

City of Ramsey
Agenda
Environmental Policy Board (EPB)
Monday, April 19, 2021
6:30 pm
Lake Itasca Room, 7550 Sunwood Drive NW

This meeting is being held in accordance with Minnesota Statutes 13D.021. Due to the COVID-19 Pandemic, it is not practical and prudent for all members of this board to attend in person. Current Minnesota law requires certain social distancing standards that impacts the capacity of the Lake Itasca Room. For these reasons, it is not practical and prudent to have this meeting exclusively in person. Members of the public are welcome to attend in person or remotely.

Remote Attendance available at www.cityoframsey.com/meetings. To maximize social distancing due to the COVID-19 Pandemic, those that can join remotely are encouraged to do so. Those joining remotely and requesting to speak are asked to use a webcam when speaking.

1. **Call to Order**
2. **Citizen Input**
3. **Approve Agenda**
4. **Approve Minutes**
 1. Approve Meeting Minutes Dated March 15, 2021
5. **Policy Board Business**
 1. Appoint Chairperson and Vice Chairperson
 2. Discuss Potential Topics for 2021-2022 Work Plan
6. **Board/Staff Input**
 - Spring Recycling Day Event - Saturday, May 1, 2021; 8am -12pm
7. **Adjournment**

Environmental Policy Board (EPB)

4. 1.

Meeting Date: 04/19/2021

By: Chris Anderson, Community
Development

Information

Title:

Approve Meeting Minutes Dated March 15, 2021

Action:

Attachments

Meeting Minutes Dated March 15, 2021

Form Review

Inbox

Chris Anderson (Originator)
Tim Gladhill
Form Started By: Chris Anderson
Final Approval Date: 04/15/2021

Reviewed By

Chris Anderson
Tim Gladhill

Date

04/14/2021 11:35 AM
04/15/2021 01:43 PM
Started On: 04/14/2021 11:33 AM

**ENVIRONMENTAL POLICY BOARD
CITY OF RAMSEY
ANOKA COUNTY
STATE OF MINNESOTA**

On Monday, March 15, 2021, the Environmental Policy Board (EPB) met in the Council Chambers at the Ramsey Municipal Center, 7550 Sunwood Drive N.W., Ramsey, Minnesota.

Members Present: Chairperson Michael Valentine
 Board Member Jane Covart
 Board Member Melissa Fetterley
 Board Member Michael Hiatt
 Board Member Jared Little
 Board Member Laura Moore

Members Absent: Board Member Reid Bernard

Also Present: City Planner Chris Anderson
 City Council Liaison Chelsee Howell

1. CALL TO ORDER

Chairperson Valentine called the meeting to order at 6:30 p.m.

2. CITIZEN INPUT

None.

3. APPROVE AGENDA

Motion by Board Member Little and seconded by Board Member Covart to approve the agenda as submitted.

A roll call vote was performed:

Board Member Moore	aye
Board Member Fetterley	aye
Board Member Little	aye
Board Member Covart	aye
Board Member Hiatt	aye
Chairperson Valentine	aye

Motion carried.

4. APPROVE MINUTES

4.01: Approve Meeting Minutes Dated February 22, 2021

Motion by Board Member Covart and seconded by Board Member Little to approve the regular meeting minutes dated February 22, 2021.

A roll call vote was performed:

Board Member Fetterley	aye
Board Member Covart	aye
Board Member Hiatt	aye
Board Member Moore	aye
Board Member Little	aye
Chairperson Valentine	aye

Motion carried.

5. POLICY BOARD BUSINESS

5.01: Consider Landscaping Plan for Bunker Lake Industrial Park Building 4 (Project #21-109); Case of PSD, LLC

City Planner Anderson presented the staff report. He stated that the City has received a Site Plan and Plat Application for the property located at the northwest corner of Jackal Street and 147th Lane. The project is proposing an approximately 72,000 square foot building fronting Bunker Lake Boulevard, with the loading docks/bays on the south side facing 147th Lane. He stated that staff does recommend approval of the Landscape Plan contingent upon compliance with the corrections noted by staff.

Motion by Board Member Little and seconded by Board Member Hiatt to recommend approval of the proposed Landscape Plan contingent upon compliance with the corrections required.

A roll call vote was performed:

Board Member Fetterley	aye
Board Member Moore	aye
Board Member Covart	aye
Board Member Little	aye
Board Member Hiatt	aye
Chairperson Valentine	aye

Motion carried.

5.02: Review Natural Resources Aspects of Sketch Plan for Williams Woods (Project #20-138); Case of Bill Boyum

City Planner Anderson presented the staff report. He stated that the City has received a Sketch Plan application for a proposed nine lot subdivision on approximately 94 acres. The project involves six individual parcels, all affiliated with 7363 175th Avenue NW. While this project is only at the Sketch Plan step, which does not include detailed plans, staff wanted to route this through the Board for any initial comments or feedback.

Chairperson Valentine commented that this is a large site and asked if further subdivision would be expected in the future.

City Planner Anderson replied that he does not necessarily envision further division. He stated that this project would require a variance for the cul-de-sac as proposed. He stated that there are significant wetland complexes near the large estate lots that would make further division and an additional road connection difficult.

Chairperson Valentine commented that if there were a sense that further subdivision is anticipated, decisions could be made in this planning process to support that in the future. He commented that there are natural resources in this area, and he would want to be careful in how that could be developed.

City Planner Anderson commented that the public road as proposed is attempting to follow the existing driveway that currently accesses the existing home in order to reduce impact to the tree cover.

Board Member Hiatt asked how close the MUSA line is to this property.

City Planner Anderson displayed a map highlighting the MUSA line in relation to this property. He noted potential developments that could bring the MUSA closer to this property but noted that there would still be some distance from this property.

Board Member Hiatt asked if future subdivision would require City sewer and water connection.

City Planner Anderson stated that would require an amendment to the Comprehensive Plan as this property is not guided for urban services.

6. BOARD / STAFF INPUT

City Planner Anderson commented that there is an opportunity for a tree planting event on April 8th in Central Park in coordination with the Park and Recreation Commission meeting that evening. He noted that the trees could fill in a gap between existing tree cover along a boundary with an adjacent residential property. He stated that staff will continue to work on the details and encouraged Board members to attend if possible. He stated that staff will send out additional details as they develop.

7. ADJOURNMENT

Motion by Board Member Covart and seconded by Board Member Hiatt to adjourn the meeting.

A roll call vote was performed:

Board Member Little	aye
Board Member Fetterley	aye
Board Member Moore	aye
Board Member Covart	aye

Board Member Hiatt aye
Chairperson Valentine aye

Motion carried.

The meeting adjourned at 6:54 p.m.

Respectfully submitted,

Chris Anderson
City Planner

ATTEST:

JoAnn Shaw
Community Development Secretary

Drafted by Amanda Staple
TimeSaver Off Site Secretarial, Inc.

Environmental Policy Board (EPB)

5. 1.

Meeting Date: 04/19/2021

By: Chris Anderson, Community
Development

Information

Title:

Appoint Chairperson and Vice Chairperson

Purpose/Background:

Each year, the Commissions and Boards appoint officers. Currently, Mr. Michael Valentine serves as Chairperson and Mr. Mike Hiatt serves as the Vice Chair. The term of appointment would April 19, 2021 to April 18, 2022.

Action:

Motion to appoint _____ as Chairperson of the Environmental Policy Board.

-and-

Motion to appoint _____ as Vice Chairperson of the Environmental Policy Board.

Attachments

No file(s) attached.

Form Review

Inbox

Tim Gladhill

Form Started By: Chris Anderson

Final Approval Date: 04/15/2021

Reviewed By

Tim Gladhill

Date

04/15/2021 01:39 PM

Started On: 04/13/2021 09:39 AM

Environmental Policy Board (EPB)

5. 2.

Meeting Date: 04/19/2021**By:** Chris Anderson, Community
Development

Information**Title:**

Discuss Potential Topics for 2021-2022 Work Plan

Purpose/Background:

In May, the City Council will be participating in their annual strategic planning to outline the City's objectives for the year. Per City Code, the Environmental Policy Board (EPB) must develop a work plan consistent with the City Council's Strategic Plan. Thus, now is an ideal time for the EPB to begin discussing potential items and/or topics to include on a 2021-2022 Work Plan. The 2020 Work Plan is attached for reference.

Observations/Alternatives:

The EPB has already specified an interest in exploring ways to increase accessibility of EV charging stations within Ramsey and more specifically, within The COR. Since a new Work Plan is needed, Staff felt it more prudent to include this topic as part of a draft Work Plan rather than forwarding an individual topic on to City Council for consideration. Thus, this item has been added to the draft Work Plan.

Staff has received some suggestions from Board Members for discussion purposes, including:

- Identify opportunities to work collaboratively with the Parks and Recreation Commission
- Public engagement through implementation of a demonstration project(s)
- Revitalizing the Focus on Environment column in the Ramsey Resident
 - Identify topics for inclusion
 - Create a calendar to ensure seasonally appropriate topics
- Develop meaningful Earth Day and/or Arbor Day programming for the public
- Public engagement with elementary and middle school students with potential topics including:
 - Recycling
 - Beneficial (and problematic) insects
 - Composting
 - Others?

Additionally, attached to this case are some of the final reports from the City's participation in the Resilient Communities Project through the University of Minnesota. These reports may help prompt additional ideas for discussion/inclusion in the Work Plan. There are ideas ranging from potential demonstration projects to strategies related to public engagement (with both the general public and developers). These serve as good background information for the Work Plan discussion. Staff acknowledges the vast amount of information in these reports and wants to reiterate that these are for background information only. Furthermore, the Work Plan does not need to be finalized in a single meeting (e.g. there is more time to review the attached information and then circle back at a subsequent meeting to continue and finalize a draft Work Plan).

Funding Source:

This case is being handled as part of Staff's regular duties.

Action:

Based on discussion. The desired outcome is identification of topics and/or specific items for inclusion in a draft Work Plan.

Attachments

2020 Work Plan

RCP Final Report on Natural Resources Management

Terrestrial (Bees/Pollinators) Resources Report

Aquatic Resources Report

Shoreline Restoration Report

Form Review

Inbox

Tim Gladhill

Form Started By: Chris Anderson

Final Approval Date: 04/15/2021

Reviewed By

Tim Gladhill

Date

04/15/2021 01:43 PM

Started On: 04/14/2021 09:53 AM

Environmental Policy Board Work Plan

2019 Update – September 12 Version

ABOUT RAMSEY

Ramsey is a suburban city located in the northwestern part of Anoka County, with a population of approximately 26,500. Two rivers dominate its borders, the Rum River and the Mississippi River.

The first settlement in Ramsey began because of trading along the banks of the Mississippi. Many settlers came here on a steamboat called *The Governor Ramsey* named after our first territorial governor, from which the City reportedly acquired the name.

Only a few of the first houses and structures built in Ramsey remain today. The most notable structure of historic significance is on the National Register of Historic Places, the Old Ramsey Town Hall, located west of Highway 47 (Saint Francis Boulevard) just north of County Road 116 (Bunker Lake Boulevard). This 19th century structure was originally used as a schoolhouse. The building is a community landmark and the City is working on a long term plan for the structure.

Two school districts now serve Ramsey - Elk River #728, and Anoka-Hennepin #11. Students from both districts regularly exceed the state average on the Minnesota Basic Standards in math, reading, and writing, and score well above the national average on college entrance exams.

Many people have chosen to live in Ramsey because of its rural character, wetlands, wildlife, parks, recreation and the housing choices. Ramsey is a mixture of farms, large-lot single family, urban single-family, and multi-family with a range of prices that appeals to a wide variety of families and individuals. The City is expected to grow by approximately 10,000 people over the next 20 years. Economic Development continues to be a priority for our City. With nearly 7,000 employees working in Ramsey everyday, new industrial and retail growth may add an additional 5,000 employees over the next 20 years. We are proud of our commitment to attract economically and environmentally sound commercial development.

Ramsey is committed to manage future growth to provide a high quality of life, enhanced employment opportunities and a stable tax base. Looking ahead, our city is working toward retail and commercial growth that includes restaurants, shopping, entertainment and additional employment opportunities.

CITY COUNCIL STRATEGIC PLAN

The Environmental Policy Board Work Plan is an important component of achieving the City Council Strategic Plan. The initial sections of this Work Plan are an incorporation of the City Council's Strategic Plan.

ENVIRONMENTAL POLICY BOARD STATEMENT OF PURPOSE

The Environmental Policy Board (EPB) will promote environmental awareness and conservation practice by advising the City Council on policy issues, review of new development proposals, communication and education. Through careful review, the EPB will present multiple perspectives, ideas and new technologies that promote both discovery and accountability.

VALUES

Ethics and Integrity

Fiscal Responsibility

Cooperation and Teamwork

Open and Honest Communications

Excellence and Quality in the Delivery of Service

Treating People with Respect and Fairness

Adaptability and Continuous Learning

VISION

Ramsey will be a secure, citizen-driven, collaborative community that respects the balance and connectivity between its unique urban, rural and natural environments.

MISSION

To work together to responsibly grow our community and to provide quality, cost-effective and efficient government services.

OBJECTIVES

Financial Stability

A Balance of Rural Character and Urban Growth

An Active and Connected Community

Smart, Citizen-Focused Government

An Effective Organization

ENVIRONMENTAL POLICY BOARD (EPB) WORK PLAN

Action	Timeframe	Resources	Key Outcomes and Indicators	Responsible Party
Strategy: Enhance sustainability and efficiency through <i>public policy</i>, public facilities and infrastructure investments.				
1. Create a Shoreline Erosion Control Plan for the Mississippi River	2020	Budget Impact = Low	Reduced erosion along the Mississippi River that adds sediment load and reduces water quality. High priority shorelines are identified for partnerships with Owners to improve stabilization of shoreline.	Chris Anderson
2. Consider smart irrigation (<i>and other water reduction</i>) rebate program.	2019	Budget Impact = Medium	Reduced demand on public water supply and avoid/delay of infrastructure investments. Review policy recommendations of the Metropolitan Council Regional Surface Water Supply Feasibility Study. <i>This action is identified as a specific action from the City Council's Strategic Plan.</i>	Chris Anderson
3. Update City Recycling Program	2020	Budget Impact = Low	Maintain or increase amount of material recycled rather than entered into the solid waste stream. Increased participation in organics recycling program.	Chris Anderson

Budget Impact Key; Low = Existing Staff/thousands of dollars; Medium = Additional Staff/Consultants/tens of thousands of dollars; High = capital improvement/hundreds of thousands of dollars.

RCP Report = Partnership with the University of Minnesota completed in 2018. This partnership created a library of resources and policy alternatives. A full list of completed reports can be found online at rcp.umn.edu/ramsey-projects.

CULTURE

- Utilize Strategic Plan to prioritize budget requests.
- Leverage additional funding sources.
- Seek grants to do high priority projects.
- Seek public and private partnerships.
- Improve Park and Recreation revenue through user fees and sponsorships.
- Provide adequate public safety staffing based upon common metrics (i.e., calls for service, time of day caseload, land use and population, citizen expectations).
- Continue Staff Recognition Programs.
- Increase awareness of various employee resources.

Integrating Resources into Our Future



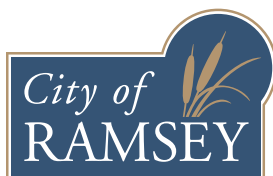
Prepared by

Max Dickson, Olivia Dorow Hovland, Nellie Jerome,
Sam Neill, Liz Scherber, and Josh Pansch

Students in PA 5252: Planning and Participation
Processes Instructor: Dr. Dan Milz
Hubert H. Humphrey School of Public Affairs

Prepared in Collaboration with

Chris Anderson
City Planner, City of Ramsey



The project on which this report is based was completed in collaboration with the City of Ramsey as part of the 2017–2018 Resilient Communities Project (RCP) partnership. RCP is a program at the University of Minnesota’s Center for Urban and Regional Affairs (CURA) that connects University faculty and students with Minnesota communities to address strategic projects that advance local resilience and sustainability.

The contents of this report represent the views of the authors, and do not necessarily reflect those of RCP, CURA, the Regents of the University of Minnesota, or the City of Ramsey.



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This publication may be available in alternate formats upon request.

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Integrating Resources into Our Future - City of Ramsey RCP



(Image Source: City of Ramsey Facebook Page, 2015)

December 22nd, 2017

Max Dickson, Olivia Dorow Hovland, Nellie Jerome, Sam Neill, Liz Scherber, Josh Pansch

PA 5253: Designing Planning and Participation Processes

Professor Dan Milz, Urban and Regional Planning, University of Minnesota

Abstract

The City of Ramsey is currently facing strong growth pressures, placing stress on the city's natural resources and its open spaces. In response, the City of Ramsey, through its comprehensive plan update, is looking for innovative strategies that create a platform for discussion and engagement on the value of natural resources as they pertain to sustainable development. Through the Resilient Communities Project (RCP), our group in the Humphrey School class, PA 5253: Designing Planning and Participation Processes, worked with the City to develop communications strategies for both Ramsey residents and developers, as well as to produce a strategy for ongoing community engagement. We used a series of case studies, literature reviews, and informational interviews with subject matter experts to identify a series of strategic actions for the Ramsey Communications plan. The proposed strategic actions include; to develop and enhance the scope of the Environmental Policy Board, utilize strategic education tools, and launch a frequently asked questions page geared towards developers on the City's website.

Executive Summary

The City of Ramsey, a vibrant municipality located at the confluence of the Mississippi and Rum Rivers in southern Anoka County, has nearly 3,710 acres of natural areas (City of Ramsey, 2007). These areas represent a variety of distinct natural ecosystem types including forest, woodland, shrubland, herbaceous wetlands, and grasslands, as well as areas of open water (lakes and ponds). The city's scenic environment, its proximity to the urban centers of Minneapolis and St. Paul, and its location along Highway 10 are all contributing factors to strong growth pressures within Ramsey. Currently, over 51% of the land cover within the city is impervious surface and associated areas (City of Ramsey, 2007). This includes residential, commercial, and industrial parcels with impervious cover ranging from 4% to 100%. Growing interest in development could increase the proportion of artificial surface areas in the city. In response to the growing interest in development, Ramsey is looking for innovative strategies to create a platform for discussion and engaging with the community on the value of natural resources as they pertain to sustainable development during the critical time frame of the comprehensive plan update.

The City of Ramsey currently supports an Environmental Policy Board (EPB). The EPB reviews, considers, and recommends policies, plans or projects that could preserve or infringe on the natural environment in the city. Other city-led initiatives include recycling day events, lake management and stormwater plans. These types of events, along with the EPB meetings, act as platforms for natural resource information sessions. However, there are limitations to these types of engagement. The EPB's public meetings, while open to the public to attend, have had historically low attendance rates. Fortunately opportunities exist to expand public outreach at community events, to engage community stakeholders, and to established institutions/groups. Taking advantage of these opportunities allows residents to be more involved in making decisions around the future of their community and its resources.

Strategic Action A: Expand the Scope of the Environmental Policy Board

For the first strategic action, we turned to the City of Eden Prairie for a case study on how natural resource communications can be approached through different models of city boards and commissions. Eden Prairie has a Conservation Commission that looks at natural resources at a high-level of policy, while the Parks, Recreation, and Natural Resources Commission look at the lower-level, more related to technical review, of natural resources. This lower-level policy Commission is responsible for reviewing development plans and city ordinances that address topics within their scope. We recommend that Ramsey further examine the roles and responsibilities of Eden Prairie's commissions to see if there are issue areas or approaches that may resonate with Ramsey residents. This includes the possible creation of a liaison between the Parks Board and the Environmental Policy Board to relay information between groups on major initiatives and projects. Further, we recommend that Ramsey consider working with local high school students by appointing them to an advisory role to the existing EPB. In addition to this younger perspective, the EPB could also bring in speakers from outside of the community to speak on topics in which existing board members may have interest.

Strategic Action B: Increase Learning and Engagement With the Environment Through Key Terms, Signage, and Innovative Communication

Education in effective interaction between the community and developers, with regard to natural resources in Ramsey, is important in preserving the character of the community. An interactive and effective form of education can help create a common understanding of the impact that both developers and the community can have on the natural resources around them. We recommend that strategic educational engagement take a few different forms, in order for it to be easily received by all groups.

1. Key Terms Page

First, we want to direct residents and developers to a newly created key terms page on the city website for definitions and examples of important natural resources in the city. Ramsey has a unique set of natural resources and due to the vast nature of the phrase, it is crucial that this be broken down in an understandable way.

2. Creative Signage

Another educational tool to implement is creative signage placed near recreational locations around the community in order to reach wide audiences. This tool will help bring learning to places in which the community already frequents.

3. Interactive Programming

We also propose more interactive city programming, such as a traveling chalkboard and visual documentation projects, to facilitate engagement with the public at on-going/existing public events in Ramsey. These projects can both give and gather information from the residents surrounding natural resources.

Strategic Action C: Create Frequently Asked Questions (FAQ) Sheet for Developers

The third strategic action we propose is the implementation of a frequently asked questions (FAQ) resource for developers on the city's website. This web page will act as a signal that the City is both prepared to welcome development proposals, and prepared to communicate effectively with developers and residents. The FAQ could easily incorporate links to city regulations and other resources, like the expanded scope of the EPB or various community groups (eg. youth athletic associations, schools, faith based organizations, and civic groups).

Acknowledgements

We would like to express our gratitude to Chris Anderson, City Planner at Ramsey, for his guidance, direction, and feedback on this project. We would also like to thank Ramsey City Staff, the members of Ramsey's Environmental Policy Board, Jay Lotthammer (Natural Resource Liaison for the City of Eden Prairie), Jen Kader (Freshwater Society), Mark Riverblood (Ramsey Parks and Assistant Public Works Superintendent), Tara Brown and Jessica Vanderwerff Wilson (City of Edina) among others for their contributions to this project. Thank you.

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Introduction

Rich in natural resources: Opportunities to communicate the value of natural resources to residents

The City of Ramsey is experiencing strong growth pressure due to its scenic environment, proximity to the Twin Cities, and location along Highway 10. The City recognizes this pressure and the stress it places on its natural resources and open space. In response, Ramsey is moving proactively to develop planning policies that will balance growth with natural resource protection. Within Ramsey, there is a strong interest on the part of citizens to maintain a high quality of life. (City of Ramsey, 2007).

The preservation of natural communities and open spaces is often an important component of this goal. Such areas provide opportunities for active and passive recreation, wildlife habitat, scenic vistas and buffers between developed areas, and can serve as landmarks or distinguishing features for the local community. It has also been shown that property values increase near natural open spaces (Geoghegan, 2002), and that effective planning for natural resources can benefit all parties (Groot, 2006).

Preserving natural resources can come into conflict with private property rights, especially in rural areas like Ramsey. When property values increase, landowners have a significant amount of money tied up in their property and not in physical cash. This can cause them to be very protective of their property. Keeping natural resources around private property can help to build its value. It is important to communicate this connection so landowners see the importance in protecting natural resources in the city. With growing developmental pressures, these landowners might feel forced to sell their land to developers without understanding the value of the adjacent resources to their property and to the city overall. Education around the importance of natural resources is how we can overcome this conflict with property owners. It can help the community preserve their rural character, maintain opportunities for recreation, and have a sustainable community. Creative engagement strategies will help landowners become engaged with their city and find new ways to protect the environment.

As Ramsey updates its comprehensive plan, it is crucial to begin looking for innovative strategies to best communicate the value of natural resources as they pertain to sustainable development.

RCP partners with Designing Planning & Participation Processes Course: Developing innovative communications strategies

PA 5253: Designing Planning and Participation Processes, a course at the University of Minnesota taught by Professor Dan Milz in the Fall of 2017 focuses on the design, implementation and evaluation of participatory planning processes. On a high level this course explores theories and designs of participatory planning to investigate challenges with design issues, community engagement, and democratic deliberation. In partnership with project lead Chris Anderson, Ramsey City Planner, our group developed innovative communications strategies surrounding natural resources as part our course and Ramsey's Partnership with RCP.

Natural Resources Communication Challenge with City, Residents, and Developers

Problem: Ramsey's rural character is highly valued as documented by community-wide survey results. This rural character is closely tied with the natural resource base that is present in the city. However, there is a lack of

effective communication with residents on how to go about preserving the natural resource base and the value that comes with this preservation. Specifically, communication is needed to help articulate threats to environmental resources. There is also a lack of effective communication with developers about the loss of natural areas/open space and concerns that residents may have on this issue. Finally, there is a lack of ongoing public engagement opportunities for the residents to express their concerns about natural resources.

