological change had altered the environment and economy of the Dakota's traditional territory. Dakota culture was dwindling and many Native Americans relied on the "charity" of American garrisons for support. At this point Fort Snelling stood prominently overlooking the confluence of the Minnesota and Mississippi rivers. Its construction necessitated the establishment of the first sawmill in Minnesota at St. Anthony Falls in 1821 for timber.⁹⁹ Settlers drawn to the fort followed suit and the forests of southeast Minnesota quickly fell to the axe and saw-mill for building and heating homes. An 1854 letter written to the *New York Daily Times* documented steamboat trips along the upper Mississippi, commenting on both the stunning rate at which the Twin Cities area was growing and the timber needed to supply it. Describing St. Anthony Falls, the correspondent wrote, "Several saw-mills have been built, driven by water power derived from the falls, and are steadily and busily employed in sawing timber for the neighborhood."¹⁰⁰ The clearing of forests led to the easy planting of agricultural crops in newly cleared fields.¹⁰¹ Timber companies moved into the forests in the 1830s and the economy of Minnesota changed forever, when lumbering became the leading industry in the state, primarily to supply the fledgling cities of Minneapolis and St. Paul.

⁹⁹ John R. Tester, *Minnesota's Natural Heritage: An Ecological Perspective* (Minneapolis: University of Minnesota Press, 1995), 109.

¹⁰⁰ "The Great Railroad Excursion," *New York Daily Times*, June 14, 1854.

¹⁰¹ *Ibid.*

Geyer kept a botanical journal of the plants he saw as he traveled with Nicollet's party through the steadily changing Minnesota landscape. On the trip from St. Louis to Fort Snelling in 1838, Geyer collected and pressed (for preservation) over 400 plants.¹⁰² An unfortunate accident caused the loss of most of his specimens when a mule fell off a cliff into a river en route to a herbarium in New York. Geyer's journal survived the trip, however, and the Minnesota History Center holds a manuscript edition that shows the precision with which he cataloged the hundreds of species, many of which he encountered near the confluence of the Mississippi and Minnesota Rivers at Sibley American Fur Company, just south of Fort Snelling.

From June through September 1838, Geyer recorded the botany of the upper Mississippi River ecosystem as the Nicollet expedition traveled through and mapped the region.¹⁰³ Along the Minnesota River by Sibley American Fur Company, Geyer saw giant goldenrod and fringed gentian. Other botanists such as Thomas Say and Thoreau, similarly found numerous samples of these species, indicating that they grew abundantly throughout the upper Mississippi ecosystem at this time. Willow and poplar species covered the banks of the Minnesota, chiefly meadow willow. On the floodplains, mostly sedges and sunflower grew. Geyer saw native Minnesotan species yellowish bladderwort frequently along the margins between the river and the woods, and in both rivers he saw American

¹⁰² Charles Umbanhowar Jr. et al., "Charles Andreas Geyer," *Re-imagining Joseph Nicollet's Mapmaking Expeditions*,
<http://www.stolaf.edu/academics/nicollet/geyerjournalintro.html>.

¹⁰³ Charles A. Geyer, Charles A. Geyer Botanical Journal May 18 to October 5, 1838, Minnesota Historical Society.

eelgrass. On the high bluff prairie above the Minnesota River by Pilot Knob he documented such native species as silky aster, goldilocks aster, rock polypody, sunflower, gold star, rock cress, birds foot violet, and cankerweed. These species appear throughout botanical descriptions of the area during this time period, which illustrates the limited influence of Euro-American settlement in displacing native plant species at this time. Flowering spurge grew abundantly throughout the area too. Common to the plains he passed through was curly gumweed and blackroot. He saw a single specimen of white turtlehead, a rare native species. On the high rocky banks of the Mississippi near Fort Snelling he cataloged cottongrass, staghorn sumac, several sedge species and many large trees that frequently occur in native prairie habitats such as box elder, black cherry, cedar, white pine, birch, and oak. In the naked margins of rocks he saw tarragon and on limestone ridges grew stiff marsh bedstraw. On the Cannon River, far from the reaches of contemporary Euro-American settlement, he saw endemic American gentian, cankerweed, American elm, white maple, white and red oak, and after crossing a prairie saw a five flowered gentian “in the most beautiful state of perfection.”¹⁰⁴ Geyer noted the preponderance of ragweed near river shores and the cultivated land where Native Americans and settlers then began growing corn and other crops.

In the face of the increasing presence of Euro-American settlers, Native American tribes struggled to survive. Nicollet met frequently with Native American tribes, which inculcated in him a taste for ethnographic inquiry into the

¹⁰⁴ Ibid.

