Opportunities and Recommendations for Native Planting in Northfield

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Executive Summary

Native planting, or planting species that grow naturally in Minnesota, is in the best interest of the government and community of Northfield. Native planting has important ecological benefits including soil, water, and habitat conservation. Importantly, it also is cost-effective, and can save money for citizens and the government alike. In addition, with exposure and education, native planting can come to be greatly valued by the community, giving Northfield residents pride and a sense of place.

Increasing native planting is a current objective of the Northfield city government that can be achieved through a combination of laws, awareness programs, and projects directed by the local government itself. In order to expand native planting in Northfield, we recommend that the local government actively work to increase citizen awareness of native planting, implement native planting in Northfield's public parks, and provide a demonstrative garden of native plants. To encourage native planting in residential areas and boulevards, the city should better advertise its rebate program. We also recommend that the city expand buffers of native plants along public waterways, and work towards consistently planting native species along major roadways.

Introduction

Native planting is a globally recognized, sustainable approach to land use. In communities around the country, native planting is becoming more widely accepted and utilized as a method of ecological conservation. Northfield has already established its commitment to environmental conservation, sustainable development, and promotion of "green" actions, especially in its role as a Minnesota GreenStep City. Advocating for and creating new policies surrounding native planting is an impactful way to further this commitment. Northfield recognizes the extensive benefits of native planting, and includes native planting as part of its commitment to improve sustainability. Although there is current policy that promotes native landscaping, the city has much room for growth. There are a several policies and programs that

Northfield can implement in the future, such as continuing the rebate program, enforcing mandated waterway buffers, and introducing a requirement for native gardens in city parks.

In Section I, this paper will discuss the problems with current widespread landscaping practices and further detail the environmental, social, and economic opportunities associated with implementing native landscaping. Section II will focus on the actions Northfield has already taken to encourage native landscaping. Section III will cover specific recommendations for further action, including examples from programs run by other municipalities and evaluations of policy alternatives, where appropriate. Our recommendations include encouraging native landscaping on roadsides (particularly along highways), expanding and planting buffer zones along waterways, creating clear guidance and incentives for native residential landscaping, increasing native planting in local parks, and raising awareness about various aspects surrounding the issue of native plants, especially in public schools and advertising about the rebate program.

I. Advantages of Native Landscaping - Exploring Current Problems and Future Benefits

Native landscaping has a wide range of environmental, economic, and social benefits. As detailed in this section, native planting is environmentally beneficial for our soils, water quality, pollinator habitats, water consumption, biodiversity, and integrity of the land. Economically, it is much cheaper, due to the reduced need for irrigation, fertilizer, and pesticides. Socially, it connects people to the land in a way that exotic plants do not; fundamentally, native planting reminds us of the natural community we are a part of. As Aldo Leopold reminds us in *A Sand*

County Almanac, ethical land use requires a shift away from the conception of humans as conquerors of the land.[1] Native landscaping is a step in this direction.

A. Environmental Problems and Opportunities

Non-native planting has a multitude of adverse environmental effects. Intentional non-native planting can threaten native ecosystems, and can be found in a variety of forms, from grass lawns and ornamental flowers to invasive species. Conversely, native planting has a variety of positive environmental impacts, such as water decontamination, increased biodiversity, erosion control, better water infiltration, and improved air quality.

I.A.1. *Water Quality*

Perhaps the greatest benefit of native planting is the services it provides in terms of water conservation. The adverse effects of non-native planting on water filtration further reveal this: their shallow root systems increase the rate water is absorbed into the ground, which hinders the filtration ability. As a result, the groundwater often carries more toxic components. Secondly, the shallow root systems increase the amount of stormwater runoff into surface water, facilitating rapid water movement through contaminated human infrastructure, such as streets and sewers. Essentially, planting more non-native species increases pace and the amount of water flowing through water systems, and places waterways at higher risk of pollution.

On the other hand, native plants have deep and complex root systems which both facilitate gradual absorption of stormwater and filter the water as it travels.[2] Sturdy native plants slow down storm water runoff and "[allow] more rain to soak into the ground… because native

[1] Leopold, Aldo, and Charles W. Schwartz. *A Sand County Almanac, and Sketches Here and There*. London: Oxford University Press, 1968.
[2] "Why Plant for Clean Water?" *Blue Thumb*, www.blue-thumb.org/why/

plants make the soil surface spongier by increasing organic matter in the upper layer."[3] In addition, the "natural decay of deep roots leaves channels through which water can percolate deep into the soil."[4] This improved water filtration is useful for flooding and stormwater management because it protects groundwater from contamination. In essence, native plants enhance the filtration of contaminated water.