Objectives: Ramsey Communications Plan

1. Develop communications strategies for Ramsey
 - a. For residents: public education
 - b. For developers: guidebook and reference materials
 - c. Translating community feedback into an action plan
2. Develop a solution for ongoing community engagement



Image courtesy of the Resilient Communities Project

Methods - Identifying Natural Resource Communication Priorities

We used a series of case studies, in class discussions, a brief literature review, and informational interviews with subject matter experts to identify a series of recommendations for the Ramsey Communications Plan.

Suggested Priorities

As a group we identified and reviewed 14 unique articles, case studies, videos, organizational communications strategies etc., surrounding natural resources. We performed a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of each of these strategies. Key themes emerged from the SWOT analysis, as well as readings throughout the semester in PA 5253, and are highlighted below. We used these themes to inform our final recommendations.

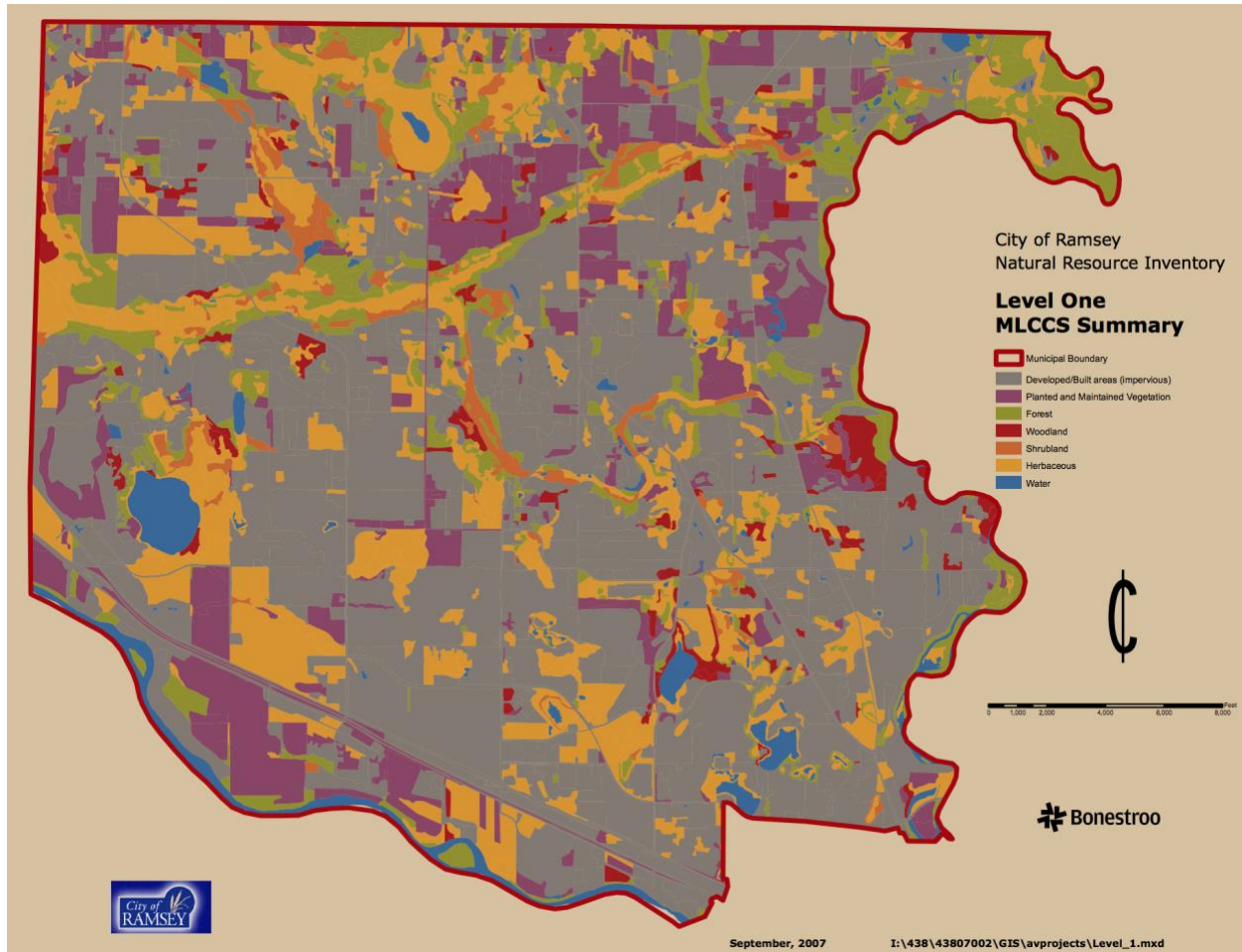
Figure 1. Suggested Communications Priorities

Natural Resources Communications Issue	Suggested Priorities
<p>Natural Resources may be an alienating topic because it contains inherently complicated subject matter</p>	<ul style="list-style-type: none"> ● Get everyone on the same page by identifying key terms early on in the process ● Embrace various learning styles by incorporating visual materials for communication
<p>Natural Resources and their management strategies impact a broad range of residents, businesses, organizations, as well as both current and future community members.</p>	<ul style="list-style-type: none"> ● Identify Key Stakeholders to understand the specific community members and their unique communication needs ● Go to them. Target key stakeholders where they already gather.
<p>Natural resources communications strategies that lack cohesive messaging are ineffective</p>	<ul style="list-style-type: none"> ● Maintain cohesive messaging throughout all platforms of communication to increase impact.
<p>Residents may feel they lack ownership of and feel distanced from the broad management of natural resources</p>	<ul style="list-style-type: none"> ● Through innovative communications empower citizens by showing them how their input is valued and used by planning staff ● Be present and available for community members, prioritize transparency
<p>Short-term Land Use Management decisions may hinder long range health of natural resources</p>	<ul style="list-style-type: none"> ● Partner long range vision with ad hoc decision making.
<p>The preservation of natural resources in rural areas may cause tension with private property rights, and land owners</p>	<ul style="list-style-type: none"> ● Be transparent with the community, be prepared to address concerns of natural resource beneficiaries and stakeholders with clarity. Take a proactive voice in educating the public through creative communication.
<p>Preserving natural resources can conflict with the desired outcomes for development projects. Financial losses or increased red tape can be dissuasive to developers.</p>	<ul style="list-style-type: none"> ● Utilize community and developer communications strategies with specific framing that increases the intrinsic value of natural resources within the community, creating buy-in from developers, current community members, and future residents

Background

Inventory Report documents Ramsey's Diverse Natural Resources

To plan effectively for natural resources, the City conducted a study on the status of the existing natural resources in Ramsey. Based on information collected through the Natural Resource Inventory Report, nearly 3,710 acres of natural areas were documented as representing a variety of distinct natural community types including forest, woodland, shrubland, herbaceous wetlands, and grasslands, as well as areas of open water (lakes and ponds). The results from the study concluded that 51% of the land cover in the City of Ramsey is artificial surface and associated areas (this includes residential, commercial, and industrial areas with impervious cover ranging from 4% to 100%). Planted cover, which includes cropland, pastures, gardens, and tree plantations, as well as areas of mowed grass, accounted for 13% of land cover. Herbaceous vegetation types were prevalent, making up 19% of the land cover in Ramsey. Open water only makes up 3% of land cover in the city (City of Ramsey, 2007).



(City of Ramsey, 2007).

Partnering Demographic Growth with Ramsey's Rural Character

Taking stock of existing natural resources in Ramsey and planning for future preservation and integration of these resources will be important for the current residents as well as future residents of the city. Identifying the existing demographics in Ramsey allows us to understand how to educate and engage residents on the importance of natural resources. Based on 2010 Census data, Ramsey only has 3.2% of the population sitting at or below the poverty line. This is almost 7 percentage points below the Minnesota average and five times less than the national average (15%). As previously mentioned, Ramsey is experiencing a population growth and has seen an increase of 10.7% to its population compared to only 4.1% in Minnesota. This population increase highlights the urgency to preserve natural resources to support residents' quality of life.

Ramsey has a high homeownership rate at 89.1% compared to Minnesota at 71%. Because of the large stock of single family homes, Ramsey has relatively low-density rates. This means that efforts need to be focused on educating homeowners on the importance of natural resources as well as encouraging developers to implement practices that do not decrease the quantity or quality of the natural resources that already exist.

Existing Natural Resource Engagement through Environmental Policy Board and Parks Department

Currently, the City of Ramsey has an EPB as well as a Parks and Recreation Commission. The Parks and Recreation Commission focuses more on parks and open space planning, while the EPB focuses more on technical aspects such as Landscape and Tree Preservation plan reviews, innovative stormwater management opportunities, and recycling.

The EPB reviews development proposals that infringe on natural resources in Ramsey. This board makes recommendations to City Staff and the City Council. The City also host annual events like the Game Fair, where people can gather for the nation's largest outdoor sporting event. These types of events, and other community programs such as the Happy Days Festival, Summer Concert Series, or Youth Athletic Associations, can act as platforms for natural resource information sessions.

Existing Limitations for Natural Resource Communications

While there are efforts being made to educate and provide tools for natural resource education on a local governmental level, there are also some limitations. The EPB is one way for residents to participate in decisions directly influencing local policy. However, it can not be the only method of public participation. These public meetings are consistently held at the same time and place, which may be inconvenient for some residents. The lack of public turn-out at these meetings, proves that there must be alternative forms for public input made available to community members.

Another limitation is the lack of public outreach around natural resources at community events. The City hosts many community events but there has been little engagement or targeted conversation around natural resources. These community gathering spaces are not yet being capitalized on to integrate and educate residents around the importance of preserving and protecting natural resources.

While the City of Ramsey has taken on responsibility for natural resource integration in its comprehensive plan and policies, more responsibility can be put on community stakeholders and established institutions/groups to integrate policies that can be easily followed and understood. By doing this, the residents can become more involved in decision making around the future of their community and its resources.

Continuing to provide tools and resources through the City will be important, while also assigning responsibility to community stakeholders to act upon and give input on city initiatives.

The final limitation around current community engagement practices is the historical conflict of prioritizing development around a growing economy and respecting natural resources. Changing the priorities around preservation of resources, and holding them to the same level of importance as development, will be crucial for the future of Ramsey. Fortunately, there are ways that a city can respond to growth while also being conscious of environmental stressors.

Regulating Natural Resources through Permitting and Overlay Districts

Currently, Ramsey has implemented overlay districts over portions of the community to protect existing resources (e.g. Wild and Scenic Overlay District along the Rum River and the Critical River Overlay District along the Mississippi River). The City has also adopted various legal measures (ordinances) to take this one step further. The implementation of environmental permitting standards, reforestation requirements, topsoil requirements, and the required use of water efficient technologies in irrigation systems are just a few examples. These types of legal actions can allow development while also protecting the existing resource base, which will be important as Ramsey grows and changes in the coming decades.

Proposed Strategic Actions

A. Expand the Scope of the Environmental Policy Board

City boards and commissions help to advise and guide city staff in their decision-making in particular areas. Ramsey currently has a Charter Commission, Economic Development Authority, Parks and Recreation Commission, Planning Commission, and an Environmental Policy Board (EPB). The EPB's objective is to "review, consider, initiate and recommend to the City Council such policies, plans or projects which will enhance and preserve the natural environment of the City". (City of Ramsey Website, 2017). The scope of the EPB "shall include, but not necessarily be limited to, matters of the preservation of the community forest, water quality, wetland preservation, groundwater protection, control of soil erosion and air, noise and light pollution." (City of Ramsey Website, 2017). This existing board should be leveraged to maximize community engagement on the topic of natural resources.

We turned to the City of Eden Prairie for a case study on how natural resource communications can be approached utilizing municipal boards and commissions. Eden Prairie has a Conservation Commission that looks at natural resources at a high level. The commission focuses on city-wide programs like recycling, lake management, and stormwater plans. The commission also makes recommendations to City Council on how to approach these issues, while dedicating time to doing public outreach at city events. The City takes the commission's recommendations and incorporates them into plans, and may also take some ideas for high level planning from the commission's own original priorities.

On a more technical level, Eden Prairie also has a Parks, Recreation, and Natural Resources Commission that is responsible for reviewing development plans and city ordinances that address topics within its scope. This commission works more with residents to make sure their concerns are heard and brought to a larger stage. This commission takes on more of an education role, engaging with residents and maintaining accessibility. We

recommend that Ramsey further examine the roles and responsibilities of Eden Prairie’s commissions to see if there are issue areas or approaches that may resonate with Ramsey residents.

Further, we recommend that Ramsey consider working with local students, appointing one in an advisory role to the existing EPB. The student could work with EPB members to discuss topics of importance to them, and bring attention to the priorities of a new generation. In addition to this younger perspective, the EPB could also bring in speakers from outside of the community to speak on topics in which board members may not be as fluent. Educating existing and potential board members in key areas could help to frame the city’s priorities and ensure a consistent agenda.

Finally, we recommend that Ramsey create a liaison between the Parks Commission and the EPB, with the possibility of joint meetings. There is a substantial amount of overlap and collaborative opportunities for these two groups and opening communications with a liaison would be an excellent first step.

This strategic action is important because of the potential for unguided growth that can harm natural resources in the community. Future development in Ramsey can benefit the environment if planned and implemented correctly. It is important for the EPB to take community feedback and deliver clear development guidelines to city planners. An efficient and clear governance structure between the EPB, the Parks Commission and the city is essential. Ramsey can take what works for Eden Prairie and adjust it to create a structure that works for them. This will help build authority in the EPB and solve the pressing issue of rapid development impact on resources in the community.



Image courtesy of the Resilient Communities Project

B. Increase Learning and Engagement With the Environment Through Key Terms, Signage, and Innovative Communication

How the community and developers interact with natural resources in Ramsey is important to preserving the character of the city. Many people in the area care about its rural character and a key aspect of this is the surrounding natural environment. An interactive and effective form of education can help create a common understanding on the impact developers and the community can have on the natural resources around them. Building knowledge around what natural resources means to the community is an important first step and is necessary in building strategies to protect specific assets in the city. We suggest that strategic educational engagement take a few different forms including: a key terms page centrally located on the city website, creative signage placed near recreational activities in the community and an interactive chalkboard activity that gives the EPB an opportunity to discuss natural resources directly with the community. take a few different forms.

A key terms page will define natural resources that are important to the community. Clear examples and definitions on the city website will build credibility and a reference for development or projects interact with these resources. The list can encompass and define important words and phrases the community feels are important when describing natural resources and the environment. To build the list the EPB can utilize engagement strategies like a chalkboard activity (expanded upon in Appendix A) and other surveys. Some examples of terms include “natural resources, stormwater, watershed, vegetated buffer, rain garden, native plants and pollinator species.” Creative visuals or videos (Figure 2) go a long way in helping people understand complicated environmental terms and issues. The community will get a better understanding of what natural resources means when they see real examples from their daily lives. Pictures taken from the city and maps showing the location of where the community interacts with natural resources can help create meaning to the key terms list.

A key terms list on the city website forces the community and developers to actively seek out information. Integrating educational tools into places the community may already be can broaden the audience. There are bike paths, parks, rivers and other recreational activities in which to integrate signage to educate people about the importance of natural resources protection. Education can be fun for residents and can enhance the experience people have with the outdoors. The Department of Natural Resources (DNR) has several educational activities, typically run through schools, which Ramsey could leverage. The DNR has posters already created (Figure 3) for resources like

Figure 2. Example of Visual Learning Aid



Image from the Center for Urban Pedagogy

Figure 3. Example of Learning Poster



lex.html

trees, water, pollinators and animals. Custom signage created by Ramsey can add to these signs and can build off of the key terms information from the website. By tying these two educational tools together it can help create a cohesive story of natural resources in the city.

Engaging the community in an interactive activity that is used for public good can be a powerful tool of communication. A case study in Argentina (Balestrini, et.al, 2014) used video recording to determine how heritage preservation was important to the community. Members of the community were asked to create a short video explaining what was important to them so that it could be preserved. We suggest taking a similar approach to natural resources in Ramsey. The EPB can interact with the community by using a chalkboard (Figure 4) to create simple text or pictures of important resources. In order to collect data outside of regular city meetings, city staff and the EPB can go to public functions and ask the community to write, for example, which natural resources are important to them and why. The answers given on the chalkboard will be summarized and presented at EPB and planning meetings as a way to center focus on the voices of residents. Integrating community input into something that will actually be used is an important step in engagement. This can foster future discussions and build an engaged and active community looking to learn more about how they can improve and protect the environment in their city (Appendix A).

Figure 4. Chalkboard Activity



Image courtesy of Liz Scherber

Education is important in helping solve the concern Ramsey has to create innovative strategies to best communicate the value of natural resources. The community cares about its environment and wants to find new ways to communicate that back to city leaders and developers. Historically, EPB meetings and other traditional city meetings have low attendance. The voice of many in the community isn't being heard. This strategic action can help overcome that through creative techniques to both deliver and gather information and suggestions.

C. Create Frequently Asked Questions (FAQ) Sheet for Developers

The third strategic action we propose is the implementation of a frequently asked questions (FAQ) resource for developers on the city's website. Because this FAQ will be made public by the City, it will be accessible not only to developers but also to Ramsey's residents. Residents will be able to access some important regulations and have a better understanding of the development process in their community.

This web page will also act as a signal that the City is both prepared to welcome development proposals, and prepared to communicate effectively with developers and residents. The FAQ could easily incorporate links to city regulations and other resources, like the EPB or various community groups. An example of this is the "Going Green Pledge" survey at the City of Edina (Appendix C). Some potential questions and answers, identified by city staff, that may be useful for inquisitive developers are:

Why do I have to do a tree inventory? What trees need to be included?

We have a definition in City Code that specifies what a Significant Tree is considered, and those must be included in the inventory.

We do allow an exemption for trees clearly outside the limits of construction.

Are there any reforestation requirements?

Yes, 40% of significant tree diameter at breast height (DBH) must be retained for residential development, 30% of significant tree DBH must be retained for commercial/industrial development.

If a project exceeds the threshold above, for every 1" removed beyond the threshold, developers must replace with 1.25" of new trees or pay \$125 per inch.

See City Code Section 117-327.

Is there any type of topsoil requirement?

Yes, the City has a requirement for 4" of topsoil meeting a certain specification to be applied to all disturbed areas not otherwise improved with buildings, driveways, or other impervious surfaces.

See City Code Section 117-348 (i).

Is in-ground irrigation required?

No, City Code was recently amended to eliminate that requirement and instead require the use of water efficient technologies such as soil moisture sensors, smart controllers, etc. if an irrigation system is installed.

See City Code Section 117-111 (g) (4).

What is Density Transitioning and is it applicable to my development?

This has to do with higher density development adjacent to lower density development. That often times requires transitioning and most commonly developers use landscaping to satisfy this, but there are other alternatives as well.

See City Code Section 117-110.

What is the lot depth standard?

This standard was recently developed to try and ensure a certain amount of 'usable' land in newly created lots.

See City Code Section 117-614 (h) (11).

Are there wetland and/or stormwater pond setbacks?

Yes, See City Code Section 117-289.

Another useful communication tool between the City and prospective developers could be a natural resources survey, following the model of other Minnesota cities like Eagan. This survey could be a required step in the development process, as part of the City's building policy, making it a potential regulation tool as well. Eagan's survey is a questionnaire for developers to review and complete, and gets them thinking about bigger impacts of their projects. The questionnaire also helps inform the city council, environmental boards, and planning staff on the development project and its impacts. Eagan prioritizes this survey as part of their larger sustainability goals, and can use survey feedback and data as a policy driver going forward. Ramsey may be interested in utilizing tools like this, and other recommended strategic actions mentioned in this section.

Residents expect development to follow regulations and direction set forth by the community. One objective of this project is to deliver reference materials or a guidebook for developers and the community to have access to. An open and clear set of expectations and information will help deliver community goals and protect natural resources.

Implementation

The three proposed strategic actions should be implemented in a timely manner. The following matrix defines when and how each strategy should be rolled out:

Proposed strategic action	Timeframe	Implemented by
A. Expand the scope of the environmental policy board	Medium-term (within 2-5 years)	City Council, Environmental Policy Board
B. Increase learning and engagement with the environment	Short-term and incidental implementation (within 1 year, and in conjunction with scheduled events like Happy Days, Summer Concert Series)	City Staff
C. Create an FAQ sheet for developers	Short-term (within 1 year)	City Staff

Conclusion

The City of Ramsey is at a crucial moment in their planning process. With strong growth projections and an increased interest in development, Ramsey’s comprehensive plan update has the opportunity to protect natural resources and open space, while guiding future development in a way that is sustainable for future generations. By utilizing innovative communication strategies, the City of Ramsey can effectively communicate to residents and developers the value of natural resources as they pertain to sustainable development. The recommendations laid out in this report help to move the City of Ramsey from an ad-hoc planning approach for natural resources as individual developers come to the city with their plans, to a strategic approach with a long-term, comprehensive vision of natural resources in Ramsey leading the conversation.

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Appendix A

Class Demonstration Report

Project Leaders: Max Dickson, Olivia Dorow Hovland, Nellie Jerome, Sam Neill, Liz Scherber, Josh Pansch

Activity Purpose

The natural resources group practiced a chalkboard engagement activity and mock Environmental Policy Board meeting in class on November 9th, 2017. The purpose of the demonstration was to practice each in a real life setting, gather feedback and improve our recommendations prior to presenting to Ramsey.

One problem we are trying to solve for is a lack of effective communication to residents about the value of natural resources: specifically, education that articulates threats to environmental resources. One way of solving this lack of effective communication is by engaging with the community in places they will already be. Many public engagement activities expect the community to go to places outside of their day to day lives like a public board meeting at city hall. The chalkboard activity was meant to engage with community members not typically represented in these meetings. In order to solve our problem around education we need to build outreach to more than just a few residents. The purpose of this type of engagement activity is to lift the level of knowledge and interaction with everyone in the community instead of just the few attending public meetings at city hall.

Our second engagement meeting was an Environmental Policy Board meeting meant to follow the chalkboard activity. We created this type of activity to meet the purpose of the second part of our problem that there is a lack of effective communication to developers about the loss of natural areas/open space from the view of the residents. We view the Environmental Policy Board as an advocate for the concern of the community about protecting and enhancing the natural and rural environment of Ramsey. The chalkboard activity is there to gather the input of a diverse group of people and the purpose of the board meeting is to summarize and express the point of view of the community. The content and result of the board meeting should be an accurate representation of feedback gathered at the chalkboard activity.

Activity Description

Our first activity was a chalkboard engagement session where members of our project group acted as the Environmental Policy Board and engaged with our classmates as if they were the Ramsey community. This practice session took place as if it was at the Ramsey Happy Days festival. Our recommendation will be for members of the board to use this activity to get into

the community and gather feedback and point of view of a group they do not normally interact with during board meetings. Members of the board were tasked with asking festival goers “*What do natural resources mean to you?*” The question was asked open ended and gave each person the opportunity to answer with their own words. The board member wasn’t tasked with any additional information regarding a definition of natural resources or examples of natural resources in the city. Answers to the question were written one at a time on a chalkboard and pictures were taken (*Appendix A.1*) of each person that participated in the activity.

The results of the chalkboard activity were then compiled into a simple bar chart (*Appendix A.2*) in order to present at a later board meeting. We ran our meeting according to Robert’s Rules and had a great turnout from the community. We created an agenda and attempted to follow the prescribed format throughout. Some community input steered the conversation away from the intended purpose but we were able to get back on topic after allowing the attendee to voice their opinion. The meeting concluded with an approved resolution to take the community feedback to the city and integrate it into developer guidelines.

What We Learned

The activities (community chalkboard event and board meeting) were selected because they are two very different approaches to community engagement. In this in-class demonstration we wanted to test both in their effectiveness in communicating the value of natural resources in Ramsey. While initially thinking that one would stand out as a more effective approach, we learned that both approaches have their benefits and that they should be used together. This paired approach to community engagement can effectively communicate the value of natural resources to both Ramsey residents and developers.

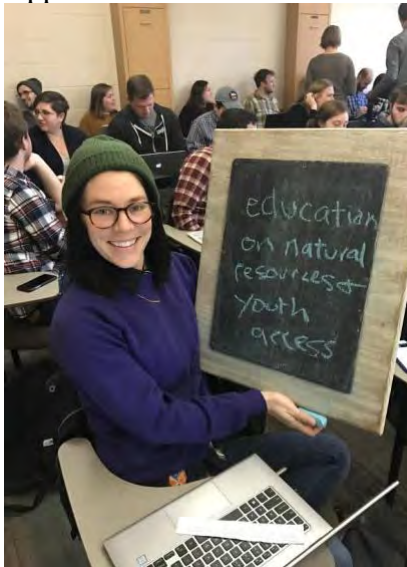
The chalkboard activity was great at getting into the community and hearing how residents of Ramsey view natural resources and how they interact with them in their own lives. Each response, while personal, started to form a larger view of natural resources in the city and reveal what is important to the community. We also learned that taking a person’s picture and attaching it to their response is a powerful tool. In one sense it can be good because people can then see themselves and feel a stronger connection to the project. However, it can also create pressure and a forced commitment to a response a person may not have given much thought to. Overall, we thought the image of the person with their response was an effective engagement tool, especially when it came to the board meeting.