Dakota culture of the area. Martha and Edmund Bray, the editors of Nicollet's journals, included an ethnobotany appendix with his notes on the indigenous uses of several plants.¹⁰⁵

Nicollet's ethnobotanical observations hint at the historical presence of these species, and their firm roots in Dakota culture signify a long, steady relationship between the Dakota and these select plant species. He described four o'clocks, whose bulb the Dakota called "Bear root" because it "has the power of making the Dakota discover that animal when using it."¹⁰⁶ They called it Warhankstcha tapejuta, or medicine of the bear. Nicollet cataloged the bark of the butternut tree, or Tathuka, from which the Dakota made a black dye. He also noted a grass of great importance to Dakota people, black oat grass, which they called witchapetaha. This sharp, prickly grass would annoy buffalo so its presence meant that the herds had left the prairie for the woods. Nicollet identified an odiferous plant burned in Dakota ceremonies as prairie sagewort. Besides ceremonial plants, some species also held significant value as medicine. Medicinal plants included Indian sweet grass, known as wachanra, which has a pleasant odor and settles stomachs when drunk as a medicinal tea. Nicollet noted a root used against stomach pain, purple-stem angelica. He described the prairie turnip, a food that provided a great deal of nutrition and sustenance and purple

¹⁰⁵ Edmund C. Bray and Martha Coleman Bray ed., *Joseph N. Nicollet on the Plains and Prairies: The Expeditions of 1838-1839 with Journals, Letters, and Notes on the Dakota Indians* (St. Paul: Minnesota Historical Society Press, 1993), 280.

¹⁰⁶ Ibid.

coneflower, a root that killed snakes.¹⁰⁷ The degree to which the Dakota culturally ingrained these species of plants suggests that they have a long history of growing in this area.

Although Nicollet's ethnobotanical list offers clues as to what grew in the area during the very early settlement period, it ultimately leaves more questions than answers. It remains hard to determine whether these species grew endemically because they could have migrated with the Dakota from the east about two hundred years ago when the Ojibwa pushed them west. It is likely that many of the aforementioned species grew in water and aquatic ecosystems throughout Minnesota. Either way, the cultural use of plants provides insights into how the Dakota interacted with and shaped the environment of the Mississippi River. Clearly they were not passive occupants but active agents of ecological change. They collected roots, cultivated beans and corn, and swept rice from the surface of waterways. In recreating any historical ecology of the area it is important to remember that the actions of indigenous tribes had lasting effects on the ecosystem in the same way that Euro-American settlers drastically changed the Minnesotan landscape. Were restorationists to plant species that the Dakota carefully maintained in large numbers, it is questionable whether these species would survive on their own.

Indeed settlers dramatically altered the landscape beginning in the 1830s and continued to do so with the establishment of St. Paul, St. Anthony, and Minneapolis in the next two decades. By the mid nineteenth century America's

¹⁰⁷ Ibid., 51-54.

northwestern frontier was rapidly developing into cities and towns. At this time Henry David Thoreau, one of the nation's most famous naturalists and a skilled writer about nature and wild places, had to see the transformation of the Minnesotan frontier for himself before it became completely developed.

In 1861, Thoreau traveled from his home in Concord, Massachusetts to experience what he called the western frontier of his native land. Thoreau's doctors urged him to seek a change of climate to combat his worsening bronchitis and tuberculosis, which prompted his journey west to Minnesota. Thoreau left ninety-two pages of journals of his "Notes on the Journey West," which he eventually intended to publish. He never got the chance, however, and died early in 1862 after returning from Minnesota. Thoreau and his seventeen year-old accomplice, Horace Mann Jr., also a naturalist obsessed with botany, spent late May and June of 1861 exploring and cataloging the land of Minnesota at a time when the prairies and forests were just giving way to the growing towns of Minneapolis, St. Anthony, and St. Paul. Thoreau lamented the reduction of what he considered wild America to endless development and sought to see the frontier land of Minnesota himself before it too became permanently settled. Over the course of two months he traveled to such places as Nicollet Island, Lake Calhoun, and Minnehaha Falls to botanically catalog the plant species he encountered. He knew that settlers would soon transform the forests, lakes, and prairies of Minnesota into cities reminiscent of the highly developed Northeast he called home.

On May 25th, 1861, Thoreau arrived in Minnesota aboard a steamboat traveling up the Mississippi River. He first floated past the town of Red Wing where he saw its “remarkable bluff” and noted the white maple and white birch growing on it.¹⁰⁸ In St. Paul, Thoreau saw black mustard and Solomon’s seal, a native species, and in the marshes west of the city saw monkey flower, American brooklime, mock pennyroyal, and scurfy pea, a common Minnesota plant.