I.A.3 *Water Use*

Non-native landscaping greatly increases water consumption. American households in total use about 29 billion gallons of water a day,[5] of which thirty percent (8.5 billion gallons) is used outdoors. The Environmental Protection Agency estimates that an average household uses 58,000 gallons of water outdoors annually.[6] Though Minnesota is known for its abundant freshwater, Northfield and its neighboring Twin Cities rely on pumped groundwater at a level identified as unsustainable.[7] Non-native plants need more water than native species, as native plants "require little water beyond normal rainfall"[8] and "eliminate the need to use water for irrigation."[9] By instead favoring ornamental, non-native landscaping, Northfield gardens contribute to the unsustainable strain placed on the Jordan Aquifer, the groundwater source for the city's water supply.[10]

I.A.2 *Biodiversity*

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[3] Smith, Daryl, Dave Williams, Greg Houseal, and Kirk Henderson. *The Tallgrass Prairie Center Guide to Prairie Restoration in the Upper Midwest.* (Iowa City: University of Iowa Press, 2010), 171.
[4] Smith, *The Tallgrass Prairie Center Guide,* 171.
[5] *Water-Smart Landscapes: Start with WaterSense*, Environmental Protection Agency, 2013, www.epa.gov/sites/production/files/2017-01/documents/ws-outdoor-water-efficient-landscaping.pdf.
[6] *Ibid.*
[7] Freshwater Society; http://www.house.leg.state.mn.us/comm/docs/freshwater-report4-8-13.pdf
[8] *Ibid.*
[9] Northeastern Illinois Planning Commission, *Source Book on Natural Landscaping,* 6.
[10] City of Northfield Water Division; https://www.ci.northfield.mn.us/365/Water-Division

Non-native planting also affects biodiversity and natural ecosystem balances. Species diversity is an incredibly important part of ecosystem health, as each species has a role to serve and diversity is essential for ecosystem resilience. Monoculture landscaping, which is most commonly seen with grass lawns, allows for little to no species diversity and is much more susceptible to disturbances and changing climates. Also, using non-native plants may put native plant populations at risk or displace them if the non-native plants are invasive. For example, the state has a list of recognized noxious weeds (invasives) which it warns endanger Minnesota's natural areas.[11] In addition, "popular bedding plants such as petunias and geraniums often provide little value for wildlife."[12] By contrast, native planting increases biodiversity; by aiding in the preservation of threatened plant species and supporting wildlife "including beneficial insects, pollinators, and native birds."[13]

I.A.3 ***Fertilizer, Pesticides, and Soil Quality***

Non-native planting is far less durable than native planting because non-native species lack the area-specific adaptation that native species have. As a result, non-native, ornamental, and agricultural planting requires increased use of fertilizers and pesticides. As Brian Kermath of the Global Environmental Management Education Center says:

> "Urban landscaping is characteristically industrial. It relies heavily on unsustainable inputs of synthetic fertilizers, toxic pesticides, fossil fuels, exotic plants…. We use more synthetic fertilizers on our yards than India uses in agriculture…. We spent three quarters of a billion dollars annually on chemical pesticides for yards and we use ten times or more of these pesticides per urban acre than per agricultural acre…"[14]

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[11]Minnesota DNR; Terrestrial Invasives; https://www.dnr.state.mn.us/invasives/terrestrial/prevent_the_spread.html
[12] Krischik, "Native Plants for Sustainable Landscapes"
[13] Ibid.
[14]Kermath, Brian. "Why Go Native? Landscaping for Biodiversity and Sustainability Education." *International Journal of Sustainability in Higher Education*, vol. 8, no. 2, 2007, pp. 210-223. *ProQuest*, http://ezproxy.carleton.edu/login?url=https://search.proquest.com/docview/205040222?accountid=9892

This distinctly unecological approach to land use is widespread in American gardens and spaces. The increased use of pesticides and fertilizers contaminates groundwater and surface water, where they cause excessive plant growth and "toxicity to… aquatic organisms."[15] In a 1990s U.S. Geological Survey, pesticides were found in all rivers with mixed agriculture and urban use, and in 99 percent of non-agricultural streams and waterways.[16] Pesticides and fertilizers also degrade soil fertility by decreasing the population of beneficial microorganisms in the soil. [17] On the other hand, native plants are adapted to the local environment, and can "thrive without fertilizers, or heavy use of pesticides or herbicides."[18] With the right expertise, people should be able to grow native plants even in very poor soil. Native plants also "absorb chemicals such as nitrogen and phosphorous that would otherwise enter the runoff."[19] Native plants ultimately "reduce the amount of chemicals put into the environment which have non-targeted effects on the ecosystem."[20] Native plants also reduce soil erosion, and can effectively stabilize steep slopes as well as soil along stream or river bank and areas vulnerable to stormwater runoff.