The Environmental Policy Board meeting is a more formal engagement method. It is traditionally not great at engaging the community, so to help solve that barrier, we presented the images of residents at the Ramsey Happy Days Festival with their responses to the question we asked. By showing these images we helped bridge the gap between the informal community event and the formal policy meeting. It was also a way to show community members that their responses and thoughts about natural resources were being used to directly inform policy decisions in the city. This is important in creating transparency, building community trust, and holding the board accountable for representing the community.

Feedback & Next Steps

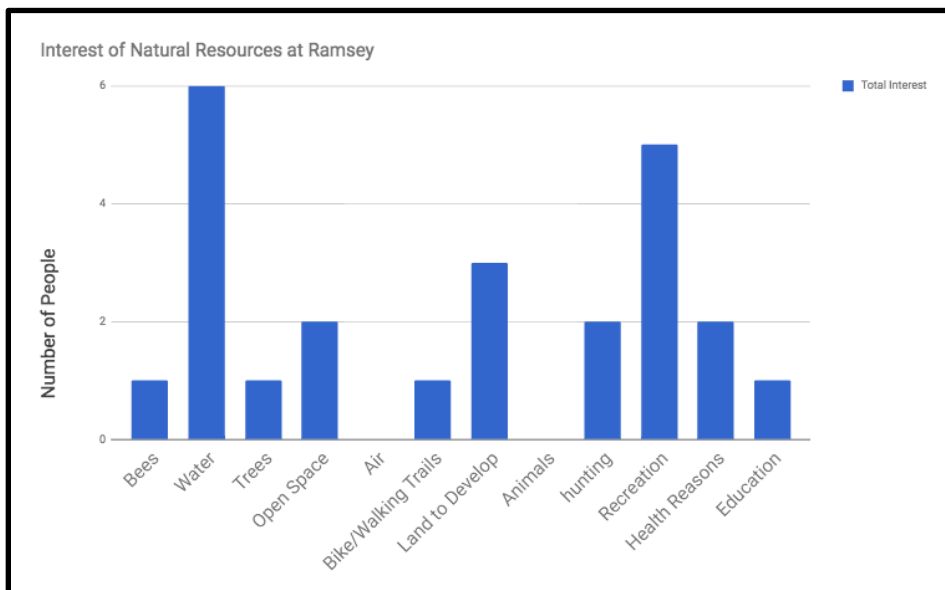
By presenting these activities to our peers we were able to gain some valuable feedback and insights that will be helpful in future refinement of the engagement strategies. It is important for city staff or whoever may be conducting engagement to be mindful of the question they are asking and the format they are presenting/gathering community feedback. Both of those things can have an impact on the comments or type of comments that are received. In our activity, we asked a broad, open-ended question - What do natural resources mean to you? It may be more helpful in the future if we add more specificity to the question or add a definition of natural resources. Some people may not know what we are asking since natural resources is a confusing term. By adding key terms or further explanations, we may receive more refined comments from residents. Another thing we should be aware of is asking people to write down their response. In asking them to do this we are assuming many things - that they are literate, fluent in English, comfortable spelling, etc. Another way of getting responses might be to have images - cut-outs of trees, river, clouds, fishing, etc. - that people can use for their response. This might appeal to and reach a larger audience, allowing more community voices to be heard.

Appendix A.1



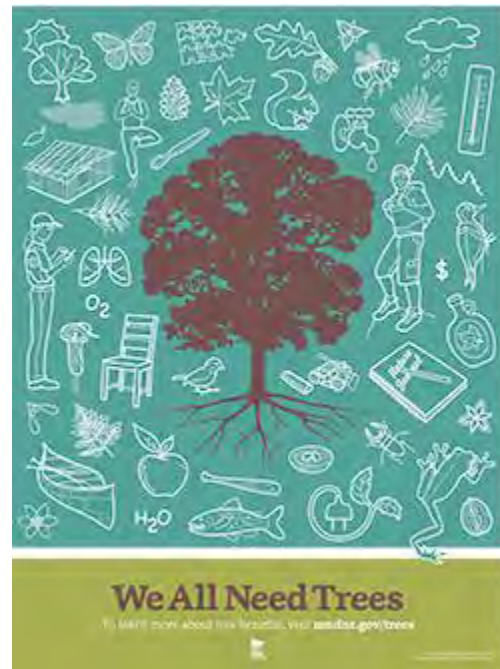
iz Scherber

Appendix A.2



Appendix B

Link to Minnesota DNR Educational Tools: <http://www.dnr.state.mn.us/education/index.html>



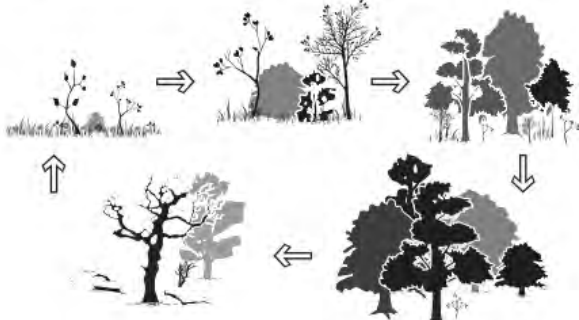
WHAT IS SUCCESSION?

Plant communities flourish or perish depending on their environmental conditions. As these conditions change, the types of plants that make up the community may also change. This process is called succession. In a stable community, the plants are well suited to the amount of water, nutrients, and sunlight available to them. As the availability of these resources change, the conditions may favor a different set of plants, and these plants will become more abundant. This causes a shift in the makeup of the plant community. In effect, the new plants succeed the old, creating a slightly different community. Events can cause change in a plant community. Such disturbances can include windstorms, wildfires, insect infestations, and widespread disease.

In a mature deciduous forest dominated by maple and basswood trees, fire can provide a dramatic example of succession. Following a fire disturbance, the charred land is friendly terrain for some species, and hostile to others. Grasses and other nonwoody plants are first to pioneer the newly disturbed area. These are soon followed by bushes such as raspberry. Species that do well in full sun such as boxelder, ash, and cherry are the first trees to recolonize the area. As these trees mature, they shade the forest floor, making it difficult for their own young to grow. Shade-loving species such as maple and basswood find themselves at a competitive advantage, and the species composition of the forest slowly shifts. Over time, the older sun-loving trees die out and the shade-tolerant species take over. The process may take hundreds of years, but left undisturbed, this forest will evolve into a plant community dominated once again by maple and basswood.

SUCCESSION IN A DECIDUOUS FOREST

In an undisturbed setting, succession progresses from pioneer grasses and shrubs to mature trees that return to pioneer grasses. However, disturbance, such as a wildfire, windstorm, or insect infestation, can happen at anytime and interrupt the cycle. This returns the forest to an earlier stage of success and the process begins again.



MINNESOTA'S PRAIRIE GRASSLAND BIOME

On a prairie the lines of the landscape are clean. No trees clutter the horizon. Nothing blocks the view extending forever. Ripples run through the grasses so they seem to advance in front of the wind. These are the waves that early settlers saw as an ocean, a sea of grass and unbroken soil stretching as far as the eye could see. Minnesota once had 18 million acres of prairie that stretched across the state from southeast to northwest. Fertile prairie soil grew good agricultural crops, however, and most of the prairie was plowed. The patches of prairie remaining are mostly the remnants that could not be plowed.

WHAT IS A PRAIRIE?

Prairies are defined as extensive areas of flat or rolling grasslands. In Minnesota these grasslands range from sparsely vegetated sand dunes to vast fields of big bluestem up to 8 feet tall, from wet meadows to shortgrass prairies high on the bluffs of the Minnesota River.

FOUNDATIONS OF TODAY'S PRAIRIE GRASSLAND

The last glacial episodes in Minnesota advanced across the state leaving behind the soils that the prairie formed upon. The northern parts of the prairie biome were primarily influenced by Glacial Lake Agassiz. The south and southwestern parts feature a high plateau of quartz bedrock topped with glacial debris.

CLIMATE IS KEY

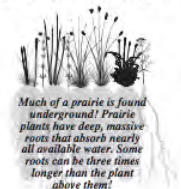
Rainfall and temperature play a major role in where prairies form. Prairies develop where rainfall is generally lower and summer temperatures are higher compared to Minnesota's other biomes.

FIRE, BISON, DROUGHT

Three major factors have influenced the prairie grasslands. Fire eliminates trees and shrubs while improving the growth of prairie wildflowers and grasses. Prairie plants have adapted to grazing by bison and other large herbivores (plant eaters) by having underground growing points that quickly sprout after being eaten. Many prairie plants can go dormant during a drought then begin growing again after the drought ends.



FUN FACT



Much of a prairie is found underground! Prairie plants have deep, massive roots that absorb nearly all available water. Some roots can be three times longer than the plant above them!

Appendix C

Edina Going Green Pledge

<https://edinamn.gov/FormCenter/Sustainability-Forms-30/Going-Green-Pledge-106>

Going Green Pledge

Sign in to Save Progress

Steps

✓ [Step One](#)

2. [Pledge](#)

3. [Helpful Contacts](#)

Pledge

I commit to taking the following actions (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> Attending an event put on by the City of Edina on energy conservation | <input type="checkbox"/> Reviewing renewable energy options |
| <input type="checkbox"/> Contacting CenterPoint Energy's Business Customer Hotline | <input type="checkbox"/> Sharing your businesses' energy story |
| <input type="checkbox"/> Contacting Xcel Energy's Business Solutions Center | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Requesting Xcel Energy's Turn Key Services | |

My business has already taken the following actions to save energy:

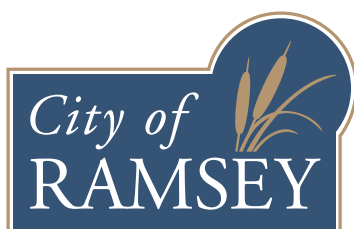
Bee-ing Ramsey: Planning Pollinator Habitats



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The contents of this report represent the views of the authors, and do not necessarily reflect those of RCP, CURA, the Regents of the University of Minnesota, or the City of Ramsey.



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Resilient Communities Project

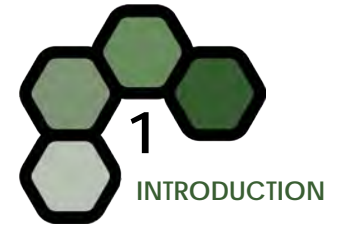
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Bee-ing Ramsey

Planning Pollinator Habitats



The creation, protection, and renewal of pollinator habitats is critical to preserving and strengthening the rural roots of the City of Ramsey. Promoting pollinator habitats can be achieved by encouraging the conservation of natural environments and implementing sustainable landscapes in both rural and urban locations.

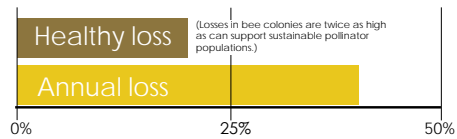
PROMOTING POLLINATOR HABITATS

Pollinators and their habitats play an important role in many aspects of daily life. In recent years their numbers have drastically declined, impacting the productivity of many rural landscapes.

THE KEY FACTOR IN HABITAT LOSS

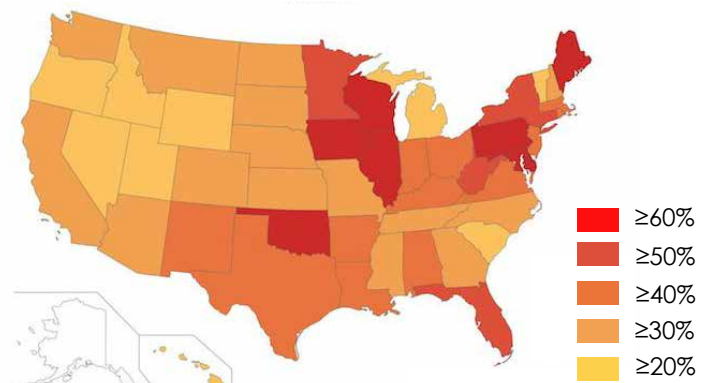
- **Clearing** of agricultural and natural land for development is a **major loss** in land suitable for pollinator habitats.
- Mono-cultural landscapes in urban developments provide **inadequate natural resources** for pollinator populations.
- Chemical treatment **damages** natural landscapes and **inhibits pollinators' biological functions** beyond initial location of the chemical application.

2014-15 Commercial Bee Colony Loss



The ability of bee colonies to sustain healthy population numbers has been impacted by development through loss of habitat and pesticide use.

Bee Colony Losses (%) in the U.S.

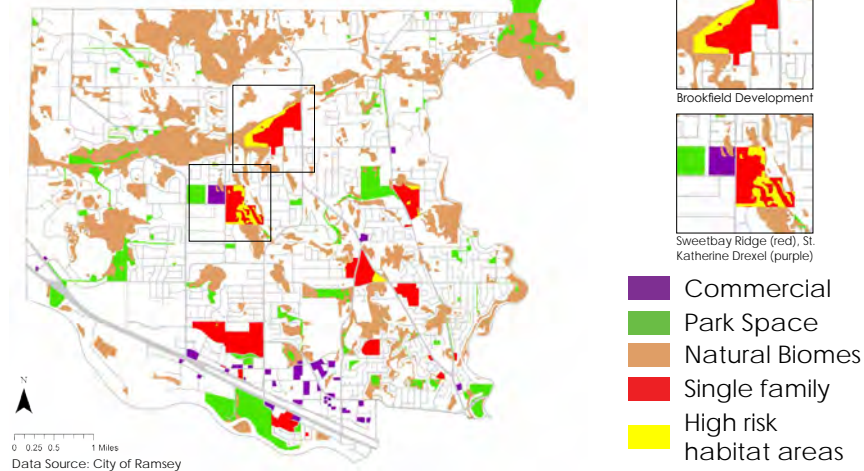


Loss of commercial bee colonies throughout the United States, as seen above, is greater than the ability of the colonies to regenerate, causing continual population decline. Minnesota is a state that is experiencing losses at or above 50%, which will impact both producers and consumers.

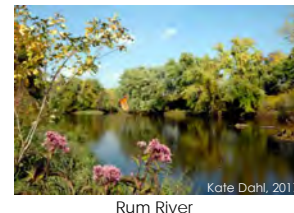
SUITABLE POLLINATOR HABITATS AND FUTURE DEVELOPMENT

Urban development in Ramsey has negatively impacted natural areas that are critical for pollinator health. It is important to consider conserving existing habitats and increasing native pollinator vegetation in existing developments.

High-Risk Urban Development Sites Within Pollinator Habitats.

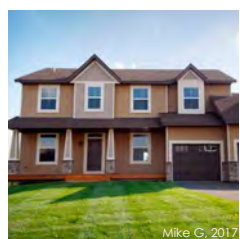


Native undeveloped landscapes provide resources for pollinators and other wildlife, as well as providing **economic and environmental benefits** in Ramsey. The city contains **significant areas of wetland** and other natural environments that are crucial for maintaining **environmental quality** for residents. They also provide centrally located pollinator habitats that are **highly visible and aesthetically pleasing**. Many of the future and recent urban developments in Ramsey are located near these **areas of significant natural resources**. Considering the possible negative impacts of urban development on the environment, the **rural character and landscape** that Ramsey residents hold in high regard may be at risk as the community develops.



POLLINATOR LANDSCAPE STRATEGIES FOR DEVELOPING CITIES

The City of Ramsey is poised to be a leader in planning for pollinators by addressing urban expansion into its natural landscapes. Residents can advocate for pollinator landscape strategies to improve the productivity and abundance of the natural landscape in Ramsey.



Single-Family Residential

Standard suburban developments can provide small niches for pollinators.

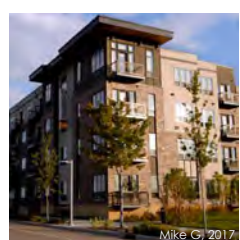
- Convert areas of turf to **flowering grasses**
- Leave decaying plant material in place
- Populate open soil with diverse natives
- Provide constructed dwellings for pollinators



Open Space

Large, continuous natural landscapes provide the necessary resources for a pollinator to thrive.

- Mix in native grasses and flowers turf
- Use larger plots for park space



Apartment and Mixed Use

Large complexes can incorporate smaller green spaces not typically available to pollinators.

- Use green roofs to support vegetation
- Use balcony spaces for native plantings
- Plant native trees and landscapes nearby



Highways

Transportation corridors provide connections between different habitats, supporting increased diversity.

- Line corridors with native flowering plants
- Loosely cover earth for ground dwellings

Project outline:



Bee-ing Ramsey

Pollinators: Types and Habitats



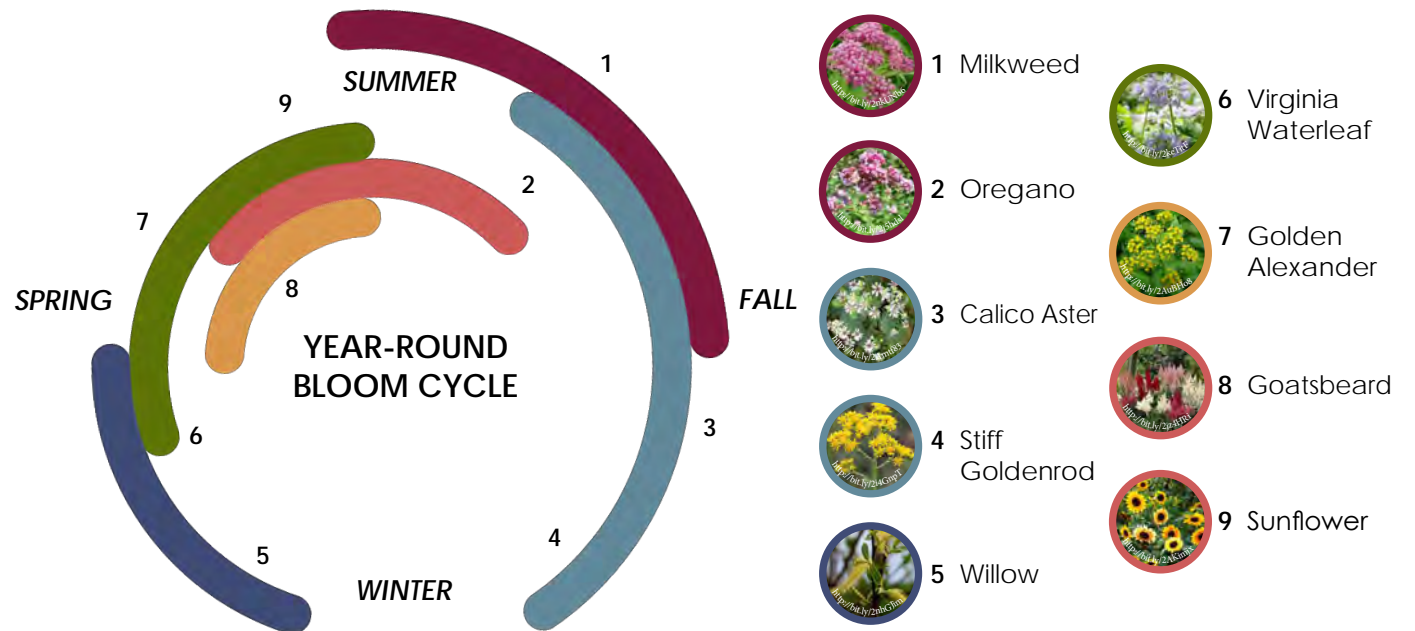
Pollinators contribute to a stable ecosystem by moving pollen from one plant to another, allowing plants that prevent soil erosion to reproduce. These plants are crucial for buffering waterways and facilitating habitats for other living organisms. In this poster we take a close look at pollinators and how they relate to landscape strategies.

ESSENTIAL POLLINATOR FLORA

Some essential flora for pollinators include **colorful flowering trees and shrubs, native grasses, and herbs.**

Ensuring that there are various types of **native flora year-round** in the city of Ramsey is a crucial strategy for maintaining pollinator habitats and populations. In addition, the **removal of invasive plant and weed species** will also aid in pollinator protection. Native plants can **withstand harsh winters**, and require less water.

The figure to the right offers some suggestions for plants that are native to Minnesota.



ESSENTIAL POLLINATOR FAUNA



BEES: With **400 native species** in Minnesota, bees are some of the best documented pollinators. They are **vital for agriculture** in the state. Unfortunately, there has been a **dramatic decline** in bee population in recent years due to **lack of floral resources** and **toxic pesticides**.



BEETLES: Beetles play a role in pollinating **various types of plants**, including large, solitary day-opening flowers. Beetles rely strongly on their **sense of smell**, so they are associated with pollinating flowers that are aromatically sweet, spicy, or fermented.



MOTHS: Moths are predominately **night-time pollinators**. They are mostly attracted to sweet-smelling, pale flowers that are more easily located after dark.



FLIES: Flies are generalist pollinators, mainly pollinating flowers that **bloom in the shade**. They are essential for pollinating small, ornamental flowers with strong, putrid scents.

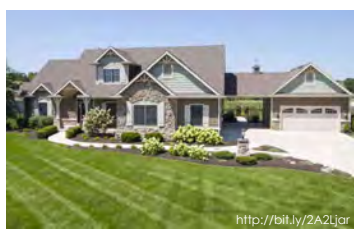


BUTTERFLIES: Butterflies, akin to moths, are diurnal and are primarily attracted to **brightly colored flowers** that exist in clusters. They require a **flat-landing surface** and enjoy living around **water permeated environments**.

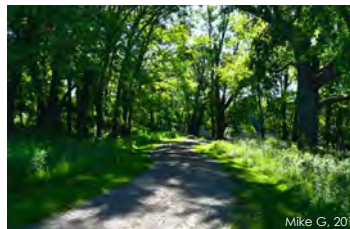


BIRDS: Birds are mainly pollinators for **tubular flowers**. Hummingbirds are a key player for these flower shapes. Due to their poor sense of smell, birds are not attracted to flowers by scent. However, **bright colors** and an **abundance of nectar** are attractors for birds.

HOTSPOTS: When identifying prospective locations for pollinator habitat, it is essential to maximize green space.



Residential: Residential gardens can offer small-scale, **edible food production**. Flower gardens are **simple additions** that benefit both the homeowner and pollinators.



Public Parks: Parks and trails allow for **bigger-scale plantings**, such as flowering trees and shrubs. In addition to providing pollinator habitat, they can provide a **cooling effect** in warmer months and **cleaner air quality**.



Balconies: Urban rooftops and balconies can make use of **neglected space**. Due to the harsher environment, these spaces are **ideal for herbs** and other edibles, such as tomatoes.



Infrastructure: Boulevard plantings allow for **native grasses** and **flowering species** that can simultaneously attract pollinators and the gaze of passersby.

There are many suitable pollinator environments found in Ramsey's urban and rural areas. In the next poster, we will look at existing biomes in Ramsey, as well as various programs and policies in place to protect the natural habitat.



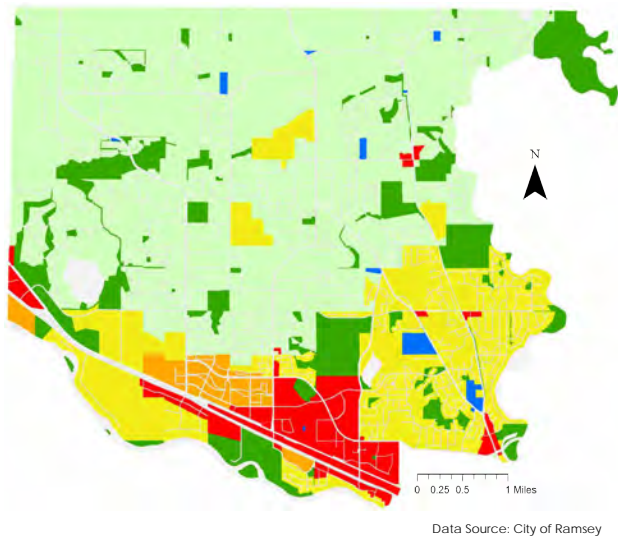
Bee-ing Ramsey

Promoting and Protecting Natural Habitat



Ramsey has diverse natural areas which are fundamental to the historic rural character of the city. This poster explores the make up of these natural areas, Ramsey's pollinator policies, and the timeline of environmental policies that have promoted and protected the natural environment.

