

---

# Chapter 1

## Introduction

The Open Space Preservation Plan is a strategic plan implementing the vision and guiding principles of the Community System Policies in the 2007 City of Red Wing Comprehensive Plan. A significant organizing element of the Comprehensive Plan is a planning approach that identifies and connects the most important natural and cultural resources of the City. The City of Red Wing intends to take a proactive role in the “green infrastructure” systems to preserve for future generations. The goals of this plan include identifying areas with those resources and then establishing priorities for open space preservation purposes. These goals are achieved by utilizing the concept of green infrastructure. In addition, numerous tools and funding options list the ways to acquire and preserve these valuable environments. Finally, an action plan lists the strategies for policies to obtain, manage, and educate the public about the significant resources for the next 15-25 years. The plan allows for amendments in future updates as different needs are realized in the community.

### Green Infrastructure: What is it and why is it important?

Infrastructure usually leads people to think of roads, sewer systems and utility lines. This “grey infrastructure”, when used as a connected system, benefits the community by providing efficient services at a low cost. Green infrastructure seeks to achieve the same connectivity. One definition for green infrastructure is “an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife”.<sup>1</sup> In other words, green infrastructure seeks to link all resources, whether of cultural or natural significance.

---

<sup>1</sup> Benedict, Mark A. and Edward T. McMahon, Green Infrastructure: Linking Landscapes and Communities (Washington: Island Press, 2006) 1.

In their book, Green Infrastructure: Linking Landscapes and Communities, Mark Benedict and Edward McMahon list ten principles of green infrastructure:

1. Connectivity
2. Context matters
3. Green infrastructure should be grounded in sound science and land-use planning theory and practice.
4. Green infrastructure can and should function as the framework for conservation and development.
5. Green infrastructure should be planned for and protected *before* development.
6. Green infrastructure is a critical public investment that should be funded up front.
7. Green infrastructure affords benefits to nature and people.
8. Green infrastructure respects the needs and desires of landowners and other stakeholders.
9. Green infrastructure requires making connections to activities within and beyond the community.
10. Green infrastructure requires long-term commitment.

### *Green Network of Corridors and Patches*

Trends in housing development since World War II have brought about the need for sound green infrastructure planning. One consequence of the increase in developments spreading further from the central city into rural land, commonly referred to as sprawl, is the fragmentation of natural habitats. Fragmentation exacts many costs to the environment and creates a barrier for plants, wildlife and human movement. Many species of animals, especially amphibians and reptiles, depend on the ability of moving between different habitats. Bicyclists or pedestrians lose their sense of nature or face danger when crossing a highway to continue on a trail. Fragmentation has led to over 95% of species listed under the Federal Endangered Species Act because some species are unable to survive when the destruction of a significant amount of their habitat occurs.<sup>2</sup> Fragmentation increases threats from invasive and predator species. For example, human pets can kill many native animals. Dogs and cats often kill plants or animals that may be endangered. In addition, humans introduce plants that take over the natural vegetation.

---

<sup>2</sup> Statistics from EPA, in Funders' Network for Smart Growth and Livable Communities, "Translation Paper #10: Biodiversity and Smart Growth" as seen in Benedict, Mark A. and Edward T. McMahon, Green Infrastructure: Linking Landscapes and Communities (Washington: Island Press, 2006) 9.

In order to avoid fragmentation, green infrastructure creates a network with large patches connected to each other with corridors. The patches consist of ecosystems or landscapes defined as natural or cultural resources in this plan. Natural resources examples include rivers, streams, steep slopes, and rare and endangered species habitat. Cultural resources examples include archaeology sites, parks, trails, and golf courses. Patches come in all shapes and sizes, but the larger ones are preferable because of their ability to sustain plants, animals, and people as a starting point and final destination. The patches in this plan include areas over forty acres. The interior of patches should be left untouched while the exteriors uses include connections with other patches through green corridors or greenways. Greenways tie the system together by allowing wildlife to travel to and from patches without hazard from human development. Rivers and streams often serve as natural greenways for flora and fauna. Humans can enjoy greenways for recreational opportunities such as hiking.