He then traveled from St. Paul nine miles across the prairie to the growing town of St. Anthony (now part of Minneapolis) and noted the changes that settlement was bringing. St. Anthony was founded in 1847, four years before Minneapolis. He noticed that its main streets were “a mere trail more or less broad and distinct” containing “unaltered prairie with bur and other oaks lefts.”¹⁰⁹ He said houses on the prairie were half a mile apart with rudimentary fencing. This area had a preponderance of slippery elm and blackberry, which commonly inhabit dry Minnesotan prairies. Here he also saw native Minnesotan species such as gooseberry, bird-foot violet, and prairie violet. Continuing through the young city of St. Anthony, Thoreau noted crowfoot going out of bloom along with rock avens and wood-whitlow grass. He also saw “the very showy” native harebell growing abundantly on the riverbank and side of the road. Crossing the bridge onto Nicollet Island he saw Northern prickly ash, wild mustard, sugar maple, white maple, butternut, hackberry, and hickory. He visited the University of Minnesota, whose campus was set in an opening of bur oaks, and described it as

¹⁰⁸ Walter Harding ed., *Thoreau’s Minnesota Journey: Two Documents*, Thoreau Society Booklet No. Sixteen (Geneseo, New York: The Thoreau Society, 1962), 5.

¹⁰⁹ *Ibid.*, 8.

“quite artificial.”¹¹⁰ On its prairie he cataloged several non-native species, including plantain, shepherds purse, violet and red sorrel, all of which had been introduced since the time of settlement. He mentioned that the Wisconsin state agricultural report for 1852 says, “bison last seen east of Mississippi in [18]32 & the last beaver killed in s[outh] part of Wisconsin in 1819.”¹¹¹

Thoreau then traveled west to Minnehaha Falls and Lake Calhoun, which today are part of Minneapolis, to catalog the plant species of a less developed area. At Minnehaha he noticed carrion flower, blue cohosh, bent milk vetch, golden corydalis, and long-leaved willow. At Lake Calhoun, Thoreau characterized a tower mustard species as straight tower mustard, as opposed to varieties in his native East. He saw pin oak, downy arrow-wood, false indigo, wild yellow plum, wild cranes-bill, downy-leaved poplar, dwarf raspberry, alder-leaved buckthorn, low birch, hoary willow, and honeysuckle all on the shores of Lake Calhoun. Many of these species commonly inhabit the dry prairies of Minnesota, which suggests that this area had still not seen much vegetation-altering development.¹¹² On the prairie between Lake Calhoun and Lake Harriet, Thoreau noticed prairie violet and bird-foot violet, ash-leaved maple, wild strawberry, honeysuckle, green orchis, and red oak. Thoreau noted the abundance in oak openings of hazel, willow, aspen, roses, smooth sumac, meadow parsnip, and rigid goldenrod, which he characterized as “very abundant.”¹¹³ These species signify a natural community largely unaltered by settlement, which continued into

¹¹⁰ Ibid., 6.

¹¹¹ Ibid.

¹¹² Aaseng, *Minnesota's Native Vegetation*, 47.

¹¹³ Harding, *Thoreau's Minnesota Journey*, 15.

the woods northwest of Lake Calhoun. Here Thoreau saw red oak, elm, bass, hop hornbeam, and tall anemone and by Lake Harriet saw golden aster, ground cherry, clammy weed, four o' clock, and geranium, meadow parsnip and northern bedstraw, which he said were all common to oak forests in Minnesota.

Thoreau's "journey west" came at a time that perfectly suited him to examine the changes being brought to Minnesota's ecosystems. Instead of prizing Minnesota for its unaltered landscape or disparaging it for its rapid development, Thoreau understood that he was witnessing a turning point in the settlement of the northern frontier. At times romantic and at times scientific or indifferent, Thoreau documented the species composition of what is now the Twin Cities with a historical focus. He wanted to describe the changes to the land associated with the contemporary settlement of Minnesota. His historical focus and botanical acumen greatly assist efforts to reconstruct the nature of Minnesota's ecosystems during this period of settlement. Thoreau rarely left his native Northeast, but luckily he visited the frontier Northwest just in time to witness its large-scale American development.