I.A.4 *Air Quality*

Beyond the use of pesticides and fertilizers, non-native planting results in the increased use of landscaping machinery, which increases energy consumption and air pollution. Lawn mowers and weed trimmers are powered by the same fossil fuels that are so often cited with transportation-related pollution. In a single year, Americans use around 600 million gallons of

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[15] Northeastern Illinois Planning Commission, *Source Book on Natural Landscaping,* 11.
[16] Aktar, Wasim, et al. "Impact of Pesticides Use in Agriculture: Their Benefits and Hazards." *Interdisciplinary Toxicology*, vol. 2, no. 1, 2009, pp. 1–12., doi:10.2478/v10102-009-0001-7.
[17] Ibid.
[18] Northeastern Illinois Planning Commission, 11.
[19] Krischik, Vera, Catherine C. Reed, and Serena E. Willey. "Native Plants for Sustainable Landscapes: Establishment and Management of Lakeshores and Gardens," Center for Urban Ecology and Sustainability, University of Minnesota, 2000, https://www.extension.umn.edu/garden/yard-garden/landscaping/native-plants-for-sustainable-landscapes/.
[20] Krischik, "Native Plants for Sustainable Landscapes"

gasoline for lawn mowers.[21] Specifically, "the US EPA estimates that a gasoline-powered lawn mower emits 11 times the air pollution of a new car for each hour of operation."[22] The "high levels of carbon monoxide, hydrocarbons and nitrogen oxides" that lawn-maintenance equipment emits contribute to the formation of smog.[23] However, management of native planting sites less relies on lawn-maintenance equipment. Equally important, prairie grasslands in Minnesota are "superior soil carbon sinks"[24] that remove more carbon dioxide from the air than turf-grass lawns, therefore improving air quality.

I.B Economic Problems and Benefits

When compared to native landscaping, non-native landscaping is expensive. Ornamental or exotic species are often more expensive than native species and the planter must repurchase frequently, especially with annuals. Maintaining non-native landscapes has a high demand for irrigation, which leads to higher utility bills.[25] Also, there are increased taxes based on increased water maintenance, for the upkeep of reservoirs and treatment plants.[26]

Native planting is not only more sustainable environmentally, but is also cost-effective. Case studies have found that "the combined costs of installation and maintenance for a natural landscape over a ten-year period may be one fifth of the costs for conventional landscape maintenance."[27] Planting turf grass seeds "may cost in the range of $4,000 to $8,000 per acre"

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[21] Kermath, Brian. "Why Go Native? Landscaping for Biodiversity and Sustainability Education." *International Journal of Sustainability in Higher Education*, vol. 8, no. 2, 2007, pp. 210-223. *ProQuest*, http://ezproxy.carleton.edu/login?url=https://search.proquest.com/docview/205040222?accountid=9892

[22] Northeastern Illinois Planning Commission, *Source Book on Natural Landscaping,* 12.

[23] Ibid.

[24] Ibid.

[25] *Water-Smart Landscapes: Start with WaterSense*, Environmental Protection Agency, 2013, www.epa.gov/sites/production/files/2017-01/documents/ws-outdoor-water-efficient-landscaping.pdf.

[26] Ibid.

[27] Northeastern Illinois Planning Commission, *Source Book on Natural Landscaping,* 9.

compared to "$2,000 to $4,000 per acre for seeding native prairie grasses and forbs."[28] Most importantly, native planting saves money in terms of long term maintenance, which for most native plants is very simple, involving one annual mowing, or burning, in the fall or spring. Native plants may need to be watered in the months after installation and weeded for a few years after, but they will eventually outcompete weeds due to their deep roots. Native plants are perennials, meaning most live for many years, so replanting is not necessary, and prairie plants will survive heat and drought. Thus, once established, native plants require significantly less time and labor "spent on mowing, planting of annual bedding plants, [and] chemical spraying."[29] In addition, "volunteers [and local organizations] are often willing to assist in the installation and maintenance of native landscapes, which further reduces costs."[30]

I.C. Social Problems and Benefits

America's current land use practices contribute to resource loss, pollution, and ecological damage. Planting non-native plants, whether as domestic agriculture, ornamental gardens, or lawns, contributes to this environmental degradation, which in turn degrades people's quality of life. For example, the increased use of pesticides and fertilizers used for non-native planting has serious implications for human health. Pesticides can be ingested after eating contaminated food products and have poisoning effects on human beings. Both pesticides and fertilizers are also water contaminants, and are found increasingly in water that runs through non-native landscaping. Water pollution affects far more than just the people with ornamental or exotic gardens; it affects all those who are living close to contaminated waterways and using contaminated water.