### *Economic Benefits of Green Infrastructure*

Green infrastructure has many other benefits besides eliminating the problems occurring from fragmentation. A green infrastructure plan helps communities prioritize areas for conservation and areas for development. One key benefit from prioritization is the increase in property values. A May 2007 release of a study of 1,536 single-family properties in Washington County, Minnesota, showed parcels located within 200 feet of open space are worth an average of \$16,570 more than those that are not.<sup>3</sup> In addition, people and businesses want to locate to areas where there is open space. In a 2005 Twin Cities Metro Area Public Opinion Survey, 71 percent said they would pay at least 10 percent more for a home within walking distance of an open space.<sup>4</sup> Businesses are attracted to these cities because they know people want to live there and, in turn, these businesses bring more tax revenue to the city. Developers benefit from a green infrastructure plan as well. This plan lets a developer know where development should and should not occur. Knowing these areas saves

---

<sup>3</sup> Embrace Open Space, “The Economic Impact of Proximity to Open Space on Single-Family Home Values in Washington County, Minnesota” (St. Paul: Embrace Open Space, May 2007) 1-2.

<sup>4</sup> Embrace Open Space, “2005 Twin Cities Metro Area Public Opinion Survey” 2005, 26 May 2007 <http://www.embraceopenspace.org>.

time and money in the face of possible public resistance. Further financial benefits are displayed in Chapter 4 in **Table 4.1**.

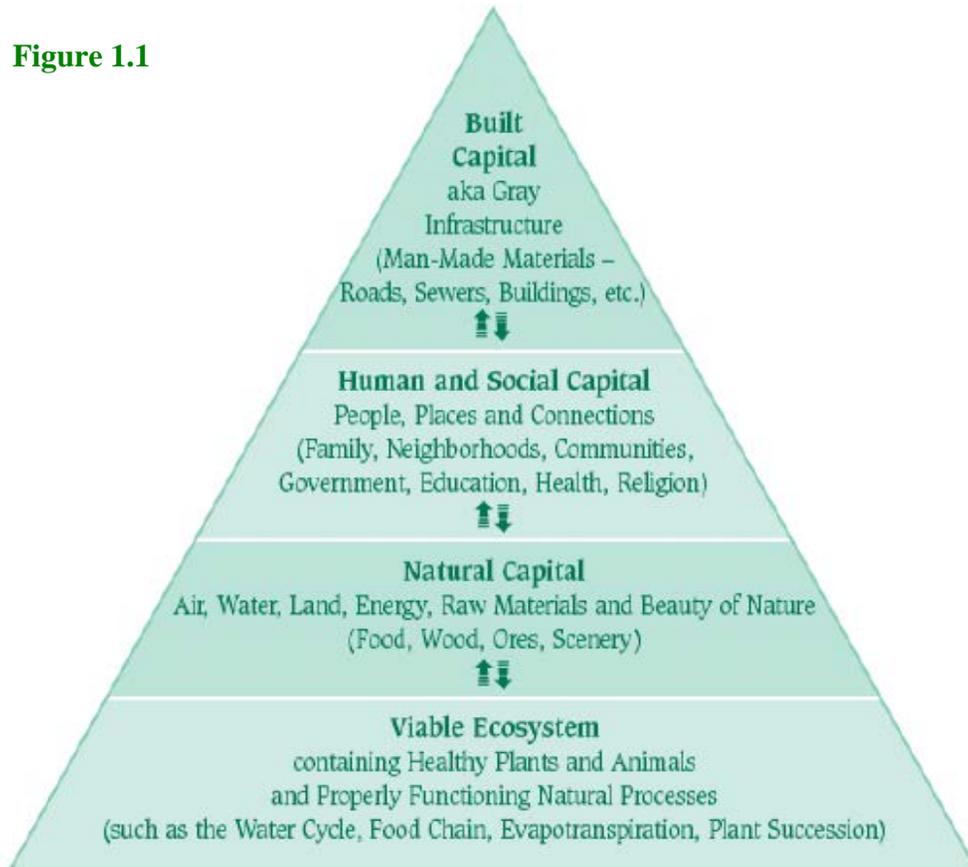
Total Maximum Daily Loads (TMDL) is a new approach in green infrastructure used to solve the problem of water pollution. TMDL's water quality standards define how much of a pollutant can be in a surface and/or ground water while still allowing it to meet its designated uses, such as for drinking water, fishing, swimming, irrigation or industrial purposes. The pollution originates from a combination of point and non-point sources. Point sources include pollutants where the location of the source can be identified, such as a coal plant. Non-point sources include pollutants where the location of the source cannot be identified, such as surface water runoff. A TMDL study identifies the sources of each pollutant. The study sets a standard for how each pollutant source must reduce its input. TMDL studies have been conducted in Red Wing's four main bodies of water: Mississippi River, Cannon River, Vermillion River and Lake Pepin. These bodies of water suffer problems with turbidity, mercury, PCB, nitrogen, and phosphorus.