Conclusion

By the time Thoreau toured Minnesota in 1861, he knew better than to consider it a "wild" frontier. Thirty years had passed since the construction of Fort Snelling, and an era of far-reaching transformations—economic, social, and ecological—had taken root. What was once a Native American-dominated landscape had turned into one of constant Euro-American settlement in the

growing cities of Minneapolis, St. Anthony, and St. Paul. Instead of hunting buffalo, burning prairie, and gathering vegetables, as they had traditionally done, the Dakota of the upper Mississippi valley collected government payments for their lands. After days of studying the vegetation of St. Paul and recording it in his botany journal, Thoreau took a steamboat, the undying symbol of nineteenth century American civilization, along the Mississippi and up the Minnesota River to witness the annual federal payment to the Dakota at Redwood. This event, more than any other, symbolized the completion of a shift in the cultural, economic, and ecological hegemony of the Minnesotan landscape.

Thoreau in the nineteenth century grappled to understand the authenticity of Minnesotan ecosystems undergoing profound transformations—the same ecosystems that restorationists in the twenty-first century aim to restore. Viewed historically, hindsight demonstrates that ecosystems change over time and that their varied histories occur along a relative continuum of authenticity. Ecologists doing restoration work should pick a point in history and defend it with good reason rather than arguing over the “naturalness” of different landscapes, which plunges nature and restoration projects into an ahistorical quagmire.

For restorationists today, this means restoring the ecosystems of pre-settlement Minnesota with a historical understanding of the cultural and economic variety that has shaped its landscapes and caused them to change over time. As long as humans have been around, humans have changed landscapes. Economic activities have diversified and evolved over the years, yet they have never stopped shaping the ecosystems upon which they depend. What looked new to the eyes of

Euro-American explorers such as Carver, Long, and Nicollet in the early nineteenth century were in actuality landscapes with hundreds of years of direct human habitation and alteration, such as the cleared prairie of Dakota villages and hunting grounds where the Twin Cities metropolitan area now hums. The National Park Service, charged by Congress to represent, interpret, and restore the Mississippi River and its ecosystems, should capitalize on the river's rich history and build it into informative and honest displays of ecological understanding. It also must figure out how to manage restored ecosystems in today's wider ecological and economic climate, which differs substantially from that of the time period it is restoring. We can restore the habitat of the period immediately preceding Euro-American settlement, but cannot recreate the complex human-environmental connections and relationships of that period.

Restoration ecology is a powerful tool to have at our disposal in this unique turning point in human history, when environmental consciousness has infiltrated every cultural arena. Humans now recognize their widespread impact on the natural systems on which they depend. Long confused about our relation to the natural world, ecological restoration creates a healthy space for humans in nature: one of participant, student, nurturer, and healer. Instead of disturbing and defiling nature, as has been the custom, restoration allows humans a way to ameliorate it, and to recognize the complexities of human-environmental relationships.

Aside from the tangible benefit of a self-functioning and robust ecosystem, ecological restoration work enlists public volunteers that learn how to

be good stewards of their environment, creating just the kind of ecologically aware citizens that the twenty-first century needs in the face of growing concerns over resources and the imminent threat of global warming. Equipped with a clear environmental ethic, humans can confront the myriad environmental challenges of the day. As Donald Worster, the prominent environmental historian, explains, “increasingly in modern times, when the balance of power has shifted more and more away from nature and in favor of humans...the sum of people’s perceptions and ideas about nature has clearly become the decisive one in promoting change.”¹¹⁴

The field of ecological or environmental history teaches that humans are indeed an anomaly with respect to our place in nature, yet this distinction does not free us from the ecological constraints and responsibilities of sharing a planet with other species. In fact it gives us greater responsibility. “This new history rejects the common assumption that...people are a separate and uniquely special species, that the ecological consequences of our past deeds can be ignored.”¹¹⁵ Humans recognize our undue impact on the rest of the natural world and the intimate ways in which we depend on it. The human ecological consciousness increasingly understands its ability to serve the needs of our biological neighbors. It is not just guilt that leads us to try to stop polar bears or endangered plant species in Minnesota like alpine milk-vetch from vanishing from the face of the earth. We worry what a planet with 25% of its plant and animal species wiped out might

¹¹⁴ Donald Worster, “Transformations of the Earth: Toward an Agroecological Perspective in History,” *The Journal of American History* 76 (Mar. 1990), 1091.

¹¹⁵ *Ibid.*, 1088.

look like and whether or not it could support the rest of life. Humans are concerned that the dominance of our industrial society has caused the extinction of other species through pollution and habitat fragmentation and loss. Worster asks, “Does *Homo sapiens* have any moral obligations to the earth and its circle of life, or does that life exist merely to satisfy the infinitely expanding wants of our own species?”¹¹⁶ Seed depositories worldwide are now stocking specimens of every plant species possible to ensure they do not go extinct, under the recognition that extinction is not only a possibility, but also a reality. Zoos and conservation societies are doing the same with rare and endangered animals. Environmental histories and ecological studies have proven that humans depend on the livelihood of plant and animal species as much as they are coming to depend on us. We can only expect the trend of extinction to continue unless we take certain immediate steps such as protection, repopulation, and restoration. But the work does not end there.