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[28] Ibid.
[29] Krischik, "Native Plants for Sustainable Landscapes"
[30] Northeastern Illinois Planning Commission, *Source Book on Natural Landscaping,* 9.

Native plantings can provide genuine social benefit, especially to a knowledgeable community. They are overall very different from normalized landscapes, "resembling more of a traditional flower bed early in the year and a small piece of wilderness by late in the growing season."[31] However, native plantings are generally well-received and appreciated once communities recognize that they are anything but an unmanaged landscape,[32] sometimes even increasing property values.[33] They provide a "visually dynamic system"[34] of many different textures, colors, and shapes that changes with the seasons, and provide opportunities for people to become familiar with regional plants. Native planting benefits conservation education, creates "a distinctive image… that preserves the unique characteristics of a community,"[35] and restores natural heritage. Larger plantings can provide a space for passive recreation as well.

II. Actions Northfield Has Taken

The City Council of Northfield officially recognizes the city's native species goal "to increase the utilization of and expand the use of native landscape species within the City of Northfield."[36] Northfield has included native planting in its municipal code for "landscape, screening, and buffering standards." The City of Northfield aims to promote the growth and development of native plant communities and natural landscapes by implementing a variety of

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[31] Ibid., 199.
[32] Krischik, "Native Plants for Sustainable Landscapes"
[33] Realtors have long recognized that attractive landscaping, especially with trees, can increase property values by as much as 20 percent" and "the number-one green home improvement recommended by realtors is planting native trees and flowers". Marinelli, Janet. "Backyard Habitat, Making Dollars and Sense in Your Yard: Recent Studies Demonstrate that Eco-Friendly Gardening Practices Not Only Reduce Utility and Maintenance Costs but Also Increase Property Values." *National Wildlife*, 15 July 2011, cpb-us-w2.wpmucdn.com/sites.udel.edu/dist/9/604/files/2012/09/ National-Wildlife-Article.pdf.
[34] Smith, *The Tallgrass Prairie Center Guide,* 193.
[35] Northeastern Illinois Planning Commission, *Source Book on Natural Landscaping,* 10.
[36] "Northfield Land Development Code." A*rticle 3, Section 5.1, Letter K Municode Library*, https://library.municode.com/mn/northfield/codes/code_of_ordinances?nodeId=PTIIINOCO_CH34LADECO_ART3SIDE_3.5LASCBUST

projects, both through the city and private citizens. Ultimately, Northfield identifies native planting as a step towards sustainability, but has room to improve its implementation.

II.A Rebate

Currently the City has the Native Plant Rebate Program (NPRP)[37], where the participants who plant native species in their gardens get a utility bill credit for 33 percent, or up to $75, of the cost. The city supplies the Native Plant List, which consists of various native species that count for the Rebate Program, and it can be picked up in city City Hall, or downloaded from the City's website.[38] This list is accessible for citizens to decide which plants work best for their yard. It contains the list of plants, the zone where the plant grows, the amount of sun it needs, its growth form, ease of growing, the height of the plant, wildlife that depends on this plant, and other interesting species facts. The list does not specify the range of the native location for these plants.

II.B Current Public Planting

The city makes it approachable for private landowners to gather the information necessary to plant native species. They aim to incentivize the growth and development of native landscapes in private areas, but the public land can also provide the city with opportunities for native landscaping. In 2016, the Northfield Garden Club built two gardens, Dragonfly and Butterfly Garden, to promote the biodiversity of pollinators. Although the parks include flower beds, the species mostly only benefit honey bees, since native pollinators benefit more from native plants. Other parks, like Central Park and Lash Brook, have a wide variety of native plants and trees.

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[37] Rain Garden / Rain Barrels/ Native Plant Rebate from the City of Northfield Website https://www.ci.northfield.mn.us/338/Rain-Garden-Rain-BarrelsNative-Plant-Reb

[38]Native Plant List https://www.ci.northfield.mn.us/DocumentCenter/View/5524

Northfield has a total of 33 parks in which they could create communities of native plants, like they did in Lashbrook Park. Northfield also has an ordinance[39] about the types of trees that are allowed on boulevards; and they supply the public with a list of recommended trees, in which most of the trees are native.[40]

III. Actions for Northfield Yielding the Most Significant Impact

The city of Northfield has a responsibility to create public native landscapes and incentivize private native landscaping. Additionally, Northfield has the advantage of local government to be a powerful catalyst for change, because the municipality is intrinsically connected to their policies and the community they serve. The following recommendations address both policy and actions that would advocate for the Northfield community to change wasteful landscaping, including: increased native planting on roadsides; adhering to Minnesota buffer laws and increasing native planting within waterway buffers; increasing native tree species within Northfield parks and adding more native plants to pollinator gardens; educating residents about native planting through demonstrative gardens, public information, and educational programs; and finally, promoting native planting within residential gardens.