A major benefit of green infrastructure is that a connected system can address water pollution problems. Wetlands are able to absorb and clean

runoff before the water discharges into the river. Thus, a city spends less money on cleaning both air and water pollution through drainage and filtration systems. Trees and other plants, through photosynthesis, clean the air by synthesizing the harmful greenhouse gas carbon dioxide. Providing more opportunities for alternative forms of transportation also cuts down on carbon dioxide from automobiles. The shade created by trees provides protection for pedestrians and helps reduce the effects of heat island. Heat islands occur in urban areas with large amount of roads, parking lots, buildings, and heat absorbent surfaces. Cities often measure 5-10 degrees warmer than the nearby countryside because of these heat absorbent surfaces.

Another major benefit in a well-established green infrastructure system is improved city aesthetics. Green systems provide buffers from development. Tourism rises as the aesthetics and the recreational opportunities become well known regionally. Residents take pride in their city and in an improved quality of life. **Figure 1.1** shows how green infrastructure forms the foundation for a community's quality of life.

Figure 1.1



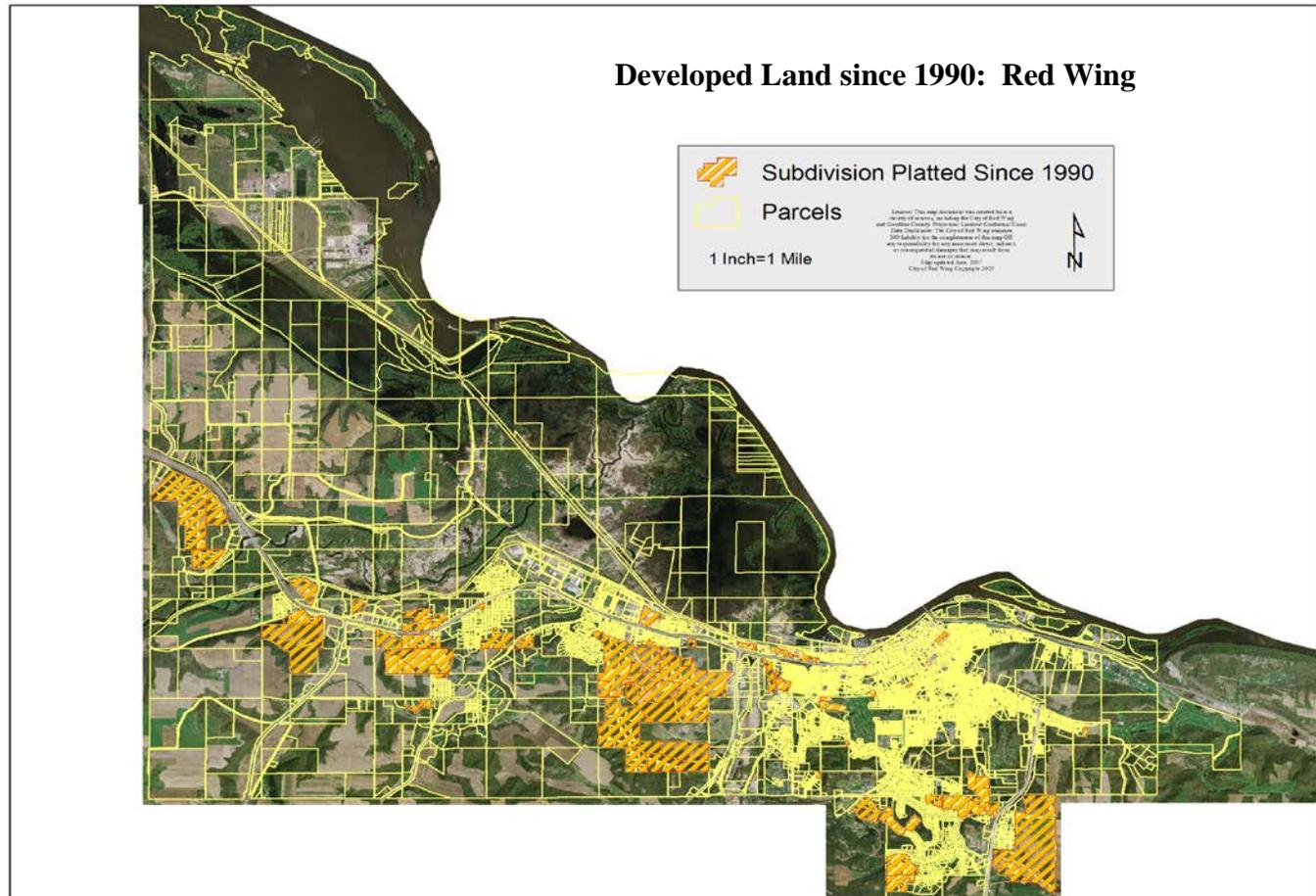
The figure displays the necessity of having green infrastructure at the base of the pyramid in order to provide for the natural resources human consume, the communities people develop around these resources and to obtain the resources to build our communities. Source: Williamson, Karen S., Growing with Green Infrastructure (Heritage Conservancy, 2003) 6.