Humans must heed the philosophy of ecological restoration and apply it to the broader community of life on earth. A shift in the way we value nature—from one of human mastery over it towards one of inclusion and partnership—will rework economic and societal models to reflect the modern change in eco-consciousness that restoration ecology summons. To truly combat the excessive influence of humans over the sum of the earth’s land, humans need to live smaller, more locally, and more in tune with bioregional ecological systems. The era of human conquest—ecological, social, and economic—has taken a terrible

¹¹⁶ Ibid.

toll on the planet. In its place humans need to live more ecologically, by living in nature as a participant instead of above and beyond it as a controller. As we move ahead into the uncertainties and problems of the twenty-first century, such as population growth, freshwater availability, and global warming, human civilization will have to adapt to ecological stresses by limiting the extent of anthropogenic degradation and adopting creative solutions in which we encourage the rest of life to flourish on its own terms. The work of the environmental historian will endure to use cues from the past to rework society towards a more environmentally just and prosperous future for all species that call earth home. Andre Clewell, in the journal *Ecological Restoration*, updates the mission of ecological restoration, when he says it now “encompasses any action that returns an impaired ecosystem to its developmental trajectory in a manner that allows it to endure.”¹¹⁷ The great challenge of the coming decades will involve restoring the developmental trajectory of the larger community of earth and its many species to ensure that earth remains a vitalized, green planet.

¹¹⁷ Andre Clewell, “The Intent of Ecological Restoration, its Circumscription and its Standards,” *Ecological Restoration* Vol. 27, No. 1, (2009): 5.

Appendix 1

Complete Plant List

The sum of my research into the pre-settlement vegetation of the upper Mississippi River is represented in a plant inventory for use at the disposal of the Park Service, which I have organized by location and listed using common name, scientific name, location, and source.

Please note: Some species from my historical sources may have been confused for European counterparts, leading to false classification. It is also possible that true European species were in Minnesota, as introduced species, at the time of the following recordings.

American mountain-ash, *Sorbus americana*, St. Anthony Falls, Say
blackberry, *Rubus allegheniensis*, St. Anthony Prairie, Thoreau
bird-foot violet, *Viola pendata*, St. Anthony Prairie, Thoreau
crowfoot, *Ranunculus* sp., St. Anthony Prairie, Thoreau
gooseberry, *Ribes* sp., St. Anthony Prairie, Thoreau
harebell, *Campanula rotundifolia*, St. Anthony Prairie, Thoreau
hyssop, *Hyssopus*, St. Anthony Falls, Say
ninebark, *Physocarpus opulifolius*, St. Anthony Falls, Say
prairie violet, *Viola palmate*, St. Anthony Prairie, Thoreau
rough avens, *Geum laciniatum*, St. Anthony Prairie, Thoreau
slippery elm, *Ulmus rubra*, St. Anthony Prairie, Thoreau
wood-whitlow grass, *Draba nemorosa*, St. Anthony Prairie, Thoreau

bitternut hickory, *Carya cordiformis*, Nicollet Island, Thoreau
butternut, *Juglans cinerea*, Nicollet Island, Thoreau
hackberry, *Celtis occidentalis*, Nicollet Island, Thoreau
Northern prickly ash, *Zanthoxylum americanum*, Nicollet Island, Thoreau
sugar maple, *Acer saccharum*, Nicollet Island, Thoreau
white maple, *Acer saccharinum*, Nicollet Island, Thoreau
wild mustard, *Sinapis arvensis*, Nicollet Island, Thoreau

Minnehaha Falls

bent milk vetch, *Astragalus vexilliflexus*, Minnehaha Falls, Thoreau
blue cohosh, *Caulophyllum thalictroides*, Minnehaha Falls, Thoreau
carrion flower, *Smilax* sp., Minnehaha Falls, Thoreau
golden corydalis, *Corydalis aurea*, Minnehaha Falls, Thoreau
long-leaved willow, *Salix acutifolia*, Minnehaha Falls, Thoreau