III.A. Roadsides

Northfield should establish a goal to have consistent native planting on roadsides. To achieve this goal, Northfield can locate feasible areas for native planting where the shoulder of the road is either grass or unplanted and then implement native landscaping projects in these areas over time. In general, "many roadsides and adjacent lands have been highly disturbed and

[39] Ordinance. Article IV. Section 60-107.- Trees in the public right-of-way https://library.municode.com/mn/northfield/codes/code_of_ordinances?nodeId=PTIINOCO_CH70STSIOTPUPL_ARTIVRI-WMA_S70-107TRPURI-W

[40] Recommended Street Trees https://www.ci.northfield.mn.us/DocumentCenter/View/394

have no native seed in the soil. To allow these areas to grow will only result in stands of non-native invasive species [noxious weeds]"[41] This is a problem because "roadsides are a major means by which invasives are spread,"[42] and invasive species pose a significant threat to biodiversity, which is essential to ecosystem health and stability. In addition, strips of vegetation as little as 10 to 50 feet wide have also been shown to provide highly productive habitat[43] for small mammals, birds, and insects, including native pollinators, which benefit surrounding agriculture.[44] Furthermore, deep-rooted native plants provide good erosion control beside roads, especially where there are steep slopes, and improve road safety by providing effective storm water drainage.[45] Thus, native landscaping along roadways has both ecological and practical advantages. A drawback is that native plantings take a few years to develop, but otherwise native plants grow even in poor, disturbed soil and stay where they are planted. An added benefit is that plantings along roadsides would provide a continual, visible source of "regionally recognizable vegetation [and] a seasonally dynamic landscape"[46] for the citizens of Northfield.

For implementing native plantings on roadsides, focusing on the highways going through Northfield may be the most effective approach. Increasing native planting has been an objective of the Federal Highway Administration in compliance with Executive Order 13112 directing

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[41] Harper-Lore, Bonnie L. "Incorporating Grasses into Clear Zones," Federal Highway Administration. https://www.environment.fhwa.dot.gov/env_topics/ecosystems/roadside_use/vegmgmt_rdsduse.aspx.
[42] "Roadside Vegetation Management," Minnesota Department of Transportation, http://www.dot.state.mn.us/roadsides/vegetation/index.html.
[43] Note that, in the past, people have pushed back against this being a benefit from the standpoint of roadkill mitigation, but this line of thinking "is being replaced by the idea of… [highway] infrastructure that accommodates animal mobility and lessens the impact of habitat fragmentation" as more important. Kroll, Gary. "An Environmental History of Roadkill: Road Ecology and the Making of the Permeable Highway." *Environmental History*, vol. 20, no. 1, 13 Jan. 2015, pp. 4-28. *Oxford Academic*, doi:.org/10.1093/envhis/emu129.
[44] Conniff, Richard, "Green Highways: New Strategies to Manage Roadsides as Habitat," Yale School of Forestry and Environmental Studies, 2013.
[45] "Roadside Vegetation Management"
[46] Harper-Lore, "Incorporating Grasses into Clear Zones"

federal agencies to expand efforts to "prevent the introduction of invasive species; ...control populations of such species in cost-effective and environmentally sound manner; ...[and] provide for restoration of native species and habitat conditions in ecosystems that have been invaded."[47] Current roadside management practices contribute to the spread of invasives because "the qualities that make for an effective groundcover plant often make the plant weedy."[48] Thus, the most common roadside groundcover plants are crownvetch and annual ryegrass, both of which have extreme "weedy tendencies."[49] The Federal Highway Administration now "discourages the use of crownvetch" and emphasizes native landscaping for highways because "native species are less likely to be weedy [and] will be adapted to the region."[50]

An obstacle Northfield will have to overcome is encouraging the development of native ground cover plants "to the point of being economically available"[51] for widespread use. Rice County does have an annual native plant sale that Northfield could support and take advantage of.[52] The Pennsylvania Department of Transportation prescribes a mix of species with about half native plants to replace the current use of crownvetch.[53] Otherwise, highways are a feasible location for increased native landscaping. Highways have mandated clear accident recovery areas beside the road proportional to the speed limit, where native planting can occur.[54] The initial planting may be slightly more difficult due to the moving traffic and possibly steep slopes,