### Growth Pressures in Red Wing

Cities across the Midwest have seen a much higher rate of land consumed for development than the corresponding population increase. In the Midwest, the change in population from the years 1982-1997 was 7.06%, while the change in developed land was 32.23%.<sup>5</sup> The City of Red Wing has not faced a decline in population growth, but has grown at a slow rate of 0.44% from the years 1990-2005. However, the City has increased in developed land at a faster rate than population. Developed land is defined as land once used for agriculture or open space, which has been cleared and used as a built environment. Before 1990, the City's developed land totaled approximately 4,700 acres. Since then, the City's developed land has increased to roughly 6,000 acres, an increase of 22%. At the same time, the City's population has grown only 7.5%. **Figure 1.2** visually shows the change the City has seen in developed land. (The amount of developed land in Red Wing is a rough estimate using Geographic Information Systems).

<sup>5</sup> Fulton, William, et. al Who Sprawls Most? How Growth Patterns Differ Across the U.S. as seen in Benedict, Mark A. and Edward T. McMahon, Green Infrastructure: Linking Landscapes and Communities (Washington: Island Press, 2006) 7.

Figure 1.2



Note: Not all of the land shown in Subdivisions Platted since 1990 was calculated into the developed land statistics, because some of the land platted is in permanent conservation easements.

One characteristic of this trend is that households have grown at a higher rate than the population. Between the years 1990-2000, the population increased at annual rate of 0.7%, while the number of households increased at 0.9% per year during the same period. This in itself is not a huge difference. However, between the years 2000-2005, the City's population growth remained flat while the number of households grew by 1.8 % per year. The trend is expected to continue (as projected in the Comprehensive Plan) by an increase of population of 0.2% per year, while households are to increase 1.8% per year between the years 2005-2010.

Household sizes are decreasing at a fast rate because Red Wing's aging population has fewer families with children. Between the years 1990-2000, household size remained relatively stable. However, between the years 2000-2005, household size decreased at annual growth rate of 2.12%. Household sizes are projected to decrease at an annual growth rate of 1.59% from 2005-2010. As a result, more new houses with less people create pressure for sprawl and the associated consequences.