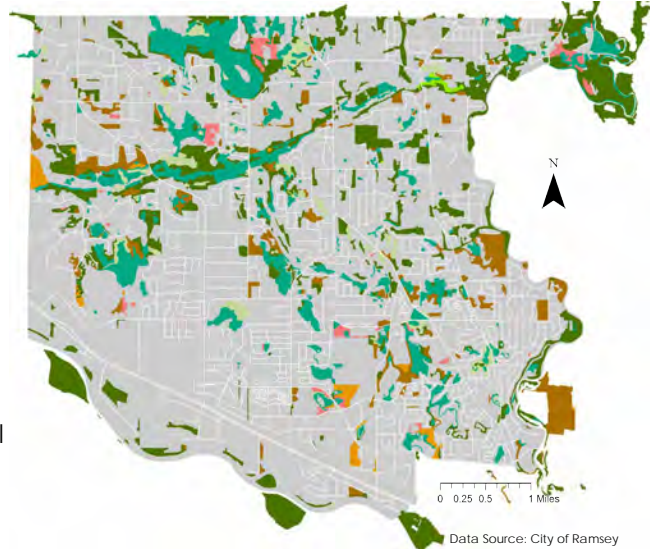
EXISTING BUILT ENVIRONMENTS



- Residential
- Commercial
- Parks
- Mixed
- Rural
- Public

- The *Existing Built Environments* map to the left shows a visual representation of the various uses of land, according to City of Ramsey officials.
- The predominance of rural areas and parks throughout the city indicates the potential for introducing pollinator friendly habitats in open spaces, but the remaining residential, public, mixed, and commercial areas are also suitable for incorporating pollinators.

EXISTING BIOMES AND CANOPY COVER



- Savanna
- Grassland
- Wetland
- Forest
- Woodland
- Prairie
- Native

- The *Existing Biomes and Canopy Cover* map to the left identifies biome types in Ramsey as well as areas with canopy cover – that is, the area covered by the leaves of trees.
- Knowing the locations of biomes and canopy coverage is important to determine ideal plant species to inhabit areas. Because pollinators have preferences for certain flowering plants, identifying areas where those plants can thrive is an initial step towards creating pollinator habitats.

POLLINATOR POLICIES IN RAMSEY: Policies that help local government and community to act in preserving and protecting pollinators.



MAYORS FOR MONARCHS

Mayors around the country are pledging to create habitats for pollinators and educate their community members regarding the importance of pollinators. Mayors commit to specific actions that fit their city to create a strategic plan. Mayor Strommen has identified potential actions below:

Link: <http://bit.ly/2AJTZSK>

Action Points for Ramsey

- Raise awareness of the decline of pollinators
- Plant a monarch demonstration garden
- Get citizens involved
- Native-plant friendly mowing practices
- Integrate milkweed on City property
- Ban neonicotinoid pesticides



TREE CITY USA

TREE CITY USA®

Tree City USA is a national program that recognizes cities and communities that are taking active steps to foster urban forests. Ramsey has been a Tree City for 21 years and counting.

Link: <http://bit.ly/2ASLvJq>

Benefits

- Urban forests planted around buildings can save the city and residents money on energy bills up to 25%.
- Trees also provide storm water management which reduces stress on infrastructure. (See [Rehydrate Ramsey](#))



COMMUNITY GARDENS

There are three community gardens in Ramsey that provide local food and opportunities for environmental education for students and local residents.

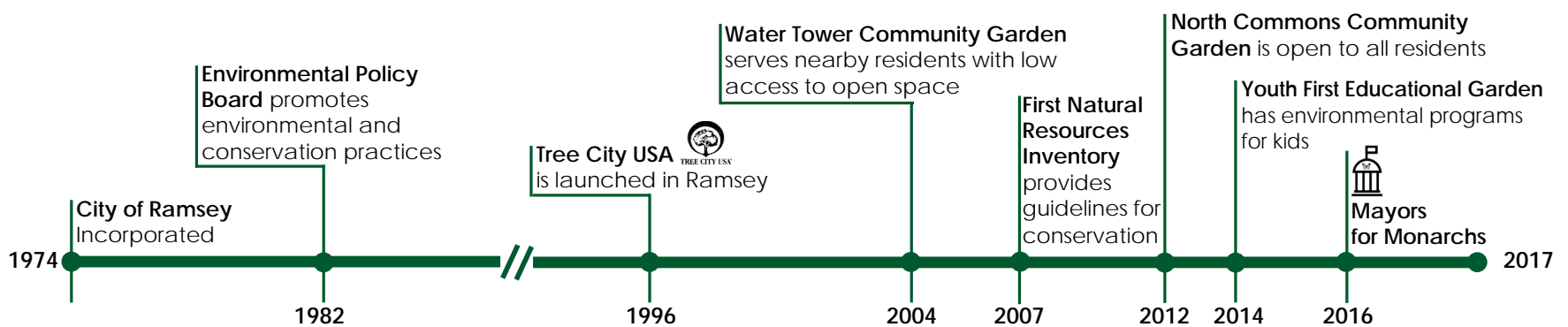
Youth First: <http://bit.ly/2kIM9II>

North Commons: <http://bit.ly/2A0T3cL> Water Tower Gardens

Benefits

- Gardens decrease water runoff, improve soil and air quality, and provide diverse habitats for pollination, all which lead to more productive agriculture.
- Water Tower Established 2004
- North Commons Established 2012
- Youth First Educational Garden Established 2016

TIMELINE OF ENVIRONMENTAL POLICIES IN RAMSEY: A majority of Ramsey's environmental policies have been enacted within the past 20 years to protect the rural characteristics of the community.



Ramsey is working to formalize natural resource protection through community engagement, organizations, and pledges. We will be looking at four common land uses within Ramsey—single family residential, high density residential, public space, and highways—to address pollinator friendly policies and best practices.



Bee-ing Ramsey

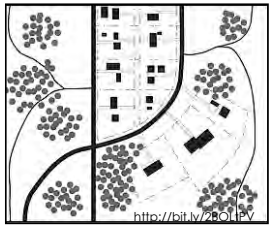
Municipal Ordinances and Best Practices



Many cities in Minnesota have adopted effective pollinator ordinances and policies. The City of Ramsey can learn from these best practices to preserve and protect pollinator habitats within the city. In this poster, we look at various municipal ordinances and best practices from communities within Minnesota.

POLLINATOR LANDSCAPE CASE STUDIES

Jackson Meadows



Characteristics:
Rural Residential
Scope of Work:
Planned unit development
Location:
St. Croix, MN

Jackson Meadows was a rural community that highly valued its surrounding open space.

Best Management Practices: Smaller cluster developments with placement close to neighboring lots. Surrounding landscape is leased for protection and designated for wildlife. These open spaces are connected by trail.

Regulation and Ordinances

- Implementation of cluster development
- Conservation easements were obtained to protect surrounding natural landscape.

Source: Jackson Meadows

Wildflower at Lake Elmo



Characteristics:
Urban Medium Density Residential
Scope of Work:
Planned Unit Development
Location:
Lake Elmo, MN

Wildflower encourages beneficial pollinator landscapes that support diverse wildlife and enrich residents' lives.

Best Management Practices: Creation of a native plant trail along a portion of the promenade. Conservation easements were given by developers for designated open space.

Regulations and Ordinances:

- Home sites required to contain at minimum 100 square feet of pollinator plantings
- Land easement given to City of Lake Elmo to preserve remaining wetland open space.

Source: Lake Elmo

Green Living Apartments



Characteristics:
Urban Complex
Scope of Work:
Apartment as built
Location:
St. Paul, MN

Green living apartments created pollinator habitat within the small plots of land outside the apartment buildings.

Best Management Practices: Creating areas of pollinator habitat within dense urban areas.

Regulations and Ordinances:

- Pollinator plantings are considered to be a "worthwhile aesthetic improvement" in line with St. Paul zoning requirements.

MnDOT Highway Pollinator Plantings



MnDOT manages open space throughout the state, including many pollinator friendly plantings.

C. L. Dees Nature Trail



This trail is located within the Sandhill Crane Wildlife Refuge, and is lined with native plants. The trail is an easy walk, making it accessible to most residents.

Edgewater Condominiums Green Roof



This green roof is 3,800 square feet and has saved over 70,000 gallons of water from entering the sewers by using native plants.

NATIVE LANDSCAPE ORDINANCES

The language in land use ordinances is very important for promoting and preserving pollinator habitat because it sets the rules and regulations for the appearance and quality of the habitat. The following cities throughout Minnesota have adopted ordinance language that promotes pollinators. Best practices are highlighted below.



Pollinators need large areas, with habitat and nesting grounds that are clearly delineated

Burnsville: Defining the Key Terms

- "Meadow Vegetation: Grasses and flowering broadleaf plants that are **native to, or adapted to the state of Minnesota**, and that are commonly found in **meadow and prairie plant communities**, except weeds."
- "Turf Grasses: Grasses commonly used in **regularly cut lawn areas**, such as bluegrass, fescue and rye grass blends, and non-woody vegetation interspersed with them."

Native Planting Ordinances

- "The **prior vegetation is eliminated** and the native vegetation is planted through **transplanting** or seed by human or mechanical means."
- "If weeds cover more than twenty five percent of the planting, it must be **cut to a height of no more than eight inches (8")** at least once per year."
- "A **sign is posted** on the property in a location likely to be **seen by the public**, advising that a meadow or prairie is being established."



Pollinators need connected habitats in order to travel. These need to be specifically designated.

White Bear Lake: Native Grass Ordinances

- "Native grasses **indigenous to Minnesota**, planted and maintained on any occupied lot or parcel of land, setback a **minimum of twenty feet (20')** feet from the front property line as part of a garden or landscape treatment are exempt from this ordinance."

St. Paul: Park Designation Criteria

- "Areas representing **significant landforms**, native plant communities, **sensitive habitat**, or historical events."
- "Areas containing **vegetation identified as endangered or threatened**, or that provide **habitat for animals** identified as endangered, threatened, or of special concern under 15 U.S.C. § 1531 et seq. or Minn. Stats. § 84.0895, and rules adopted under these respective laws."



Different pollinators need varying types of pollinating plants to provide different functions.

Mankato: Designing for a Greener Environment

- "**Preserving** existing healthy and long-lived trees whenever possible."
- "**Designing** drainage facilities to **promote** the use and **conservation** of natural watercourse and patterns of drainage."
- "**Minimizing** alterations to existing topography in environmentally sensitive areas."

Designing for Visually Pleasing Landscapes

- "Promoting the use of plant material **compatible with the climate** of the region and micro-climate conditions on the site."
- "**Ensuring** that plant material can be **maintained for long-term health** and continued growth."
- "Ensuring that the arrangement of required landscaping produces the **desired visual effect**."

Ramsey can expand on current practices and ordinance language to more fully promote and protect pollinator habitats within the city. In the following poster, we begin looking at how pollinator habitats can be integrated into residential landscapes.

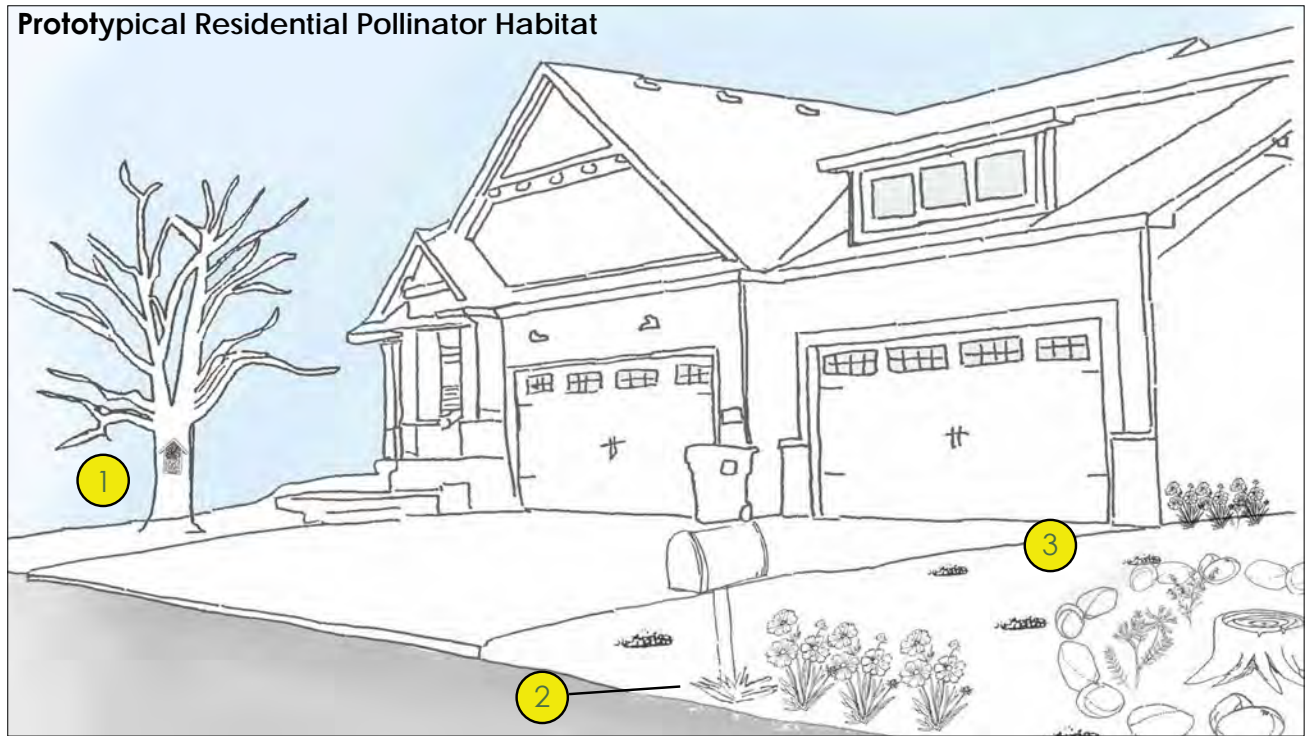
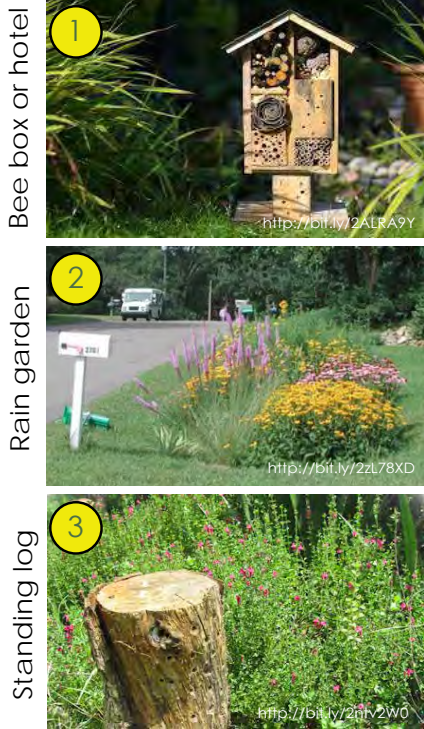


Bee-ing Ramsey

Single-Family Residential



Manicured yards do not have the capacity to sustain pollinator populations. There are many benefits to incorporating native plantings into a single-family home. This poster examines the landscapes of suburban homes and addresses how families can benefit environmentally, economically, and equitably by incorporating pollinator-friendly habitats.



ECONOMIC BENEFITS

- Because native plants need **much less watering**, residential water usage will decrease, helping to **avoid high water bills**.
- The Environmental Protection Agency (EPA) estimates that over a 20-year period, the **cost of maintaining native landscapes** totals about \$3,000/acre, versus \$20,000/acre for non-native turf lawns.

ENVIRONMENTAL BENEFITS

- 20% of landfill waste is yard clippings. If yards are mowed less frequently, it will be a **win-win** for both residents and pollinators. Increased plant diversity will **improve soil quality**, resulting in **less water runoff** and replenishing ground water sources.
- Residents can help **improve air quality** throughout the entire city by cultivating native gardens. Native plants not only pull and store excess carbon dioxide from the air, they also help **mitigate air pollution** by eliminating the need for constant mowing.

EQUITABLE BENEFITS

- Inviting pollinator presence and pollination throughout the city, and effectively the county, will **provide healthy, locally grown produce to feed families**. This allows all residents of Ramsey to have **equal access to nutritious foods** free from excessive commercial pesticides.

CHALLENGES

• Building residential homes without considering natural resources reduces pollinator habitats, which provide nesting areas and environmental services.

• Open spaces ideal for pollinators are disconnected in residential areas, making it difficult for pollinators to access resources needed for survival.

• Increasing the diversity of plant types on private properties can dramatically increase pollinator presence.

OPPORTUNITIES

• Include habitat in built environments to maximize potential habitats for pollinators.

• Front and back yards can be useful connectors because they provide livable ecosystems for pollinators.

• There is an important distinction between unfettered growth of lawns and actively making the switch to native plants that require less grooming and provide more biodiversity.

IMPLEMENTATION

- Leave tree stumps and fallen logs for pollinator reproduction
- Use native flowering plants
- Fill a birdbath with gravel and water for pollinators
- Plant dense shrubs for nesting

- Apply landscaping ordinances in residential areas designed to maintain native plant species beneficial for pollinators

- Draft weed ordinances for Ramsey
- Encourage lawns to be at least 3.5"
- Incentivize native grasses over common turf-lawns

Native habitats in the landscape of single-family homes, both by City regulation and residential maintenance, will help preserve the rural character of Ramsey while decreasing economic costs of upkeep. In the next poster, we explore mixed-use developments and how they can maximize pollinator habitats in an urban space.



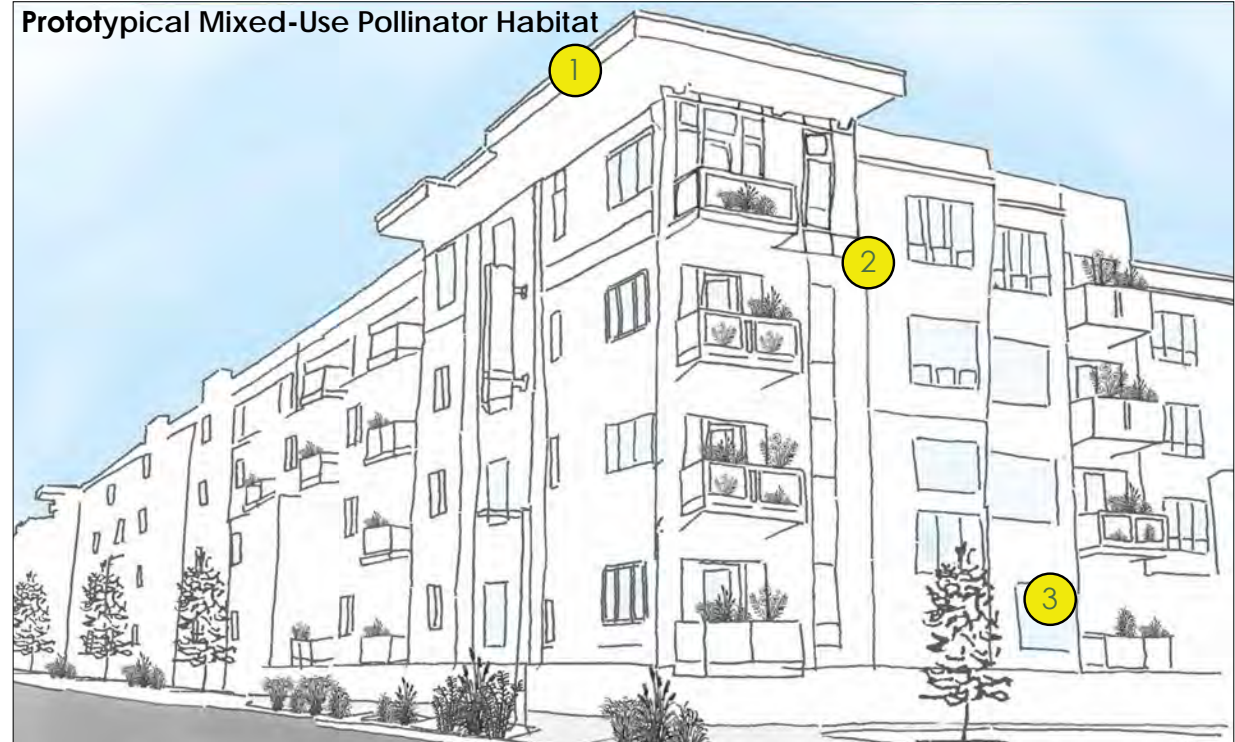
*See poster 9 for Ramsey-specific opportunities

Bee-ing Ramsey

Apartments and Mixed-Use Developments



Natural, native habitats in apartment and mixed-use developments can be platforms to sustain pollinators. In this poster, we discuss solutions to three major challenges of pollinator implementation, in addition to the benefits the residents of Ramsey can realize by implementing small changes in mixed-use developments.



ECONOMIC BENEFITS

- Local businesses, such as local plant nursery Green Valley Greenhouse, can **benefit from residents purchasing** their products to furnish their urban green spaces.
- Decreased water runoff from high-density buildings implementing pollinator habitats **reduces stress on municipal storm water infrastructure.**

ENVIRONMENTAL BENEFITS

- Because smaller pollinators do not fly more than 200 yards away from their nest, **providing bee boxes and hotels in an urban area** can draw in pollinators and subsequent benefits into the city.
- Native plants in rain gardens are more water efficient compared to traditional plantings and control pollution** from storm water runoff.
- Plantings absorb more water and are more stable, and the **resulting improved soils** allow ground water to be replenished more efficiently.

EQUITABLE BENEFITS

- Having pollinator **habitat within dense urban centers** allows pollinators to survive where they would otherwise be unable. This allows more people to **enjoy the benefits of pollinators** and the **positive externalities** they provide.
- Adding to existing landscaping, or changing the existing landscape to pollinator habitat, will make the city more sustainable by **decreasing water usage, improving soil and air quality**, and potentially increase pollination rates in local agriculture or gardens.

CHALLENGES

- Developing land without considering effects on natural resources reduces pollinator habitats, which provide nesting areas and environmental services.**
- Mixed-use developments can disrupt pollinator habitat connectivity, making it difficult for pollinators to access essential resources.**
- Using all available spaces within a mixed-use, urban development for pollinator habitats allows for increased biodiversity.**

OPPORTUNITIES

- Apartments and mixed-use developments can use rooftops and balconies to provide nesting habitat for pollinators.
- Large buildings can provide refuge for pollinators traveling between open spaces, and can help establish urban pollinator populations.
- It is important to provide a wide range of native plant types. This accommodates the needs of many types of pollinators and fulfills the year-round bloom cycle.

IMPLEMENTATION

- Bee blocks
- Uncompacted soil in landscaping
- Bee hotels
- Green roofs
- Floor boxes on balconies
- Green roofs
- Landscaping ordinances for natural plants
- Planter boxes with a variety of plants
- Prioritizing native species of plants

High-density, mixed-use developments provide a unique opportunity for native habitats within the Center of Ramsey (COR), allowing pollinators in Ramsey to thrive. In the next poster, we will look at how public park spaces can provide habitats for both humans and pollinators.