Lake Calhoun

alder-leaved buckthorn, *Rhamnus alnifolia*, Lake Calhoun, Thoreau
basswood, *Tilia Americana*, Lake Calhoun, Thoreau
downy arrow-wood, *Viburnum rafinesquianum*, Lake Calhoun, Thoreau
downy-leaved poplar, *Populus heterophylla*, Lake Calhoun, Thoreau
dwarf raspberry, *Rubus pubescens*, Lake Calhoun, Thoreau
elm, *Ulmus Americana*, Lake Calhoun, Thoreau
false indigo, *Baptisia alba*, Lake Calhoun, Thoreau
geranium, *Geranium maculatum*, Lake Calhoun, Thoreau
hoary willow, *Salix candida*, Lake Calhoun, Thoreau
honeysuckle, *Diervilla lonicera*, Lake Calhoun, Thoreau
hop, *Humulus lupulus*, Lake Calhoun, Thoreau
hornbeam, *Carpinus caroliniana*, Lake Calhoun, Thoreau
low birch, *Betula pumila*, Lake Calhoun, Thoreau
pin oak, *Quercus ellipsoidalis*, Lake Calhoun, Thoreau
red oak, *Quercus rubra*, Lake Calhoun, Thoreau
straight tower mustard, *Arabis glabra*, Lake Calhoun, Thoreau
tall anemone, *Anemone virginiana*, Lake Calhoun, Thoreau
wild plum, *Prunus americana*, Lake Calhoun, Thoreau

Lake Harriet/Lake Calhoun

aspen, *Populus grandidentata*, Prairie between Lake Calhoun and Lake Harriet,
Thoreau
bird-foot violet, *Viola pendata*, Prairie between Lake Calhoun and Lake Harriet,
Thoreau
box-elder, *Acer negundo*, Lake Calhoun and Lake Harriet, Thoreau
green orchis, *Habenaria orbiculata*, Lake Calhoun and Lake Harriet, Thoreau
hazel, *Corylus Americana*, Prairie between Lake Calhoun and Lake Harriet,
Thoreau
meadow parsnip, *Thaspium barbinode*, Lake Calhoun and Lake Harriet, Thoreau
prairie violet, *Viola palmata*, Prairie between Lake Calhoun and Lake Harriet,
Thoreau
red oak, *Quercus rubra*, Prairie between Lake Calhoun and Lake Harriet, Thoreau
rigid goldenrod, *Solidago rigida*, Lake Calhoun and Lake Harriet, Thoreau

smooth sumac, *Rhus glabra*, Prairie between Lake Calhoun and Lake Harriet, Thoreau
wild rose, *Rosa blanda*, Prairie between Lake Calhoun and Lake Harriet, Thoreau
wild strawberry, *Fragaria virginiana*, Lake Calhoun and Lake Harriet, Thoreau
willow, *Salix* sp., Prairie between Lake Calhoun and Lake Harriet, Thoreau

Lake Harriet

clammyweed, *Polanisia* sp., Lake Harriet, Thoreau
four o' clock, *Mirabilis albidia*, Lake Harriet, Thoreau
geranium, *Geranium maculatum*, Lake Harriet, Thoreau
ground cherry, *Physalis hispida*, Lake Harriet, Thoreau
meadow parsnip, *Thaspium barbinode*, Lake Harriet, Thoreau
northern bedstraw, *Galium boreala*, Lake Harriet, Thoreau
prairie golden aster, *Heterotheca villosa*, Lake Harriet, Thoreau

Fort Snelling Area/Mississippi River

basswood, *Tilia Americana*, Mississippi/Minnesota confluence, Long
blackberry, *Rubus allegheniensis*, Mississippi/Minnesota confluence, Long
box-elder, *Acer negundo*, Mississippi/Minnesota confluence, Long
cherry, *Prunus serotina*, Mississippi/Minnesota confluence, Long
chokeberry, *Aronia melanocarpa*, Mississippi/Minnesota confluence, Long
gooseberry, *Ribes* sp., Mississippi/Minnesota confluence, Long
hickory, *Carya ovata*, Mississippi/Minnesota confluence, Long
juniper, *Juniperus communis*, Mississippi/Minnesota confluence, Long
morning glory, *Ipomoea hederacea*, Mississippi/Minnesota confluence, Long
pine, *pinus*, sp., Mississippi/Minnesota confluence, Long
plum, *Prunus Americana*, Mississippi/Minnesota confluence, Long
post oak, *Quercus stellata*, Mississippi/Minnesota confluence, Long
prickly ash, *Zanthoxylum americanum*, Mississippi/Minnesota confluence, Long
raspberry, *Rubus pubescens*, Mississippi/Minnesota confluence, Long
red cedar, *Juniperus virginiana*, Mississippi/Minnesota confluence, Long
rose, *Rosa blanda*, Mississippi/Minnesota confluence, Long
rue, *Thalictrum* sp., Mississippi/Minnesota confluence, Long
spikinard, *Aralia racemosa*, Mississippi/Minnesota confluence, Long
sugar maple, *Acer saccharum*, Mississippi/Minnesota confluence, Long
walnut, *Juglans nigra*, Mississippi/Minnesota confluence, Long
white birch, *Betula papyrifera*, Mississippi/Minnesota confluence, Long
wild grape, *Vitis riparia*, Mississippi/Minnesota confluence, Long
wild parsley, *Lomatium foeniculaceum*, Mississippi/Minnesota confluence, Long