**Table 1.1** displays the city's population, households and household size between the years 1990-2010.

**Table 1.1**

	1990	2000	1990-2000 CAGR*	2005	2000-2005 CAGR*	2010	2005-2010 CAGR*
Population	15,097	16,116	0.7	16,131	0	16,282	0.2
Households	5,973	6,562	0.9	7,285	1.8	7,983	1.8
Household size	2.53	2.46	-0.28	2.21	-2.12	2.04	-1.59

\*Compound Annual Growth Rate

Source: U.S. Census Bureau

An increase in developed land and households, coupled with a decrease in household size, has been a growing trend in our nation since World War II and even more so in the last 25 years. Sprawl and large lot developments have resulted in spreading our cities out and destroying much of our valuable open space land. Society has become more automobile-dependent, and development has shifted to accommodate to that change. The market has not offered many choices in housing, business, or industry that locates towards the center of the city. Even schools and hospitals have been encouraged to locate on the edges of cities. Examples in Red Wing include the housing developments in southwest portion of the city, the big box stores along Tyler Road, Red Wing High School, and Burnside Elementary School.

Red Wing should be aware of these trends and projections. Continued suburban style development will place additional pressure on existing open space as the Twin Cities grows toward Red Wing. Twin Cities' residents will create land demand and push further away from the Cities as they realize the proximity and beauty Red Wing has to offer. Thus, the land here will become more expensive. It is important for the City of Red Wing to pursue funding measures in order to preserve open space land before it becomes unaffordable. Funding options are presented in Chapter 4, and an action plan provides open space preservation tools in Chapter 5.

### Public Process

In early 2005, the Mayor's Comprehensive Plan Steering Committee was established to develop a new Comprehensive Plan. After a 13-month public process, the City of Red Wing adopted the Comprehensive Plan on April 9, 2007. The vision statement for the Comprehensive Plan was "for the City of Red Wing to capture the vibrancy of growth while preserving and enhancing the city's unique historic and environmental character".

In order to achieve this vision, Red Wing residents recognized the need for open space preservation, with an emphasis on the integration and building of a green infrastructure system. Green infrastructure was identified as one of the three core principles throughout the Plan. As a result, Initiative 7, in the Community Initiative section of the Plan, calls for the development of a strategy for open space preservation.

Moreover, residents addressed green infrastructure in six of the fifteen Guiding Principles listed in the Comprehensive Plan: preserve the community character, have a healthy and active community, promote quality land development, preserve sensitive environmental amenities, think regionally, and have a sustainable community. Green infrastructure is a necessary component in accomplishing these principles.

The process of developing an Open Space Preservation Plan began in May of 2007. After weeks of gathering data and maps for the Plan, an Open House was held on July 12<sup>th</sup>, 2007 in the Foot Room at the Red Wing Public Library. The Open House presented an opportunity for concerned citizens to identify on maps some key natural and cultural resource parcels throughout the City that they would like to see

preserved. Residents had the opportunity to identify types of resources they would like to see protected.



Photos taken at the Open House

At the meeting, approximately fifty residents and stakeholders came to voice their opinions and identify these areas. Residents gave valuable feedback on a number of items including:

- Bluffs, archaeological sites, urbanized forests, gateways into the city, and valuable farmland were the most important resources in the city in need of protection.

- Part of the plan needs to address the management/stewardship of the lands.
- Part of the plan should include an education aspect concerning green infrastructure and the value of nature.

The City held a second Open House on August 8 at the Red Wing Public Library to explain the Open Space priority system and hand out draft copies of the plan to participants. The Red Wing Planning Commission reviewed the document on September 18, 2007 and the City Council reviewed the Executive Summary at a meeting held on October 8, 2007. The Planning Commission held a public hearing on November 20, 2007, to take public comment and to make a recommendation on adoption as an amendment to the Comprehensive Plan. Final revisions were completed at the Commission’s March 18, 2008 meeting.

*Red Wing’s History with Open Space*

Red Wing has enjoyed a long history of civic involvement in protecting both natural and cultural resources in southeastern Minnesota. The “City Beautiful Movement” influenced the City of Red Wing immensely in the early twentieth century. This movement was appropriately named because it attempted to reshape cities into extravagant, welcoming urban

areas through architecture, park systems, and planning for people to enjoy instead of the turmoil and filth that characterized cities at the end of the 1800's. A group of citizens from Red Wing attended the Chicago Columbian Exposition in 1893, where the movement formulated itself. The Exposition left an impression on those citizens, who went onward to organize the Red Wing Civic League in 1903.