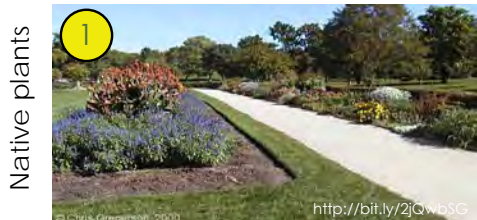
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Bee-ing Ramsey

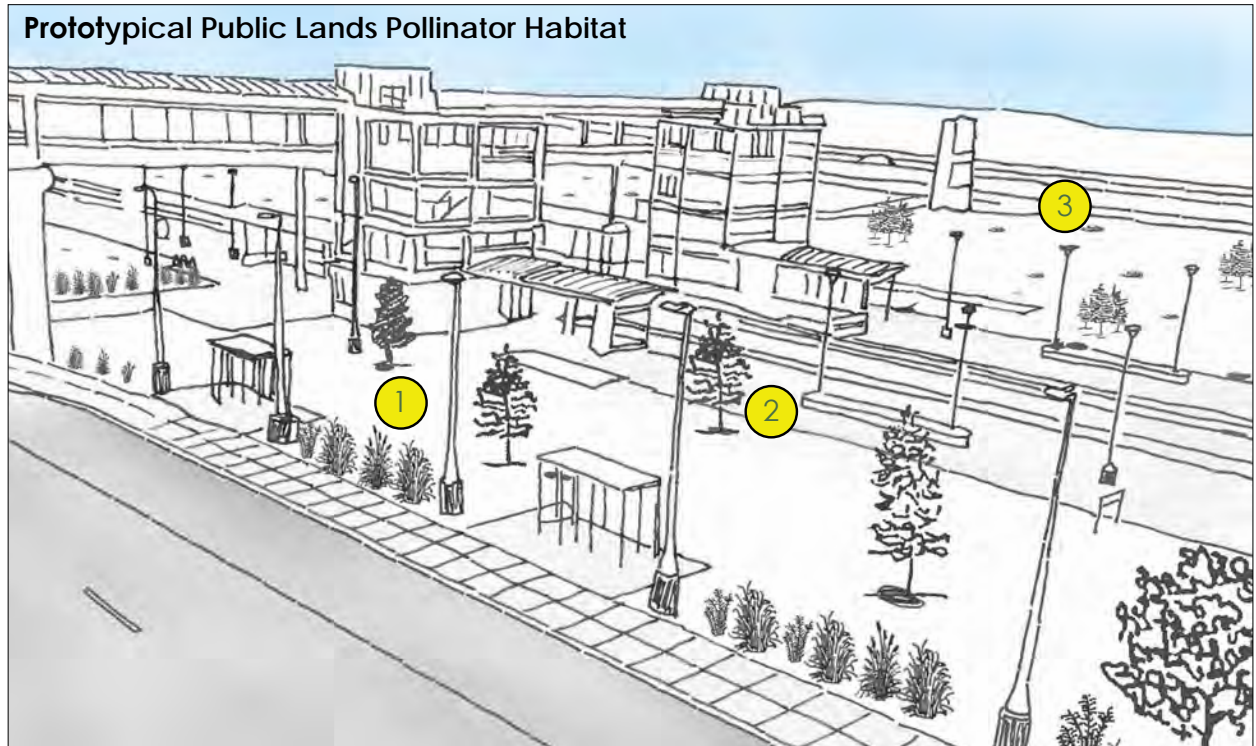
Open Space



Public land offers larger swatches of open space that **preserve natural landscapes** for pollinators and **improve living conditions** for residents through exposure to diverse greenscapes. In this poster, we discuss strategies to create diverse habitats within public parks.



(To explore greenway opportunities, see Circle of Ramsey posters)



ECONOMIC BENEFITS

- Pollinator habitats are **better suited to natural environments** and are more efficient for drainage. Fields will be **usable more frequently** for recreation activity.
- Seeds can be collected from pollinator plants and used for **further expansion of native park landscapes**.
- Parks with pollinator habitat may require less maintenance, **minimizing cost** while providing greater **environmental benefits**.

CHALLENGES

- **Open spaces designed without pollinator habitats diminish natural resources that provide nesting areas and environmental services.**
- **Open spaces ideal for pollinators are often disconnected, making it difficult for pollinators to access resources needed for survival.**
- **Not having enough native plant diversity in public parks decreases pollinator presence.**

ENVIRONMENTAL BENEFITS

- Large patches of prairie provide **better water recharge capabilities**, and **double the infiltration rates** of standard turf grass.
- Pollinator grasses offer **increased resistance to drought and flooding**, and survive with **fewer resources and less maintenance**.

OPPORTUNITIES

- Parklands can be planted with natural vegetation, thus mimicking the productive landscapes that were lost to development.
- Plant and preserve parklands located close to trails, natural corridors, and long transportation corridors.
- Increasing the diversity of plant types in public spaces can dramatically increase pollinator presence.
- Mix in native landscapes with typical recreation park fields to create hybrids.

EQUITABLE BENEFITS

- Public landscapes provide **higher density developments access to open space**, while connecting the rural, agricultural landscapes in Ramsey with the urbanized areas near The COR.
- Open space provides **educational opportunities** for park-goers regarding the benefits of native plantings, as well as demonstration plots that show how they can **implement changes in their own yards**.

IMPLEMENTATION

- Create designated pollinator gardens within park space
- Install large-scale bee boxes or hotels
- Promote development of larger open spaces rather than small unproductive fragments.
- Plant native species that may be less desirable to homeowners

Open space can provide ecological connectivity within an urban environment and large areas of pollinator habitat. Pollinator habitats rely on movement of pollinators between landscapes to fulfill their productive capacities. In the next poster, we look at the final land use type: transportation corridors.

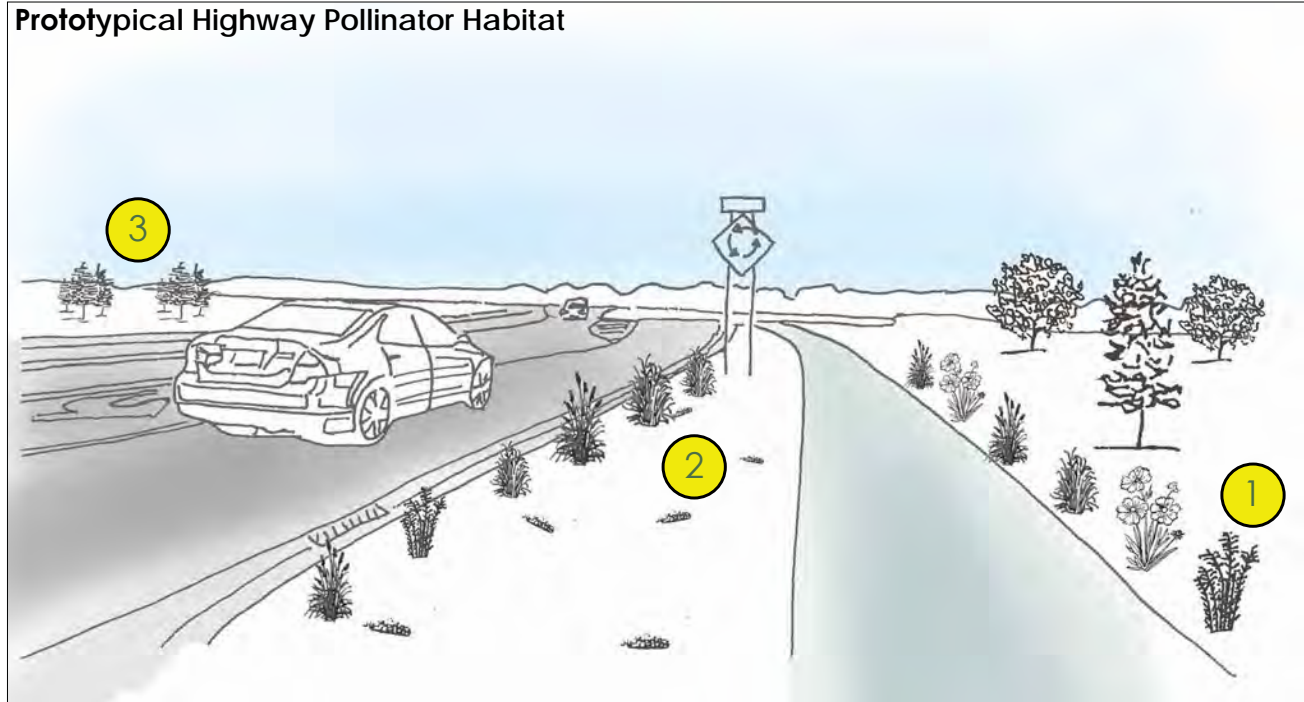


Bee-ing Ramsey

Transportation Corridors



Creating pollinator habitats along transportation corridors can decrease costly maintenance while providing environmental benefits for both Ramsey and pollinators. In this poster, we examine ways that highways and medians provide extensive pollinator habitats with attention towards landscaping with native plants.



ECONOMIC BENEFITS

- The **cost of maintenance** along highways and corridors **will decrease** because established pollinator habitat will not need to be mowed frequently.
- **Infrastructure costs will decrease** because more water will be filtered into the ground, reducing the need for storm water pipes.
- **Roadside pollinator landscapes** reduce snow drifting and water overflow, lessening city service costs.

ENVIRONMENTAL BENEFITS

- There will be reduced greenhouse gas emissions from **less frequent mowing along highways and medians.**
- Improved soil quality will **replenish and filter** ground water and decrease soil erosion.
- **Denser plant and tree coverage** near highways will help **decrease urban heat island effect.**
- Native canopy cover and plantings will provide habitat for pollinators of all types, **increasing biodiversity.**

EQUITABLE BENEFITS

- Connecting pollinators habitats within urban centers can **improve air and water quality.**
- **Health benefits from access to open space** will be enjoyed by those living in the **core of the city as well as along the periphery.**
- **Native plants decrease runoff from highways and reduce flooding** because of increased soil drainage. This can have dramatic effects for **localities prone to flooding.**

CHALLENGES

- **Highway development without considering natural resources can reduce pollinator habitats which provide nesting areas and environmental services.**
- **Roadside spaces next to highways are underutilized as patches of native plants that can connect pollinator habitats.**
- **Current green spaces near highways have low diversity in plant types that can support pollinator species.**

OPPORTUNITIES

- Green spaces along corridors and highways can be converted into native landscape to provide large amounts of nesting ground and improve the quality of the soil.
- Long stretches of native habitat that run parallel to corridors and highways can connect pollinators to different urban areas and provide large quantities of resources.
- Increasing the diversity of plant types in public spaces can dramatically increase pollinator presence.

IMPLEMENTATION

- Leave fallen trees for pollinator nests
- Prevent soil from compacting and leave bare patches for ground nesters.
- Replace turf grass with native plants along stretches of highway
- Sow native seed mixes that require minimal care

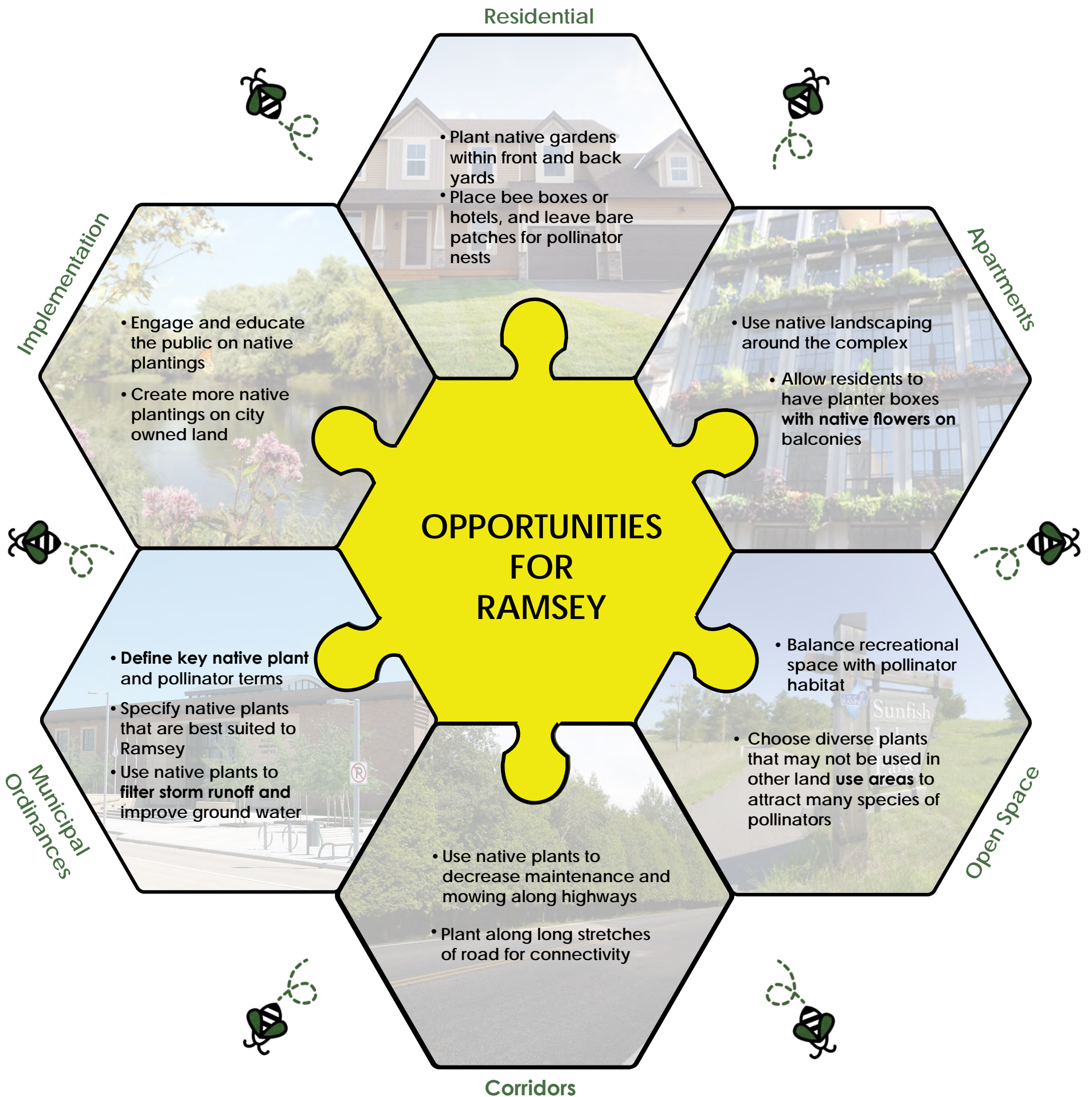
There is ample space along highways that can be used to connect pollinator habitats throughout the city. In the final poster, we take a look at how these four land-use types and ordinances can work together to preserve Ramsey's natural resources.



*See poster 9 for Ramsey-specific opportunities

Bee-ing Ramsey

What Ramsey Can Do



To protect pollinator habitat and natural resources, the City of Ramsey should implement ordinances that encourage natural landscapes on residential lots, apartments, open spaces, and along highways. The efficiency of pollinator plantings brings economic benefits to the city by decreasing maintenance, lowering water usage, and improving city infrastructure. Preserving and restoring native plants will increase soil and air quality throughout the city, and improve the health of all residents.

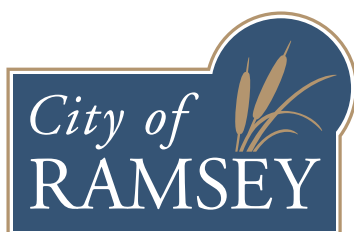
Rehydrate Ramsey: Strengthening, Enhancing, and Protecting Water Resources



Prepared by
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The contents of this report represent the views of the authors, and do not necessarily reflect those of RCP, CURA, the Regents of the University of Minnesota, or the City of Ramsey.



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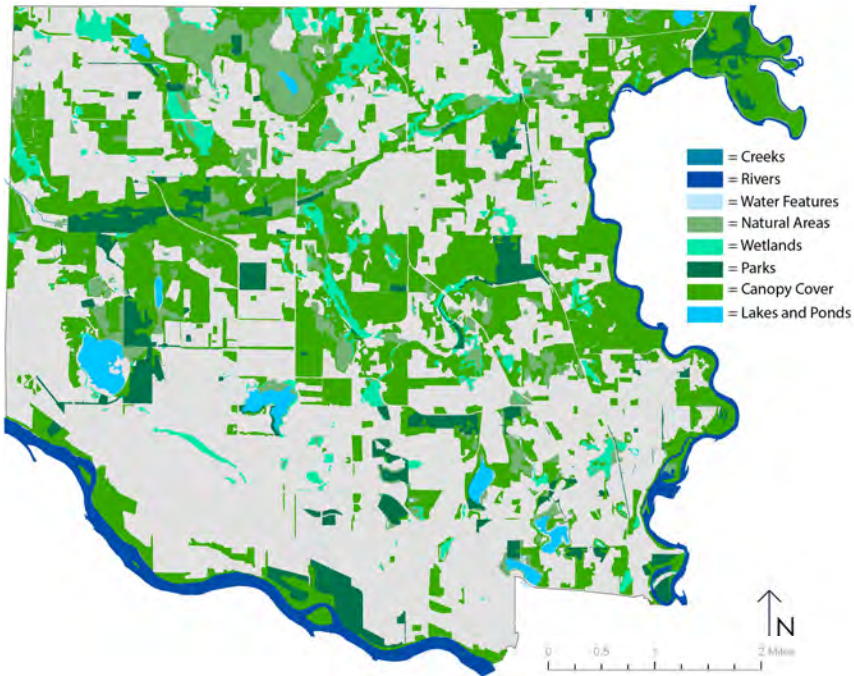
Rehydrate Ramsey

1

Strengthening, Enhancing, and Protecting Water Resources

The City of Ramsey is rich in water resources, including the Mississippi River, Rum River, various lakes, and scores of wetlands. As the City updates its comprehensive plan, it aims to **develop innovative strategies to identify, protect and communicate the value of water resources to the public**. By ensuring a high-quality, reliable water supply for all users through economically viable conservation solutions, the City can secure quality of life for years to come. In this project we identify the importance of water resources, the challenges Ramsey may face if protection and conservation efforts are not enhanced, and the value that could be realized from a proactive approach.

Map of Natural Features for the City of Ramsey



The map to the left illustrates the multitude of natural resources in the City of Ramsey. Regional governance bodies have expressed concern with the state of water resources in particular.

*"The DNR and Metropolitan Council (Met Council) have expressed concern that development and increasing water demand in...Ramsey may exceed their groundwater resources to sustain both human and ecological needs."*¹

Following this charge, this project focuses on water resources. They are a vital part of everyday life for Ramsey residents, from household and commercial activities to recreational uses.



THE GOALS OF THIS PROJECT:

- Identify best practices or strategies for inventorying Ramsey's water resources and prioritizing high-value water resources for protection or restoration.
- Identify best practices or strategies to conserve, restore, and/or enhance water resources through incentives, regulatory controls, public-private partnerships, and other mechanisms.
- Frame Concepts for developing a comprehensive outreach program focused on communicating the value of water resource protection to residents, business owners, and future land developers.

THE METHODS OF THIS PROJECT:

- Review water resource inventory precedents, including Ramsey's past Natural Resource and Wetland inventories.
- Research inventory, conservation, and outreach best practices from similar communities in Minnesota and beyond.
- Conduct four land use analyses focused on Water Assets, Water Conservation, Groundwater Quality, and Stormwater Management to inform best practices and recommendations.

WHY REHYDRATE RAMSEY?

ECONOMIC BENEFITS



Clean water resources improve the bottom lines of businesses, cities and private residents. As we explore the water resources of Ramsey we will outline the savings that accompany conservation.



PRESERVING RAMSEY'S CHARACTER

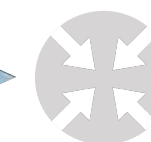
Keeping our water resources clean and plentiful allows the community to continue enjoying its beautiful natural amenities.



RAMSEY'S HEALTH

Currently the water supply for Ramsey is shrinking. With population increases we need to ensure that both present and future residents have access to clean water.

PROJECT OUTLINE



INTRODUCTION

INVENTORY

WATER ASSETS

CONSERVE

GROUNDWATER

STORMWATER

BEST PRACTICES

BENEFITS

CONCLUSION

As Ramsey updates its comprehensive plan, conversations around the value of water will be essential to the process. Understanding the role that water plays in economic vitality, community character, and population health is key to crafting an effective and citizen-supported water protection plan. The first step in this process is to complete an updated water resources inventory that accurately defines the risks and opportunities present across Ramsey's water assets. In the next poster, we take the first step by exploring inventory precedents.



Rehydrate Ramsey

2

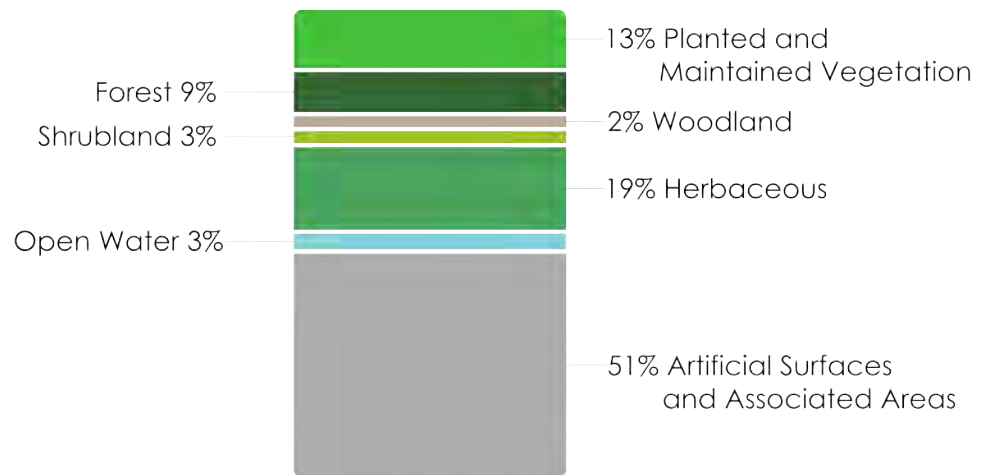
Inventory Precedents + Next Steps

An updated water resources inventory will allow the City of Ramsey to accurately assess the risks to existing water assets and devise targeted solutions to address them. In this poster we present selected observations from two previous inventories to show the value of existing precedents, then suggest a framework for moving forward. By building on the valuable observations from past reports, the City can create a foundation to invest in water security for the economic vitality and the well-being of the community.

NATURAL RESOURCE INVENTORY: PRECEDENT 1

In 2007, with the help of a consultant, the City of Ramsey completed a Natural Resource Inventory. The stacked bar chart at right shows the distribution of land cover within the city's borders. Open water, which includes lakes, rivers, and creeks, makes up 3% of the more than 19,000 acres that form the city's total area. Another 22% is comprised of wetland cover, which includes the Shrubland and Herbaceous categories at right. The full list of goals and objectives for the inventory included the following, among others:

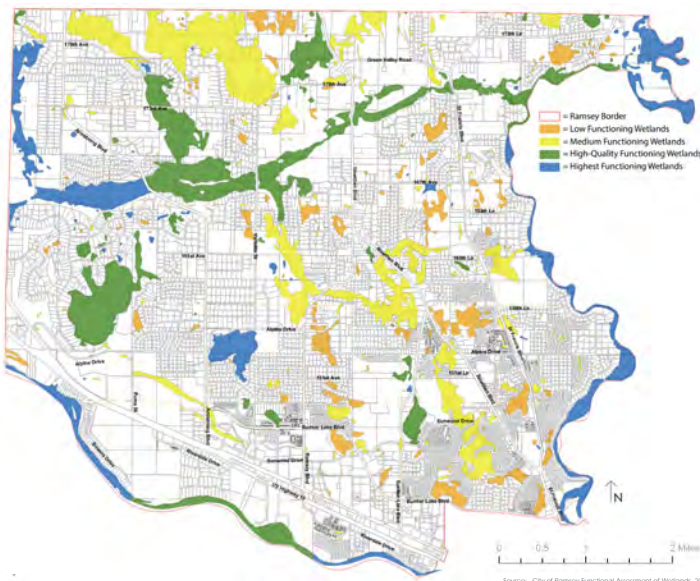
- Identify and inventory significant natural areas.
- Locate and complete a field evaluation of Natural areas
- Guide policy development
- Identify:
 - Open space with public value
 - Natural areas with restoration potential
 - Potential/suitable greenway corridors



Source: City of Ramsey Natural Resource Inventory, 2007

WETLAND INVENTORY: PRECEDENT 2

Wetland Management Classification Map for the City of Ramsey



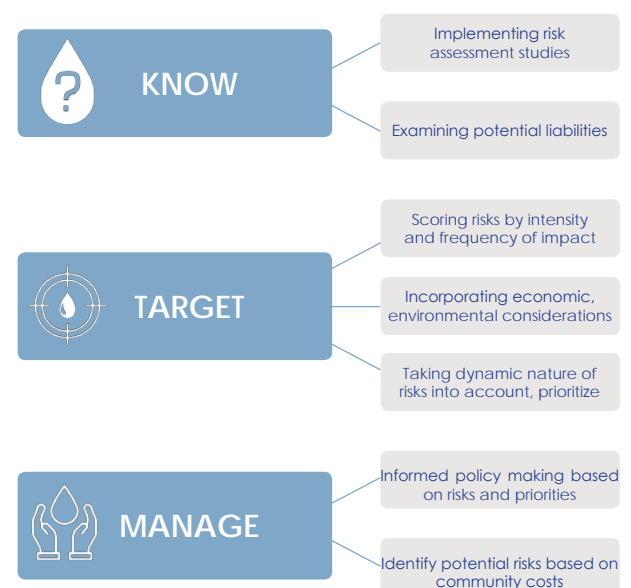
In 2006–2007, the City of Ramsey also completed a functional assessment of wetlands. Consultants used GIS data to identify and classify 349 wetlands, and at the City's request 136 received full field assessments. Each wetland was assigned to one of four categories based on quality, which can be seen in the map at left. Wetlands are classified into one of four categories based on at least one of the characteristics described in the partial list below:

- **Exceptional and highest functioning wetlands**
Exceptional vegetation, wildlife habitat and fish habitat. High shoreline protection and water quality.
- **High-Quality Wetlands**
High vegetation, wildlife habitat and fish habitat. Medium shoreline protection and high water quality.
- **Medium Functioning Wetlands**
Medium vegetation, wildlife habitat and fish habitat. Low shoreline protection.
- **Low Functioning Wetlands**
Low vegetation. All others not fitting the above categories

WHAT DOES A NEW INVENTORY LOOK LIKE?