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[47] Executive Office of the President. "Invasive Species." *The Federal Register: The Daily Journal of the United States Government*, 8 Feb. 1999, www.federalregister.gov/documents/1999/02/08/99-3184/invasive-species.
[48] "Selecting Plant Materials for the Next Generation of Roadside Groundcovers." *Vegetation Management: Department of Horticulture, College of Agricultural Sciences*, Pennsylvania State University, plantscience.psu.edu/research/projects/vegetative-management/publications/roadside-vegetative-mangement-factsheets/7roadside-groundcover.
[49] Ibid.
[50] Ibid.
[51] Ibid.
[52] Rice Soil and Water Conservation District. "Prairie." 2018, www.riceswcd.org/sample-page/prairie/.
[53] Ibid.
[54] Harper-Lore, "Incorporating Grasses into Clear Zones"

but highways will "require less maintenance attention if they are planted in native grasses and forbs."[55]

III.B. Waterways

Northfield should identify opportunities to implement native planting along the shorelines of lakes, streams, and rivers. Northfield is a part of the Cannon River Watershed, which is in general a healthy watershed, but main stretches of waterways in Rice County still do not meet Minnesota's water quality standards on several pollutants.[56] Native planting is one of two main approaches to improving water quality (along with investments in wastewater treatment) because native plants effectively prevent runoff pollutants from entering waterways. Therefore, native planting could improve water quality with positive impacts on the environment and recreation for Northfield residents. In addition, "there have been significant past flooding events causing damage in communities along both the Cannon and Straight rivers."[57] Encouraging native planting in the floodplain within Northfield or even upriver could mitigate the impacts of flooding in Northfield in future years.

To gain the most positive impact from native planting beside waterways in Northfield, the city should install and enlarge buffers along waterways. Minnesota mandates that public waters have a buffer of up to 50 feet average width and 30 feet minimum by November 2017.[58] Rice County had only 80-89 percent compliance as of September 2017 whereas 37 of the 87 counties

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[55] Harper-Lore, "Incorporating Grasses into Clear Zones"

[56] Many of the streams, rivers, and lakes in Rice County "are not meeting state standards for aquatic recreation (human use) and aquatic life (wildlife use)" because they do not meet Minnesota's water quality standards on pollutants including *E. coli* bacteria, turbidity, and nitrogen. Recent trends show continued increase in nitrites/nitrates and chloride."The Watershed," Cannon River Watershed Partnership. http://crwp.net/the-watershed/.

[57] Ibid.

[58] "Buffer Law," Minnesota State Government, 2017. https://mn.gov/portal/natural-resources/buffer-law/map/compliance-map.jsp

in Minnesota had 95-100 percent compliance.[59] Enlarging buffers is already a goal in Rice County. Using native landscapes for buffers could be mandated within these efforts, since currently the only requirement for buffer plants is that they are perennials.

In some areas there may be significant obstacles to expanding buffers, but Northfield could cooperate with the Cannon River Watershed Partnership, a very active organization, and with other city governments in Rice County to gradually increase buffers and ensure productive native landscapings within buffers on public land. An alternative to buffers along waterways is mandating buffers around agricultural land and/or industrial and construction sites. This would be effective in preventing excess fertilizers, pesticides, and other contaminants from entering runoff, but would likely be more difficult for Northfield to implement because it involves regulating dispersed private areas of land. Also, farmers in surrounding counties have previously resisted regulation of their buffer land even when many have buffers anyways. Focusing on public land along waterways - especially where there is already-existing parkland - is likely the best present option for Northfield.

III.C. Northfield Parks and Public Landscapes

Northfield has a wide variety of parks that give the city many opportunities to experiment with native planting. Currently only some parks, like Lashbrook, are designed to house native plants, but we encourage Northfield to have a patch of native plants in each of the thirty-three parks of Northfield. One of the easiest and least expensive ways to change the public parks is to implement a tree replacement program. The tree replacement program would consist of replacing

[59] Ibid.

dead or fallen trees with a tree native to Northfield. Although this is the cheapest way of changing the parks, it would take the longest amount of time.

A more active way of improving the parks in Northfield is by adding native flower beds in parks and gardens, like the Butterfly Garden and Dragonfly Garden. The non-native flowers currently planted in parks across Northfield, though they help honey bees, do not support or attract native pollinators. Adding more native flowers, however, would benefit both honey bees and native pollinators. Changing the planting in some parks, like Central Park, to gardens with more native plants would be an active way of improving public landscaping, and although it may have more up-front costs than the upkeep of the current gardens, will be cost-effective long term.