The League was instrumental in the formation of some of the city's first parks. Levee Park was the first major project undertaken. The park formed from an agreement between the City and the Milwaukee Road Railroad Company, and was completed between 1905 and 1906. In 1907, John Rich, a founding member of the Red Wing Civic League, personally financed the next park. John Rich Park is currently located itself between the post office and City library, and the Park serves as a gateway into the historic mall and downtown.

Thanks to another local citizen, Gust Freeman, Colvill Park exists today. In the late 1890's, Freeman acquired the former Colonel William Colvill's homestead with the vision of making the land into a city park dedicated to the colonel. A group of citizens organized the Colvill Park Association and succeeded in having the property purchased and held in trust by the City in 1908. The deed to the property states that the

property be held in trust for the City of Red Wing and that it should forever be maintained as a public park, bathing place and playground for children. Today, this foresight and thoughtfulness is a realization.

The last known park of this era is Red Wing's best-known landmark, Barn Bluff. Barn Bluff was partially donated to the City in 1910, with the balance of the acreage purchased in 1911 to protect it from further quarrying. Initially, a path known as "Webster's Way" led hikers up the bluff, but in 1929, thanks to the local Kiwanis Club, a completed stairway extended to the top. Today, people from all over the region visit the bluff for a rare opportunity at rock climbing in the Midwest, as well as enjoying a great view.



Barn Bluff

Memorial Park was created in the 1920's and then later added onto during the 1970's. The period from the 1980's to the end of the

twentieth century marked an era of tremendous progress. The creation of Bay Point Park, LaGrange Park, Pottery Pond Park, the Mississippi National Golf Links, the Cannon Valley Trail, and Billings-Tomfohr Preservation Project all occurred during this time.

Billings-Tomfohr Preservation Project is of particular significance because of the amount of effort and cooperation among citizens, non-profit organizations,

and public officials. A 72-acre privately owned property on the 180-acre bluff came up for sale.

Residents and the City grew concerned that the parcel might



be used for future development. Consequently, a grassroots citizen initiative raised the following resources: \$15,000 (including \$11.05 from a childrens' lemonade stand); \$27,000 from the Red Wing Wildlife League; a \$47,750 grant received from the Natural and Scenic Area Grant; and \$24,000 from the Red Wing City Council granted from the City's general fund. The purchase left the land in a conservation

easement for perpetuity with the help of the Minnesota Land Trust.<sup>6</sup> Recently, additional land donations have added property to the conservation area.

The Comprehensive Plan sets the stage to continue the City's tradition of open space protection. Over the last few months, the City has developed a few plans to establish the green infrastructure system. The Red Wing Riverfront Redevelopment Plan placed an intense focus on protecting the Mississippi River and surrounding ecology, while promoting views of the River and providing a connected path system along the River. In May of 2007, the City Council approved the Upper Harbor Master Plan, which became the next component of the Riverfront Redevelopment Plan. The Plan further details exactly where appropriate locations for trail extensions currently exist and where improvements should occur in the Bay Point Park area.

This plan was the step needed in creating a green infrastructure system throughout the whole city. The City of Red Wing is leading the way in the country as one of the few communities to take the crucial first move of establishing an open space system with the concept of green infrastructure.

<sup>6</sup> Allmann, Laurie, Natural Areas: Protecting a Vital Community Asset. A Sourcebook for Minnesota Local Government and Citizens (DNR, 1997) 72.

### *City, County, and Regional Models for Open Space Preservation*

When preparing this document, a specific task included researching progressive communities around the country in order to understand their open space planning and, more specifically, green infrastructure planning. Information collected influenced both the process and structure of this plan. The following summarizes the key points learned from these communities.

The research attempted to locate plans that focused on green infrastructure at a local or city level. This attempt was somewhat unsuccessful because of the lack of available information for this level of planning. However, there were at least two cities and other places found at a broader level that are leading the effort in green infrastructure planning. Locations from which this plan pulled the most valuable information included the cities of Fort Collins and Boulder, Colorado; the counties of Boulder County, Colorado, King County, Washington, and Saratoga County, New York; and regions of the Twin Cities, Minnesota, the Sonoran Desert, Arizona, and Kansas City Metropolitan Area.