In the future, we recommend the City of Ramsey develop a comprehensive integrated water resource inventory that incorporates community values and uses models similar to the water risk-management tool to the right. This model provides guidance in prioritizing and targeting water risks, identifying the acceptable level of risk, and designing local water policy, legislation, regulations and institutional responses that are appropriate to the extent of the risk.

Future inventories and assessments should also rely on and reference community values. In the 2007 Natural Resource Inventory referenced above, Ramsey's community values were used to frame the purpose of the inventory, which increases community support. The final report for the wetland assessment did not address these values, and as a result appears less useful in communication with the public.



Completing an updated water resource inventory will involve the identification of Ramsey's many water assets. Painting an accurate picture of the current state of these valuable resources will help the community craft targeted next steps for improvement. In the next poster, we explore a selection of Ramsey's rivers, lakes, and wetlands.



Rehydrate Ramsey

3

Identifying Water Assets

Water assets include valued water resources, such as lakes, rivers, and wetlands located in the City of Ramsey. It is important to identify the city's water assets because they are essential to the city's physical, social, and economic health. **The identification of the challenges and opportunities of water asset management is crucial to envisioning a sustainable and resilient Ramsey.** In this poster we will examine a few existing water assets in the City of Ramsey.

WHAT DO RAMSEY'S WATER ASSETS LOOK LIKE?



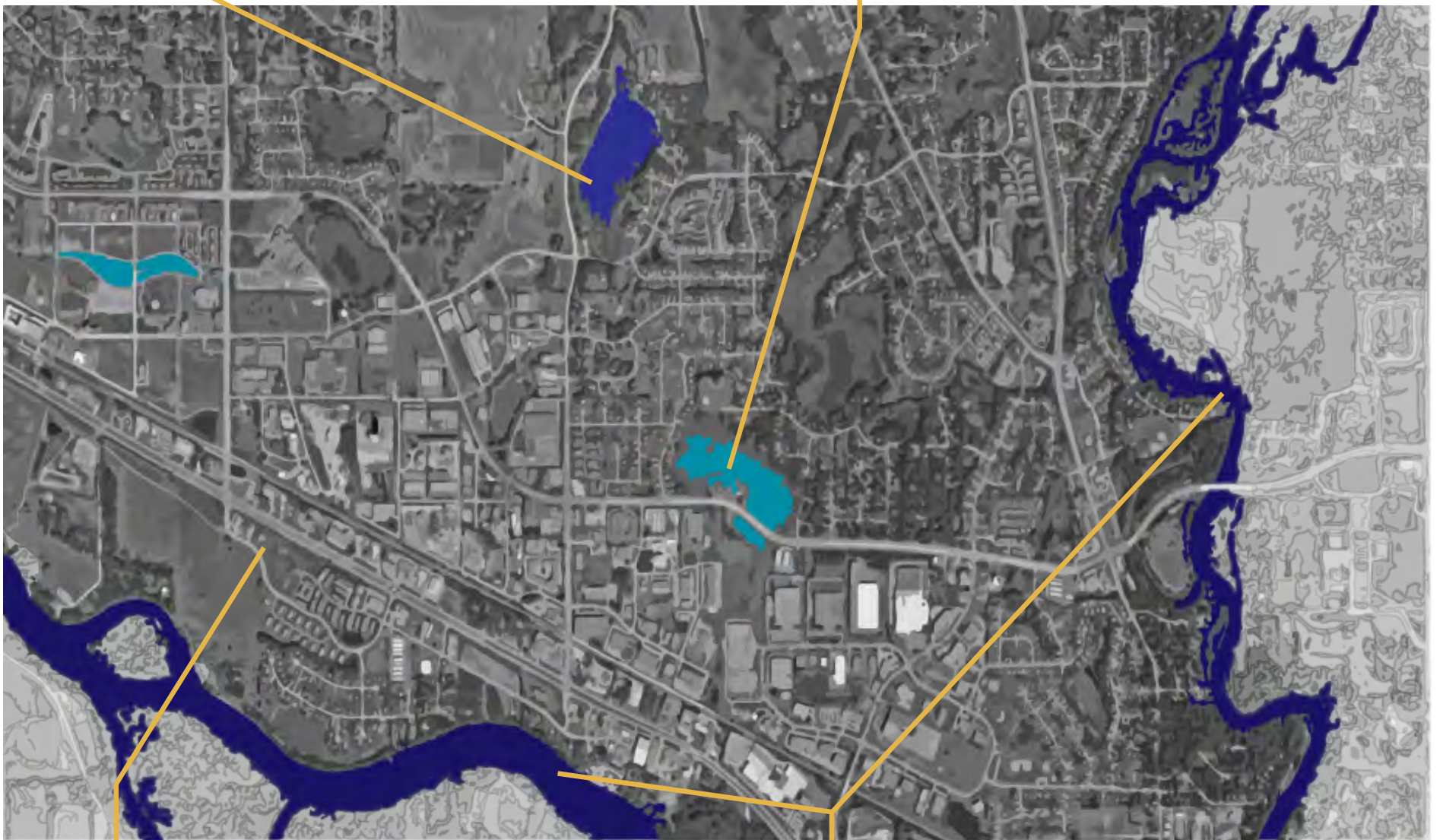
Lakes such as Sunfish Lake respond to changes in inflows and outflows, which have led to drying of shoreline habitats. Lakes are particularly sensitive to increases in sediment concentrations and chemical pollution. Protecting this water resource from sewage and fertilizer runoff is vital to improving its quality.

Challenge: Nutrient pollution
Opportunity: Recreational amenities



Wetlands in Ramsey are susceptible to development and pollution from urban runoff. Wetlands provide flood protection, shoreline erosion control, and opportunities for recreation and aesthetic appreciation.

Challenge: Loss to development
Opportunity: Natural flood protection



Recognizing that Ramsey gets 100% of its water supply from groundwater is vital to protect this resource for future growth. Groundwater in Ramsey is currently affected by high levels of extraction, calling into question its long-term viability as a water source.

Challenge: Depletion
Opportunity: Increased water supply



The Mississippi River and Rum River are currently affected by erosion and sediment transport. The release of large loads of contaminants into waterways increases soil and water impairment (including salinity), impacting many uses such as recreation, consumption and overall public health. (See [Mississippi Shoreline project](#) for details).

Challenge: Shoreline erosion
Opportunity: Improved wildlife habitat



To protect its unique set of water assets, the City of Ramsey will have to deploy a range of innovative conservation solutions. From rainwater harvesting to increased street sweeping, steps must be taken to alleviate the strain on groundwater, reduce the amount of pollution entering wildlife habitat, and address a host of other water-related issues. In the next poster, we address the need for conservation and introduce an initial set of solutions.



Rehydrate Ramsey

4

Conserving Water for Generations to Come

The City of Ramsey is consistently one of the **top ten users of water in the Metro area**, and if Ramsey continues at this rate of consumption, they will have to retrofit their water infrastructure in the future to sustain the population. This will cost millions of dollars. This poster evaluates options to **conserve water now**.



MORE USE TODAY = LESS WATER FOR TOMORROW

2016: Ramsey uses **600,435,000 gallons¹** of water from underground aquifers

2040: Ramsey is projected to use **1,009,571,409 gallons²** of water from underground aquifers

HOW DO WE CONSERVE?



PROTECT GROUNDWATER

The first step to conservation is to protect what you have. With groundwater being the single source for water in the city of Ramsey it is important to implement land use practices that best protect underground water immediately.

“Promote land use practices and best use practices that **minimize impacts on aquifers and maximize groundwater recharge**, where practical.”³

In urbanized areas with high percentages of impervious surfaces, water runoff increases and infiltration decreases. This results in reduced levels of groundwater and decreased water quality in our rivers, lakes, wetlands and aquifers.



In areas broken up by green space, infiltration increases and runoff decreases. Limiting impervious surfaces in Ramsey’s urban center to **35-50%** will substantially improve water quality in creeks and rivers.



Recommendation: New projects need to **implement and promote the construction of green spaces** immediately. **Grants for residential raingardens** from the city and rebates for any development which **reduces impermeable surfaces to 50% or below** are two possible strategies.

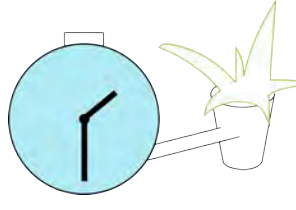


FIND OTHER SOURCES

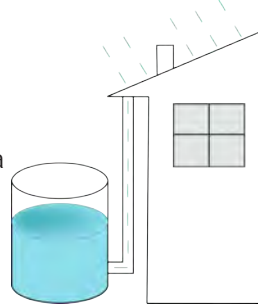
Diversifying water options is a critical step in water conservation. Ramsey should not rely on one source that can easily be depleted over time, but rather spread out water usage over various sources of drinking water.

“To **supplement groundwater and surface water**, investigate reusing treated wastewater as sources of nonpotable water to support regional growth, and when cost-effective, **implement reuse**.”⁴

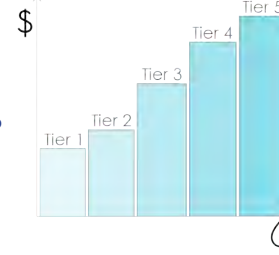
Recommendation: **Rebates for responsible irrigation.** This includes self-adjusting irrigation timers, moving to in-line irrigation from sprinklers and replacement of high-water lawns with sustainable landscapes.



Recommendation: With **rainwater harvesting**, a **1000 sq ft.** roof can harvest **11,119 gallons** a year⁶ which can be used for landscape irrigation.



Recommendation: **Increase current tiered costs for water usage:** increase rates for users that are using over **100%** of the baseline use, with increasing rates as the percentage over gets higher.



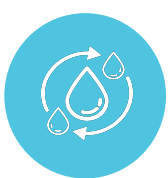
REDUCE POLLUTION

Non-point source pollution from agricultural and urban runoff is one of the biggest contributors to ground and surface water degradation. Finding ways to mitigate this pollution is critical to maintaining healthy water resources.

“Install and monitor innovative **non-point-source pollution reduction practices** at Council facilities and support economically feasible projects that demonstrate new technologies.”⁵



Recommendation: A **high-efficiency street sweeping program** that targets chemicals and organic materials that end up in our water runoff will substantially increase water quality. Street sweeping also improves visual aesthetics and road safety. Right now Ramsey conducts street sweeping in the early spring and late fall, but the practice should **continue through the summer months**, when it could have a greater effect.



Conservation is the most critical step in providing water resources for generations to come. No treatment plant can fully replenish what we’ve already used, it is only a temporary remedy to the larger problem of consumption. The way Ramsey can address this is to focus on groundwater, as we will see in the next poster.

¹ Calculated using the 2014 municipal water use data, as well as an average daily household assumption for private wells.
² Calculated using the water usage projections for Anoka County (https://www.anokacounty.com) as well as average daily household assumptions for private wells.
³ Quoted in the Metropolitan Council 2040 Water Resources Policy Plan, pg. 19 (https://www.metrocouncil.org)
⁴ See Poster # for more information.



Rehydrate Ramsey

5

Groundwater Quality Implications for Land Use

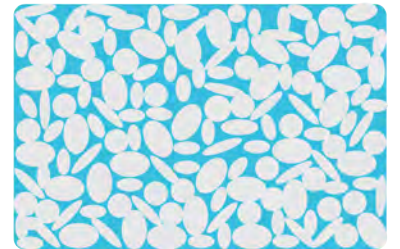
Groundwater is where Ramsey gets 100% of its drinking water, therefore it is vital to keep groundwater clean, plentiful and protected now and as Ramsey continues to grow. Groundwater sources are connected across Ramsey and beyond its borders, so it is important to look at existing land use comprehensively to understand the implications for groundwater.

RAMSEY'S SOIL AND WHAT IT MEANS FOR GROUNDWATER

Ramsey's most recognizable geologic feature is the relatively flat sand plain on which it is located. This glacially deposited sand feature is named after the county: Anoka Sand Plain. Sandy soils have large pores in between each particle which results in a high infiltration rate but does not allow for contaminants to be filtered as the water moves through the soil down into the water table.



Sand



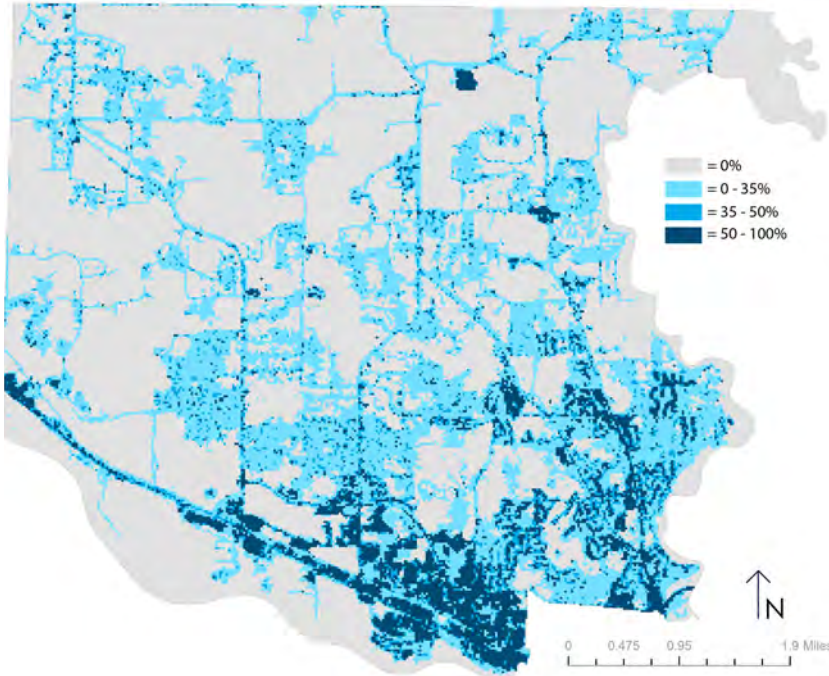
Clay

Why Does Soil Type Matter?

Drinkable water being used in urban irrigation means that clean water is moving quickly through heavily fertilized soils and into underground water reserves, resulting in contamination. The high rate of infiltration results in an overuse of water as the water moves quickly through the sand preventing plants from taking in water. In a study looking at ground water quality in the Anoka Sand Plain, homes that overwater their lawns by 3.75 cm/week of water see a 10x increase in nitrogen loss in their lawns.¹ This means that nitrogen is flowing through the soil and into the water table.

WATER INFILTRATION THROUGHOUT THE CITY

Impermeable Surface Area for the City of Ramsey



Aquifers are recharged when water has a chance to infiltrate into the ground, usually from rainfall. Ideal deep infiltration to groundwater happens at 50% or less impermeability of surface material. Currently Ramsey has areas which are 50%-100% impermeable, mostly in the urban city center.

Since Ramsey gets 100% of its water from underground sources, it is important to replenish those sources. An easy way to do this is to create infiltration zones in areas that have low permeability. These zones allow water to filter into the ground, removing contaminants and slowly refilling aquifers so that Ramsey continues to have a steady water supply.

Since the COR is slated for more development, it is important to ensure that any new development plans aim for 50% or less impermeability to increase the amount of deep water infiltration. This, combined with the current topsoil ordinance, will allow for healthy, clean water sources as Ramsey continues to expand.

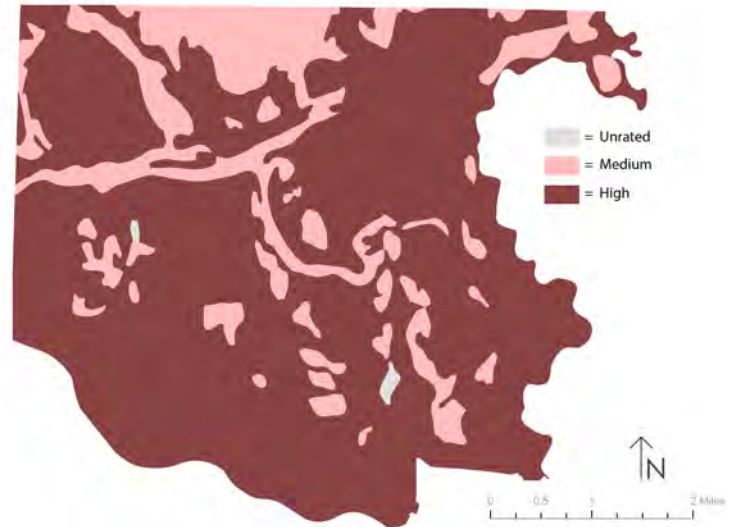
HOW DO WE PROTECT OUR GROUNDWATER?

The map to the right, created using data from the Minnesota Department of Agriculture, shows the areas that are susceptible to contamination of groundwater. It is evident that most of the city of Ramsey is high in vulnerability which means it is essential that all parts of the city follow land use practices that limit the amount of contamination that ends up in the water table.

Recommendation:

Incorporate green spaces in areas of high vulnerability that allow for infiltration without contamination. These can include rain gardens, tree wells, and permeable pavement. Suggestions can be found on posters 6 and 7.

Groundwater Vulnerability for the City of Ramsey



Now that we've taken a look at groundwater risks, the next step is to explore stormwater. Pollution carried by this excess runoff can infiltrate into groundwater and affecting drinking water supplies. In the next poster we'll take a look at urban design solutions to this problem, as well as how to deal with areas of high vulnerability.



Rehydrate Ramsey

6

Stormwater: Reducing Pollution Through Resilient Infrastructure

Stormwater is excess surface water from precipitation or flooding. Minimizing this runoff and the pollution it carries is key to a comprehensive water plan. In this poster we explore strategies to **increase infiltration and decrease runoff** through infrastructure and policy choices. We'll also examine the **unique challenges** created by the presence of Wellhead Protection Areas in Ramsey.

HOW CAN URBAN DESIGN ADDRESS STORMWATER ISSUES?



A presetting zone traps debris or other pollutants prior to infiltration.

Presetting Zone



Tree wells infiltrate stormwater and provide irrigation for street trees.

Tree Wells



Bioretention planters trap stormwater and provide a space for greenery.

Bioretention Planter



Permeable parking lanes reduce runoff by infiltrating water directly into streets.

Permeable Parking Lane

Urban areas with impervious surfaces like parking lots and streets increase the amount of polluted runoff entering bodies of water. Turning some of these areas into pervious surfaces creates a natural filtration system.



The goal of resilient stormwater design is to increase the amount of water that is absorbed where it falls rather than traveling across impervious surfaces. The photos on the left show four common examples.



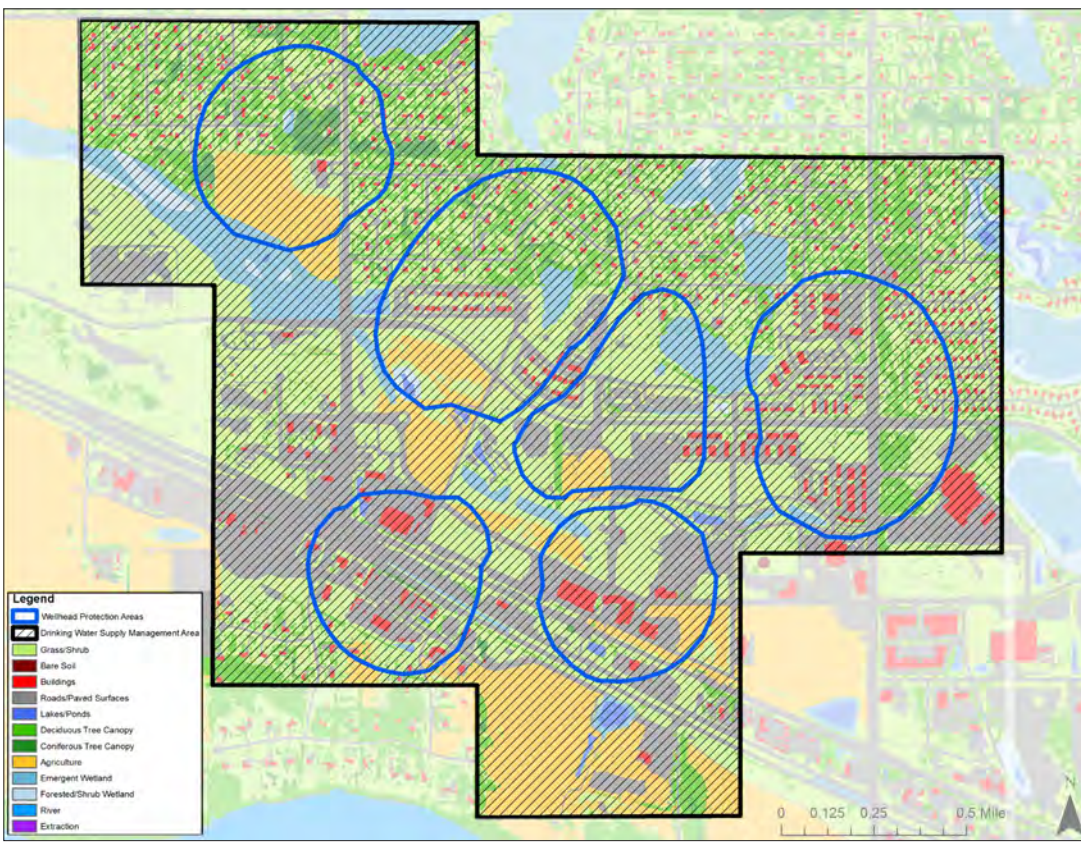
Narrow Streets for Improved Resilience

As part of the street reconstruction process in Crystal, MN, streets are being evaluated for narrowing. Permitting construction of 22-foot streets in areas with fewer than 400 daily trips not only reduces the overall share of impervious surface, it also improves pedestrian safety and reduces the cost of initial construction and lifetime maintenance. Street reconstruction also creates a perfect opportunity to implement best practices.

More information: <http://bit.ly/2ANNi2d>

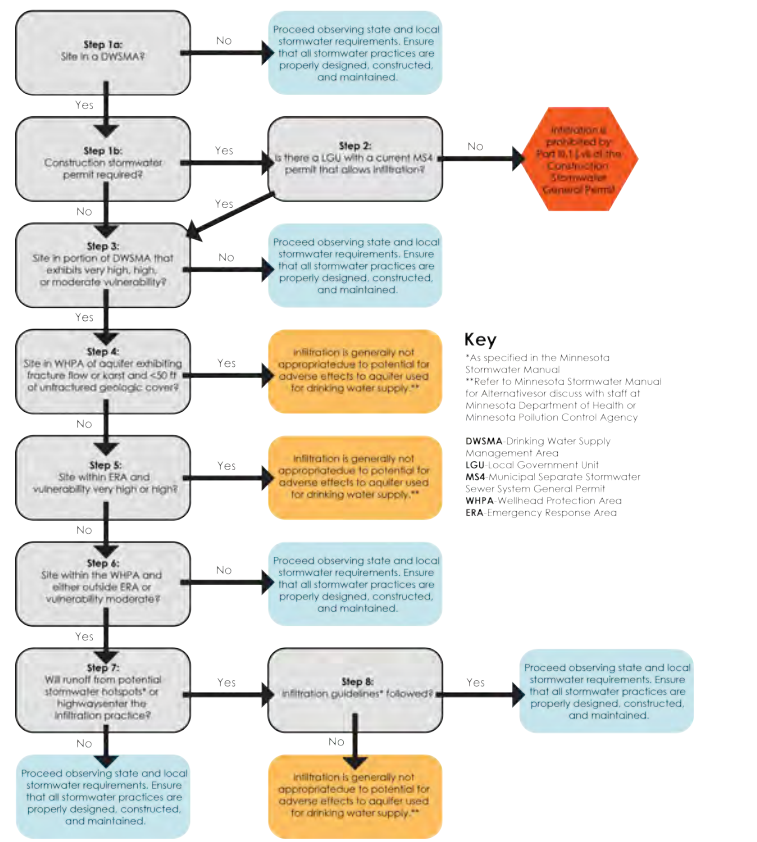
PROTECTING DRINKING WATER SOURCES FOR THE FUTURE

The Minnesota Department of Health (MDH) regulates drinking water in the state, and designates areas of vulnerability as Drinking Water Supply Management Areas (DWSMAs). MDH recommends special attention be paid to stormwater infiltration strategies in these areas to avoid drinking water contamination from infiltration. The map below shows an area of moderate drinking water vulnerability in Ramsey and areas designated as Wellhead Protection Areas. The decision tree to the right from MDH can be used to select appropriate stormwater interventions.