Another way to increase awareness of native landscaping is by creating demonstrative gardens. Demonstrative gardens can vary in size and specificity, general native landscape examples include Cheekwood Gardens in Nashville and the Phoenix Botanic Gardens, and more specific examples of native botanical centers include the Garden in the Woods in Framingham, Massachusetts.[60] These gardens enhance public awareness of native planting and make it a focal point for the community.

Northfield can also model what water conscious planting looks like through the creation of a xeriscape.[61] As an example, the Denver Water Department's xeriscaping program and advocacy has been at the forefront of municipal native planting, and ecologically beneficial planting initiatives. Denver has a demonstrative garden that allows homeowners to experience the beauty and versatility of water-saving native planting, so they can better understand what

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[60] Wasowski. *The Landscaping Revolution: Garden with Mother Nature, Not Against Her*. Contemporary Books, 2000.

[61] "Xeriscaping is "water conservation through creative landscaping... [It] simply means using plant materials that can exist on whatever rainfall the area gets naturally." Ibid., 23.

their yard could look like. Northfield could plant a demonstrative garden of its own. This action would encourage and educate Northfield residents about native planting in their own spaces.

III. D. Awareness Programs for Native Planting

The previous recommendations have focused on actions Northfield can take to increase the use of native landscaping, but it is equally important to create awareness about native landscaping and its usefulness, especially as awareness will motivate more residents to incorporate native plants into their property. Our recommendations for community awareness programs include advertising the rebate program, promoting native landscapes in residential areas, implementing education programs for children, and lastly, addressing some of the misconceptions surrounding native landscaping.

III.D.1 Rebate Program Advertising

While the rebate program is a comparably good program, it is not as widely used as it should be and this is because of the lack of advertising surrounding this program. Most gardeners buy their plants impulsively, so Northfield should partner up with local plant retailers to put up a signs that promote the rebate program where people are buying plants for their gardens. The signs could have some information about the rebate program itself and a part that directs the customer to an employee that could give advice for keeping native plants in their yard.

III.D.2 Addressing Misconceptions

There is a national lack of awareness about native planting - which is often incorrectly labeled as weeds - coupled with a nationwide concept of turf lawn and overflowing exotic plants as desirable landscaping. This is has been attributed to historical preferences, where “land was a valued commodity, so covering it with unproductive lawn was seen as the epitome of having

made it big time."[62] As a result, "when confronted with something different, like a reconstructed prairie of tallgrasses and other unfamiliar plants, many people tend to react negatively."[63] But native landscapes can be both beautiful and ecologically beneficial.

There is also a misconception that prairies have to be burned for them to grow the next season, and people use that as a reason not to plant native prairies in their backyard. However, a contained prairie does not have to be burned to grow; cutting is a sustainable maintenance option for homeowners. Another misconception is that all flower species support all types of pollinators. Instead, though honey bees do not need specifically native plants to thrive, there are a variety of other pollinators that flourish when provided native habitats. Minnesota's native pollinators, including hummingbirds, moths, and 418 species of bees, need more native plants. Therefore, Northfield should better inform residents about native plant species that would attract native pollinators, not solely honey bees.

III.D.3 Children's Educational Programs

One of the most effective ways to change the attitudes of people about a topic is by getting children involved in the topic. A California-based organization, California Native Plant Society (CNPS[64]), has created a curriculum that goes on field trips and uses field notes to develop important scientific skills of observation and documentation, as well as build awe and respect for finite resources. Implementing a similar conservation curriculum in Northfield Public Schools could be a way of exciting children about native planting, hopefully encouraging native planting in students' own yards. Schools can also guide children in planting native spaces on the

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[62] Wasowski, Andy, and Sally Wasowski. *The Landscaping Revolution: Garden with Mother Nature, Not Against Her*. Contemporary Books, 2000.
[63] Smith, *The Tallgrass Prairie Center Guide,* 157.
[64] California Native Plant Society, https://www.cnps.org/

campus to provide hands-on conservation education and an effective model for installing native plants.

III.D.4 Promoting Planting in Residential Areas

Northfield can educate their residents about incorporating native planting in both residential yards and in the city-owned boulevards. Though the two areas differ in ownership, the residents manage both areas. Residential areas are an impactful part of Northfield's landscape: in the 2010 census, there was an average density of 789.1 housing units per square mile[65], making the residential landscape a large fraction of Northfield's land use. The Northfield Rebate Program is a positive first step, but there are many more ways to encourage native planting within the residential areas of Northfield.