American eelgrass, *Vallisneria Americana*, Mississippi and Minnesota Rivers,
Geyer
birds foot violet, *Viola pendata*, Pilot Knob, Geyer
black cherry, *Prunus serotina*, Fort Snelling, Geyer
blackroot, *Veronicastrum virginicum*, Minnesota prairie, Geyer

box elder, *Acer negundo*, Fort Snelling, Geyer
canker weed, *Prenanthes serpentaria*, Pilot Knob, Geyer
cottongrass, *Eriophorum*, Fort Snelling, Geyer
curly gumweed, *Grindelia hirsutula*, Minnesota prairie, Geyer
flowering spurge, *Euphorbia corollata*, Minnesota prairie, Geyer
fringed gentian, *Gentiana puberulenta*, Minnesota River, Geyer
giant goldenrod, *Solidago gigantea*, Minnesota River, Geyer
gold star, *Hypoxis hirsuta*, Pilot Knob, Geyer
meadow willow, *Salix petiolaris*, Minnesota River, Geyer
Northern bedstraw, *Galium boreale*, Minnesota River, Geyer
oak, *Quercus* sp., Fort Snelling, Geyer
paper birch, *Betula papyrifera*, Fort Snelling, Geyer
poplar, *Populus* sp., Minnesota River, Geyer
prairie golden aster, *Heterotheca villosa*, Pilot Knob, Geyer
rock cress, *Arabis* sp., Pilot Knob, Geyer
rock polypody, *Polypodium virginianum*, Pilot Knob, Geyer
sedge, *Carex* sp., Fort Snelling, Geyer
sedge, *Carex* sp., Minnesota River floodplain, Geyer
silky aster, *Aster sericeus*, Pilot Knob, Geyer
staghorn sumac, *Rhus typhina*, Fort Snelling, Geyer
stiff marsh bedstraw, *Galium tinctorium*, Fort Snelling, Geyer
sunflower, *Helianthus annuus*, Minnesota River floodplain, Geyer
sunflower, *Helianthus annuus*, Pilot Knob, Geyer
tarragon, *Artemisia dracunculoides*, Fort Snelling, Geyer
white cedar, *Thuja occidentalis*, Fort Snelling, Geyer
white pine, *Pinus strobus*, Fort Snelling, Geyer
white turtlehead, *Chelone glabra*, Minnesota prairie, Geyer
yellowish bladderwort, *Utricularia ochroleuca*, Mississippi and Minnesota Rivers, Geyer

Mississippi River

ash, *Fraxinus americanus*, Mississippi River, Schoolcraft
black oak, *Quercus velutina*, St. Anthony prairie, Schoolcraft
black walnut, *Juglans nigra*, Mississippi River, Schoolcraft
box-elder, *Acer negundo*, Pike Island, Schoolcraft
elm, *Ulmus* sp., Mississippi River, Schoolcraft
maple, *Acer* sp., Mississippi River, Schoolcraft
oak, *Quercus* sp., Mississippi River, Schoolcraft
stink grass, *Eragrostis cilianensis*, St. Anthony prairie, Schoolcraft

American elm, *Ulmus Americana*, Mississippi/St. Croix, Pike
ash, *Fraxinus* sp., Mississippi/St. Croix, Pike
balsam fir, *Abies balsamea*, Mississippi/St. Croix, Pike
big-toothed aspen, *Populus grandidentata*, Mississippi/St. Croix, Pike
Eastern hemlock, *Tsuga Canadensis*, Mississippi/St. Croix, Pike

oak, *Quercus* sp., Mississippi/St. Croix, Pike
sugar maple, *Acer saccharum*, Mississippi/St. Croix, Pike

Cannon River

American elm, *Ulmus Americana*, Cannon River, Geyer
canker weed, *Prenanthes serpentaria*, Cannon River, Geyer
gentian, *Gentiana affinis*, Cannon River, Geyer
ragweed, *Ambrosia* sp., river shores/cultivated land, Geyer
red oak, *Quercus rubra*, Cannon River, Geyer
silver maple, *Acer saccharinum*, Cannon River, Geyer
stiff gentian, *Gentianella quinquefolia*, Cannon River, Geyer