Wellhead Protection Areas Near the COR

Some of the WPAs have significant areas of impervious surface, making them prime candidates for the introduction of novel best practices that address stormwater issues and protect vital drinking water supplies. These practices should be incorporated into any future updates to Ramsey's Wellhead Protection Plan, a document that is required by MDH. The City is currently devising strategies to address stormwater in the COR in particular.



Now that we've examined water in Ramsey from multiple perspectives, the next step is to explore solutions. A wide range of innovative solutions are available, but we'll examine a few possibilities in detail. By combining **incentives, regulatory tools, and public-private partnerships**, we can use all the tools at our disposal to support and improve Ramsey's supply of clean water.



Rehydrate Ramsey

7

Best Practices for Management and Conservation

The City of Ramsey has tools to transform an updated water resources inventory into action to support water stewardship. Through a combination of **incentives, regulatory frameworks, and public-private partnerships**, clean water for **drinking, recreation, and industry** can be secured for years to come.



INCENTIVES

Start a "Living Cover" Revegetation Program



- Planting native grasses and other perennial vegetation (living cover) around bodies of water creates a natural filtration system
- Incentives for property owners can encourage this practice

More information: <http://bit.ly/2qXn3b>

Provide Rebates For Residential Best Practices



- Rebates give homeowners a stake in water resource protection
- They create rewards for good stewardship
- Rebates allow residents to select the best strategies for their property

More information: <http://bit.ly/2xTWKFL>

Provide Incentives to Developers for Implementing Best Practices



- Development incentives attract investment and promote conservation
- Rain gardens, pervious pavement, tree trenches, and other best practices can be rewarded with an expedited review process or other incentives

More information: <http://bit.ly/2kho7QF>



REGULATORY TOOLS

Reduce Non-Point Source Pollution



- Non-point source pollution includes organic matter on streets
- Increasing the frequency of street sweeping is one way to reduce this type of pollution
- See poster 4 for more details

More information: <http://bit.ly/2hMUMH4>

Create a Lake Improvement District



- A Lake Improvement district gives power to landowners
- LIDs address impacts on surface water quality, wildlife habitat, or other issues of concern to property owners with land adjacent to lakes

More information: <http://bit.ly/2qXn3b>

Establish Impervious Surface Standards for New Development



- Setting standards ensures compliance with best practices
- They create local examples for possible infrastructure improvements in existing developments
- See poster 4 for more details

More information: <http://bit.ly/2xOm1M>



PUBLIC-PRIVATE PARTNERSHIPS

Adopt-a-Wetland Program



- Adopt-a-Wetland programs give local businesses a visible leadership role in water stewardship
- This helps communicate the value of water stewardship to the broader community

More information: <http://bit.ly/2qXn3b>

Partner With Businesses to Implement Rainwater Catchment Systems



- Catchment systems collect stormwater and reduce water costs
- Harvested water is commonly used for landscape purposes
- Also applicable in residential context
- See poster 4 for more details

More information: <http://bit.ly/2bz7J5>

Start a Stormwater Infrastructure Cost-Sharing Program



- In a cost-sharing program, the City can provide full or partial funding
- The City receives a conservation easement and a commitment to ongoing maintenance and upkeep by the property owner

More information: <http://bit.ly/2kho7QF>



By utilizing a set of best practices that includes incentives, regulatory tools, and public-private partnerships, Ramsey can encourage community-wide water stewardship. These efforts can provide a wide range of benefits including cost savings, improved wildlife habitat, increased property values, and an increased supply of water for a variety of uses.



Rehydrate Ramsey

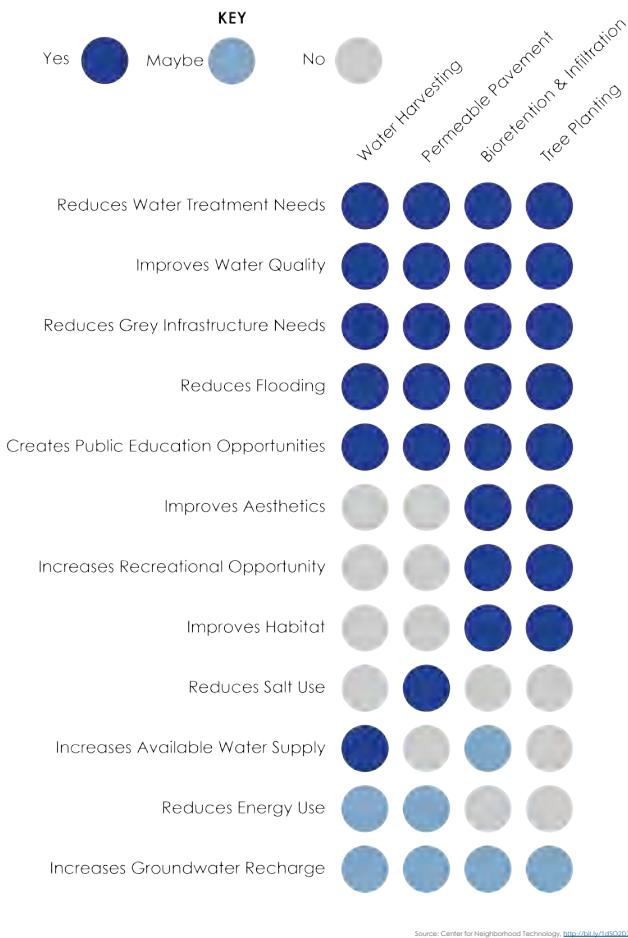
8

Quantifying the Benefits of Better Water Management

Good water stewardship can provide Ramsey with many community and economic benefits, including increased property values, reduced water demand, better water quality, and improved wildlife habitat. The costs of inaction are significant. Water sources can become permanently impaired, and remediation efforts are costly. In this poster, we explore a few opportunities in greater detail.

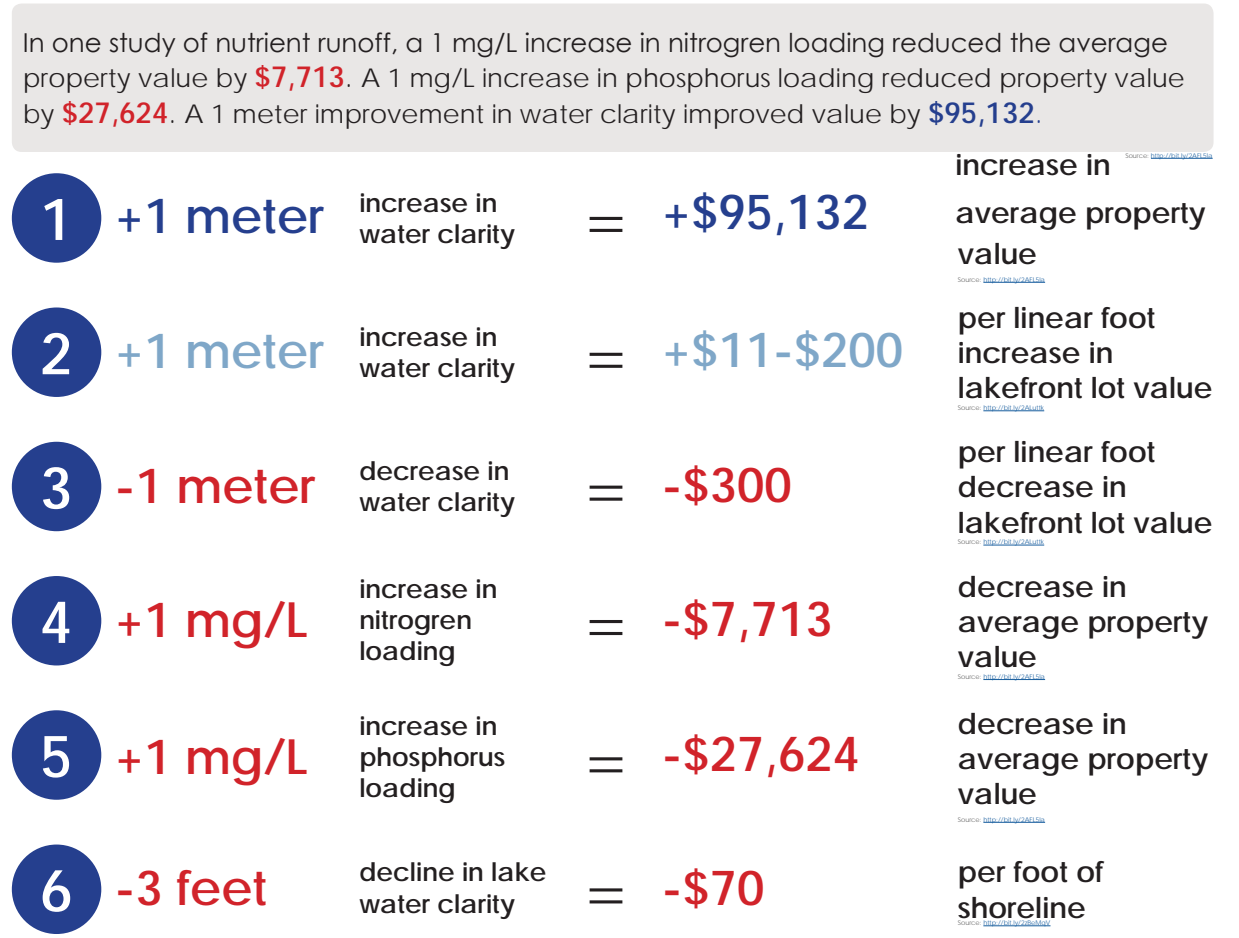
Resilient Water Infrastructure Creates Cross-Sector Benefits

The chart below shows the wide range of benefits provided by a selection of common water infrastructure best practices.



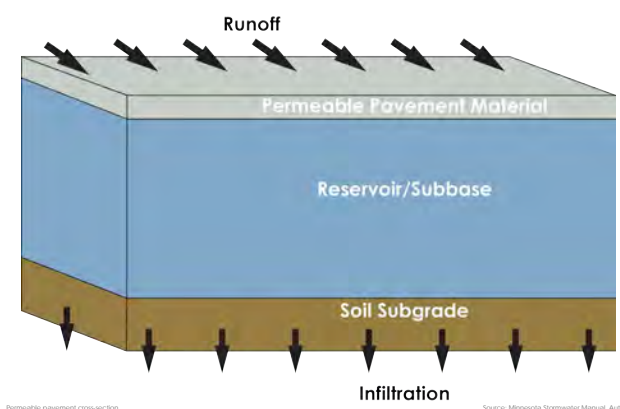
Protecting Property Values: Research on Water Quality Impacts

A number of studies in Minnesota and other states have linked water quality, measured in water clarity and quantity of pollutants like nitrogen and phosphorus, to property values. The relationship as described by these studies is shown below:



Reducing Road Salt Costs

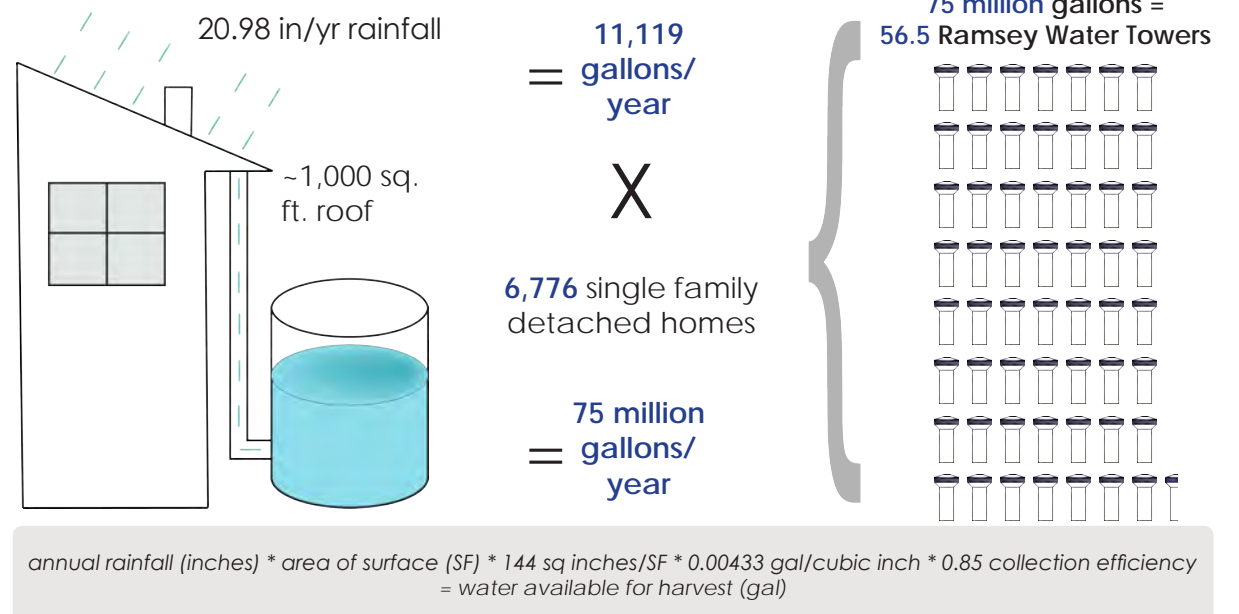
- **Pervious pavement** can reduce the amount of road salt needed in winter months by **up to 75%**, reducing costs.
- Road salt also contributes to surface water pollution, so reducing the amount used **results in better wildlife habitat and aquifer health.**



- Permeable pavement also delays frost layer formation, and it allows melt water to infiltrate, **reducing the amount of ice created by refreezing.**
- Source: Center for Neighborhood Technology. <http://www.cnt.com>

Decreasing Demand Through Water Harvesting

- A single-family homeowner in Ramsey who implements a **rain barrel catchment system** can expect to collect roughly **11,119 gallons of water** over the course of one year.
- A **cost-sharing program** would incentivize this practice.
- If all single-family homeowners implemented this strategy, the city would collectively have over **75 million gallons** of water available for use.



Ramsey has the potential to reap a wide range of benefits by protecting and preserving water quality. Some small steps today can help support larger changes tomorrow, securing a **healthy, productive future for the residents of Ramsey.** An updated water resources inventory is the first step in planning for Ramsey's future water needs.



Rehydrate Ramsey

9

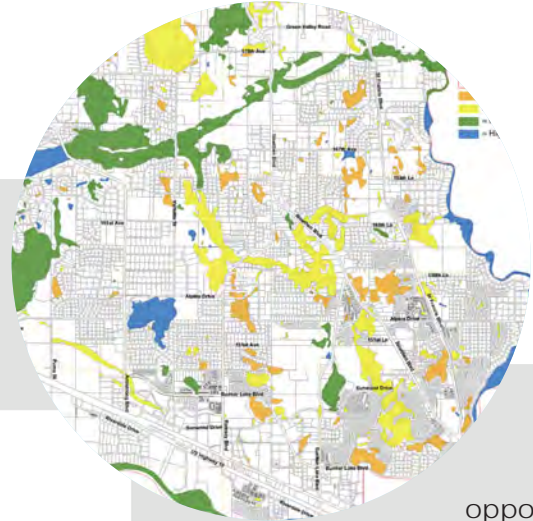
Bringing It All Together

As the City of Ramsey continues to grow, the water issues discussed in the preceding posters will only become more apparent. In this poster, we retrace our steps through the measures required to make Ramsey a resilient city in the face of future water management risks.

Existing Conditions

POSTER 2

To best assess the future of Ramsey's water it is important to conduct a thorough inventory of the current water resources in the city. A water inventory allows the City of Ramsey to know which areas of water management to target.



POSTER 3

An updated inventory will help us grasp the risks and opportunities posed by Ramsey's water assets. This assessment allows the water assets to be ranked, and priority to be placed on high ranked assets such as rivers and lakes.

Identifying value in water

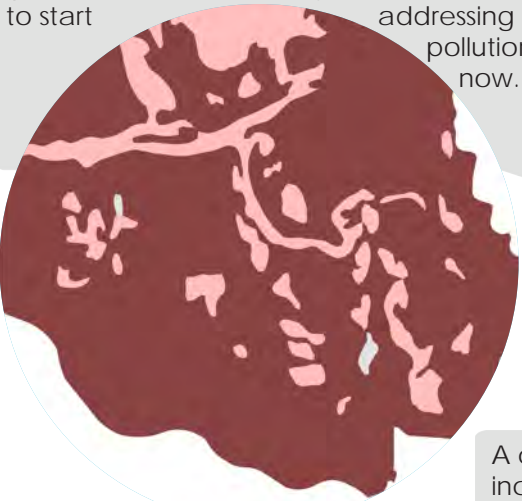
POSTER 4

Conservation looks at the different water assets that Ramsey has and prioritizes strategies that protect the most vulnerable areas first. Techniques include limiting consumption of groundwater and reducing pollution from non-point sources.

Community conservation

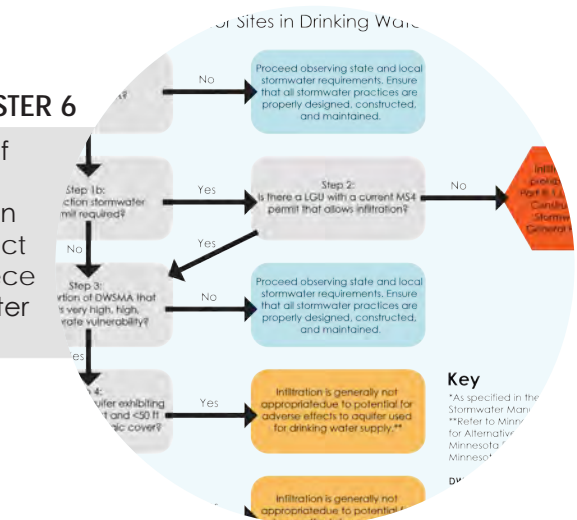
POSTER 5

Groundwater is Ramsey's most vital water resource and land use practices should work to protect groundwater. Most of the City of Ramsey is located in an area of high groundwater vulnerability, so it is important to start addressing pollution now.



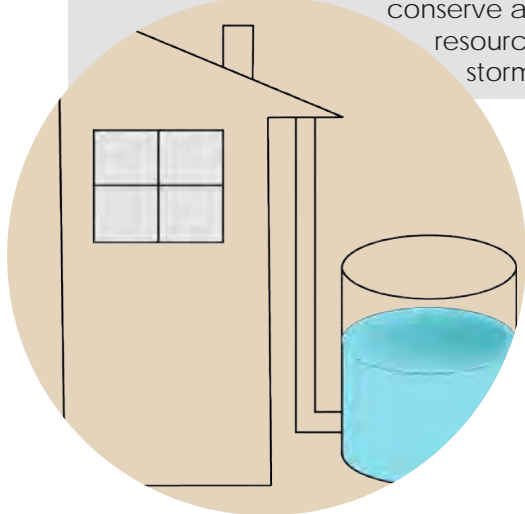
Stormwater is a major source of contamination for ground and surface water. Innovative urban design solutions that also protect drinking water will be a key piece of the solution to Ramsey's water challenges.

POSTER 6



POSTER 7

A combination of best practices that includes incentives, regulatory tools, and public-private partnerships will help the City of Ramsey best conserve and protect water resources and limit stormwater runoff.



Business Participation

City-supported strategies

Economy Health Character

POSTER 8

These steps will lead to a wide range of benefits for the City of Ramsey and its residents, including increased property values, a steady drinking water supply, and improved wildlife habitat.



With an integrated approach that addresses all facets of water, Ramsey will be well-positioned to accommodate the demands of projected growth. With an updated water resources inventory in hand and a set of proposed strategies to address water conservation, groundwater, and stormwater, the City will be ready to engage the community in a conversation about one of its most valuable assets. These strategies are essential to maintaining future economic prosperity and preserving Ramsey's character and health. By including them in the current comprehensive plan update, the City can take the next step towards cleaner and more abundant water for all.

Restoring Our Edge: Rehabilitating the Mississippi Shoreline in Ramsey



Prepared by

Alec Dix, Claire Freesmeier, and Ally Hillstrom

Students in PA 5211 Land Use Planning

Instructor: Dr. Fernando Burga

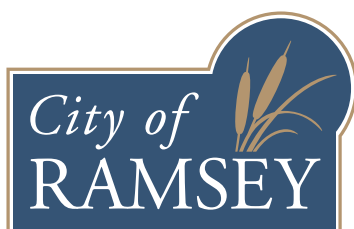
Hubert H. Humphrey School of Public Affairs

Prepared in Collaboration with

Chris Anderson

City Planner

City of Ramsey



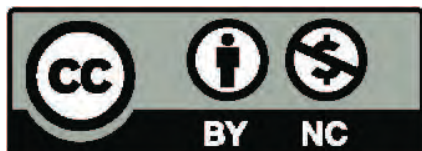
Resilient Communities Project

UNIVERSITY OF MINNESOTA

Building community-university partnerships for sustainability

The project on which this report is based was completed in collaboration with the City of Ramsey as part of the 2017–2018 Resilient Communities Project (RCP) partnership. RCP is a program at the University of Minnesota’s Center for Urban and Regional Affairs (CURA) that connects University faculty and students with Minnesota communities to address strategic projects that advance local resilience and sustainability.

The contents of this report represent the views of the authors, and do not necessarily reflect those of RCP, CURA, the Regents of the University of Minnesota, or the City of Ramsey.



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RESTORING OUR EDGE

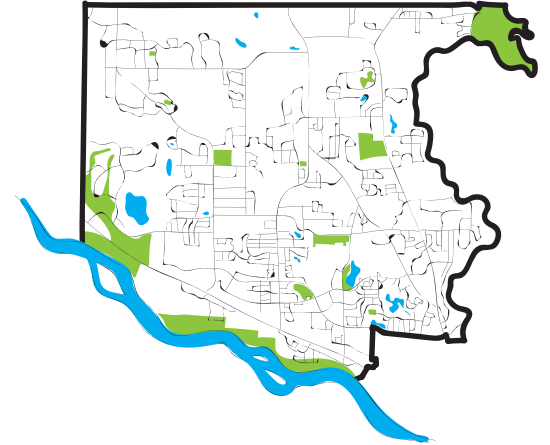
Rehabilitating the Mississippi Shoreline in Ramsey

1

Introduction

Erosion and the City of Ramsey

In 2015, the City of Ramsey hired the Anoka Conservation District to conduct a shoreline inventory, detailing the riverbank conditions in terms of erosion severity. This study provided a comprehensive understanding of property owners affected by shoreline issues. As a result of the inventory, segments of Ramsey's shoreline were classified under three erosion severity categories: **slight to moderate**, **severe**, and **very severe**.



The Mississippi River stretches 5.8 miles along the southern boundary of Ramsey, primarily through residential development.

PROJECT GOALS

- 1 **Identify** best shoreline restoration practices for property owners in Ramsey
- 2 **Identify** available funding options to assist property owners
- 3 **Identify** most effective engagement tools to increase property-owner participation
- 4 **Provide** case studies of real-world implementation of shoreline restoration projects



KEY COMPONENTS FOR SHORELINE RESTORATION IN RAMSEY

Shoreline erosion affects property owners through loss of land, but it also contributes to water quality issues that affect a much broader population. The extent of the problem has been identified and documented, so the next step is identifying and implementing solutions, as highlighted in this series of posters.