Northfield should adopt a set of native planting steps and recommendations that are widely publicized for the citizens of Northfield to clearly understand what native planting is and why it is important. We believe recommendations like those of Andy Wasowski in *The Landscaping Revolution* are appropriate for Northfield. We have included a mock list as some starting ideas. The publication could look like the following:

Tips to Better Your Garden with Native Planting

- **Consider Purchasing and Planting a Native Plant Each Season**
  If you plant a native species each season, soon your garden will include a beautiful, healthy variety of plants that are good for Northfield and Minnesota! Ask at local retailers for native species.
- **Alternative Lawns/Grasses**
  There are other options than turf grass for your lawn or garden. Turf grass is very high-maintenance, increases water consumption (and water bills!), and does not have the soil benefits that a native grass does.

[65] Data Access and Dissemination Systems (DADS). "Community Facts: Housing." *American FactFinder*, U.S. Department of Commerce, 5 Oct. 2010, factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml.

- Try **Buffalograss** (*Buchloe dactyloides*)! It is native to Minnesota, and only needs 15 inches of rainfall a year to stay green. It is sturdy and durable, and stays out of flower beds because its roots are not invasive. It has a variety of lengths, and only needs mowing 1-2 times a summer, if at all.

- **Planting Native Trees, especially native shade trees.**
  When planting new trees in your yard, consider some of the native trees to Minnesota, such as Elm, Basswood, and Bur Oak. Be patient and it will pay off in a beautiful, environmentally beneficial tree!
- **Avoid Invasive Plants**
  Invasive plants are the non-native plants to avoid: they are "noxious weeds" that are plant aliens to a geographical area that "threaten natural and agricultural ecosystems."[66]

Additionally, the Minnesota Department of Natural Resources has an extensive part of its website dedicated to native planting, including helpful advice for home landscaping.[67] Northfield could adapt and distribute this DNR information.

III.E Certification and Planting Standards Program

Northfield should adopt a set of standards to certify native planting areas and create signage for these areas, so to increase public awareness of native planting. Homeowners could be certified and have a sign put in their garden to publicly recognize their work. In other municipalities, the simple use of "Prairie Restoration" and "Prairie in Progress" signs have been effective in improving public opinion about native planting.[68] There are also a variety of existing certification programs that Northfield can adapt. For residential gardens, the National Wildlife Federation's Certified Wildlife Habitat program[69] is a fantastic certification which requires gardens to meet standards across a range of wildlife-beneficial factors. The NWF is also a partner in the Million Pollinator Garden Challenge. The challenge's goal is one million

[66] Wasowski, Andy, and Sally Wasowski. *The Landscaping Revolution: Garden with Mother Nature, Not Against Her*. Contemporary Books, 2000, pp. 68.
[67] *Landscaping with Native Plants*. https://www.dnr.state.mn.us/gardens/nativeplants/index.html
[68] Smith, *The Tallgrass Prairie Center Guide.* 206.
[69] National Wildlife Foundation Certification; https://www.nwf.org/Garden-for-Wildlife/Certify

registered "public and private gardens and landscapes to support pollinators."[70] A more local residential certification program is the Native Plant Butterfly Garden certification through the Wild Ones organization.[71] Based in Wisconsin, the organization recognizes the work of residential gardens as using native plants to attract pollinators.

Minnesota has some certification programs that are not quite fit to Northfield's needs; however, they provide positive examples. Especially for roadsides, the Minnesota Crop Improvement Association's Native Seed Certification[72] certifies native species used along roads. Additionally, specifically for waterways, the Minnesota DNR Shoreline Habitat Restoration Project posts certification signage in native planting areas around shores[73].

Conclusion

Northfield has great potential to expand existing native planting projects and measures, especially given the wide range of environmental, economic, and social benefits native planting provides. Policies Northfield should consider include enacting a certification program for current and future native planting sites; increasing public awareness through a range of actions, including advertising the current rebate program, enriching basic citizen education about the benefits of native planting, providing a demonstrative native garden, and modeling native planting in the majority or all of the city's parks. Other areas Northfield should begin gradually working on are (1) implementing native planting along roadsides, including major roadways and highways, and (2) in buffers along public waterways, expanding and increasing the effectiveness of these buffer zones.

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[70] Million Pollinator Garden Challenge; https://tinyurl.com/millionpollinator
[71] Wild Ones Butterfly Gardens; https://www.wildones.org/butterfly-garden-program/
[72] MN Crop Improvement Association; http://www.mncia.org/native-seeds
[73] MN DNR Shoreline Restoration; https://www.pca.state.mn.us/living-green/keep-your-shoreline-natural