A key finding was the importance of coordinating the government's plan across political boundaries and levels. Plans should be coordinated at the state, region, county, local, and even site level. Many cities around the country have yet to adopt green infrastructure plans because their state, region, or county have not adopted these plans. Recently, more states around the country are adopting such plans, including Maryland and Florida. In addition to coordinating planning at all levels, plans should involve various stakeholders interested in preserving a green network.

Researched inventories divided their resources into different categories and gathered information into those categories. Once this was complete, each plan developed their own unique ranking system where the stakeholders prioritized the most valuable resources in the category. Two of the most important characteristics in ranking included the area's size and connectivity to other resources. When completed, the categories were compiled together to prioritize the most important overall resources further. Geographic Information Systems (GIS) was influential in the assemblage of data process and helped visualize the main resource areas through maps, which made the process of prioritizing areas for connections easier.

After the completion of the prioritization process, the plans formed strategies for acquiring, managing, and funding the highest-ranking green infrastructure parcels while leaving the door open on other parcels. All plans listed the idea of publicly promoting green infrastructure as well as providing incentives for residents and developers to leave open space in perpetuity on their own.

Accomplishments in open space preservation have occurred since the implementation of these plans. Boulder County and the City of Boulder manage a joint effort in open space preservation. As of 1998, Boulder County has preserved 52,000 acres for open space, roughly 84 square miles or two Cities of Red Wing. In addition, they have constructed over 70 miles in trails.<sup>7</sup> The City of Boulder has preserved 28,000 acres of that land. Boulder's success is due in large part to a 0.73 percent sales tax. Since the inception of the sales tax in 1967, the City has spent nearly \$100 million on acquiring land for open space.<sup>8</sup>

Fort Collins also was able to acquire lands for open space thanks to tax initiatives. Between the years 1993 to 2004, tax revenues totaled \$61.77

<sup>7</sup> Colorado, Boulder County Land Use Department, Boulder County Comprehensive Plan: Open Space: Goals, Policies, and Maps Element, 28 May 2007 <http://www.co.boulder.co.us/lu/bccp/openspace.htm>.

<sup>8</sup> Benedict, Mark A. and Edward T. McMahon, Green Infrastructure: Linking Landscapes and Communities (Washington: Island Press, 2006) 156.

million. These revenues created the majority of the open space funding, but the City received grants, donations and partnership money as well. With the money, the 47 square mile City has preserved 11,470 acres or roughly 18 square miles of open space.<sup>9</sup>

The Metro Greenways Program in the Twin Cities Metropolitan is relatively new, forming in the late 1990's, but has already enjoyed several successes. Over 2,500 acres of natural habitat have been protected and over 600 acres of open space restored, mostly along the St. Croix River. The local support for the program is tremendous, and the resulting bond referendum for land conservation passed (totaling \$23.5 million).<sup>10</sup>

Pima County, Arizona is experiencing some of the fastest population growth in the nation, especially in Tucson. The County is home to many national parks and forests. The Sonoran Desert Conservation Plan was created to encourage development in some areas while protecting and restoring the desert in others. Before the process began, Pima County did not have a list of any key areas for resources, especially concerning

<sup>9</sup> Colorado, City of Fort Collins, Land Conservation and Stewardship Master Plan: City of Fort Collins, 29 May 2007 <http://www.ci.fort-collins.co.us/naturalareas/pdf/napp-update.pdf>.

<sup>10</sup> Benedict, Mark A. and Edward T. McMahon, Green Infrastructure: Linking Landscapes and Communities (Washington: Island Press, 2006) 78-82.

biology. Now, after many years the County has created an extensive inventory, including detailed maps. These maps help identify areas where development should not occur, while stipulating that if it does as much as 80-90 % of open space might be required to support that development. The Plan received the national Outstanding Planning Award by the American Planning Association in 2002.<sup>11</sup>

Looking at innovative and progressive plans from around the country has provided a foundation for an effective preservation model. These plans show many accomplishments in open space preservation. Red Wing staff utilized these plans for an outline, but this plan has its own unique features needed to preserve the green infrastructure for future generations.

---

<sup>11</sup> Benedict, Mark A. and Edward T. McMahon, Green Infrastructure: Linking Landscapes and Communities (Washington: Island Press, 2006) 100-108.