Restoration Practices

Best Land-Use Practices

- Vegetative plantings
- Branch pruning
- Buckthorn removal
- Proper yard waste disposal
- Limit mowing

Restoration Techniques

- Native vegetative plantings
- Cedar tree revetment
- Log bank
- Live staking
- Bank grading
- Hard armoring



Project Funding

Agencies

- MN Board of Soil and Water Resources
- Anoka Conservation District
- Conservation Corps of MN and IA
- Lower Rum River Watershed Management Organization (WMO)

Funding

- Non-point engineering assistance
- Water quality cost share

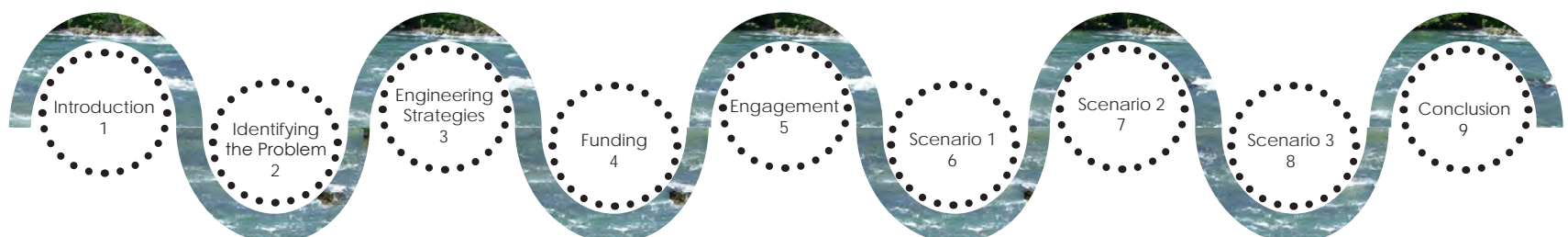


Public Engagement

Outreach Opportunities

- Host public meeting
- Send direct mailing
- Host community workshop
- Provide site tours
- Create a website
- Host a pop-up event

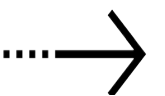
PROJECT OUTLINE



RESTORING THE EDGE



Management strategies, funding resources, and engagement tools are essential to successfully restore our edge. Quantifying the shoreline erosion problem will ensure that appropriate strategies, funding, stakeholders, and engagement opportunities are identified. The next poster illustrates and quantifies the problem of shoreline erosion—specifically as it relates to Ramsey, but also at a larger scale.



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

What is the current condition of our edge?

In 2016, the Anoka Conservation District (ACD) documented the presence of **shoreline erosion** along the Mississippi River in Ramsey. They reported that both private and public land in Ramsey had **severe** and **very severe** rates of erosion in some areas, contributing to **tons of soil** entering the Mississippi River each year.

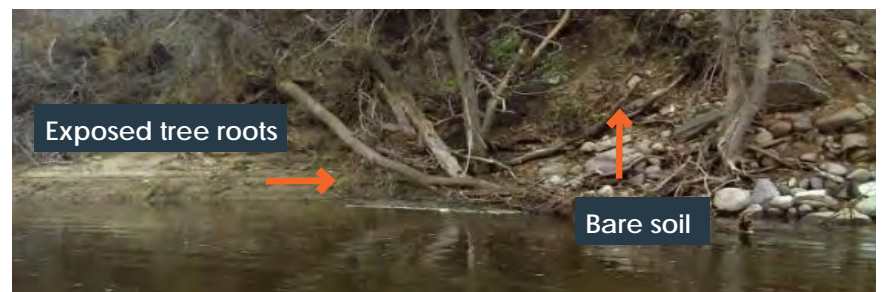
STATUS OF SHORELINE EROSION IN RAMSEY

- **0.64 miles** of Ramsey's shoreline has **severe erosion**
- **0.60 miles** of Ramsey's shoreline has **very severe erosion**
- **5,148 tons** of sediment enters the Mississippi each year due to shoreline erosion in Ramsey
- **77%** of this sediment enters the Mississippi from private properties with very severe erosion

PRESSING CONCERNS for Ramsey's Shoreline Property Owners

Property Loss

- Natural factors such as accelerated flow rates, waves, wind, and ice cause shoreline erosion.
- Unstabilized shorelines are unprotected from erosion and vulnerable to property loss.
- Property owners along Lake Itasca lost 6 inches of shoreline per year prior to shoreline stabilization.



Property loss due to shoreline erosion in Ramsey

Decreased Water Quality

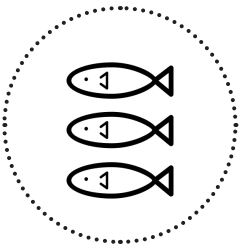
- Shoreline erosion deposits sediment in the river, which is carried downstream.
- Increased sediment concentration decreases the clarity of the water.
- This in turn reduces the depth to which light can penetrate through the water, impacting aquatic ecosystems.



The Mississippi River has a high concentration of suspended sediment, affecting water clarity

Ecosystem Impacts

- Reduced water clarity leads to a reduction in light absorbed by aquatic plants, which is critical for growth.
- Without plants, fish communities are threatened by habitat loss, which reduces reproduction.
- Sediment and other pollutants carried down the Mississippi have created a dead zone in the Gulf of Mexico.

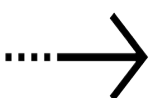


Sediment and other pollutants carried by the Mississippi enter the Gulf of Mexico at the Mississippi River Delta

WATER QUALITY MATTERS



The water quality of the Mississippi River is greatly influenced by land uses along the river, from the Minnesota headwaters to the Mississippi River Delta in Louisiana. Fortunately, effective shoreline restoration options exist. The City and property owners can collaborate to limit shoreline erosion in Ramsey, while simultaneously improving the Mississippi's water quality both locally and downstream.



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

3

Shoreline Restoration Techniques

What causes shoreline erosion in Ramsey?

Shoreline erosion is caused by natural factors and land use practices. To prevent erosion, avoid excessive mowing and removing vegetation along your property's edge. If erosion already exists on your property, effective restoration techniques can be implemented. Below are illustrations of the three categories the Anoka Conservation District uses to define shoreline erosion severity.



Slight to Moderate Erosion



Severe Erosion



Very Severe Erosion

Shoreline Restoration Techniques

Staking



Where it Works: Slight to Severe Erosion
Basic Idea: Take cuttings of woody plants (live stakes) like willow and dogwood and drive them into the substrate of the eroded area. They will sprout roots and grow. Typically this is done in early spring or late winter.
Cost: Low
Difficulty: Easy, can be done by landowner.

Grading



Where it Works: Moderate to Severe Erosion
Basic Idea: The objective of bank grading is to reduce the steepness of the bank slope and decrease erosion caused by waves striking the bank.
Cost: Moderate
Difficulty: Moderate

Hard Armor



Where it Works: Severe to Very Severe Erosion
Basic Idea: A layer of stones (riprap) is laid along a slope face or bank to prevent erosion caused by wave action.
Cost: Moderate to high
Difficulty: Moderate

Vegetation



Where it Works: Slight to Moderate Erosion
Basic Idea: This method involves re-planting native vegetation that will naturally stabilize the shoreline. The deep roots of these plants tightly binds the earth below, effectively protecting the shoreline from erosion.
Cost: Low
Difficulty: Easy, can be done by landowner.

Cedar Revetment



Where it Works: Slight to Moderate Erosion
Basic Idea: The technique involves cable-anchoring cut cedar trees alongside the bank. The tree's dense branches and naturally rot-resistant wood provide years of bank armoring, and allows for the build-up of sediment over time.
Cost: Low
Difficulty: Moderate, can be done by landowner.

Log Bank



Where it Works: Slight to Moderate Erosion
Basic Idea: Place coarse woody debris, such as brush bundles or logs, along the shoreline to reduce wave action and allow natural regeneration of plants.
Cost: Low
Difficulty: Easy, can be done by land owner.

RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

What funding is available for restoration projects?

Although private property owners are financially responsible for landscape alterations on their land, financial assistance can offset shoreline restoration costs. Funding for engineering designs, materials, and labor is available through the Anoka Conservation District.

FUNDING AGENCIES

MN Board of Water and Soil Resources (BWSR)	Anoka Conservation District (ACD)	Lower Rum River WMO (LRRWMO)	Conservation Corps of Minnesota and Iowa (CCMI)
BWSR is the state agency that funds Soil and Water Conservation Districts (SWCD) and programs to prevent sediment and nutrients from entering water resources. → www.bit.ly/BWSR_MN	ACD is Anoka County's SWCD. This agency provides technical assistance, tools, and funding for property owners to manage and protect water resources in Anoka County. → www.bit.ly/ACD_MN	LRRWMO is a government unit that protects and improves water resources in Ramsey, Anoka, and portions of Andover. Funding assistance is provided to ACD and then passed to applicants. → www.bit.ly/LRR_MN	CCMI provides natural resource-based community-service projects for local governments with the help of young adults interested in natural resource management. → www.bit.ly/CCMI_MN

AVAILABLE FUNDS for Property Owners

Non-Point Engineering Assistance Program (NPEAP)	Water Quality Cost Sharing Program	Conservation Corps Funding
This program provides financial assistance to contract with consulting engineers for the design of conservation practices. Disbursement Method Applicant applies through ACD. Residents from eleven counties are eligible for these competitive funds. → www.bit.ly/ACD_NPEAP	ACD, LRRWMO, and BWSR provide financial assistance for implementation of shoreline restoration projects. Disbursement Method Applicant applies through ACD for funds that cover 50–75% of material and labor expenses. → www.bit.ly/ACD_CostShare	BWSR provides the CCMI \$500,000 annually to fund labor for restoration projects that protect water resources. Disbursement Method ACD applies on behalf of the property owner for funds that cover 100% of labor costs. → www.bit.ly/CCMI_Funding

CASE STUDIES of Funded Private Restoration Projects in Ramsey

Smith Property: Cedar Revetment	Geldaker Property: Hard Armor/Riprap
 <p>Cedar trees laid to stabilize shore</p> <p>Project Funding CCMI grant: \$3,850 ACD in-kind: \$2,236 Landowner: \$914 ACD cost share \$533 Community donation: \$475 ----- Total project cost: \$8,009</p>	 <p>Mixed size rocks placed on shore</p> <p>Project Funding LRRWMO cost share: \$1,431 Ag Preserves cost share: \$5,746 NPEAP: \$9,722 ACD in-kind: \$4,086 Landowner funds: \$23,100 ----- Total project cost: \$44,085</p>



We encourage the City of Ramsey to spread awareness of available funds to property owners through outreach activities presented in the next poster. Additionally, property owners interested in funding opportunities may contact the City or ACD for more information.



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

What are the best engagement strategies for Ramsey?

Engaging landowners to participate in shoreline restoration is essential to ensure success in restoring our edge. **The City of Ramsey may consider implementing a combination of the six public engagement strategies identified below.** Depending on the relationship with the property owners, certain engagement strategies can generate increased participation.

Direct Mailing

Direct mailings can include letters, pamphlets, and surveys.

- Simplicity
- Wide range of audience
- Loaded with information

- Indirect
- Lack of enticement
- Easily disregarded

- Primarily Adults

Public Meeting

Public meetings allow the City to address the issue and shoreline owners to voice their opinion.

- Promote discussion
- Brainstorm alternative solutions
- Opportunity to create consensus

- Attendance is voluntary
- Less vocal participants overshadowed by the more vocal

- All levels

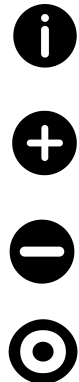
Workshop

Workshops can include presentations, breakout sessions, and interactive activities.

- Enhanced understanding of topic
- Visualization of solutions
- High participation rate

- Can require an extended amount of time
- Can require outside materials/trainers

- All levels



Case Studies

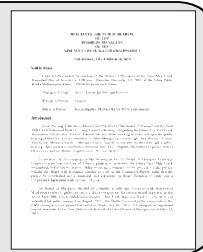
Anoka Conservation District

- Mailed a brochure of restoration strategies to residents
- Included technical and financial resources



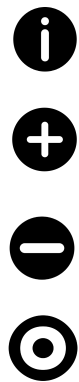
The City of Edina

- Nine Mile Creek Stream-bank Stabilization Project
- Addressed public comments about the engineers' report and easements



Scott County SWCD

- Held a workshop for landowners to learn about stabilizing shorelines with native buffers and available financial assistance



Case Studies

Site Tours

Site tours present an opportunity to see first-hand possible solutions.

- Participatory appeal
- Visualization
- Promote action

- Amount of time
- Extensive organization

- All Levels

Pop-Ups

Pop-up events rely on individual responses to surveys, questions, and ideas in exchange for a giveaway

- Inclusive of less vocal participants
- Encourages honesty
- Unique and engaging

- Reliant on appropriate time frame
- Informal

- All levels

E-Based

E-based engagement comes in many forms, such as websites, social media, emails, and mobile apps

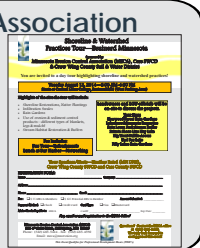
- Accessibility to information and involvement
- Minimal time commitment

- Inefficient sharing of information
- Lack of direction and potential for exclusion

- Technologically literate

Minnesota Erosion Control Association

- Held a tour to highlight shoreline and watershed practices
- Hosted by MN DNR, Crow Wing SWCD, and Cass SWCD



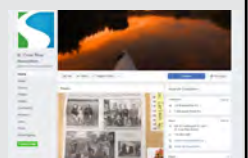
City Popsicle Truck (St. Paul)

- In exchange for answering questions, surveys, and quizzes, participants received a popsicle



The St. Croix River Association

- Has a Facebook page with over 1,600 likes
- Posts relevant events, informative articles, and photographs related to the river



ENGAGEMENT TOOLS



Given these engagement options, the best approach for Ramsey is a combination of direct mailings, social media, and site tours. The next three posters will help landowners understand potential implementation strategies and funding opportunities using several shoreline restoration scenarios.



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

6



Restoration: Slight to Moderate

How to address slight to moderate erosion?

The following three posters present example restoration projects for the three erosion-severity categories: slight to moderate, severe, and very severe.

Erosion Severity Category: Slight to Moderate Erosion

Slight to moderate erosion includes areas with some bare banks, but where active erosion is not readily apparent. Some vegetative overhang and some exposed tree roots may be present, but no slumps or slips are visible.

EXAMPLE RESTORATION PROJECT



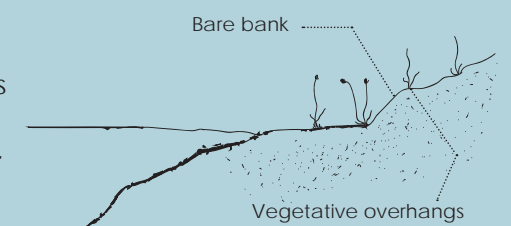
Slight to Moderate Erosion

Edge Conditions:

- 1 Bare bank
- 2 Vegetative overhangs

Potential Causes of Erosion:

- Removal of vegetation
- Excessive mowing



Case study cross section, NTS



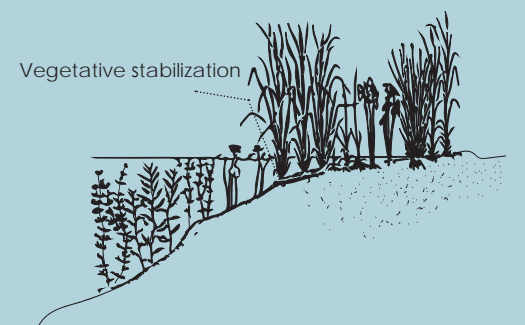
Please note that the shoreline depicted in this example is only for the purpose of illustrating commonly used restoration techniques, and has not been approved by an engineer.



Restored Shoreline

Description:

Revegetation, which involves replanting with native vegetation, was used to stabilize the shoreline. The deep roots of these plants bind the earth below tightly, effectively protecting the shoreline from erosion.



Case study cross section, NTS

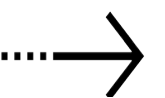
Why This Strategy Was Used:

This strategy was chosen because it is a relatively easy and cost-effective method of shoreline restoration for areas with slight to moderate erosion. After consultation with an engineer, this method can be completed by the landowner.

KEY TAKEAWAYS



Both natural edge conditions and land-use practices on adjacent land may lead to slight to moderate erosion. In this example, a moderate slope, wave action, and ice abrasion from the river increased the shoreline's susceptibility to erosion. When shorelines are unmanaged and vegetation is removed, slight to moderate erosion is likely to occur. Before beginning a restoration project, an engineer should be consulted to review and approve the restoration plan. To see a completed restoration project in Ramsey involving revegetation, visit <http://arcg.is/2ArNvae>



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

7

Restoration:
Severe Erosion

How to restore severe erosion?

Erosion Severity Category: Severe Erosion

Severe erosion is identified as a bare bank with visible vegetative overhang and rills. Often there will also be exposed tree roots and even fallen trees. A cross-section view of the river channel would show a U-shaped slope rather than an uneroded V-shape. The Anoka Conservation District considers shorelines that lose 0.3–0.5 feet per year to be experiencing severe erosion.

EXAMPLE RESTORATION PROJECT



Severe Erosion

Edge Conditions:

- 1 Bare bank
- 2 Vegetative overhang
- 3 U-shaped slope

Potential Causes of Erosion:

- Tall bank
- Steep slope
- Excessive mowing

! Please note that the shoreline depicted in this example is only for the purpose of illustrating commonly used restoration techniques, and has not been approved by an engineer.

Case study cross-section, NTS



Restored Shoreline

Description:

Cuttings (live stakes) of woody plants like willow and dogwood are driven into the substrate of the eroded area. They will sprout roots and grow. Typically this is best done in early spring or late winter.

Case study cross-section, NTS

Why This Strategy Was Used:

Live staking establishes native, woody shrubs that catch sediment and begin to rebuild the shoreline. Bank grading and revegetation were also used to recontour and stabilize the upper section of the shore. This is an effective restoration solution for this shoreline because there is minimal human use.

KEY TAKEAWAYS



Both natural edge conditions and land-use practices may lead to severe erosion. In this example, a steep slope, wave action, and ice abrasion from the river increased this shoreline's susceptibility to erosion. When shorelines are unmanaged and left with bare soils, severe erosion is likely to occur. Before beginning a restoration project, an engineer should be consulted to review and approve the restoration plan. To see a completed restoration project in Ramsey involving live staking, visit <http://arcg.is/2ArNvae>.



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

8

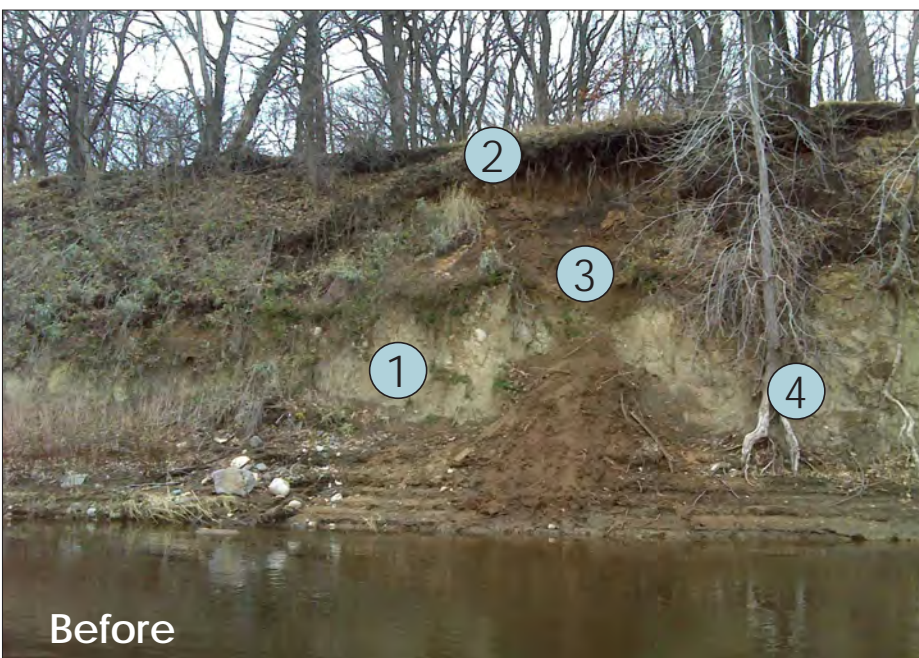
Restoration:
Very Severe

How to restore very severe erosion?

Erosion Severity Category: Very Severe Erosion

The Anoka Conservation District considers shorelines that lose 0.5 feet or more per year to be experiencing very severe erosion. Shorelines with very severe erosion typically have bare banks with severe vegetation overhang. Very severe erosion can cause tree roots to become exposed and may result in these trees falling over time. Very severe erosion will also cause drains and culverts to wash out. Massive slips, where a large portion of the shoreline breaks off, are another indication of very severe erosion.

EXAMPLE RESTORATION PROJECT



Before

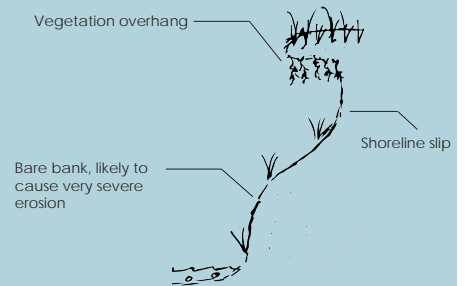


After

Very Severe Erosion

Edge Conditions:

- ① Bare bank
- ② Vegetation overhang
- ③ Shoreline slip
- ④ Tree root eroding



Potential Causes:

- Steep slope
- Tall bank

Case study cross-section, NTS

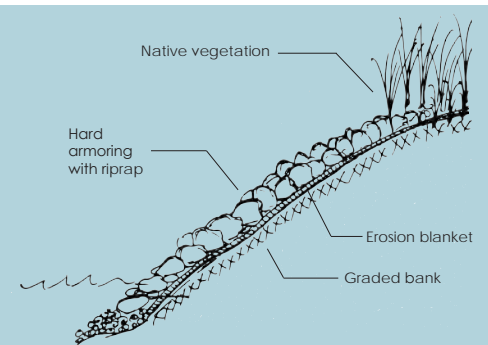


Please note that the shoreline depicted in this example is only for the purpose of illustrating commonly used restoration techniques, and has not been approved by an engineer.

Restored Shoreline

Description:

The bank was backfilled with soil and graded to reestablish a gradual slope. Riprap (mixed-size rock) was then laid over geotextile fabric to further protect the edge. Native vegetation was also planted.



Case study cross-section, NTS

Why This Strategy Was Used:

Hard armoring with riprap is a common restoration technique for severely eroded edges. This strategy was chosen to stabilize the bare soil and prevent erosion caused by wave action. Native vegetation was also added in adjacent areas with less severe erosion to stabilize the edge and provide wildlife habitat.

KEY TAKEAWAYS



In this example, a steep slope and wave action from the river increased the shoreline's susceptibility to erosion. If riprap and native vegetation are used as restoration techniques, it is important to occasionally eliminate weed growth and check for dislodged rocks and bank failures. Before beginning a restoration project, an engineer should be consulted to review and approve the restoration plan. To review a hard armoring restoration project that has been completed in Ramsey, visit www.bit.ly/HardArmor



RESTORING OUR EDGE

Rehabilitating the Mississippi Shoreline in Ramsey

What are the key takeaways?

The City and Ramsey's shoreline property owners should consider the following key components when collaborating on a shoreline restoration initiative.

HOW DO YOU RESTORE YOUR EDGE?

Below are six restoration strategies that could be deployed to rehabilitate your edge.

Which Restoration Method Should I Use?

Slight to Moderate Erosion

- Revegetation
- Cedar Revetment
- Staking
- Log Bank

Severe Erosion

- Hard Armor
- Grading
- Staking

Very Severe Erosion

- Hard Armor

WHO PROVIDES FUNDING FOR RESTORATION PROJECTS?

Although private property owners are financially responsible for landscape alternations on their land, financial assistance can offset shoreline restoration costs. Funding for engineering designs, materials, and labor can be obtained through the Anoka Conservation District. Funding availability may change on an annual basis as funds are allocated by state legislation. Property owners are encouraged to contact the Anoka Conservation District to determine which grant funds would be most appropriate for their shoreline restoration project.

MN Board of Water and Soil Resources (BWSR)	Anoka Conservation District (ACD)	Lower Rum River WMO (LRRWMO)	Conservation Corps of Minnesota and Iowa (CCMI)
BWSR is the state agency that funds Soil and Water Conservation Districts (SWCD) to prevent sediment and nutrients from entering water bodies. www.bit.ly/BWSR_MN	ACD is Anoka County's SWCD. This agency provides technical assistance, tools, and funding to property owners to manage and protect water resources in Anoka County. www.bit.ly/ACD_MN	LRRWMO is a government unit that protects and improves water resources in Ramsey, Anoka, and portions of Andover. Funding is provided to ACD and then allocated to applicants. www.bit.ly/LRR_MN	CCMI performs natural resource-based community-service projects for local governments with the help of young adults interested in natural resource management. → www.bit.ly/CCMI_MN

HOW DO YOU ENGAGE STAKEHOLDERS IN THE PLANNING PROCESS?

The best stakeholder engagement approach for Ramsey is a combination of **direct mailing, public meetings, social media, and site tours**. A **direct mailing** consisting of an informational brochure explaining the impacts of shoreline erosion could be effective in helping landowners understand the significance of the problem. **Social media** could foster discussion and interaction among shoreland owners. A **public meeting** would give landowners a chance to learn more about restoration options and grants that are available to assist landowners with projects. Finally, a **site tour** would allow landowners to see firsthand completed shoreline restoration projects, and talk to those property owners about their experiences.