Minnesota River and Plains

balsam poplar, *Populus balsam*, Say *ifera*, Minnesota River
bent grass, *Agrostis hyemalis*, Minnesota River prairie, Say
common hops, *Humulus lupulus*, Minnesota River plains, Carver
dogwood, *Cornus* sp., Minnesota River, Say
Eastern white pine, *Pinus strobus*, Minnesota River, Say
fescue, *Festuca* sp., Minnesota River prairie, Say
forget-me-not, *Myosotis* sp., Minnesota River prairie, Say
fringed gentian, *Gentiana puberulenta*, Minnesota River, Say
Great Lakes gentian, *Gentiana rubricaulis*, prairie along the Minnesota River,
Say
hickory, *Carya ovata*, Minnesota River plains, Carver
loosestrife, *Lysimachia quadriflora*, Minnesota River prairie, Say
milk vetch, *Astragalus adsurgens*, Minnesota River prairie, Say
neckweed, *Veronica peregrina*, Minnesota River, Say
panic grass, *Panicum* sp., Minnesota River prairie, Say
purple-stem angelica, *Angelica atropurpurea*, Minnesota River plains, Carver
prairie crabapple, *Pyrus ioensis*, Minnesota River plains, Carver
prairie turnip, *Psoralea esculenta*, Minnesota River prairie, Say
red swamp-fire, *Salicornia rubra*, Minnesota River, Say
stinging nettle, *Urtica dioica*, Minnesota River plains, Carver
strawberry weed, *Potentilla norvegica*, Minnesota River prairie, Say
sugar maple, *Acer saccharum*, Minnesota River plains, Carver
tamarack, *Larix laricina*, Minnesota River, Say
wheat, *Triticum aestivum*, Minnesota River prairie, Say
wild mint, *Mentha arvensis*, Minnesota River plains, Carver
wild rice, *Zizania aquatica*, Minnesota River plains, Carver
willowherb, *Epilobium* sp., Minnesota River, Say

black oat grass, *Stipa avenacia*, observed in traditional Dakota territory, Nicollet

butternut, *Juglans cinerea*, observed in traditional Dakota territory, Nicollet
four o' clock, *Mirabilis albida*, observed in traditional Dakota territory, Nicollet
prairie sagewort, *Artemisia frigida*, observed in traditional Dakota territory,
Nicollet
prairie turnip, *Psoralea esculenta*, observed in traditional Dakota territory,
Nicollet
purple coneflower, *Echinacea purpurea*, observed in traditional Dakota territory,
Nicollet
purple-stem angelica, *Angelica atropurpurea*, observed in Dakota territory,
Nicollet
sweet grass, *Hierochloa odorata*, observed in traditional Dakota territory, Nicollet

Appendix II

Traditional Dakota Uses of Plants of the Upper Mississippi River Valley

Numerous sources document the ways in which the Dakota utilized plant species in the area that is now the Twin Cities. This list is by no means exhaustive, but instead represents a few ethnobotanical findings during my research that show the intimate ways in which Native Americans related to and shaped their ecosystem. The plants are organized by common name, Dakota name (if available), and traditional use.

black oat grass, witchapetaha, a sharp, prickly grass that annoyed buffalo herds and moved them from the prairie to the forest.

box-elder, the inner bark, boiled with nettle, used as a remedy for syphilis.

butternut, tathuka, used to make a black dye.

corn, wannaheza usually roasted, although sometimes put it into soup with venison.

four o' clocks, tarhankstcha tapejuta, a ceremonial bulb said to help find bears.

Indian sweet grass, wachanra, an aromatic grass used to celebrate a victorious warrior, possibly distilled into an intoxicating liquor.

pond lily, ta-wah-pah, boiled with fowl or roasted and preserved.

prairie sagewort, burned in Dakota ceremonies, medicinal tea that settles stomachs.

prairie turnip, tip-sui-ah, a staple, eaten boiled or mashed, or ground to make bread.

purple coneflower, a root that killed snakes.

purple-stem angelica, a root used against stomach pain.

sugar maple, caahasaa, prized source of syrup as a sweetener.

swamp potato, two varieties: psui-chin-chah and psui-chah, eaten with salt or meat.

wild artichoke, pang-he, only eaten in times of want because it caused flatulence.

wild bean, omen-e-chah, a favorite, usually boiled them in water or cooked with fat.

wild rice, psia, a staple, used in feasts, also dried and stored.

wild sweet potato, mendo, usually boiled in water or cooked with fat.

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